



RTCA Paper No. 264-22/SC222-109  
EUROCAE EUR. 341-22 / WG82-115

Washington, 19.October 2022  
St Denis, 19.October 2022

**Minutes of  
EUROCAE WORKING GROUP 82 (WG-82) (Meeting #60)  
“New Air-Ground Data Link Technologies”  
related to SATCOM  
and  
RTCA SPECIAL COMMITTEE 222 (SC-222) (Meeting #50)  
“Aeronautical Mobile Satellite (Route) Services (AMS(R)S)  
Plenary Meeting**

<b>Date</b>	<b>14<sup>th</sup> and 15<sup>th</sup> September 2022</b>
<b>Place</b>	<b>Virtual Meeting</b>
<b>Venue</b>	<b>RTCA – Webex</b>
<b>Hosted by</b>	<b>RTCA</b>

**Participants:**

Name	Company	14 <sup>th</sup>	15 <sup>th</sup>
Adam Sarhage	Garmin	X	X
Alan Schuster-Bruce	INMARSAT		X
Al Malaga	ACES Inc	X	X
Anna Guegan	EUROCAE	X	X
Antonio Correias	Skymetrics	X	X
Armin Schlereth	DFS	X	X
Catherin Gandolfi	EASA	X	
Florin Grafu	Romatsa		X
Gary Colledge	INMARSET	X	
Hiroshi Okochi	Jransa	X	X
Ian Crompton	PARKAITSYSTEMS	X	X
Jason Fieldhouse	Collins	X	X
Jeff Knickelbein	Coham	X	X
Johan Gericke	Coham	X	X
Karan Hofmann	RTCA, Inc.	X	
Marco Riccato	IFATCA	X	X
Martina Angelone	ESA	X	X
Matt Clifford	Thales Group	X	
Michael Hooper	IRIDIUM	X	X

Nkululeko Ntombela	ATNS	X	X
Radek Zaruba	Honeywell	X	X
Ravi Jain	FAA	X	X
Ryan Mustoe	Boeing	X	X
Sam Weich	Ligado	X	X
Stephan Hubl	BAF	X	X
Thomas Gahler	DFS	X	
Stéphane Tamalet	Airbus		X

## DOCUMENTS

Agenda Item	Title	File name
All	MOPS update by Radek	
	Minutes of the Working session of 09 August 2022	SC-222_WG-82_Working Session 2022-08-09_Minutes
5	D6.2.200 - PJ14-W2-107 “TRL 6 on-going” Technical Note on SATCOM Voice Development	SESAR SATVOICE TN (HF replacement).docx

## PRESENTATIONS

Agenda Item	Title	File name
1	Calling Notice and Agenda	SC-222 (49) and WG-82 (59) Calling Notice Meeting-Final.pdf
3	Meeting Minutes of last Meeting	SC-222_48_WG-82_58_Meeting 2022-05-18_Final Minutes.docx
6	MOPS IPS updates kick-off	MOPS (and MASPS) IPS updates kick-off
8	TAC DP 181 Summary	EUROCAE WG-82 – DP 181 on TOR update proposal_v2.pptx

All documents and presentations will be uploaded on the according RTCA and EUROCAE repository (in the folder of September Plenary meeting).

### 1) Welcome, Introductions, Administrative Remarks by Special Committee Leadership

Armin Schlereth (chair WG-82) welcomed the group and the co-chair of the SC-222, Michael Hooper.

Karan Hofmann and Anna Guégan informed about the anti-trust policy, IPR policy, and call and participation membership policies for RTCA Special Committees (SC) and EUROCAE Working Groups

### 2) APPROVAL OF THE AGENDA

After a round table, Armin Schlereth introduced the proposed agenda of the RTCA SC-222/ EUROCAE WG-82 Plenary meeting. The final agreed agenda looks as follows:

## AGENDA

14-15 September 2022 (9:00 am – 12:00 pm EDT) – (15:00 – 18:00 CEST)

Welcome, Introductions, Administrative Remarks by Special Committee Leadership

- Government Authorized Representative (GAR): Ravi Jain
- Co-Chair RTCA SC-222: Michael Hooper, Iridium
- Co-Chair RTCA SC-222: Alan Schuster Bruce, Inmarsat
- Chair EUROCAE WG-82: Dr. Armin Schlereth, DFS

1. RTCA/EUROCAE Opening Material
2. Review Agenda
3. Review Minutes from previous meeting and Actions
4. Reports from other organizations (e.g. PT-S, WG-78, AEEC)
5. Industry presentations
6. Discussion on MOPS (DO-262G/ED-243D) update
7. Discussion on MASPS (DO-343E/ED-242D) update
8. Any Other Business
  - a. TAC Discussion Paper on TOR update for WG-82
  - b. Dual SATCOM Paper from Honeywell
9. Review Action
10. Set Future Meetings
11. Adjourn

### 3) Review Minutes and Actions

The minutes of the last meeting have been reviewed and the action item list has been updated accordingly. The result is summarized at the end of the present minutes.

The groups were informed that MOPS Change 1 has been approved by RTCA PMC and EUROCAE Council. Armin thanked all participants for their contributions to complete the work in time and especially Michael Hooper for his lead on the work.

### 4) Reports from other organizations (e.g. PT-S, WG-78, AEEC)

#### **PT-S:**

The comments from WG-82 on Draft SARPS have been taken over. A general agreement was reached to reduce the number of recommendations in the Draft SARPS material.

#### **SC-214/WG-78 Safety and Performance subgroup meetings:**

The Proposal on performance levels for the CSP prepared and presented by Andrew's Ives (INMARSAT) has been accepted and will be reflected in next release of DO-350/ED-228.

RSP160: Difficulty to measure delay value due to the lack of timestamp depending on the A/C; however, this is not impacting the CSP allocation. A discrepancy related to continuity value of 99,9 % in the safety case of SPR has been identified.

#### **AEEC:**

Some discussions are on going on the IPS Dual SATCOM as well as on the OSI/ACARS operations. An APIM is planned for October to cover ARINC 771/781 update for ATN/OSI, ATN/IPS and Dual SATCOM implementation.

#### **SESAR:**

IPS infrastructure about to be validated. Sol 77 and 107 validation exercises are about to be completed (in combination with LDAC AeroMACS VDL-M2 and SATCOM); Documentation gate is end of October. It should be mentioned that in the IPS testbed SATCOM SBB is the only live link used.

## 5) Industry presentations

No presentations have been given at the meeting.

## 6) Discussion on MOPS (DO-262G/ED-243D) update

Radek explained the proposed changes to Appendix E of the MOPS. More details can be found in the MOPS comments Table and the updated document itself. Both will be distributed until end September for further consideration by the groups. Main items discussed are:

- Table E-5 on valid combinations of ACD services to be supported by the AES; Input from AIRBUS clarified that a triple stack (ACARS, OIS, IPS) is not needed and too costly. Boeing is expected to have the same view. It is also planned that adaptation of IPS on the ground will be done through implementation of gateways. Therefore, it was decided not to include such a triple stack scheme in Table E-5.
- Discussion on the prioritisation aspects: IPS interface needs to support differentiation of data with different priorities; parallel use of ATN/OIS and IPS is not to be supported by any of the service sets supported by the AES. Radek Zaruba presented a prioritisation scheme for IPS to be further reviewed by the group.

## 7) Discussion on MASPS (DO-343E/ED-242D) update

During discussion of MOPS material it was identified that prioritisation concept should be part of the MASPS material and being explained in more detail. This is of importance especially when describing the behaviour of the AES supporting IPS when several simultaneous data streams are possible. This is different compared to ACARS with its "wait for ACK before issuing a next message" procedure. Regarding ATN/OIS the amount of data is expected rather low and so consideration of prioritisation of data streams are of now significant relevance.

## 8) Any Other Business

### a) TAC Discussion Paper on TOR update for WG-82

Armin presented the executive summary of DP 181. Discussion of the material showed that even the question coming from the DP are not well understood and require further clarification. In order to supportively proceed on the matter the group agreed on the following response to be further reviewed after the meeting:

Feedback to TAC on DP 181:

- Architecture of airborne implementation are very different (e.g. Boeing, AIRBUS, Business Jets)
- 
- Certain elements of standards are implementation aspects of manufacturers and will/cannot be defined (e.g. VDL2 ground station selection for hand-off)
- 
- Standardisation of avionics is historically established within ICAO (emphasizes signal in space interoperability), RTCA, EUROCAE, AEEC
- 
- CSP in addition have their own qualification tests procedures (e.g. SITA, ARINC, Inmarsat, Iridium)
- 
- There is certainly lack of a common responsibility end-to-end for the whole datalink service
- 
- In general there remains always a risk of standardisation gaps, which will be identified late in the process (validation and testing cannot cover all error cases. Test cases are positive test scenarios)
- 
- A common CMU will not solve the problem and would become too complex to be described in one MOPS. As a consequence, this approach might become even more error-prone
-

- Proposal to initiate a joined effort by FAA/EASA to define an advisory circular for data link end-to-end functionality with all required standards referenced and explanation on how these standards do interoperate. This activity should be done in coordination with the appropriate standardisation bodies (RTCA, EUROCAE, AEEC, ICAO).

After consolidation of this response it is foreseen that Armin forward the material to EASA TAC member as a first feedback and invite him for one of the future meetings to further discuss the subject in more detail.

**b) Dual SATCOM Paper from Honeywell**

Radek presented a paper developed in SEAR Solution 107 on Dual SATCOM implementation for LRCS. This paper shows operational impacts of different failure modes.

**9) Review actions**

An action items list related to the meeting are enclosed with status after the meeting.

**10) Set Future Meetings**

RTCA SC-222 and EUROCAE WG-82 have agreed on the following next meetings:

**WEBEX's:**

- **19.10.2022 WG-82/RTCA SC-222: Working Session Meeting from 3pm to 5pm CET** (WEBEX will be organized by EUROCAE)
- **29.11.2022 and 30.11.2022 WG-82/RTCA SC-222: Working Session Meeting from 3pm to 6pm CET** (WEBEX will be organized by EUROCAE)

**Physical Meetings:**

- **No physical meeting(s) are planned.**

**6) Adjourn – Plenary meeting**

Armin thanked the group for the lively discussion and the contributions given.

**Action items**

**RTCA SC-222/EUROCAE WG-82 52<sup>th</sup> meeting: 28.09.2021**

<b>Action#</b>	<b>Content</b>	<b>Responsible</b>	<b>Deadline</b>	<b>Status</b>
A52-02	Inmarsat to provide a presentation on the possible interest in covering UAS C2-link at the next meeting.	Alan Schuster Bruce	Next meeting	Closed

A52-03	<p>Guillaume De Bony De Lavergne (Airbus) to prepare a presentation on the possible impact on MASPS and MOPS of the automated data download for TRFD (Timely Recovery of Flight Plan).</p> <p><b>Discussion at Plenary February 2022:</b> AIRBUS will inform about internal discussion on strategy results when available.</p> <p><b>April Meeting:</b> Unchanged <b>May/June/July/August/September Meetings:</b> Unchanged</p>	Guillaume De Bony De Lavergne	Next meeting	<b>Open</b>
--------	---	-------------------------------	--------------	-------------

**RTCA SC-222/EUROCAE WG-82 55<sup>th</sup> meeting: 8.02 -09.02.2022**

Action#	Content	Responsible	Deadline	Status
A55-01	Present material on MOPS core part items to be updated	Honeywell (Radek Zaruba)	At the next meeting in March 2022	Closed
A55-02	Present details about 3 main items on Inmarsat MOPS (slide 4 on Radek's slide presentation); modifications will be captured in spread sheet for the discussion.	Honeywell (Radek Zaruba)	At next meeting in September 2022	Closed
A55-03	<p>To identify which new material could be relevant for MASPS related to L-band Satcom C2 link.</p> <p><b>September meeting:</b> Keep it open for next meeting.</p>	Alan Schuster Bruce	Next meeting	<b>Open</b>
A55-04	Ravi to send an invite on behalf sc-228 for having a discussion on the ISRA topic	Ravi	End of February	Closed
A55-05	To present material on CERTUS MOPS update	Michael Hooper	At the next Meeting in March 2022	Closed

**RTCA SC-222/EUROCAE WG-82 56<sup>th</sup> meeting: 15.03.2022**

Action#	Content	Responsible	Deadline	Status
A56-01	<p>Define UAV service in DO-377</p> <p><b>September meeting.:</b> Unchanged. UAV service definition ongoing. Input from SATCOM experts needed.</p>	Alan Schuster-Bruce/Mike Hooper	Next meeting	<b>Open</b>

A56-02	<p>Coordinate with WG-105 on support of work of SC-228 on UAV C2-link in L-band using SATCOM links.</p> <p><b>April Meeting:</b> First coordinate between Alan, Mike and Armin about what WG-105 is covering.</p> <p><b>May/June/July/September meetings:</b> Unchanged</p> <p>August meeting: Wait until Alan is back.</p>	Armin S.	asap	<b>Open</b>
A56-03	<p>Check whether AMS(R)-S band can be used for C2-link</p> <p><b>July/September meetings:</b> Unchanged</p>	Alan Schuster-Bruce	For next meeting	<b>Open</b>
A56-04	<p>Check whether AMS(R)-S band can be used for C2-link</p> <p><b>July meetings:</b> Unchanged</p> <p><b>September meeting.:</b> SARPs in final review for C2 link. It clearly defines AMRS frequencies for C2 link. Expect a ICAO paper from Mike to be distributed on this subject.</p>	Mike Hooper	For next meeting	<b>Open</b>
A56-05	<p>Provide chairman report on decision about UAV C2-link issue to PMC → Update of TOR of SC-222</p>	Alan/Mike	End of April 2022	Closed
A56-06	<p>MOPS: Update Generic Section 1 about wording related to ATN</p>	Radek	Meeting 13 <sup>th</sup> April	Closed
A56-07	<p>MOPS Core Part: Identify useful material to be kept (section 2 onwards). Especially dependencies to Appendices (D; E, F) have to be identified.</p> <p><b>July meetings:</b> Unchanged</p> <p><b>September meeting.:</b> New material on Appendices D and F for next meeting planned to be presented (Mike).</p>	Alan Schuster-Bruce/Mike Hooper	Next meeting	<b>Open</b>
A56-08	<p>Prepare presentation on end-to-end architectures for SATCOM (IP, ATN/IPS etc.)</p>	Radek	Meeting 13 <sup>th</sup> April	Closed
A56-09	<p>Send presentations provided to Armin for the minutes</p>	Alan/Mike	18 <sup>th</sup> March	Closed
A56-10	<p>Clarify mix up of ATS traffic (CPDLC), payload/mission traffic and C2-link com on the same satcom equipage level.</p> <p><b>April Meeting:</b> Current TSO distinguishes between APC and ATS. Further to be considered in the committee.</p> <p><b>July/September meeting:</b> Unchanged until C2-link issue discussed at next meeting.</p>	Al Malaga	Next meeting	<b>Open</b>

A56-11	Clarify with EUROCAE procedure on Change 1 for MOPS  <b>April Meeting:</b> EUROCAE Task Sheets to be updated and require TAC approval.	Karan	asap	Closed
--------	--	-------	------	--------

**RTCA SC-222/EUROCAE WG-82 57<sup>th</sup> meeting: 13.04.2022**

Action#	Content	Responsible	Deadline	Status
A57-01	Anna Guegan to coordinate on Task Sheet update for MOPS Change 1 to prepare for next TAC	Anna Guegan	21.04.2022	Closed
A57-02	Karan to provide updated working schedule to include MOPS change 1.	Karan Hofmann	14.04.2022	Closed
A57-03	Mike Hooper, to send updated MOPS change 1 material to Alan and Armin	Mike Hooper	14.04.2022	Closed
A57-04	Alan and Armin to upload MOPS change 1 material onto RTCA/EUROCAE workspace.  May 2022 Meeting: WG-82: A new document item on change 1 can be added when TAC accepted Change 1 activity described in according Task Sheet. Same for RTCA. May 18 <sup>th</sup> meeting: New folder on EUROCAE side will be created and material being uploaded.	Alan Schuster-Bruce/Armin Schlereth	21.04.2022	Closed

**RTCA SC-222/EUROCAE WG-82 57<sup>th</sup> bis meeting: 03.05.2022**

Action#	Content	Responsible	Deadline	Status
A57-05	Check ETSI Requirements in Table F-18 on lists of Harmonics, Spurious and Noise Reqs for Tx Power limits	Mike Hooper, Johan Gericke, Richard Tapp	Before May Meeting	Closed
A57-06	Change 1 paper Section 6.1: Check -43 dBc and -60 dBc source	Mike Hooper	Before May Meeting	Closed
A57-07	Upload Change 1 paper onto RTCA workspace. Give it a WP number	Mike Hooper	Before May Meeting	Closed



A57-08	<p><b>MASPS:</b> Annunciation to pilot for PVC voice failure within 90 seconds → Is it end-to-end or only related to the SATCOM system? Some more discussion needed, whether only SSP part or whole end-to-end link. Desirable to keep it within SATCOM system boundary. Some more guidance in MASPS would be desirable. Text like "SATVOICE being available as the sole voice LRCS" required?</p> <p><b>August meeting:</b> For further discussion wait until Alan is back.</p> <p><b>September meeting.:</b> Part of the dual SATCOM discussion.</p>	Alan/Mike	At next Meeting	<b>Open</b>
--------	--	-----------	-----------------	-------------

**RTCA SC-222/EUROCAE WG-82 58<sup>th</sup> bis meeting: 18.05.2022**

Action#	Content	Responsible	Deadline	Status
A58-01	Clarify with ETSI about test parameters for in-band blocking characteristics (ETSI 301 473 - Table 22)	Richard Tapp	Until July Meeting	Closed
A58-02	<p>Radek to make a check on the mathematical correctness of the 25 seconds value as part of the proposed RSP160/20 term.</p> <p><b>July meeting:</b> Proposal was RSP160/15 among several other options presented to SC-214/WG-78. No final decision at SC-214/WG-78 Plenary in June taken. Will be further discussed in SC-214/WG-78.</p>	Radek Zaruba	Before June Meeting of SC-214/WG-82	Closed

**RTCA SC-222/EUROCAE WG-82 69<sup>th</sup> bis meeting: 14and15.09.2022**

Action#	Content	Responsible	Deadline	Status
A60-01	Prepare a presentation on outcome of SESAR Solutions 77/107 work	Radek Zaruba	Next meeting	<b>Open</b>
A60-02	Contact AIRBUS on Table E-5 on valid combinations of ACD services provided by an AES. Clarify whether triple stack will be supported by AIRBUS	Radek/Gary Colledge	OBE	Closed
A60-03	Distribute updated MOPS INMARSAT material	Radek Zaruba	30.09.2022	<b>Open</b>
A60-04	Comment on distributed updated MOPS INMARSAT material and send it to SC-222 and WG-82 chairs and secretariat.	all	18.11.2022	<b>Open</b>

A60-05	Send group discussion results related to TAC DP 181 on common MOPS proposal for final review before sending it to Anna Guegan.	Armin	16.09.2022	Closed
A60-06	Review summary of WGs discussion results on TAC DP 181	all	30.09.2022	<b>Open</b>
A60-07	Invite EASA TAC member for the next meeting	Armin	30.09.2022	<b>Open</b>
A60-08	Radek to prepare short presentation to explain header compression schemes	Radek	Next meeting	<b>Open</b>