



RTCA Paper No. 192-19/SC222-071
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Washington, 16 October 2019
 St Denis, 16 October 2019

**Minutes of EUROCAE
 WORKING GROUP 82 (WG-82) (Meeting #37) and RTCA SPECIAL COMMITTEE 222
 (SC-222) (Meeting #34)
 “New Air-Ground Data Link Technologies”**

related to SATCOM

Date	Wednesday 24th July and Thursday 25th July 2019
Place	Virtual Meeting
Venue	EUROCAE – Webex
Hosted by	EUROCAE

Participants:

Name	Company	24 th	25 th
Andrew Ives	INMARSAT	X	X
Daniel Tesfagaber	INMARSAT	X	X
Steven Lepage	SKYTRAC	X	X
Sachin Chhibber	Ligado	X	X
Maqbool Aliani	Ligado	X	
Rebecca Morrison	RTCA	X	X
Karan Hofmann	RTCA (SC-222 PD)	X	X
Anna Guegan	EUROCAE (WG-82 TPM)	X	X
Jeroen Hoppenbrouwers	Avionica	X	X
Johan Gericke	COBHAM SATCOM	X	X
Armin Schlereth	DFS (Chair WG-82)	X	X
Richard Tapp	Honeywell	X	X
Radek Zaruba	Honeywell		X
Adam Sarhage	Garmin	X	X
David Green	Collins Aerospace	X	
Alan Schuster-Bruce	INMARSAT	X	X
Gary Colledge	INMARSAT	X	X
Chuck LaBerge	LaBerge Engineering (Chair SC-222)	X	X
Dave Robinson	IRIDIUM	X	X
Luke Sienkiewicz	IRIDIUM	X	X
Darrell Andregg	Collins Aerospace	X	X
Laurent Cadiet	AIRBUS	X	
Cristian Bertoldi	AIRBUS	X	X

Michael Gertsman	Squarepeg	X	X
Vaughn Maiolla	ICAO	X	X
Martin Arndt	COBHAM	X	
Glenn Torgerson	The Boeing Company	X	X
Martina Angelone	ESA	X	X
Steve Van Trees	FAA (SC-222 GAR)	X	X
Ravi Jain	FAA	X	X
Aristides Cintra	Embraer	X	
Nigel Silverthorn	Honeywell	X	X
Mark Insley	Latitude Tech	X	X
Philippe Sacre	EUROCONTROL	X	
Rainer Koll	Stellar Aerospace	X	X
Sam Barrett	Honeywell	X	
Jose Godoy	SAE-ITC		X
Alden Fuchs	IRIDIUM		X

DOCUMENTS

Agenda Item	Title	File name
1	Calling Notice and Agenda	SC-222 (34) and WG-82 (37) Calling Notice.pdf
2	Meeting Minutes of last Meeting	222_33_WG-82_Meeting_36_Minutes_v0-2 final.pdf
5	MASPS Core Document	222WP261 DO-343B Avionica-Inmarsat edits[2].docx
5	MASPS Attachment on SBB	222WP260 DO-343B Attachment Avionica-Inmarsat edits[1].docx
8	MOPS on SBB	222WP266 DO-262D_draft3_Inmarsat.docx
6	MOPS DO-210D	Change Not5_draft4_JG.docx

Documents related to SBB are available on the EUROCAE WG-82 SharePoint and on the RTCA SC-222 Workspace.

Documents related to IRIDIUM are available on the RTCA SC-222 Workspace.

PRESENTATIONS

Agenda Item	Title	File name

No presentations have been given at the meeting.

1 Welcome, Introductions, Administrative Remarks by Special Committee Leadership

Chuck Laberge (CLAS) welcomed the group.

After a round table introduction Rebecca Morrison from RTCA and Anna Guegan from EUROCAE secretariat informed about the IPR and participation statement for RTCA and EUROCAE working groups.

2 APPROVAL OF THE AGENDA

The final agenda of the EUROCAE WG-82 meeting looked as follows:

24-25 July 2019 (9:00 am – 12:00 pm ET)

Welcome, Introductions, Administrative Remarks by Special Committee Leadership

- Government Authorized Representative (GAR): Steve Van Trees
- Chair RTCA SC-222: Dr. Chuck LaBerge, LaBerge Engineering
- Chair EUROCAE WG-82: Dr. Armin Schlereth, DFS

1. Agenda Overview
2. Review/Approve prior Plenary Meeting Summary – (action item status)
3. Coordination with other GROUPs (EUROCAE, RTCA, SESAR, AEEC)
4. SC-228 ISRA Discussion
5. SATCOM MASPS DO-343B/ED-242A updates related to Inmarsat SBB
 - a. Review of discussion papers on changes;
 - b. Outline agreement on form of changes to be made;
 - c. Initial allocation of section updates;
6. SATCOM MOPS DO210D update
7. Discuss draft MOPS Material for Iridium CERTUS (1 – 5 PM 25 July)
8. SATCOM MOPS DO-262D/ED-243A updates related to Inmarsat SBB
 - a. Review of discussion papers on changes;
 - b. Outline agreement on form of changes to be made;
 - c. Initial allocation of section updates;
9. Industry Presentations
10. Update Work Plan for SC-222 and WG-82
11. Establish Agenda, Date and Place for next meeting
12. Review of Action Items
13. Adjourn – Plenary meeting

3 Minutes of last meeting

There were no specific comments on the minutes. The action item list has been discussed and updated accordingly. The updated action items with additional ones coming from this meeting are added at the end of the minutes.

4 Coordination with other GROUPS

EUROCAE

No input provided at the meeting.

ICAO

No input provided at the meeting.

RTCA

No input provided at the meeting.

AEEC

No input provided at the meeting.

SESAR

No input provided at the meeting.

IRIS-IOC

No input provided at the meeting.

6 SC-228 ISRA Discussion

It has been agreed between the groups that actual high priority is given within SC-222 and WG-82 to complete MASPS and MOPS documentation. Interrelation will be further dealt with in more detail when this work has been completed. See also according remarks in the action item list attached.

In particular, there is interest from SC-228 to understand whether satellite can provide the required data-rate and link quality for RPAS C2 considering the antenna characteristics, multipath and related channel impairments. Further discussion on this subject is required.

6 Updates to MASPS of SBB part

Jeroen Hoppenbrouwers (JH) and Andrew Ives (AI) led through the MASPS documentation with updates provided on the Dual PS Voice aspects. Some discussion took place on the requirement V150 on latency as INMARSAT cannot fulfil it. As there seems to be physical limitations it was discussed to get back to ICAO to have a general discussion on it, whether a relaxation would be possible.

In general all items have been discussed and the updates of the documents have been agreed upon during the meeting. For more details see the updated documentation to be uploaded on the workspace of SC-222 and WG-82.

Material related to ATCt interference distributed in advance of the actual meeting has been withdrawn at the meeting. New material will be presented and discussed at the next joint meeting.

7 Discussion of Draft Material of IRIDIUM CERTUS

The SC-222 members of the committee and those WG-82 members had interest, reviewed the draft Iridium Certus MASPS material on the afternoon of July 24. David Robinson of

Iridium lead the discussion, following the comment spreadsheet provided by Chuck LaBerge. Johan Gericke of Cobham provided a set of comments via Word redline version of the document. Johan's comments and other comments from the committee members were discussed as David lead the group through the spreadsheet comments.

In general, there were several general problems with the draft document. Committee members were concerned that the document needed additional organization: some material was repeated multiple in multiple different places. Committee members were also concerned that much of the material reflected Iridium Block 1, not Iridium Certus. David agreed to remedy these flaws in the next revision of the document.

Chuck LaBerge reported on his conversations with Chris Hegarty, Chair of RTCA's Program Management Committee. He reported that Chris supports the necessity of presenting PMC with MASPs and MOPS simultaneously (or MASPS before MOPS). This means that the MASPS, including the intended Inmarsat SBB-on-Iridium Certus interference model(s) is on the critical path for MOPS approval.

The SC-222 members of the committee and those WG-82 members had interest, reviewed the draft Iridium Certus MOPS material on the afternoon of July 25. Luke Sienkiewicz of Iridium lead the discussion, Alden Fuchs of Iridium (via Webex) provided a quick overview of Certus operation, emphasizing that the acquisition of the Certus channel is identical to the process used in Block 1. There were multiple comments about the way in which Iridium sensitivity was specified. Additional comments about the way susceptibility was specified were generally related to the use of CW versus a (noiselike) broadband signal of specified signal level or PFD. The channel must accommodate Inmarsat use of the full 1626.5-1660 band, with 1626.5 plus a small increment being the worst-case for Iridium. There may be different concerns for both the ring channel and the working channel, due to the different fundamental performance of the modulations used in those channels.

In general, there were a few areas where the MOPS requirements still need some refinements that can only be provided by Iridium and its partners. One example is the "coverage volume percentage". The groups will consider appropriate permissive wording that will permit manufacturers to degrade performance to some minimum (1V + 1 data?) with temperature, and where such material should be placed.

8 Updates to SBB part of NG MOPS

Dual PS Voice

AI and JH led through the proposed changes. It has been agreed to delete E4 in Table 2-2 as no avionics vendor plans to develop it. Discussion was held on the combination of the valid system components (Transceiver, DLNA, Antenna): 6MA transceivers has been replaced with the 6J.

FAA explained that no TSO for the most recent MOPS update is planned. They will wait until the actual work is complete. Johan Gericke explained that EASA will provide an ETSO based on the most recent updates on MOPS.

All changes in the MOPS have been discussed and the document will be updated accordingly.

LTE/ATCt aspects

This time no material on these aspects have been presented. It is planned to discuss updated version of the MOPS in this relation at the next joint meeting.

9 Updates to classic aero MOPS (DO-210D)

LTE/ATCt aspects

Richard Tapp presented Change Note 5. All items have been discussed. Some of the items require some rewording and inputs (Change 4, Change 11, Change 14), but in principle this material could be considered covered and closed and is considered ready for FRAC/OC. Details can be found in the updated version of Change Note 5.

11 Establish Agenda, Date and Place of next meeting

For RTCA SC-222 and EUROCAE WG-82 the planning of next steps has been discussed. The following next meetings have been agreed on.

WEBEX's:

- **19 and 20 September, 15:00-18:00 CEST SC-222/WG-82 WEBEX Meeting**
- **19 September, 13:00-16:00 EDT SC-222 Iridium working session**
(WG-82 welcome to participate)

Note 1: Expectation is to have draft MASPS (ATCt part has not yet been presented and discussed) and final classic aero MOPS and a first draft for the SBB MOPS part (ATCt/LTE part has not yet been presented and discussed).

Note 2: In the SC-222 dedicated session IRIDIUM material will be further discussed.

RTCA/EUROCAE to set up webex

- **19 and 21 November, 15:00-18:00 CEST SC-222/WG-82 Plenary Meeting**

Note: This meeting is planned to have IRIDIUM and SBB plenary review before starting the FRAC and OC process.

RTCA/EUROCAE to set up webex

- **27 January 2020, 15:00-18:00 CEST SC-222/WG-82 Plenary Meeting (to be confirmed)**

Note: This meeting is planned as FRAC and OC resolution review meeting.

Physical Meetings:

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

11 Adjourn – Plenary meeting

Chuck LaBerge explained at the end of the meeting that it became more and more difficult for him to handle RTCA SC-222 work in parallel to his daily business. He therefore decided to resign as chair of RTCA SC-222 after the next PMC planned for March 2020. He is open to further support IRIDIUMs work on finalizing the MOPS and MASPS material but no longer as chair of the meeting as it is quite a challenge on one side to dive into technical details and that part of the discussion and on the other side chairing the meeting and keeping all items organized properly.

Armin thank him for his help and support in the SATCOM community, which did and does alleviate his work on the EUROCAE side within WG-82 in this matter due to his comprehensive knowledge on the technical matters and his elegant way of handling the joined meeting. The groups wished him well in his retirement from the chairmanship.

Action items

RTCA-SC222 / EUROCAE WG-82 30th meeting: 6.02.2018 and 7.02.2018

Action#	Content	Responsible	Deadline	Status
A30-09	<p>Review of SC-228 slides and material (ITU M.2127) to provide feedback on the following items:</p> <ol style="list-style-type: none"> 1) Support of 2000 UA 2) 10 – 100 kbps per UA (Peak!) 3) Voice latency of 390 millisecond maximum 4) Use of protected spectrum (L-Band) <p>Discussion at WG-82#31: Chuck will provide a response on it asap.</p> <p>Discussion at WG-82/#32: Values might change in the MASPS for UAS. MASPS are available end of the year. So no activities required by WG-82/SC-222 until availability of MASPS.</p> <p>Discussion at WG-82/#33: MASPS on C2 link support by SATCOM expected Q1/2019.</p> <p>Discussion at WG-82/#34: Status unchanged.</p> <p>Discussion at Plenary June 2019: Status unchanged.</p> <p>Discussion at Plenary July 2019: Current priority on MASPS and MOPS actual documents. Status unchanged.</p> <p>Status Plenary Sept 2019: Status unchanged.</p>	Chuck	asap	Open

RTCA-SC222 / EUROCAE WG-82 31st meeting: 26.06.2018 and 28.06.2018

Action#	Content	Responsible	Deadline	Status
A31-01	<p>Coordinate with RTCA SC-159 on GNSS issues (sensitivity level etc.)</p> <p>Discussion at WG-82/#33: e-mail from Laurent (AIRBUS) → Chuck will respond asap on the numbers provided.</p> <p>Discussion at WG-82/#34: In context of IRIDIUM review will take care of it soon.</p> <p>Discussion at WG-82/#35: Still open.</p> <p>Discussion at Plenary June 2019: Status unchanged.</p>	Chuck	end of 2018	Closed

A31-02	<p>Coordinate with EUROCAE WG-62 on GNSS issues (sensitivity level etc.)</p> <p>Discussion at WG-82/#33: Follow activities of A31-01</p> <p>Discussion at WG-82/#34: Status unchanged.</p> <p>Discussion at WG-82/#35: Still open.</p> <p>Discussion at Plenary June 2019: Status unchanged.</p>	Armin	end of 2018	Closed
A31-03	<p>Contact EUROCAE WG-105 (RPAS) to ask for requirements on SATCOM Performance Class A</p> <p>Discussion at WG-82/#34: Still open. Armin to take care of it soon.</p> <p>Discussion at WG-82/#35: Still open.</p> <p>Discussion at Plenary June 2019: Status unchanged.</p> <p>Discussion at Plenary July 2019: Current priority on MASPS and MOPS actual documents. Status unchanged.</p> <p>Status Plenary Sept 2019: Status unchanged.</p>	Armin	asap	Open

RTCA-SC222 / EUROCAE WG-82 planning meeting: 6.03.2019

Action#	Content	Responsible	Deadline	Status
A35-01	<p>Provide input material (working papers) for the May meeting of WG-82 to cover draft SATCOM MASPS, classic MOPS (DO210D) and draft NG MOPS.</p>	all	26 th April 2019	Closed
A35-02	<p>Armin to clarify with Chuck on the need to update interference simulation results IRIDIUM versus SBB.</p> <p>Discussion at WG-82/#35: Armin's view that IRIDIUM has to take the lead on this item to further process. Armin will contact IRIDIUM.</p> <p>Discussion at Plenary July 2019: Covered in current review process within RTCA SC-222.</p>	Armin	end of May 2019	Closed

RTCA SC-222/EUROCAE WG-82 meeting: 12.06. and 13.06.2019

Action#	Content	Responsible	Deadline	Status
A36-01	Distribute Excel sheets to indicate required changes and comments to SATCOM MOPS and MASPS to SC-222 and WG-82. Remark: From now on all changes and comments shall be documented in these specific Excel-sheets to be able to provide a comprehensive view on the work of the groups to RTCA and Secretary for preparation of FRAC and OC later on.	Chuck/Armin	14 June 2019	Closed
A36-02	Armin to organize a WEBEX specifically dedicated to Performance Class A planning in October/November 2019 timeframe.	Armin	beginning of October 2019	Open
A36-03	Clarify changes on classic aero TSO. Harmonize planned change 5 for DO210-D with actual TSO.	Steve van Trees/Chuck	for July 2019 meeting	Open
A36-04	Distribute Draft ICAO SATCOM SARPS to Armin and chuck for further distribution within SC-222 and WG-82. Review by both groups appreciated. Status Plenary July 2019: Armin to ask Nikos on this matter. Status Plenary Sept 2019: ICAO PT-S plans to provide the draft SARPs for EUROCAE/RTCA review and comments in January 2020.	Nikos Fistas	End January 2020	Open
A36-05	Prepare NG MOPS material for July meeting with documents including track changes related to LTE/ATCt issue. Include the changes also in the Excel sheet as in the past. Remark: Harmonization with ARINC 781 required! Status Plenary July 2019: Excel-sheet not yet available. Status Plenary Sept 2019: Excel-sheet now available. Actual status of comments?	Richard Tapp	for July 2019 meeting	Open
A36-06	Prepare classic aero MOPS material for July meeting with documents including track changes related to LTE/ATCt items. Include the changes also in the Excel sheet as in the past. Status Plenary July 2019: Decided not to use Excel-sheet for DO210-D.	Richard Tapp	for July 2019 meeting	Closed

A36-07	<p>Prepare NG MOPS material for July meeting with documents including track changes related to Dual PS Voice issue. Include the changes also in the Excel sheet as in the past.</p> <p>Status Plenary July 2019: Excel-sheet not yet available.</p> <p>Status Plenary Sept 2019: Excel-sheet now available.</p>	Andrew Ives	for July 2019 meeting	Closed
A36-08	<p>Prepare classic aero MOPS material for July meeting with documents including track changes related to Dual PS Voice item. Include the changes also in the Excel sheet as in the past.</p> <p>Status Plenary July 2019: Action not valid as no changes on classic aero MOPS required.</p>	Andrew Ives	for July 2019 meeting	Closed
A36-09	<p>Prepare SATCOM MASPS changes related to ATCt issues with document including track changes for review. Include the changes also in the Excel sheet as in the past.</p> <p>Status Plenary July 2019: Excel-sheet not yet available.</p> <p>Status Plenary Sept 2019: Excel-sheet now available.</p>	Sachin Chhibber	for July 2019 meeting	Closed

RTCA SC-222/EUROCAE WG-82 meeting: 24.06. and 25.07.2019

Action#	Content	Responsible	Deadline	Status
A37-01	Ask ICAO PT-S whether V80 voice requirement will be further discussed in ICAO and might be updated in the future. Requirement is 0.485 sec delay. Actual SBB installation cannot meet it.	Dave Robinson	mid September 2019	Closed
A37-02	Update the DO210-D change Note 5 material: Clarify whether Change 4 when making it a shall requires re-certification of older equipment. Need to coordinate with FAA on it.	Richard Tapp	2 nd September 2019	Closed
A37-03	Distribute DO210-D change Note 5 with all required input to SC-222 and WG-82 for final review	Richard Tapp	2 nd September 2019	Closed
A37-04	SBB SATCOM MASPS: Update and distribute SBB SATCOM MASPS material with agreed changes for final review by SC-222 and WG-82	Andrew Ives	2 nd September	Closed
A37-05	SBB SATCOM MOPS: Update and distribute SBB SATCOM MOPS material with agreed changes for review by SC-222 and WG-82. It shall include changes related to LTE/ATCt interference issue.	Richard Tapp	2 nd September 2019	Closed

A37-06	IRIDIUM MOPS Update	Luke	2 nd September 2019	Open
A37-07	IRIDIUM MASPS Update	Dave	2 nd September 2019	Open