Summary of the 8th Meeting   **RTCA Special Committee 242 (SC-242)**
Summary of the 8th Meeting   **EUROCAE Working Group 124 (WG-124)**
Spectrum Compatibility

Executive Summary

The joint RTCA SC-242 / EUROCAE WG-124 Plenary #8 meeting was held on Thursday February 29, 2024. The meeting was held in hybrid format with both in-person at EUROCONTROL facilities and virtual attendees.

- Briefings were presented on the following topics:
  - Subgroup 2 Summary Activity
  - Report 2 Status
  - Risk Register

  Meeting materials are available as follows (link may need to be copied into browser):
  - See RTCA AerOpus February 29, 2024, Plenary Meeting #8 folder: https://aeropus.i3cloudservices.com/Group/GroupLanding/10010?tab=Documents&folder=Plenary+Sessions%2F2024+Sessions%2F8-February+29%2C+2024
  - See EUROCAE Workspace February 29, 2024, Plenary Meeting #8 folder: https://eurocae.sharepoint.com/sites/strato/143ce6de-838d-ec11-b400-000d3ab41693/674e24de-8072-ee11-8179-000d3ab4bde1/SitePages/Documents.aspx

- Next Meeting:
  - Joint RTCA SC-242 / EUROCAE WG-124 Plenary #9
    - July 30-August 1, 2024 at RTCA in Washington, DC

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Joint Plenary Meeting Summary

The joint RTCA SC-242 / EUROCAE WG-124 Plenary #8 meeting was held on Thursday February 29, 2024. The meeting was held in hybrid format with both in-person at EUROCONTROL facilities and virtual attendees.

Meeting materials are available as follows (link may need to be copied into browser):
- o   See RTCA AerOpus February 29, 2024, Plenary Meeting #8 folder:
  https://aeropus.i3cloudservices.com/Group/GroupLanding/10010?tab=Documents&folder=Plenary+Sessions%2F2024+Sessions%2F8-February+29%2C+2024
- o   See EUROCAE Workspace February 29, 2024, Plenary Meeting #8 folder:
  https://eurocae.sharepoint.com/sites/strato/143ce6de-838d-ec11-b400-000d3ab41693/674e24de-8072-ee11-8179-000d3ab4bde1/SitePages/Documents.aspx

Thursday, February 29th Plenary
The Plenary convened at approximately 0900 EST / 1500 CET

1. Host and Co-Chairs Welcome and Introductions
    - Ed Hahn and John Micallef welcomed participants.
    - Ed managed the participant introductions.
    - Attachment A lists the combined participants for the Plenary and subgroup meetings that occurred on February 27-29, 2024.

2. Administrative Matters – RTCA & EUROCAE Policies
    - Rebecca Morrison presented the RTCA and EUROCAE mandatory slides on anti-trust, proprietary/intellectual property, committee participation membership, GDPR privacy policies, and Russian participation prohibition.

3. Agenda Review
    - Ed Hahn presented the meeting agenda.
    - Ed asked if there were other agenda items, and none were offered.

4. Approval of Minutes from Plenary #7
    - Clay Barber presented the draft October 24, 2023, virtual plenary minutes noting a few editorial changes since the prior draft was posted to RTCA AerOpus and EUROCAE Workspace.
    - Some real-time adjustments were made to the minutes.
    - A motion and second were made to approve the minutes.
    - The minutes were approved as adjusted.

      Post meeting note: The final minutes were posted to the October 24, 2023, Plenary Meeting #7 folder on AerOpus and Workspace.

5. Subgroup Reports to Plenary
    - Subgroup 1 (SG1):
      - o Andy Roy briefed the SG1 status
        - The ER-028/RR-001 Survey Report is complete and published.
        - SG1 is now in standby mode.

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- Subgroup 2 (SG2):
  - o Olivier Pellay briefed the SG2 status (see attached slides), which included an overview of the:
    - 9 Information Papers (IPs) and status of each IP,
    - Next steps and plan for completion of the IPs, and
    - Other presentations made during the SG2 working session that may be helpful to completing IPs.

- Report 2 Ad Hoc:
  - o Ed Hahn briefed the Report 2 status (see attached slides).
    - The full outline of the report is complete,
    - A draft of the report is partially complete,
    - Authors for the remaining sections have been identified,
    - A complete draft is expected in late Spring / early Summer after which the Review and Comment (RAC) on Report 2 will be opened. The RAC opening may be via virtual plenary.

6. Any Other Business (AOB)
   - Guest Paper
     - o Guest Piet van den Berg (KLM) provided a paper in advance of this plenary for discussion. The paper includes summarized RF frequency and performance information for various ARINC specifications similar to that included in the ER-028/RR-001 Survey Report Appendices A and B.
     - o Ed Hahn noted the committee's appreciation for this paper.
     - o Piet noted appreciation for the work being performed by SC-242/WG-124 in light of KLM's and other airline's concerns with RF vulnerabilities in installed airborne equipment and the issues such vulnerabilities can cause. Of particular concern is the lengthy period required to replace equipment with vulnerabilities with equipment that will reduce such vulnerabilities.
     - o The committee agreed to post the paper to the RTCA AerOpus and EUROCAE Workspace as part of this plenary's meeting materials.
     - o Ed invited Piet to join RTCA SC-242 or EUROCAE WG-124.
   - Terms of Reference (TOR) Revision
     - o A request was made during the Sep 21, 2023, RTCA Program Management Committee meeting for SC-242/WG-124 to consider changing the title of the Guidance document to avoid confusion with the WAIC MOPS title ("wireless"). This resulted in Action 34 recorded during the SC-242/WG-124 October 24, 2023, Plenary #7.
     - o Ed Hahn presented a draft TOR that proposed changing the Guidance document title from "Spectrum Guidance for the Developers of Standards for Aviation Wireless Systems" to "Spectrum Guidance for the Developers of Standards for Aviation Radio Frequency Systems". The draft TOR also removed the ER-028/RR-001 Survey Report since it is complete.
     - o A motion and second were made to update the TOR as presented.
     - o The TOR revision was approved as presented.

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- - - o John Micallef noted that the WG-124 TOR also will need to be updated for consistency.
      - o **ACTION**: John Micallef to amend the WG-124 TOR to align with the revised SC-242 TOR.
  - Action 33-Related Discussion
    - o Sai Kalyanaraman raised an issue regarding assessment of band compatibility when more than one system shares a band, with the specific example of WAIC and Radar Altimeters sharing 4 200 to 4 400 MHz, with high power 5G IMT operations in adjacent bands. Other examples of shared bands include (DME, SSR, and LDACS) and (VOR, ILS, GBAS VDB).
    - o While the group agreed that the point raised is valid, the issue is that the current scope of the DO-XXX Guidance document is for use by RTCA Special Committees/EUROCAE Working Groups to develop a specific system and does not currently have a focus on how to ensure adjacent band compatibility with multiple aviation systems sharing a single band. There was additional discussion by the group, but no conclusions were reached on a path forward.
    - o Ed Hahn suggested that this issue needs further discussion to better understand the scope of the problem and its implications for SC-242/WG-124 and elsewhere (e.g. SC-239/WG-119, ICAO ICNSS, etc.), with possible elevation to RTCA Program Management Committee/EUROCAE Technical Advisory Committee once a specific problem statement and proposal for future work is identified.
    - o **ACTION**: SC-242/WG-124 to consider way forward on shared and adjacent band interference tolerance.

7. Date and Venue of Next Meeting
   - The committee agreed to an in-person Plenary #9 July 30-August 1, 2024, at RTCA with plenary on August 1st. There will be a hybrid option.
   - The committee agreed to an in-person Plenary #10 November 12-14, 2024, in Europe. Location TBD with EUROCONTROL, EASA, and Airbus as possibilities. There will be a hybrid option.
   - Ed Hahn also noted the potential need for a virtual plenary to open RAC on Report 2 before Plenary #9 if sufficient progress is made on the report.
   - The committee also agreed to resume biweekly subgroup meetings beginning March 12, 2024.

Meeting Dates	Locations (Hosts)	Meeting Goal
July 30-August 1, 2024	Washington DC (RTCA) (hybrid)	1. Progress Guidance document 2. Open Report 2 RAC
November 12-14, 2024	Europe (TBD) (hybrid)	1. Progress Guidance document 2. Close Report 2 RAC

8. Review of Actions [and Risk Register]
   - Review of Open Actions: Clay Barber reviewed the open actions from the October 24, 2023, plenary minutes.
     - o March 20, 2022, Plenary #1:

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- Action 1: Efforts continue to be made to identify a WG-124 Secretary. John Micallef is working a potential Secretary candidate. It was agreed to keep Action 1 open and extend the due date to Plenary Meeting #9.
- Action 2: It was agreed to keep Action 2 partially open to identify the Guidance document editor and to extend the due date to Plenary Meeting #9.

- April 20, 2023, Plenary #5:
  - Action 23: Provide semi-annual briefings on SC-242/WG-124 to FSMP. This action will remain open as an ongoing action.
- July 27, 2023, Plenary #6:
  - Action 27: RTCA and EUROCAE published an additional call for participation on Jan 29, 2024. Agreement to close.
- October 24, 2023, Plenary #7:
  - Action 32: Post-RAC comments were incorporated into RR-001/ER-028. Agreement to close.
  - Action 33: Coordinate with SC-239/WG-119 to support new RA MOPS development. SC-239/WG-119 is moving more rapidly than SC-242/WG-124. Several members of SC-239/WG-119 also participate in SC-242/WG-124, so will provide input as opportunities are presented. Additionally, SC-239/WG-119 can provide their FRAC document to SC-242/WG-124 as an opportunity to provide input. Agreement to close.
  - Action 34: Discussion of request from RTCA PMC to make DO-XXX title change occurred during the AOB agenda item. Agreement on revised title change and updates to TOR. Agreement to close.

- Review of New Actions: Clay Barber provided the list of actions he had captured from this Plenary. The actions were amended as suggested by the committee and are captured in the following table.

- Risk Register: John Micallef presented the risk register.
  - John provided an update on each risk.
  - The risks related to the RR-001/ER-028 Survey Report are closed due to the completion of the report. Additionally, the risk related to WRC23 is closed since that is now in the past.
  - A new risk was opened related to contention for scarce RF expert resources to assist with drafting the Guidance document IPs.
  - John will continue to maintain the risk register and requests any additional risks be communicated to him and Ed.

- Current SC-242/WG-124 Plenary Action Item list
  - Action Items closed during this Plenary are shaded in grey in the following table.
  - New Action Items identified during this Plenary are shaded in green in the following table.
  - Actions closed in previous Plenary sessions are not listed.

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#	Owner	Action	Date	Due Date	Status
1	Mark Watson / John Micallef	Identify WG-124 Secretary	Mar 10, 2022	Aug 1, 2024	Open
2	Ed Hahn / John Micallef	Identify subgroup leads and document editors • Subgroup leads identified Apr 20, 2022 • Editor for Guidance document will be needed as further progress is made on Information Papers	Mar 10, 2022	Aug 1, 2024	Partially Open
23	Ed Hahn / John Micallef	Provide semi-annual briefings on SC-242/WG-124 to FSMP	Apr 20, 2023	Per FSMP Meeting Schedule	Open
27	Ed Hahn / John Micallef	Work with RTCA/EUROCAE staff to produce an additional call for participation for system/equipment designers	Jul 27, 2023	Jan 29, 2024	Closed
32	Clay Barber	Incorporate post-RAC comments into RR-001/ER-028	Oct 24, 2023	Oct 24, 2023	Closed
33	Ed Hahn / John Micallef	Coordinate with SC-239/WG-119 to support new RA MOPS development	Oct 24, 2023	Feb 29, 2024	Closed
34	Ed Hahn / John Micallef	Consider Guidance document title change	Oct 24, 2023	Feb 29, 2024	Closed
35	John Micallef	Amend the WG-124 TOR to align with the SC-242 TOR changes	Feb 29, 2024	Aug 1, 2024	Open
36	All	Consider way forward on shared and adjacent band interference tolerance	Feb 29, 2024	Aug 1, 2024	Open

9. Adjourn
- Ed Hahn and John Micallef thanked the committee for their participation and engagement.
- Rebecca Morrison thanked EUROCONTROL for hosting.
- The Plenary adjourned at approximately 1045 EST / 1645 CET on Thursday February 29, 2024.

CERTIFIED as a true and accurate summary of the meeting.

Clay Barber, SC-242 Secretary   TBD, WG-124 Secretary

Ed Hahn, SC-242 Chair   John Micallef, WG-124 Chair

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Attachment A – Participants

Leadership

Name	Organization
Ed Hahn SC-242 Chair	ALPA
John Micallef WG-124 Chair	EUROCONTROL
Clay Barber SC-242 Secretary	Garmin
Chris Tourigny SC-242 Government Authorized Representative	FAA
Rebecca Morrison SC-242 Program Director	RTCA
Mark Watson WG-124 Technical Programme Manager	EUROCAE
Andrew Roy Subgroup 1 Lead	ASRI
Olivier Pellay Subgroup 2 Lead	Airbus

Membership

Name	Organization
Donny Morrow	ALPA
Earle DePass	TCCA
Gary Berz	EUROCONTROL
Guillaume Novella	DGAC
Ivan Clark	NASA Langley
Jessie Turner	Boeing
Jose Luis Chinchilla	Indra
Josep Gine	ATR
Kambiz Rahnavardy	FCC
Kathryn Bernazzani	DOT Volpe Center
Kim Kolb	Boeing
Mauro Pagliarini	EASA
Miles Bellman	FAA
Patrick Ris	United Airlines
Rodrigo Moraes	ANAC
Sai Kalyanaraman	Collins
Sasa Jankovic	Bundesaufsichtsamt für Flugsicherung, Germany
Sayed Rastaghi	NAV CANADA
Stephen J N Parry	UK NATS
Steve Van Trees	FAA

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Guests

Name	Organization
Alex Wanda	Satnav-Africa
Mark Gibson	CommScope
Max Minev	ERA a.s.
Nathalie Bossiroy	EUROCONTROL
Paco Salabert	EC DG MOVE
Petr Jonas	EUROCONTROL
Piet van den Berg	KLM

SG2 Summary activity

- Information Paper progress

IP1: Synthesis of RF survey and first recommendations
 - Parameters information and questions raised in Report 1 were consolidated
 - Information from other SDOs have been introduced

IP2: How to fully describe a transmitter spectrum envelope

IP3: How to fully describe a receiver spectrum envelope
 - Some additions have been introduced related to TX and RX Spectrum regulatory performances

IP4 : Interference protection criteria for radio frequency interference assessment
– First preliminary draft is available including guidance to be further developed
- need to be coordinated with RX/TX parameters

IP5: Interference scenarios
– skeleton is available but need to be further developed

IP 6: Methodology for interference assessment
IP7: Measurements
IP8: Margins in RF environment
IP9: Interference reduction techniques
– Not yet started
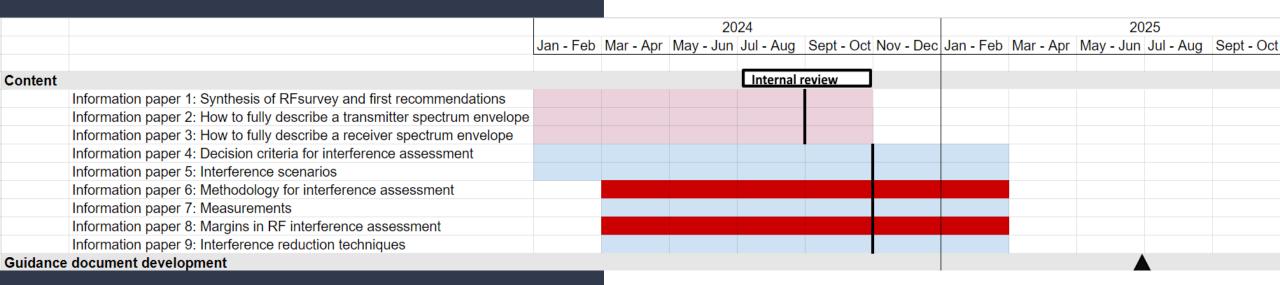– Focal points were identified

SG2 Summary activity

- ## Next steps

- ## Time plan

The following actions has been agreed to progress on the development of the IPs :

– To take into account **ECC deliverables on receiver resiliency** (ECC Report 310, draft ECC Recommendation (24)01, draft ECC Report 356)
– To further analyze **European Market access on Radio equipment** in terms on essential requirement to be fulfilled
– To consider applicability **of CEPT Method to assess Receiver resiliency** to aero radio systems
– Start developing IP6 to IP9 with a priority on top **for IP6 and IP8**

		2024						2025				
		Jan - Feb	Mar - Apr	May - Jun	Jul - Aug	Sept - Oct	Nov - Dec	Jan - Feb	Mar - Apr	May - Jun	Jul - Aug	Sept - Oct
Content												
Information paper 1: Synthesis of RFsurvey and first recommendations						Internal review						
Information paper 2: How to fully describe a transmitter spectrum envelope												
Information paper 3: How to fully describe a receiver spectrum envelope												
Information paper 4: Decision criteria for interference assessment												
Information paper 5: Interference scenarios												
Information paper 6: Methodology for interference assessment												
Information paper 7: Measurements												
Information paper 8: Margins in RF interference assessment												
Information paper 9: Interference reduction techniques												
Guidance document development												

✈ Report 2: "Report on Aeronautical Radio Frequency Systems, their Regulatory Framework, and Operational Considerations"

✈ Scope:
  ✈ The committee shall develop high-level material to assist non-aviation stakeholders to understand how aeronautical RF systems are used and the performance necessary (e.g., availability, reliability, continuity, latency, etc.) for safety-of-life functions and how they fit into the overall management of airspace. Additional material that discusses aviation lifecycles and the timeframes necessary for design, testing, certification, manufacture, and installation of new or updated equipment also shall be developed.

✈ Status
  ✈ Full outline / partial draft presented
  ✈ Reviewed and edited during Working Group sessions this week

✈ Future Outlook
  ✈ Remaining section authors identified
  ✈ Expect complete draft in late Spring / early Summer
  ✈ RAC to be opened at that time (may be via virtual plenary)

RISK MANAGEMENT LOG	
Column	**Instructions For Completing This Document**
	Complete the Project Name, NC, Project Manager Name, and Project Description fields
	For each risk identified, complete the following:
A	**ID**: A unique ID number used to identify the risk in the risk tracking log.
B	**Current Status**: This column should be populated with the risk's current status. o **Open**: The risk is currently open but is not yet an issue. o **Closed**: The risk is no longer considered an active project threat and can be closed with or without resolution.
C	**Risk Impact**: This column should be populated with the potential impact of the risk if it did become a project issue. Valid options include the following: High, Medium, Low. These are defined as follows: o **High**: Risk that has the potential to greatly impact project cost, project schedule or performance. o **Medium**: Risk that has the potential to slightly impact project cost, project schedule or performance. o **Low**: Risk that has relatively little impact on cost, schedule or performance.
D	**Probability of Occurrence**: This column should be populated with the estimated probability that the risk will at some point become a project issue.
E	**Risk Map**: This is a calculated field based on the values selected for both Risk Impact and Probability of Occurrence. o **Green**: LL (Low Probability, Low Impact), LM (Low Probability, Medium Impact), ML (Medium Probability, Low Impact) o **Yellow**: LH (Low Probability, High Impact), MM (Medium Probability, Medium Impact), HL (High Probability, Low Impact) o **Red**: MH (Medium Probability, High Impact), HM (High Probability Medium Impact), HH (High Probability, High Impact)
F	**Risk Description**: This column should be populated with a description of the risk.
G	**Project Impact**: This column should be populated with a description of the potential project impact as a result of the risk.
H	**Risk Area**: This column should be populated with the appropriate risk area.
I	**Symptoms**: This column should be populated with the symptoms of risk that may eventually lead to the execution of a risk contingency plan.
J	**Trigger**: This column should be populated with the triggers that would indicate the requirement to execute contingency plans.
K	**Risk Response Strategy**: This column should be populated with the preferred risk response strategy.
L	**Response Strategy**: This column should be populated an appropriate response strategy to prevent the risk from becoming an issue.
M	**Contingency Plan**: This column should be populated with a description of the risk contingency plan.

Column	**Instructions For Changing the Contents of Drop-Down Menus**
C, D, H	Highlight the cell of which you wish to change the content of the drop down menu. From the file menu click "Data" -> "Validation" and change the content of the source field

Column	**Instructions For Filtering Data**
Any	Highlight the header of the cell you wish to filter data on From the file menu click "Date" -> "Filter" ->"Auto Filter" Then select your filter criteria from the drop down menu that appears on your header cell

RISK MANAGEMENT LOG

Project Name:	SC242/WG124
Project Manager Name:	Chair
Project Description:	Spectrum efficiency

ID	Current Status	Risk Impact	Probability of Occurrence	Risk Map	Risk Description	Project Impact	Risk Area	Symptoms	Triggers	Risk Response Strategy	Response Strategy	Contingency Plan
P1	Closed	Medium	High	Green	Survey outcome ineffective or late.	SG1 report delivery timescale slippage, with spillage onto SG2 timescales.	Schedule	Lack of timely responses, or no responses from committee chairs	Four weeks prior to scheduled start date if no resource is identified with required skill set implement contingency plan.	Mitigation	(i) Guidance clarifying instructions for survey respondees (ii) Segmentation of responses into compulsory and optional entries (iii) New delivery dates to be proposed to the PMC.	Agree a sequential delivery of responses.
P2	Open	Medium	High	Red	Lack of internal (SG) expert resource	SG1 and SG2 delivery slippage.	Resources	Lack of committee member contributions		Avoidance	Sequential sequencing of tasks. Allocation of experts' time through resource register managed at SG level.	Find resource that meets required skill set through external hiring sources. Publish request to RTCA and Eurocae membership for contribution of additional system expertise at WG level.
P3	Closed	Low	Low	green	Lack of system expertise to cover gaps in survey	Inability to substantiate gaps for specific systems, leading to incomplete SG2 guidance.	Expertise	Incomplete survey submissions		Contingency		
P4	Closed	Low	Low	Closed	Impact of WRC23 preparations on committee's calendar	Busy spectrum calendar in 2023 impacting on availablity of key experts	Schedule	Key experts inability to attend meetings or to contribute to deliverables in a timely manner.	Meeting clashes with other spectrum committees related to ICAO and to ITU WRC23	Contingency	active tracking of external spectrum committee meetings vs key experts	
P5	Open	Low	Medium	Green	Resource diverted from SG2 drafting efforts on Do-XXX/ED-XXX to address guidance on ongoing topical issues like radalt.	Slow progress in Issue Papers completion resulting in further Do-XXX/ED-XXX delivery slippage.	Schedule	Slow progress in IP development		Avoidance		Actively track internal WG resource by allocating IP drafters. Start linking common themes and linking threads between IPs to storyboard the draft Do-XXX/ED-XXX. Engage with RTCA/Eurocae WGs for specific guidance and also further input considerations for the deliverable.