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**Input paper for the following Committee(s):**  **Purpose of paper:**

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ARM  ENG  PAP  Input

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**Agenda item** n.n

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**Author(s)/Submitter(s)** China MSA

Proposed Revision to Recommendation ITU-R M.2092-1[[1]](#footnote-1)

# Summary

This document presents proposals for revising the preliminary draft revision of Recommendation ITU-R M.2092-1, which resulted from the 34th meeting of ITU-R Working Party 5B. The proposed revisions include: the use of Message 7 to suppress the transmission of ASM-SAT messages within shore coverage areas, the acknowledgement of uplink addressing messages, and several clarifications intended to improve the Recommendation.

## Purpose of the document

The purpose of this document is to propose revisions and enhancements to Recommendation ITU-R M.2092-1, update its technical details, and provide a reference for the Committee.

## Related documents

1. IALA Committee Work Program (2023-2027)
2. ITU-R M.2092-1 Technical characteristics for a VHF data exchange system in the VHF (R23-WP5B-C-0315!H4-N04.07)

# Background

At its 110th session, the International Maritime Organization (IMO) Maritime Safety Committee (MSC) agreed in principle to incorporate VDES into the International Convention for the Safety of Life at Sea (SOLAS). Consequently, the implementation and deployment of VDES applications are expected to become widespread.

However, with the practical deployment and application of VDES technology, some potential issues in Recommendation ITU-R M.2092-1 have emerged. It is therefore necessary to revise and improve the original standard to enhance its applicability. Additionally, the current preliminary draft revision of the Recommendation contains some imprecise statements, and it is proposed that these be clarified.

# Discussion

We propose:

* Add a new field in Message 7 to the suppression of ASM-SAT message transmissions within shore-based coverage areas and its corresponding description;
* To address the issue of ambiguity in the bit-to-fragment correspondence in the ACK message when both the start and end fragments of an uplink addressed message are lost, a limit of 200 fragments has been set for uplink addressed messages.

In addition, for the imprecise expressions in the current preliminary draft revision, clarification suggestions are as follows:

* Change the title of Figure 6 to match its content.
* Modify Figure 24 in Annex 4 to make its presentation clearer and more complete.

The revision of ITU-R M.2092-1 in detail is shown in the annex.

# References

1. ITU-R M.2092-1 Technical characteristics for a VHF data exchange system in the VHF

# Action requested of the Committee

The Committee is requested to:

1. Consider the suggestions in section 3.
2. Take appropriate actions.

| Comment Number:  Name-# | Change Log ID | Annex / Section | Section, Table, Figure | Type of change | Reason for the change, or what you want to accomplish | Proposed change to ITU-R M.2092-1, short editorial changes can be include here (large changes should be documented below) |
| --- | --- | --- | --- | --- | --- | --- |
| China MSA-1 | NA | Annex 3 | 7.10,  Table 33 | Tech. Improvement | In accordance with the consensus reached at the DTEC4 meeting, the suppression of ASM-SAT transmissions from shipborne stations within coastal areas shall be controlled by the shore-based station. To support this functionality, a control field has been added to Table 33, and corresponding instructions on its use have been included in Section 7.10. | Modify as shown below. |
| China MSA-2 | NA | Annex 5 | 3.10.13,  Table 83 | Tech. Improvement | If both the start and end fragments are lost, it becomes impossible to determine the correspondence between the bits in the acknowledgement (ACK) message and the individual data fragments. Therefore, the number of fragments for an uplink addressed message is limited to 200. | Modify as shown below. |
| China MSA-3 | NA | Annex 4 | 4.9.7,  FIgure 42 | Tech. Improvement | According to the conclusion of the previous meeting, China MSA has conducted practical tests on two solutions for overlapping service area management as discussed at DTEC4. The first solution is the “service area priority” approach proposed by China MSA, and the second is the “single base station broadcasting multiple service areas” approach. Test results indicate that both solutions can effectively resolve the issue of overlapping service areas, though there are some differences in terms of deployment and type approval complexity.  At this meeting, China MSA will give a brief presentation to introduce the test process and main findings for the reference of all participants. It is proposed that DTEC5 discusses the advantages and disadvantages of these two solutions in detail and reaches a consensus. | Modify as shown below. |
| China MSA-4 | NA | Annex 2 | 1.2.3.5,  Figure 6 | Clarity | Figure 6 shows the case that FEC is applied. The title doesn’t match the figure. | Change the title to  Typical order of operations for symbol data; if cyclic redundancy=1 and forward error correction is ~~not~~ applied |
| China MSA-5 | NA | Annex 4 | 4.6,  Figure 24 | Clarity | Section 4.6 of Annex 4 specifies the data structure of the VDE data packet. In Figure 24, "Segment" and "Fragment" have been added to comprehensively illustrate the hierarchical relationship within the VDE-TER protocol, from upper-layer application data to link-layer messages. | Modify as shown below. |

**Comments:**

The proposed revisions are shown in track changes and highlighted blue in the Attachment.

**China MSA-1**

**7.10 Message 7: ASM data link management message**

In addition, this message is also used to control the enabling and disabling of the ASM-SAT function on shipborne stations within the coverage area of shore stations. For shipborne stations, ASM-SAT is disabled by default. If the shipborne station receives message 7 containing the value 0 in transmission control for ASM-SAT field for at least 4 minutes within a 5-minute window, it shall disable ASM-SAT. Conversely, if no messages containing the value 0 in transmission control for ASM-SAT field are received for 3 consecutive minutes within 5 minutes, the shipborne station shall enable ASM-SAT.

Table 33

**ASM data link management message**

| **Reservation Block** | **Parameter** | **Number of bits** | **Description** |
| --- | --- | --- | --- |
|  | Message ID | 4 | 7 – ASM Data link management. |
| Retransmit flag | 1 | 0 (reserved for future use). |
| 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. |
| Session ID | 6 | The Session ID associates the VDL transmission with a specific PI transaction. |
| Source ID | 32 | The Unique Identifier of the transmitting station as described in § 2.4, Annex 1. |
| Reservation Block 1 | Channel selection | 2 | 0 = ASM1; 1 = ASM2; 2 = ASM1 and ASM2; 3 = no reservation. |
| Offset number | 12 | Reserved offset number. |
| Number of slots | 4 | Number of reserved consecutive slots: 1-15. |
| Time-out | 4 | Time-out value in minutes. |
| Increment | 4 | Increment to repeat reservation block 1.  0 = one reservation block per frame.  1 = 30, 2 = 45, 3 = 50, 4 = 75, 5 = 90, 6 = 125, 7 = 150, 8 = 225, 9 = 250, 10 = 375, 11 = 450, 12 = 750, 13 = 1125, 14-15 not used. |
| Reservation Block 2 | Channel selection | 2 | 0 = ASM1; 1 = ASM2; 2 = ASM1 and ASM2; 3 = no reservation. |
| Offset number | 12 | Reserved offset number. |
| Number of slots | 4 | Number of reserved consecutive slots: 1-15. |
| Time-out | 4 | Time-out value in minutes. |
| Increment | 4 | Increment to repeat reservation block 2.  0 = one reservation block per frame.  1 = 30, 2 = 45, 3 = 50, 4 = 75, 5 = 90, 6 = 125, 7 = 150, 8 = 225, 9 = 250, 10 = 375, 11 = 450, 12 = 750, 13 = 1125, 14-15 not used. |
| Reservation Block 3 | Channel selection | 2 | 0 = ASM1; 1 = ASM2; 2 = ASM1 and ASM2; 3 = no reservation. |
| Offset number | 12 | Reserved offset number. |
| Number of slots | 4 | Number of reserved consecutive slots: 1-15. |
| Time-out | 4 | Time-out value in minutes. |
| Increment | 4 | Increment to repeat reservation block 3.  0 = one reservation block per frame.  1 = 30, 2 = 45, 3 = 50, 4 = 75, 5 = 90, 6 = 125, 7 = 150, 8 = 225, 9 = 250, 10 = 375, 11 = 450, 12 = 750, 13 = 1125, 14-15 not used. |
| Reservation Block 4 | Channel selection | 2 | 0 = ASM1; 1 = ASM2; 2 = ASM1 and ASM2; 3 = no reservation. |
| Offset number | 12 | Reserved offset number. |
| Number of slots | 4 | Number of reserved consecutive slots: 1-15. |
| Time-out | 4 | Time-out value in minutes. |
| Increment | 4 | Increment to repeat reservation block 4.  0 = one reservation block per frame.  1 = 30, 2 = 45, 3 = 50, 4 = 75, 5 = 90, 6 = 125, 7 = 150, 8 = 225, 9 = 250, 10 = 375, 11 = 450, 12 = 750, 13 = 1125, 14-15 not used. |
| Reservation Block 5 | Channel selection | 2 | 0 = ASM1; 1 = ASM2; 2 = ASM1 and ASM2; 3 = no reservation. |
| Offset number | 12 | Reserved offset number. |
| Number of slots | 4 | Number of reserved consecutive slots: 1-15. |
| Time-out | 4 | Time-out value in minutes. |
| Increment | 4 | Increment to repeat reservation block 5.  0 = one reservation block per frame.  1 = 30, 2 = 45, 3 = 50, 4 = 75, 5 = 90, 6 = 125, 7 = 150, 8 = 225, 9 = 250, 10 = 375, 11 = 450, 12 = 750, 13 = 1125, 14-15 not used. |
| Reservation Block 6 | Channel selection | 2 | 0 = ASM1; 1 = ASM2; 2 = ASM1 and ASM2; 3 = no reservation. |
| Offset number | 12 | Reserved offset number. |
| Number of slots | 4 | Number of reserved consecutive slots: 1-15. |
| Time-out | 4 | Time-out value in minutes. |
| Increment | 4 | Increment to repeat reservation block 6.  0 = one reservation block per frame.  1 = 30, 2 = 45, 3 = 50, 4 = 75, 5 = 90, 6 = 125, 7 = 150, 8 = 225, 9 = 250, 10 = 375, 11 = 450, 12 = 750, 13 = 1125, 14-15 not used. |
| Reservation Block 7 | Channel selection | 2 | 0 = ASM1; 1 = ASM2; 2 = ASM1 and ASM2; 3 = no reservation. |
| Offset number | 12 | Reserved offset number. |
| Number of slots | 4 | Number of reserved consecutive slots: 1-15. |
| Time-out | 4 | Time-out value in minutes. |
| Increment | 4 | Increment to repeat reservation block 5.  0 = one reservation block per frame.  1 = 30, 2 = 45, 3 = 50, 4 = 75, 5 = 90, 6 = 125, 7 = 150, 8 = 225, 9 = 250, 10 = 375, 11 = 450, 12 = 750, 13 = 1125, 14-15 not used. |
| Reservation Block 8 | Channel selection | 2 | 0 = ASM1; 1 = ASM2; 2 = ASM1 and ASM2; 3 = no reservation. |
| Offset number | 12 | Reserved offset number. |
| Number of slots | 4 | Number of reserved consecutive slots: 1-15. |
| Time-out | 4 | Time-out value in minutes. |
| Increment | 4 | Increment to repeat reservation block 6.  0 = one reservation block per frame.  1 = 30, 2 = 45, 3 = 50, 4 = 75, 5 = 90, 6 = 125, 7 = 150, 8 = 225, 9 = 250, 10 = 375, 11 = 450, 12 = 750, 13 = 1125, 14-15 not used. |
|  | Transmission control for ASM-SAT | 1 | 0 = default – Mobile station stops transmission via ASM-SAT of within an ASM shore station coverage area.  1 = Allow Mobile station to transmit messages via ASM-SAT within an ASM shore station coverage area. |
|  | Spare | 2 | Spare bits – reserved for the future. |

**China MSA-2**

**3.10.13 Uplink acknowledgement**

Table 83

**Uplink acknowledgement for addressed messages**

| **Field  No.** | **Size  (bytes)** | **Function** | **Content** |
| --- | --- | --- | --- |
| 1 | 1 | Type | Type = 13. |
| 2 | 1 | Satellite ID | 0-255. |
| 3 | 4 | Ship Station ID | The Unique Identifier of the ship station, as described in § 2.4, Annex 1. |
| 4 | 1 | Session ID | 1-255. |
| 5 | 1 | Resource re-allocation | Number of subsequently allocated VDE-SAT sub-frames of the logical channel this acknowledgment message refers to.  If the transmitting station is provided with a new resource allocation for this session, or in order to cancel the current allocation, this field is set to 0. |
| 6 | 1 | Uplink CQI | Received Channel Quality Indicator averaged over the last TDMA frame received as defined in § 1.2.8, Annex 2. |
| 7 | 1 | Adaptive coding and modulation control | 4 MSB.  0: Maintain Link ID.  1: Select Link ID with next higher CQI.  2: Select Link ID with next lower CQI.  4 LSB.  0: Use default power level for current Link ID.  1: Reduce Power level 10 dB.  2: Reduce power level 3 dB.  3: Increase power level 3 dB. |

Table 83 (*end*)

| **Field  No.** | **Size  (bytes)** | **Function** | **Content** |
| --- | --- | --- | --- |
| 8 | 25 | ACK/NACK mask | When a burst was not received, then its corresponding bit should be set to one to Not Acknowledge the packet.  The mask indicates ACK/NACK for the ~~previous~~ 200 bursts as historically allocated for this uplink session in the previous VDE-SAT sub-frames.  The mask works like a 200 bits long ~~shift~~ register, with the most significant bit of the first byte representing the oldest allocated burst~~, and the least significant bit of the last byte the most recent allocated burst~~. Bits representing bursts before allocation started shall be set to one.  If the uplink Link ID changes, the mask is reset and the ship station retransmits all non-acknowledged data. |
| Note: Used for the ACK of uplink addressed messages. | | | |

**China MSA-3**

**option1**

**4.9.7 Bulletin board start fragment message**

Table 42

**Control station service area**

| **Name** | **Field size  (bits)** | **Content** |
| --- | --- | --- |
| Longitude of point 1 | 18 | Longitude of area to which the assignment applies; upper right corner (North-East); in 1/10 min (±180°, East = positive, West = negative) |
| Latitude of point 1 | 17 | Latitude of area to which the assignment applies; upper right corner (North-East); in 1/10 min  (±90°, North = positive, South = negative) |
| Longitude of point 2 | 18 | Longitude of area to which the assignment applies; lower left corner (South-West); in 1/10 min (±180°, East = positive, West = negative) |
| Latitude of point 2 | 17 | Latitude of area to which the assignment applies; lower left corner (South-West); in 1/10 min (±90°, North = positive, South = negative) |
| ~~Padding~~  Priority | 2 | ~~Padding bits for byte alignment. Set to zero.~~  0 :very high  1 ;high  2 :medium  3 :low |

**option2**

**4.9.7 Bulletin board start fragment message**

Table 42

**Control station service area**

| **Name** | **Field size  (bits)** | **Content** |
| --- | --- | --- |
| Longitude of point 1.1 | 18 | Longitude of area to which the assignment applies; upper right corner (North-East); in 1/10 min (±180°, East = positive, West = negative) |
| Latitude of point 1.1 | 17 | Latitude of area to which the assignment applies; upper right corner (North-East); in 1/10 min  (±90°, North = positive, South = negative) |
| Longitude of point 1.2 | 18 | Longitude of area to which the assignment applies; lower left corner (South-West); in 1/10 min (±180°, East = positive, West = negative) |
| Latitude of point 1.2 | 17 | Latitude of area to which the assignment applies; lower left corner (South-West); in 1/10 min (±90°, North = positive, South = negative) |
| Longitude of point 2.1 | 18 | Longitude of area to which the assignment applies; upper right corner (North-East); in 1/10 min (±180°, East = positive, West = negative) |
| Latitude of point 2.2 | 17 | Latitude of area to which the assignment applies; upper right corner (North-East); in 1/10 min  (±90°, North = positive, South = negative) |
| Longitude of point 2.1 | 18 | Longitude of area to which the assignment applies; lower left corner (South-West); in 1/10 min (±180°, East = positive, West = negative) |
| Latitude of point 2.2 | 17 | Latitude of area to which the assignment applies; lower left corner (South-West); in 1/10 min (±90°, North = positive, South = negative) |
| Longitude of point n.1 | 18 | Longitude of area to which the assignment applies; upper right corner (North-East); in 1/10 min (±180°, East = positive, West = negative) |
| Latitude of point n.2 | 17 | Latitude of area to which the assignment applies; upper right corner (North-East); in 1/10 min  (±90°, North = positive, South = negative) |
| Longitude of point n.1 | 18 | Longitude of area to which the assignment applies; lower left corner (South-West); in 1/10 min (±180°, East = positive, West = negative) |
| Latitude of point n.2 | 17 | Latitude of area to which the assignment applies; lower left corner (South-West); in 1/10 min (±90°, North = positive, South = negative) |

# China MSA-4

Figure 6

Typical order of operations for symbol data; if cyclic redundancy = 1 and forward error correction is applied

# China MSA-5

Annex 4  
  
Technical characteristics of VHF data exchange-terrestrial   
in the maritime mobile band

Figure 24

Single/multiple message, zero padding and cyclic redundancy check-32 structure



Note that the padding is defined as a separate message. The CRC is always at the end of the packet. Preamble and FEC tail bits are not shown.

1. [↑](#footnote-ref-1)