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| **US Radiocommunications Sector**  **Fact Sheet** | |
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| **Purpose/Objective:**  The purpose of this document is to provide some minor editorial corrections and clarifications for Recommendation ITU-R M.2092-1. | |
| **Abstract:**  ITU WP5B has opened Recommendation ITU-R M.2092-1 for revision. The USCG has identified the need to make some minor editorial corrections and clarifications to this recommendation because of the ongoing work within IEC and IALA. | |

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| **Radiocommunication Study Groups** |  |
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| **English only** |
| United States of America | |
| Preliminary Draft Revision of Recommendation ITU-R M.2092-1  Technical characteristics for a VHF data exchange system  in the VHF maritime mobile band | |

# 1 Introduction

Working Party 5B has opened Recommendation ITU-R M.2092-1 for revisions. After a review of the current draft document, some minor editorial corrections and clarifications were identified. This contribution proposes some revisions to Document 5B/216 Annex 10.

# 2 Summary of changes

To be added when the document is complete

# 3 Attachments

The following attachment contains the proposed changes to Annex 10 of the chairman’s report. All track changes from Annex 10 have been accepted, and 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/51  Subject: Recommendation [ITU-R M.2092-1](https://www.itu.int/rec/R-REC-M.2092/en) | **Annex 10 to Document 5B/216-E** |
| **27 November 2024** |
| **English only** |
| Annex 10 to Working Party 5B Chair’s Report | |
| PRELIMINARY DRAFT REVISION OF RECOMMENDATION ITU-R M.2092-1 | |
| Technical characteristics for a VHF data exchange system in the VHF maritime mobile band | |

(2015-20-202X)

Summary of revisions

TBD

Scope

This Recommendation provides the technical characteristics of a VHF data exchange system (VDES) which integrates the functions of VHF data exchange (VDE) comprising both terrestrial and satellite components, application specific messages (ASM) and the automatic identification system (AIS) operating in the frequency bands listed in Appendix **18** of the Radio Regulations (RR).

*(There are no changes prior to this section)*

**Annex 3**

**4.5.8.4 Multiple incremental time division multiple access communication state**

The communication state provides the information used by the slot allocation algorithm in the MITDMA concept.

The MITDMA communication state is structured as shown in Table 20.

Table 20

**Multiple incremental time division multiple access communication state parameters**

| **Parameter** | **Number of bits** | **Description** | **Minimum** | **Maximum** |
| --- | --- | --- | --- | --- |
| Transmit block counter | 4 | A decrementing counter used to indicate how many transmissions are left to transmit within the chain.  A value of 1 indicates this is the last transmission within the chain.  A value of 0 indicates a recurring transmission. | 0 | 15 |
| Block Identifier | 4 | An increasing counter used to identify the block of data within the transmit chain uniquely. This identifier also maps to the acknowledgment for addressed messages.  A value of 0 indicates this is the first transmission within the chain and corresponds to the bit 0 of the ACK mask. | 0 | 14 |
| Slot Increment 1 | 8 | Offset to the next slot to be used, referenced to the current transmission start slot.  A value of 0 indicates no additional slot reservations. | 20 | 255 |
| Number of Slots 1 | 2 | Indicates the number of consecutive slots, which are allocated, starting at the slot increment  A value of 0 indicates the 8 bits from Slot Increment 1 become the MSB for the Slot Increment 2. | 0 | 3 |
| Slot Increment 2 | 8 | Offset to the next slot to be used, referenced to the slot specified by slot increment 1 (or current transmission slot if the number of slots 1 is set to 0).  A value of 0 indicates no additional slot reservations. | 20 | 255 13500(1) |
| Number of Slots 2 | 2 | Indicates the number of consecutive slots, which are allocated, starting at the slot increment.  A value of 0 indicates no slot reservations. | 1 | 3 |
| Slot Increment 3 | 8 | Offset to the next slot to be used, referenced to the slot specified by Slot Increment 2.  A value of 0 indicates no additional slot reservations. | 20 | 255 |
| Number of Slots 3 | 2 | Indicates the number of consecutive slots, which are allocated, starting at the slot increment.  A value of 0 indicates no slot reservations. | 1 | 3 |
| Total bits | 38 |  |  |  |
| (1) When combining Slot Increment 1 and Slot Increment 2 as a 16-bit field. This value should not exceed 6 frames. The combining of these values should only be done for recurring period broadcast transmissions. | | | | |

*(There are no changes prior to this section)*

**Annex 3**

**7.3 Message 0: broadcast automatic identification system application specific message**

ASM Message 0 may contain encapsulated AIS Messages 6, 8, 12, 14, 21, 25 or 26. Acknowledgement is not supported for addressed messages. This message type is for terrestrial use only.

The encapsulated message may or may not be transmitted on AIS1 or AIS2 channels.

If the encapsulation repeats a Message that was transmitted on AIS1 or AIS2 channel, the encapsulation and transmission of messages shall be performed as soon as possible, according to configuration, after receiving the relevant messages which are required to be retransmitted.

The communication state of the encapsulated message shall always be set to zero at encapsulation.

The receiving station shall output all received encapsulated AIS Messages at the PI immediately after reception. Scheduled broadcast message is defined in Table 26.

Table 26

**Broadcast automatic identification system application specific message**

| **Parameter** | **Number of bits** | **Description** |
| --- | --- | --- |
| Message ID | 4 | 0 – Selected AIS messages that are output at receiving mobile station PI by using VDM sentence with no communication state. |
| 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. |
| Data count | 11 | Size of actual data in Application Data field in bits, excluding padding bits. range: from 1 to maximum data count. |
| Application data  (no FEC / FEC) | 1 slot: 296 / 200 2 slot: 808 / 584 3 slot: 1320 / 968 | Content is encapsulated AIS Messages that are channeled through ASM Channels. Receiver is expected to be ASM-capable mobile station where the ASM-box would relay the encapsulated AIS messages to local presentation interface. The encapsulated AIS Messages would then be output at the PI using VDM sentence. The arrangement would thus be compliant with existing nav presentations.  Application data as specified by the ASM Identifier.  The available length of the binary data is specified by the Link Id. |

**7.4 Message 1: Scheduled broadcast message**

This ASM message is used to broadcast data to all stations, and utilizes MITDMA communication state. Multiple messages, or periodically broadcasted messages may be chained together using the MITDMA communication state. The first transmission in the chain will use RATDMA to access the link, and all additional transmission will use slots allocated by the MITDMA communication state. Scheduled broadcast message is defined in Table 27.

Table 27

**Scheduled broadcast message**

| **Parameter** | **Number of bits** | **Description** |
| --- | --- | --- |
| Message ID | 4 | 1 – Broadcast message with MITDMA communication state. |
| Retransmit flag | 1 | 0 – Indicates there will be no retransmission of data.  1 – Indicates there will be retransmission of data. |
| 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. |
| Data count | 11 | Size of actual data in Application Data field in bits, excluding padding bits. range: from 1 – Max data count. |
| ASM identifier(1) | 16 | Application identifier as described in § 6.2. |
| Application data (no FEC / FEC) | 1 slot: 240 / 144  2 slot: 752 / 528  3 slot: 1264 / 912 | Application data as specified by the ASM Identifier.  The available length of the binary data is specified by the Link Id.  Unused payload data is zero-filled. |
| Communication state | 38 | MITDMA communication state as described in § 6.4. |
| Spare bits | 2 | Spare bits – reserved for the future. |
| (1) The ASM identifier should be provided to the PI as the first part of the binary data payload. | | |

**7.5 Message 2: Broadcast message**

This ASM message is used to broadcast data to all stations and does not contain a communication state. These broadcast messages are used for non-periodic transmission of data, and access the link using RATDMA. Broadcast message is defined in Table 28.

Table 28

**Broadcast message**

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Number of bits** | **Description** |
| Message ID | 4 | 2 – Broadcast message with no communication state. |
| 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. |
| Data count | 11 | Size of actual data in Application Data field in bits, excluding padding bits. range: from 1 – Max data count. |
| ASM identifier | 16 | Application identifier as described in § 6.2. |
| Application data (no FEC / FEC) | 1 slot: 280 / 184  2 slot: 792 / 568  3 slot: 1304 / 952  SAT: N/A / 848 | Application data as specified by the ASM Identifier.  The available length of the binary data is specified by the Link Id. |

**7.6 Message 3: Scheduled individual addressed message**

This ASM message is used to send data to an individual station, and utilizes MITDMA communication state. Multiple transmission of messages, or periodically transmissions of messages may be chained together using the MITDMA communication state. The first transmission in the chain will use RATDMA access the link, and all additional transmission will use slots allocated by the MITDMA communication state.

These transmissions require the destination station to return a message acknowledgment (Message 5). This addressed message supplies the return slot for the message acknowledgment. Scheduled addressed message is defined in Table 29.

Table 29

**Scheduled individual addressed message**

| **Parameter** | **Number of bits** | **Description** |
| --- | --- | --- |
| Message ID | 4 | 3 – Individually addressed message with MITDMA communication state. |
| Retransmit flag | 1 | Indicates that this is a retransmission of data. |
| 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. |
| Destination ID | 32 | The Unique Identifier of the receiving station, as described in § 2.4, Annex 1. |
| Data count | 11 | Size of actual data in Application Data field in bits, excluding padding bits. range: from 1 – Max data count. |
| ASM identifier(1) | 16 | Application identifier as described in § 6.2. |
| Application data (no FEC / FEC) | 1 slot: 208 / 112  2 slot: 720 / 496  3 slot: 1232 / 880 | Application data as specified by the ASM Identifier.  The available length of the binary data is specified by the Link Id. |
| Communication state | 38 | MITDMA communication state as described in § 6.4. |
| Spare bits | 2 | Spare Bits – reserved for the future. |
| (1) The ASM identifier should be provided to the PI as the first part of the binary data payload. | | |

**7.7 Message 4: Individual addressed message**

This ASM message is used to send data to an individual station and does not contain a communication state. This message is used for non-periodic transmission of data, and access the link using RATDMA.

These transmissions require the destination station to return a message acknowledgment (Message 5). The destination station will use RATDMA to send the message acknowledgment. Addressed message is defined in Table 30.

Table 30

**Individual addressed message**

| **Parameter** | **Number of bits** | **Description** |
| --- | --- | --- |
| Message ID | 4 | 4 – Individually addressed message with no communication state. |
| Retransmit flag | 1 | Indicates that this is a retransmission of data. |
| 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. |
| Destination ID | 32 | The Unique Identifier of the receiving station as described in § 2.4, Annex 1. |
| Data count | 11 | Size of actual data in Application Data field in bits, excluding padding bits. range: from 1 – Max: data count. |
| ASM identifier | 16 | Application identifier as described in § 6.2. |
| Application data (no FEC / FEC) | 1 slot: 248 / 152  2 slot: 760 / 536  3 slot: 1272 / 920  SAT: N/A / 816 | Application data as specified by the ASM Identifier.  The available length of the binary data is specified by the Link Id. |
|  | | |

**7.8 Message 5: Acknowledgment message**

This ASM message is used to return message acknowledgments to one or more addressed messages. Note that this message should always use Link ID of 5 (3/4 coding rate). Acknowledgement message is defined in Table 31.

Table 31

**Acknowledgment message**

| **Parameter** | **Number of bits** | **Description** |
| --- | --- | --- |
| Message ID | 4 | 5 – Multiple acknowledgment message with no communication state. |
| 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. |
| Destination ID | 32 | The Unique Identifier of the receiving station as described in § 2.4, Annex 1. |
| ACK/NACK mask | 16 | Specifies which MITDMA block identifiers failed. Bit map field with the LSB representing Block identifier 0, up to the 15th bit representing Block identifier 14.  “1” indicates a packet failed.  “0” indicates the packet was received ok.  The MSB (16th bit) is not used and should be set to “0”. |

Table 31 (*end*)

| **Parameter** | **Number of bits** | **Description** |
| --- | --- | --- |
| Coding rate adaption request | 2 | 0 (reserved for future use). |
| Channel quality indicator | 8 | Signal quality. |
| Zero padding (no FEC / FEC) | 1 slot: N/A / 153 | Padding bits are added as required to complete the block size. These bits are not available for future use. |

**7.9 Message 6: Geographical multicast message**

This ASM message is used to broadcast data to a group of stations as defined by the specified geographical area. The broadcast message does not contain a communication state. These broadcast messages are used for non-periodic transmission of data, and access the link using RATDMA. Geographical multicast message is defined in Table 32.

Table 32

**Geographical multicast message**

| **Parameter** | **Number of bits** | **Description** |
| --- | --- | --- |
| Message ID | 4 | 6 – Geographical addressed message with no communication state. |
| Retransmit flag | 1 | Indicates that this is a retransmission of data. |
| 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. |
| Longitude 1 | 18 | Longitude of area to which the group assignment applies; upper right corner (north-east); in 1/10 min  (±180°, East = positive, West = negative). |
| Latitude 1 | 17 | Latitude of area to which the group assignment applies; upper right corner (north‑east); in 1/10 min (±90°, North = positive, South = negative). |
| Longitude 2 | 18 | Longitude of area to which the group assignment applies; lower left corner (south-west); in 1/10 min (±180°, East = positive, West = negative). |
| Latitude 2 | 17 | Latitude of area to which the group assignment applies; lower left corner (south‑west); in 1/10 min (±90°, North = positive, South = negative). |
| Data Count | 11 | Size of actual data in Application Data field in bits, excluding padding bits. range: from 1 – Max data count. |
| Spare bits | 2 | Spare bits – reserved for the future. |
| ASM identifier | 16 | Application identifier as described in § 6.2. |
| Application data (no FEC / FEC) | 1 slot: 208 / 112  2 slot: 720 / 496  3 slot: 1232 / 880 | Application data as specified by the ASM Identifier.  The available length of the binary data is specified by the Link Id. |
|  | | |

*(There are no changes prior to this section)*

**Annex 5**

**3.10.1 Satellite bulletin board**

Table 65

**Satellite bulletin board (Fragment 1)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Field  No.** | **Size  (bytes)** | **Function** | **Content** |
| 1 | 1 | Type | Bulletin Board start fragment 1, network info.  Type = 1. |
| 2 | 1 | Satellite ID | 0-255. |
| 3 | 1 | Primary Network ID | 0-255. |
| 4 | 1 | Roaming Network ID | 0-255. |
| 5 | 2 | SBB Version | Version number of this Bulletin Board.  All valid versions are stored in the ship terminal. |
| 6 | 4 | Start time | UTC start time for this version of the Bulletin Board in number of seconds since 1 January 2000, 00:00:00 UTC. |
| 7 | 2 | Validity duration | Lifetime of this version in number of 1-minute frames.  Up to 45 days. |
| 8 | 1 | Service capabilities | 4 MSB Bitmap.  Recommendation [ITU-R M.2092](https://www.itu.int/rec/R-REC-M.2092) version compatibility; 1 = M.2092-1;  1 = M.2092-2.  4 LSB service capabilities bitmap.  Bit3: Reserved for future use. Default = 0.  Bit2: Reserved for future use. Default = 0.  Bit1: Reserved for future use. Default = 0.  Bit0: Reserved for future use. Default = 0. |
| 9 | 2 | SBB backup frequency | As defined in Recommendation [ITU-R M.1084](https://www.itu.int/rec/R-REC-M.1084). |
| 10 | 2 | Max uplink msg size | Maximum message uplink size allowed in kilo Bytes [kB]. |
| 11 | 1 | Reserved for future use | Default 0. |
| 12 | 2 | Total message size of all fragments including overflow | SBB total size in bytes. |

*(There are no changes prior to this section)*

**Annex 5**

**3.10.2 Media access control**

Table 71

Media access control

| Field  No. | Size  (bytes) | Function | Content |
| --- | --- | --- | --- |
| 1 | 1 | Type | Type = 10. |
| 2 | 2 | Payload size | Fixed of fields 3 to 11.  Payload size = 10. |
| 3 | 1 | Satellite ID | 0-255. |
| 4 | 1 | Primary Network ID | 0-255. |
| 5 | 1 | Roaming Network ID | 0-255. |
| 6 | 1 | Media Access Priority | 0: All accesses allowed.  1: All accesses except short data message allowed.  255: No accesses allowed; system busy. |

Table 71 (*end*)

| Field  No. | Size  (bytes) | Function | Content |
| --- | --- | --- | --- |
| 7 | 1 | Random selection interval | In multiple of 15 slots.  e.g. = 12 (12 × 15 = 180 slots).  For transmitting a message on the RAC, the ship terminal determines a transmission start slot offset relative to the next RAC slot in time by calculating a uniformly distributed random number from the discrete set 0, …, random selection interval × 15 (Default 0, 5, 10, …, 180). The transmission shall start in the RAC slot defined by that random number.  Note: the transmission needs to stay entirely inside the reserved slots for RAC, therefore, the random transmission start slot offset may map the start of transmission to RAC slots beyond the current VDE-SAT sub‑frame’s RAC interval into future VDE-SAT sub‑frame’s RAC intervals. |
| 8 | 1 | RAC Message access limit | Maximum number of allowed messages sent by a ship terminal on the Random Access Channel during a 15-minute interval.  Default: 3. |
| 9 | 1 | Network status | 0: Operational.  1: Reduced availability.  2: Network down. |
| 10 | 1 | ARQ/timeout limits | 4 MSB Number of fragment retries.  Default: 3 retries for a fragment.  4 LSB: Timeout timer setting.  Reserved for future use. Default = 0. |
| 11 | 2 | Bulletin Version number | Maps to SBB version number. |

*(There are no changes prior to this section)*

**Annex 5**

**3.10.6 Resource allocation**

Table 75

**Resource allocation**

| **Field  no** | **Size (bytes)** | **Function** | **Content** |
| --- | --- | --- | --- |
| 1 | 1 | Type | Type = 12. |
| 2 | 2 | Payload size | Size of fields 3 to 22.  Payload size = 32. |
| 3 | 4 | Ship Station ID 1 | The Unique Identifier of the ship station, as described in § 2.4, Annex 1.  0 for broadcast. |
| 4 | 1 | Logical Channel 1 | Logical Channel assigned for data transmission. Only applies to data slots. LC of 255 indicates no resource. |
| 5 | 1 | Link ID 1 | Link ID that should be used in Logical Channel 1. Transmission direction can be inferred from link ID. |
| 6 | 1 | Session ID 1 | Assigned session ID. |
| 7 | 1 | Uplink link CQI 1 | Received Channel Quality Indicator as defined in § 1.2.8,  Annex 2. |