

TERMS OF REFERENCE
Special Committee (SC) 242
SPECTRUM
COMPATIBILITY

ORIGINAL REQUESTOR(S):

Organization	Person
RTCA	Terry McVenes
EUROCAE	Anna von Groote

SC LEADERSHIP:

Position	Name	Affiliation	Telephone	email	Change
Chair	Ed Hahn	ALPA	(703) 689-4189	ed.hahn@alpa.org	
Government Authorized Representative	TBD				
Secretary	Clay Barber	Garmin	(913) 596-8495	clay.barber@garmin.com	

BACKGROUND:

Access to sufficient, suitable and appropriately protected radio frequency (RF) spectrum supporting communication, navigation, surveillance, and other aeronautical safety systems is an essential resource for the aviation industry without which airspace management would not be feasible. As the use of airspace increases, including the introduction of new users such as drones, and the management of that airspace becomes more complex, the demand for spectrum will also increase along with the requirement for improved communication capacity and navigation/surveillance accuracy. Therefore, the ability to secure and protect the spectrum aviation relies upon will be a significant factor to the long-term success of aviation.

Concurrently, many other industries outside of aviation are also growing and evolving their wireless capabilities requiring access to additional spectrum. The increased demand for spectrum has reached a point where industries are competing with each other for access to this limited resource with national and international regulatory bodies having to decide on who should have access. For these decisions to be made, spectrum regulators need to have the most accurate picture of the systems they are considering and how changes to the RF environment can affect them.

Therefore, aviation needs to demonstrate and justify that their systems are required, are spectrally efficient, do not interfere with the operations in adjacent bands, and have appropriate resilience to operations in adjacent bands as defined by regulation. The justification will have to include why aviation systems require a level of safety assurance that exceeds most other industries and how through its processes and procedures it delivers that level of safety. Recent US and international spectrum proceedings have highlighted that aviation does not have sufficient detail of how all its current systems interact at the RF level, nor does it have comprehensive guidance for how new aviation radio systems should be designed and introduced.

DELIVERABLES:

As a specific near- to mid-term task, SC-242 should catalog the current standards for RF-based aviation systems in operation, develop a primer on aeronautical radio frequency systems, and develop a new DO-XXX Spectrum Guidance document for use by developers of new and updated aviation systems standards.

Product	Description	FRAC Completion Due Date*	Change
Report #1	Compendium on Radio Frequency (RF) Performance of Standards for Aeronautical RF Systems	December 2022**	
Report #2	Primer on Aeronautical Radio Frequency Systems, their Regulatory Framework, and Operational Considerations	December 2023**	
DO-XXX	Spectrum Guidance for the Developers of Standards for Aviation Wireless Systems	June 2024	

*Note: Due Date refers to the date that the committee plenary approves the document after completing the Final Review and Comment Process. Publication will take place at the PMC meeting no earlier than 30 days after the editing process by RTCA is complete.

** This is the completion date for the Report and not a FRAC completion date (FRAC is not required for this internal Report).

SCOPE and COORDINATION:

Report #1

RTCA SC-242 shall collect relevant information and produce a report on current RTCA and EUROCAE aeronautical standards for RF systems and the RF performance documented in those standards, identifying potential variations in how such performance is documented. This shall include both gaps in that information, and examples of extensive work on spectrum considerations that may be used as future models for guidance material. The committee should also identify aeronautical systems that are standardized outside of RTCA and EUROCAE (e.g., ICAO SARPS, etc.), which are out of scope for the committee.

Report #2

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.

Guidance Document

RTCA SC-242 shall develop a new DO-XXX for spectrum guidelines that should be taken into account when SCs are developing specifications for new aviation RF systems. The objective for the DO-XXX spectrum guidance is to ensure that the RF characteristics of aeronautical systems are specified in a consistent and complete manner that meets safety case requirements while being consistent with or better than existing spectral mask regulatory requirements and/or guidance material. Such guidance shall include transmitter and receiver RF parameters including, for example, performance, resilience, out of band emissions and spectral efficiency.

ENVISIONED USE OF DELIVERABLES

Report #1

The report on current aeronautical standards is envisioned to determine a consistent set of parameters that aeronautical systems need to define, and to identify any shortfalls and best practices within these standards with respect to these parameters. The identified gaps included in the report will be available to relevant SCs for consideration in their future work.

The report is intended to complement work being done within the International Civil Aviation Organization (ICAO) in relation to ICAO Doc 9718 – Handbook on Radio Frequency Spectrum Requirements for Civil Aviation.

The report will be developed jointly with EUROCAE WG-124 with EUROCAE producing an equivalent ER-xxx document.

Report #2

The report material on the following aspects:

- how specific aeronautical RF systems are used,
- the performance necessary for safety-of-life functions, and
- aviation system lifecycles

is intended to be used in communications with stakeholders inside and outside the aviation ecosystem, in order for them to better understand the constraints under which the aviation industry operates.

The report is intended to complement work being done within ICAO in relation to ICAO Doc 9718.

The report will be developed jointly with EUROCAE WG-124 with EUROCAE producing an equivalent ER-yyy document.

Guidance Document

The new DO-XXX Guidance Document is intended to be used by other SCs in the update or creation of new aeronautical standards. The new DO-XXX on spectrum guidance is also envisioned to be used in conjunction with relevant ICAO material to provide guidance to aeronautical radio system designers and as a reference document for national/international spectrum regulators. It is also intended to act as reference material for the Federal Aviation Administration, other civil aviation authorities and spectrum managers. It is not intended to fully define the RF environment, but to ensure RF performance criteria are specified in a consistent and complete manner including resilience, out of band emissions and spectral efficiency during updating of existing standards and creation of new standards.

The guidance document is intended to complement work being done within ICAO in relation to ICAO Doc 9718.

The new spectrum guidance document will be developed jointly with EUROCAE WG-124 with EUROCAE producing an equivalent ED-xxx document.

SPECIFIC GUIDANCE:

The following coordination is envisaged:

- *ICC Coordination* – inform the Integration and Coordination Committee (ICC) of the committee’s needs for coordination with other relevant Special Committees.
- *EUROCAE Coordination* – joint committee with EUROCAE WG-124 for ER-xxx Report, ER-yyy Report, and ED-xxx Guidance Document.
- *Support for the Activity* – support from the leadership of other Special Committees and Technical Working groups.
- *Additional Coordination* –
 - *ICAO Coordination* – work with the Frequency Spectrum Management Panel as well as the Integrated Communication, Navigation, Surveillance & Spectrum Task Force to ensure the optimized use of limited resources/expertise and minimize overlap between the work. Additionally, coordination may be required with ICAO operational panels to understand the

criticality and operational use of systems.

- *European Telecommunications Standards Institute (ETSI) TG Aero Coordination* – Request co-operation from ETSI TG Aero on aeronautical standards currently being developed within the ETSI framework.
- *Initial Documentation* – Following documentation are elements of the document baseline:

Documents	Intended Use
ETSI Guide EG 203 336	Input to Guidance Document
ITU-R Radio Regulations 2020 edition, Recommendations Related to Spectrum Management and/or Aeronautical System Parameters	Inputs to Guidance Document
EU Directive 2014/53/EU and Regulation (EU) 2018/1139 and related ECC Recommendations and Reports	Inputs to Guidance Document
Federal Communications Commission Notice of Inquiry on Receiver Standards	Input to Reports and Guidance Document
ICAO Doc 9718 – Handbook on Radio Frequency Spectrum Requirements for Civil Aviation	Inputs to Reports and Guidance Document

TERMINATION:

When the scope of this Terms of Reference is complete, the committee will recommend to the PMC that the committee Sunset, go into Active Monitoring Mode, or spend a period of time in Hiatus. Any change/extension in the committee’s work program requires prior PMC approval.