



RTCA Paper No.177-20/SC222-082
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Washington, 16 July 2020
 St Denis, 16 July 2020

**Minutes of EUROCAE
 WORKING GROUP 82 (WG-82) (Meeting #41) and RTCA SPECIAL COMMITTEE 222
 (SC-222) (Meeting #38)
 “New Air-Ground Data Link Technologies”
 related to SATCOM**

Date	23rd and 24th June 2020
Place	Virtual Meeting
Venue	EUROCAE – Webex
Hosted by	EUROCAE

Participants:

Name	Company	23 rd	24 th
Aristides Cintra	Embraer	X	X
Adam Sarhage	Garmin	X	X
Adam Snyder	IRIDIUM	X	X
Alan Schuster-Bruce	INMARSAT	X	X
Alden Fuchs	IRIDIUM	X	
Andrew Ives	INMARSAT	X	X
Andrew Morin	IRIDIUM	X	X
Anna Guégan	EUROCAE (WG-82 TPM)	X	X
Antonio Correias	EUROCONTROL	X	X
Armin Schlereth	DFS (Chair WG-82)	X	X
Ayaz Nemat	Thales	X	X
Ben Huang	IRIDIUM	X	X
Brandon Hinton	Consultant for Iridium	X	X
Chuck LaBerge	LaBerge Engineering (Chair SC-222)	X	X
Darrell Andregg	Collins	X	X
David Green	Collins Aerospace	X	X
Duncan Mobley	Satcomdirect	X	X

Galen Wong	Thales	X	X
Gonzalo Prieto	ESSP	X	X
Gurjinder Rakkar	Boeing	X	X
Hans Trautenberg	EASA	X	X
Hiroshi Okochi	JRANSA	X	X
Jeff Knickelbein	Cobham	X	
Jeffrey Bull	IRIDIUM	X	X
Jila Rainer Koll	Stellar Aerospace	X	X
Johan Gericke	Cobham	X	X
Jose Godoy	ARINC Incorporated	X	
Joseph Darden	IRIDIUM	X	X
Luke Sienkiewicz	IRIDIUM	X	X
Mark Insley	Latitude Technologies	X	X
Martina Angelone	ESA	X	X
Michael Hooper	IRIDIUM	X	X
Radek Zaruba	Honeywell	X	X
Ravi Jain	Federal Aviation Administration	X	X
Richard Tapp	Honeywell	X	X
Ryan Mustoe	Boeing		X
Sam Weich	Ligado Networks	X	X
Stephen van Trees	Federal Aviation Administration	X	X
William Yu	Aviage systems		X

DOCUMENTS

Agenda Item	Title	File name
1	Calling Notice and Agenda	SC-222 (38) and WG-82 (41) Calling Notice.pdf
2	Meeting Minutes of last Meeting	222_37_WG-82_Meeting_39_Minutes_final
4	EUROCAE WG-82 Status of work	EUROCAE WG-82 Status of work – June 2020.pdf
5	Iridium MASPS	200610_iridium DO343D MASPS-WP310.pdf
5	Certus Interference Analysis	200610_Iridium DO343D MASPS Appendix A Certus Interference Analysis_WP-311.pdf
5	Sensitivity Analysis	200618_Iridium DO262F Data Sensitivityv0.8-WP312.pdf
6	Iridium MOPS	200610_Iridium DO262F MOPS-WP313.pdf

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.

Welcome, Introductions, Administrative Remarks by Special Committee Leadership

Chuck LaBerge (chair SC-222) welcomed the group.

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

1. APPROVAL OF THE AGENDA

After a round table, Armin Schlereth introduced the final agenda of the RTCA SC-222/ EUROCAE WG-82 Plenary meeting which looked as follows:

AGENDA

23, 24, June 2020 (9:00 am – 12:00 pm ET) – (15:00 – 18:00 pm CEST)

Welcome, Introductions, Administrative Remarks by Special Committee Leadership

- Government Authorized Representative (GAR): Stephen 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. WG-82 SATCOM Discussion/Work
5. Iridium MASPS Discussion/Work
6. Iridium MOPS Discussion/Work
7. Industry Presentations
8. Update Work Plan for SC-222 and WG-82
9. Establish Agenda, Date and Place for next meeting
10. Review of Action Items
11. Adjourn – Plenary meeting

2. Review/Approve prior Plenary Meeting Summary: minutes of last meeting and action item status

The minutes of the last meeting have been reviewed and approved. The action item list has been reviewed focusing on the open actions and their status has been updated. The updated action item list is outlined at the end of the present minutes.

3. Coordination with other GROUPs

General discussion: Ravi Jain asks whether there is a need for coordination for the performance measurements and requirements, as both Inmarsat and Iridium are moving to IPS. Chuck La Berge mentions that is not up to RTCA/EUROCAE to define the performance measurements standards and requirements. Armin Schlereth comments that validation work will be carried out within the context of the ICAO PT-S.

It was proposed an action for Ravi to prepare a paper addressing which other standardization groups/fora should be interfaced by EUROCAE WG-82 and RTCA SC-222.

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

See agenda item 4.

IRIS-IOC

No input provided at the meeting.

4. WG-82 SATCOM Discussion/Work

Armin Schlereth presented Actual TOR of WG 82 Satcom related activities after finalization of revision B of MASPS and MOPS.

Future revision C is at the moment foreseen to address ATN/IPS, RPAS, future voice concepts, AIS/MET applications Satcom Class A.

After discussion with SESAR Solution 107 and Solution 77, it looks like 2020-2022 is a more realistic timeframe for covering the IPS: initially WG82 will help to review and down select concepts proposed under SESAR, Iris and other projects to turn them later in MASPS/MOPS.

Further to this WG 82 will keep on coordinating with ICAO PT-SAT and RTCA SC-222 for the Iridium Certus material.

Summarising, the current plan till 2021 is to support ICAO PT-SAT, support RTCA Iridium Certus MASPS and MOPS definition, assess and make decision on RPAS impact on ED 242 & 243 plus provide feedback to SC-228 on DO-377 MAPS.

Beyond 2021 the following tentative future activities can be identified:

- IPS services review and concept down - selection
- New RTCP voice 2 stage dialing and DCPC
- Potential revision of B2 RCTP/RSTP from ICAO
- Potential incremental improvements for SB-Safety

Chuck LaBerge proposes that Armin Schlereth, Anna Guégan, Karan Hofmann, and himself take the action to discuss further about the revision to the Terms of Reference document to

keep SC-222 and WG-82 in synchronization and to retain the joint nature of the SC-222/WG-82 work.

5. Iridium MASPS Discussion/Work

Luke Sienkiewicz (Iridium) presents work on WP 312, DO 262F Iridium Certus data sensitivity white paper and comments.

There was some discussion on the target BER (L-band) and on the related Power Flux Density at antenna ports depending on the waveform, and on the measurement procedure indicated in the working paper. The working paper included an overview of the BER curves for the coded/uncoded waveforms, as requested at previous meetings. The paper discusses the method used to give AES engineers access to the effective BER measurements by means of a performance statistic developed by the internal turbo decoder.

DO-343:

Further discussions on the interference model took place and the group discussed the Interference table with calculations and the Interference model and analysis. There were questions regarding the stated sensitivity levels, which were answered by Alden Fuchs and Jeff Bull of Iridium. (See action item list)

The table with comments and suggested resolutions has been updated for the Appendix on Interference analysis.

Mike Hooper of Iridium indicated that Iridium believes that the current state of the model accurately reflects anticipated performance of Iridium Certus equipment in an enroute airspace shared between Certus-equipped and Inmarsat SBB-equipped aircraft. Chuck LaBerge congratulated Iridium on the significant progress they had made in maturing the model.

The committee had an extensive discussion of the draft MASPS (SC-222/WP310), following the comments received from Cobham and from Chuck LaBerge. While not all comments were resolved, Iridium understood the changes that should be made and the questions that needed to be answered.

6. Iridium MOPS Discussion/Work – DO262F

Luke Sienkiewicz went through the MOPS document taking note of the comments (e.g. referenced documents list shall complete and updated and that the figures common to the MASPS and MOPS shall be aligned).

The group opened a discussion on the scope of MASPS vs MOSPS for what concerns system aspects and frequency assignment aspects. In that context it should be clear that there is clear guidance from RTCA and EUROCAE about the content of MASPS and MOPS. Hans Trautenberg from EASA highlighted the issue that when having the MOPS material available manufacturer very often don't read the MASPS material also due to the fact that it is outdated. So, it would be good to have a kind of system description also part of the MOPS. Chuck LaBerge made the proposal to include useful material from MOPS to MASPS as it seems even more precise now as the description in the MASPS. Armin Schlereth pointed out, that duplication of material in the MOPS and MASPS should be avoided unless absolutely necessary in order to simplify future document maintenance. Finally, it was decided that further discussion on this item is needed in future meetings.

7. Industry Presentations

There were no industry presentations

8. Update Work Plan for SC-222 and WG-82

Chuck LaBerge led a review of the draft schedule (RTCA WP306) and updated it based on the current review. The agreed schedule is shown below:

Action or Meeting	Calendar days		Content For Review
PMC Mtg (Changed)		Thursday, March 18, 2021	Post FRAC/OC Iridium MOPS/MASPS, interference model plus WG-82 material on Class A Airspace.
Documents to PMC	35	Thursday, February 11, 2021	Documents for Approval (see above)
Documents to RTCA	10	Monday, February 1, 2021	Documents for Approval (see above)
FRAC Resolution Plenary	18	Thursday, January 14, 2021	Documents for Approval (see above)
FRAC Complete	14	Thursday, December 31, 2020	Documents for Approval (see above)
FRAC Released	48	Monday, November 16, 2020	Documents for Approval (see above)
Plenary Approval	9	Tuesday, November 10, 2020	Documents for Approval (see above)
Final Docs to SC/WG	32	Tuesday, October 6, 2020	Documents for Approval (see above)
WGW Pre FRAC SC-222 Irid Review	29	Thursday, September 10, 2020	MASPS
WGW Pre FRAC SC-222 Irid Review	31	Tuesday, September 8, 2020	Focused on MOPS, with some MASPS if major issues remained after WGW
MOPS for Sept 8 Review		Friday, August 14, 2020	MOPS for Pre Frac
MASPS with model for Sept 8		Friday, August 7, 2020	MASPS+Model for Pre Frac
In progress WGW (MOPS)		July 28, 2020	If major MOPS issues
In progress WGW (MASPS)		Tuesday, July 21, 2020	Primarily MASPS, formal comments on June MOPS version
Updated Draft MOPS posted		July 10, 2020	
Updated Draft MASPS posted		Friday, July 3, 2020	
Plenary SC222/WG82		June 23-24, 2020 (Need whole days?)	WG-82 Class A SATCOM Review, MASPS, MOPS, Model for Iridium in PM

The joint committees agreed that this schedule is very tight.

9. Establish Agenda, Date and Place for 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:

- **21 and 28 July 2020** SC-222/WG-82 Working Group of the Whole

Time: 09:00 – 17:00 EDT

Note: This meeting is split into 1st day meeting concentrating on MASPS and the second day on MOPS material.

Physical Meetings:

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

12. Adjourn – Plenary meeting

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 LaBerge 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. Current publication schedule has higher approval.</p> <p>Status Plenary Nov 2019/Jan 2020: Status unchanged. Current publication schedule has higher approval</p> <p>Discussion at Plenary June 2020: Status unchanged.</p>	Chuck LaBerge	asap	Open

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

Action#	Content	Responsible	Deadline	Status
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 Schlereth 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> <p>Status Plenary Sept 2019/Jan 2020: Status unchanged. Current publication schedule has higher approval.</p> <p>Discussion at Plenary June 2020: Status unchanged.</p>	Armin Schlereth	asap	Open

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

Action#	Content	Responsible	Deadline	Status
A36-02	<p>Armin Schlereth to organize a WEBEX specifically dedicated to Performance Class A planning in October/November 2019 timeframe.</p> <p>Armin Schlereth to invite also SC-222 as they are monitoring progress on this.</p>	Armin Schlereth	Q1/2020	Closed
A36-03	<p>Clarify changes on classic aero TSO. Harmonize planned change 5 for DO210-D with actual TSO.</p> <p>Plenary Jan 2020: This coordination is outside work of RTCA SC-222 and WG-82 therefore closed.</p>	Steve van Trees/Chuck LaBerge	June 2020	Closed
A36-04	<p>Distribute Draft ICAO SATCOM SARPS to Armin Schlereth and Chuck LaBerge for further distribution within SC-222 and WG-82. Review by both groups appreciated.</p> <p>Status Plenary July 2019: Armin Schlereth to ask Nikos on this matter.</p> <p>Status Plenary Sept 2019: ICAO PT-S plans to provide the draft SARPs for EUROCAE/RTCA review and comments in January 2020.</p>	Nikos Fistas	End January 2020	Open

RTCA SC-222/EUROCAE WG-82 meeting: 19.09. and 20.09.2019

Action#	Content	Responsible	Deadline	Status
A38-01	<p>Consider Ligado potential interference issue on the Iridium MOPS in the Iridium Working Group session</p> <p>Plenary SC-222 and WG-82 Nov 2019: IRIDIUM wants to have it part of the Plenary discussion.</p> <p>Make a new AI out of it. Closed this one!</p> <p>Plenary June 2020: Decided to keep it for more discussion at next meeting.</p>	Chuck Laberge	October Meeting of SC-222	Open

RTCA SC-222/EUROCAE WG-82 meeting: 23.01., 24.01. and 30.01.2020

Action#	Content	Responsible	Deadline	Status
A40-01	<p>SATCOM NG MASPS on Inmarsat SBB:</p> <p>Action item on Richard Tapp to provide the final updated documents until 14th February 2020 to the RTCA and EUROCAE secretariat!</p>	Andrew Ives	14 th February 2020	Closed
A40-02	<p>DO210-D:</p> <p>Action item on Richard Tapp to provide the final updated documents until 14th February 2020 to the RTCA and EUROCAE secretariat!</p>	Richard Tapp	14 th February 2020	Closed
A40-03	<p>SATCOM NG MOPS on Inmarsat SBB:</p> <p>Action item on Richard Tapp to provide the final updated documents until 14th February 2020 to the RTCA and EUROCAE secretariat!</p>	Richard Tapp	14 th February 2020	Closed

RTCA SC-222/EUROCAE WG-82 meeting: 23.06. and 24.06.2020

Action#	Content	Responsible	Deadline	Status
A41-01	Write a White Paper summarizing the relevant bodies, which may provide requirements input to the work of RTCA SC-222 and EUROCAE WG-82 on Future SATCOM.	Ravi Jain supported by Armin Schlereth (European bodies)	18.July 2020	Open
A41-02	Clarify on future harmonized work program of RTCA SC-222 and EUROCAE WG-82. Organize a meeting with Karan Hofmann, Ann Guégan, Chuck LaBerge and Armin Schlereth	Armin Schlereth	1.July 2020	Open

A41-03	Write a Paper on justification of C1 low/high gain maximum level of white band noise (-114.6 dBm and -120.5 dBm). Also power loop control management to be covered clarifying not inducing multi aircraft interference.	IRIDIUM (Mike Hooper, Luke Sienkiewicz?)	18.July 2020	Open
A41-04	Provide a White Paper to Chuck LaBerge on GLONASS interference subject. Chuck LaBerge then to coordinate with RTCA SC-159	Mike Hooper, Chuck LaBerge	11.July 2020	Open