



EURPaper No: 311-22 / WG119-14
RTCA Paper No. RTCA - 238-22/SC-239-023

Saint Denis, 5 Apr 2022
Washington, 5 Apr 2022

**EUROCAE WG-119 Plenary Meeting #7 “Radar Altimeter” /
RTCA SC-239 Plenary Meeting #7 “Low Range Radar Altimeter”**

DATE: 5Apr-7Apr, 2022

TIME: 8 AM – 1 PM EDT

PLACE: Virtual

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AGENDA

1. EUROCAE/RTCA présentations and policy - Rebecca, Karan, Anna
2. Round table of introductions and detailed agenda for SG – Jean-Luc
3. Current Context, Previous plenary decisions
4. ToR update proposal
5. BAPFD discussion for the US 5G C band
6. Discussion on 3rd party identification for BAPFD data handling
7. Validate previous plenary minutes
8. Issue paper: AMOC TF discussion
9. Outline for near term deliverables (and tasking assignments) based on the ToR scope statement
10. BA PFD and related test setup discussions.
11. Identification of the next Plenary Date , document editor for the near term deliverable.
12. CEPT status discussion and review of input on the Japanese 5G scenario.
13. Other business, action item review
14. Adjourn

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1. Welcome, Introductions and Administrative Remarks

Karan Hoffman and Rebecca Morrison from RTCA and Anna Guegan from Eurocae welcomed the participants. Anna and Karan presented the RTCA and Eurocae IPR and other relevant policies. Jean luc lead the roundtable table of introductions.

2. Agenda Review

The group reviewed and approved the meeting agenda (which Jean Luc presented).

3. Plenary discussions

Discussion ensued on the ToR update proposal. Group debated the top down vs bottom up proposal to the Technical Document (DO/ED-xxx) discussed the schedule for this document (goal of PMC approval by Dec 2022). Group agreed that we can target Dec 2022 for PMC approval of the DO-xxx and Dec 2023 for MOPS completion.

The group then worked to identify the action items based on the scope of what was intended to be addressed in DO/ED-xxx. This was based on the tasking items that were identified and captured in the plenary slides by Jean_Luc (slides 12-13) and addressed items such as determining a max tolerable RFI for a given interference SiS across a range of operational altitudes,

Jim Williams stated that we should consider using a white paper for capturing the interim state and material for spectrum compatibility. Seth was open to this and Karan Hofmann mentioned that we need to FRAC this document. Sai and Seth concurred. Group intended for this to be a new DO.

Jean Luc displayed the slide on agreed approach (top – down approach) and went through the relevant inputs needed and anticipated outputs in that block diagram (slide 9 in the plenary presentation).

JLR presented the ToR. Discussion ensued on 3rd party and the intent of what is behind this ToR.

It was suggested that the FAA will be the third party for data handling. Many of the aviation stakeholders agreed with this approach. FCC And NTIA agreed that FAA can be the third party and they will work with them to review the details of the submission. It was identified that we would need to formally request and agree that the FAA is the third party.

Barbara Clark from the FAA stated that there are multiple items that need to be ironed out re: the FAA being the third party and need to ensure that the FAA is tied off with the other federal agencies and other international regulators. Charles Glass said that FCC and NTIA has mechanisms in place to exchange data. Janet from the FCC said that the decision from third party needs concurrence from the FCC as well. A poll was conducted and there was general consensus that the FAA can be the third party.

Next, Jean luc made a presentation on the PFD and approach from RA manufacturers to show what PFD levels can be met by the sensor. FAA put forth an ask to identify what PFD levels can be met in the lower frequency bands (below the current C band).

Discussion ensued on the max achievable PFD at RA antenna input on the fuselage. There was further discussion on the need to test with other waveforms (other than TM1.1). Aviation asked telecom stakeholders to help define the other FDD waveforms for testing. Sai asked if we could use AWGN to test in that case (in lieu of a waveform like FDD). Dave Wolter (ATT) planned to reach out and seek input from his Colleagues on this item.

Discussions ensued on how the 5G RMS signal power levels are measured. This was towards determining the max avg signal levels. Seth provided a note from the FCC R&O on how this

signal level is measured and Janet Young (FCC) indicated that she can provide this information as well.

Discussion pivoted to time frames from on feedback (re: best achievable PFD). The initial estimate was that it would take 8 weeks for first cut engineering results and approximately 12 weeks for final set of results from each manufacturer. Group allocated another month for the 3rd party to review the data and for stakeholder discussions around the same. Charisse Green recommended that we fine tune what is necessary for the OE (DO-XXX) and asked to reduce the time window. She also stated that we should have a concrete definition of what is needed. Further discussions ensued on addressing questions on data shared by the rad alt manufacturers (which will be presented to the group in an anonymized fashion). It was determined that this will be addressed by having rad alt manufacturers respond to question in confidence (Direct discussions with the RA OEM's).

Barbara Clark spoke to the progress that is needed to share the data with the third parties. FAA needs more in order to co-ord with third parties. For the FAA to look at the data and the installations and put it into context is about a months time (to look at the data and talk to platform OEM's etc). If the group did not need any value added from the FAA and just anonymize this will be a quick turn. Adding value will take time.

Group added a feedback loop from the sc-239 process to the 3rd party to determine what that max achievable PFD is – max achievable is the highest level of RFI that can be tolerated before any of the perf reqs are degraded to the point that the aircraft cannot support this.

Discussions pivoted to the material that Jean Luc had presented on aircraft operational cases and RFI encounter scenarios, Seth agreed that we need aircraft volume definition. He indicated that the minimum distance (to the BS) is not part of the operational volume and added the in the last Plenary it was agreed to not assume min distances and/or slant range, but instead evaluate what is feasible environment for the RA. Barbara Clark mentioned that the volume and PFD definitions need to reflect rotorcraft needs.

Discussion on classes of altimeters ensued. The group was asked if we wanted to continue with different classes of altimeter and the short answer was yes. Barbara asked if the group had discussions on what TSO's are going to be driven against the final DO(MOPS). The Goal is to define the maximum RFI env that RA's can work in and meet their perf requirements.

Pursuant to further discussions, the ToR was updated and will be posted on Aeropus for further review.

Sai presented minutes from previous plenary – minutes were validated

Jean Luc presented an outline of what we need to work on for the interim document with a delivery of this work package by the end of the DO-XXX document. Detailed on the tasking can be seen in Slides 12-13 in the plenary presentation

Polling was conducted on the ToR update which was approved by a unanimous vote.

Further discussions ensued on system compatibility and Janet Young from the FCC wanted to make sure that the compatibility with other systems such as WAIC is accounted for as well. Dave Redman said that sc-236 is looking into this item.

Group agreed upon a title for the DO/ED interim document: Technical Standard on RF Interference Environment for Radar Altimeters

Group also discussed the test setup for determining the BAPFD. This included discussions on waveform (spurious and fundamental), TDD/FDD, bandwidth and other details. There are several items that needed to be nailed down here so that all manufacturers test against the same signal / waveform. SG5 was assigned and action to this end.

Group discussed the Japan signaling and levels – Discussion from sai , Seth, Kim and Shunichi on whether signals in Japan are TDD/FDD (Japan is TDD now – based on input from Shunichi).

Dave R provided an update on the ECC PT1 activity. Dave R states that some of the PT1 activity overlapped with item 4 in the OE defining tasks. Dave referred to the rtca /eurocae liaison statement and that the interaction with ECC PT1 was through Eurocontrol. Raffi is the PoC at Eurocontrol.

4. Future Meetings

- a. Next joint plenary with Eurocae WG-119 will be the week of the 26th of Sep 2022 in person (starting on the 27th) at RTCA premises in DC (with support for hybrid participation).
- b. Other Actions – (over and above what has been mentioned in the main body of the minutes) will be updated in the final version of the minutes.
 - i. Action: determine FDD vs TDD Vs AWGN for testing - need to close this out by 4/15.
 - ii. (FAA – PoC / Charisse /Barbara) – third party data (action for the rad alt manufs to share data and info in support of best possible performance with FAA). Action for FAA to anonymize this data and share it back.
 1. There is no blanket access to the data from FAA to FCC.
 - iii. Shunichi – Check with MiC on usage of same mast for both frequency bands.
 - iv. Rebecca Morrison - Rebecca will coordinate with RTCA and EUROAE about what access may be given to telecom non-RTCA members to working meetings and working documents. For full access, membership in RTCA or EUROCAE is possible
 - v. Action for SC-239 stakeholders to identify people to help with the interim document – Dave Redman was temporarily identified as the editor
 - vi. Action for interested stakeholders to reach out to Dave R/ Rebecca if they want to get onto the SG5 mailing list.

5. Adjourn

The meeting adjourned around 1 PM ET.

