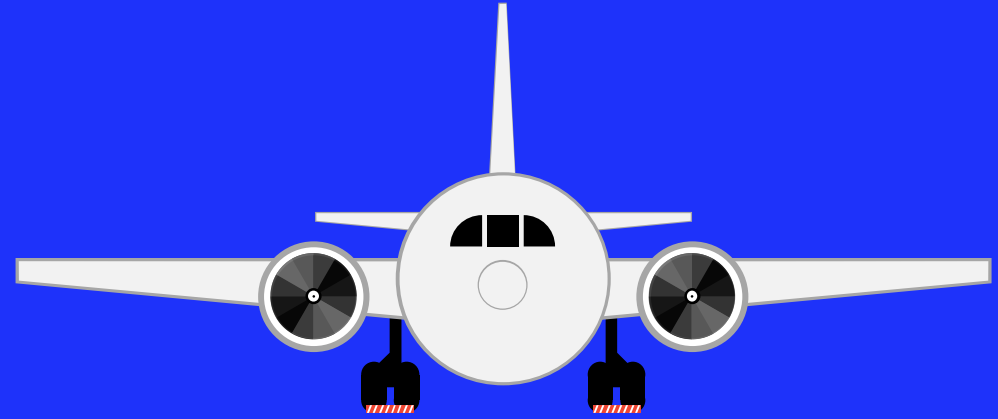


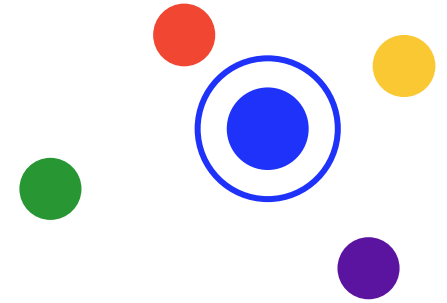
Frequency Management
work shop

5G IATA Global Strategy

Casablanca, 6-10 June 2022



Current Status – Radio Altimeter Standard



A standard set in the 1980s



2.2 TRANSMITTER OPERATING FREQUENCY

The transmitter of the radio altimeter shall be operated within a frequency band allocated for the operation of airborne radio altimeters as provided in the International Telecommunications Union regulations. The spurious radiation characteristics shall also comply with these regulations. The equipment designer should note that national requirements may be more stringent than the I.T.U. regulations.

Developed before “telecom boom” and existence of 3G/4G/5G/6G...

Few if any requirements to ensure spectrum compatibility with adjacent/nearby spectrum users.

Current radio altimeters are complied with national regulations; however, the national regulations may not be suitable for current competing needs and spectrum environment.

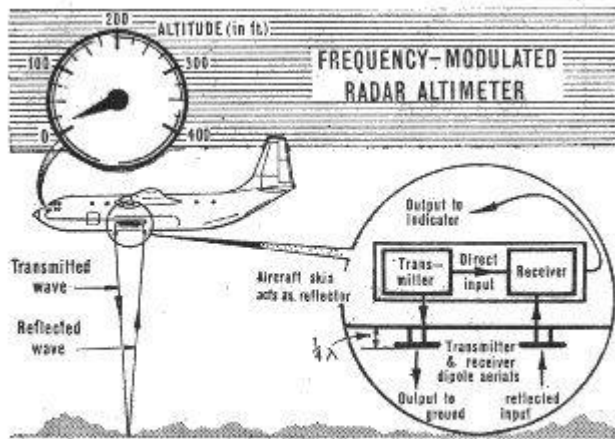
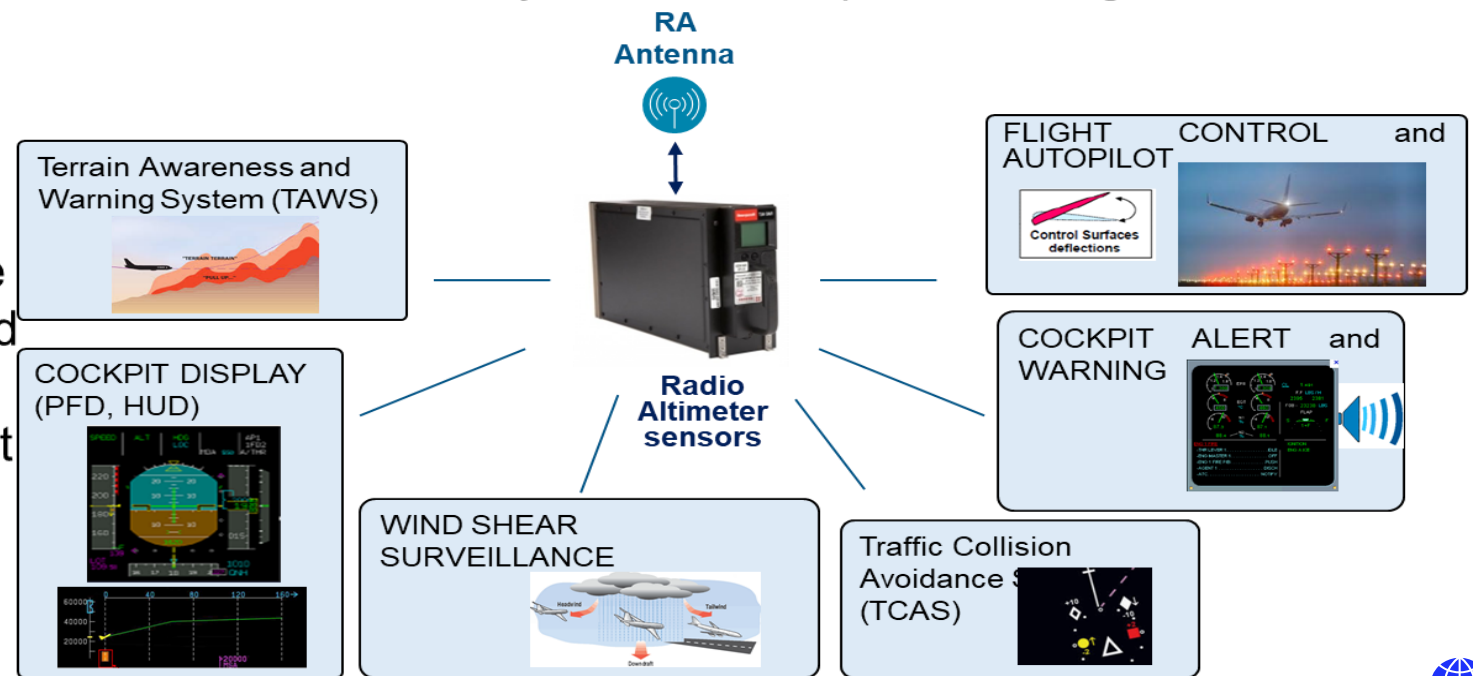


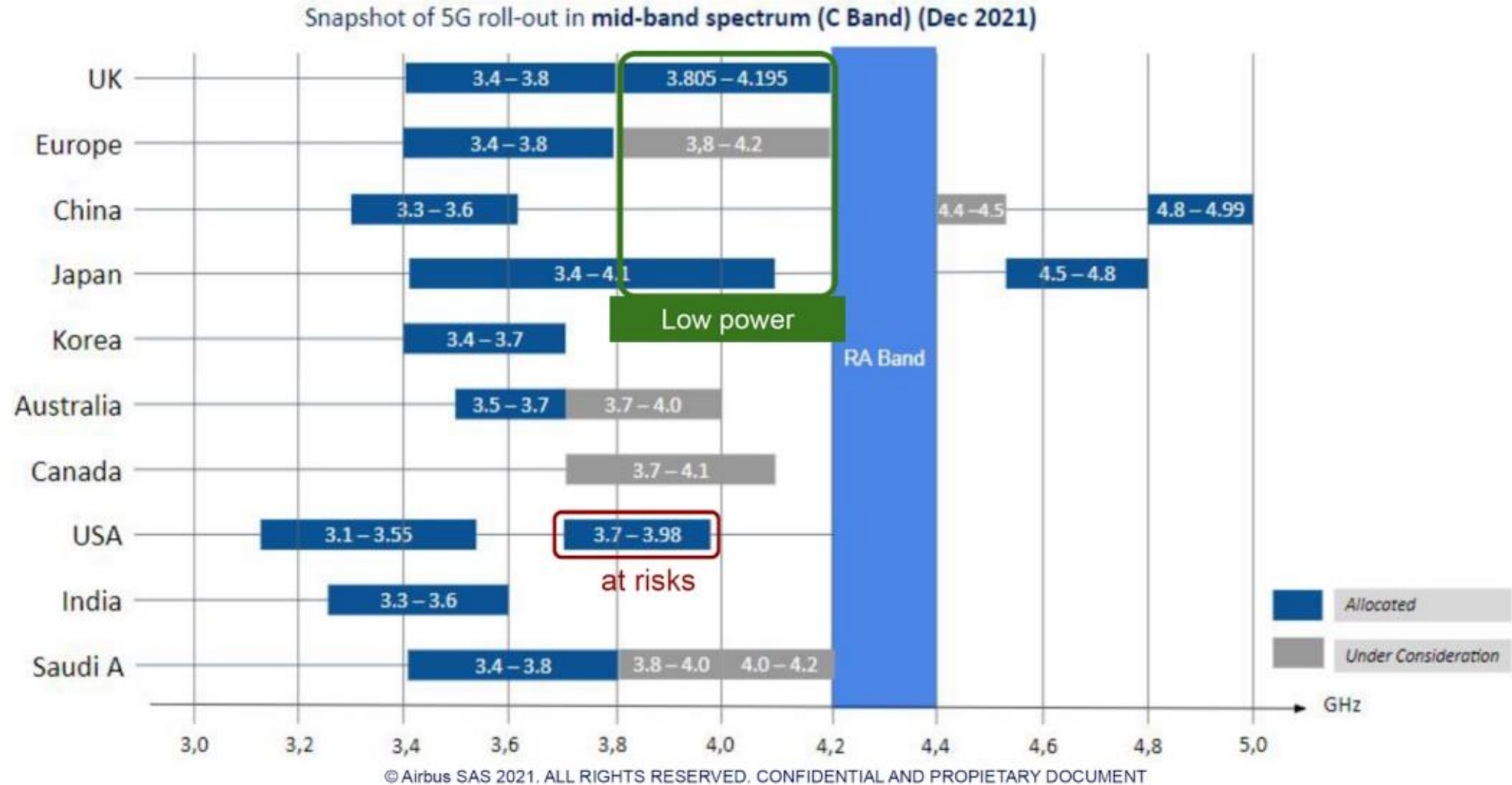
FIG 3. TYPICAL FMCW RADAR ALTIMETER LAYOUT

5 G interference Impact

- Governments all over the world are considering (or have considered) allowing 5G cellular systems to operate in parts of the frequency ranges 3.4 - 4.2 GHz and 4.4 - 4.9 GHz (adjacent to the band used by radio altimeters from 4.2 - 4.4 GHz.)
- Based on the Radio Technical Commission for Aeronautics (RTCA) Paper No. 274-20/PMC-2073, the 5G mid-band emissions may interfere with the Radio Altimeters.
- Impacted aircraft potentially include commercial aircraft, military aircraft, helicopters and larger GA & UAS aircraft with radio altimeters
- Some altimeters appear to be vulnerable to high power cellular systems.
- New Radio Altimeter standards are being developed to sustain planned 5G environment.
- The level of the problem is different depending on the platform.

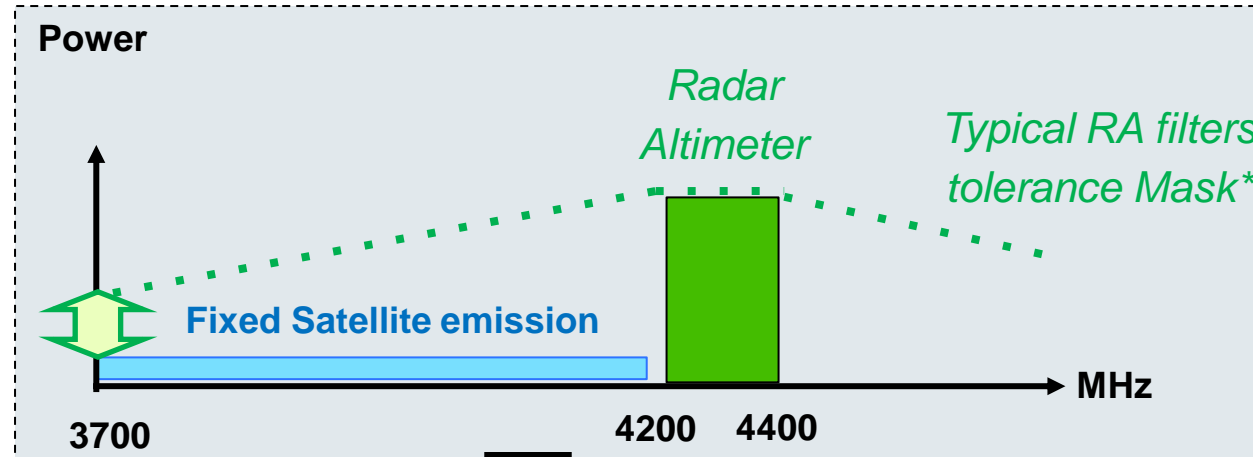


5G Proposals/Deployments Across the Globe

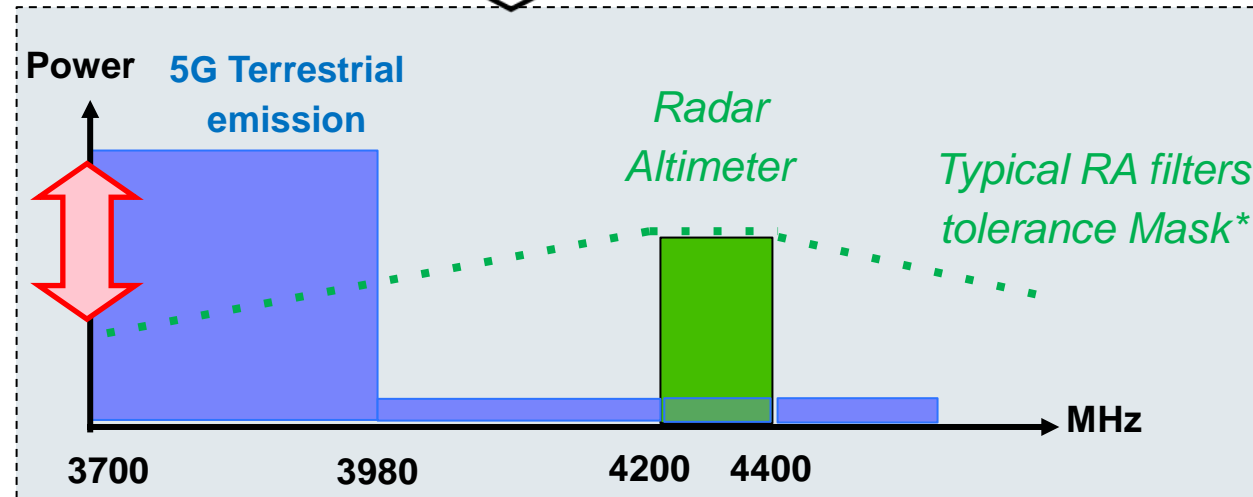


Technical Concern

Fundamental Satellite signals are filtered by RA

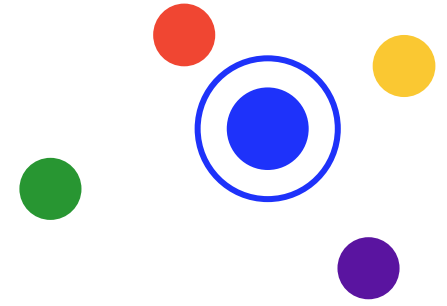


Fundamental Terrestrial 5G energy not filtered by all RA models



Air Transport RA receivers have not been designed to support such level of terrestrial interferences in its adjacent band (previously allocated to Fixed Satellites Services) even though they are fully compliant with **applicable** regulations

Current Status



- Updated [IATA Position on 5G Deployment in C-Band](#)
- IATA strategic roadmap to mitigate **current and future threats to** the civil aviation spectrum
 - Safe and uninterrupted airline operations
 - Cooperative coordination
 - Protection of civil aviation spectrum resources and establishment of predictable global spectrum environment
 - Robust aircraft and avionics design with clear and cost-effective migration path

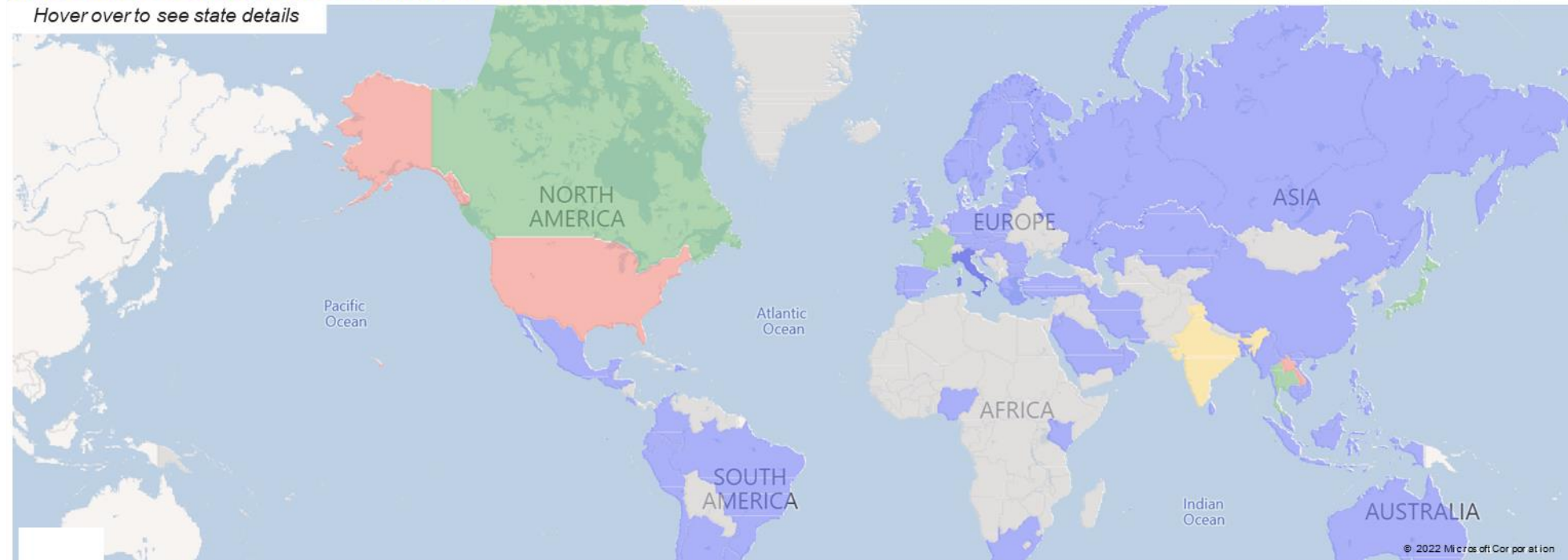
• [IATA 5G Web Site](#)

Current Status



IATA Global 5G Status Dashboard

Last Update (UTC)
06-May-22 7:19:21 AM



Filter by Country

All

Filter by IATA Region

All

Filter by ITU Region

All

Filter by ICAO Region

All

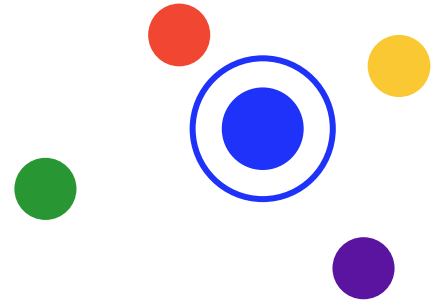
- No information on 5G roll-out obtained.
- IATA is evaluating information on 5G roll-out.
- State regulations/documentations have been published to protect operations of current radio altimeters.
- Clarification is being inquired from the government regarding upcoming 5G C-Band roll-out.
- Unresolved concerns on the impact of current/upcoming 5G roll-out to radio altimeters.

The 5G roll-out world map above provides a display of information obtained by IATA. The map focuses on 5G roll-outs in C-Band, close to the frequency band used by aircraft radio altimeters (4.2-4.4 GHz). It also contains IATA remarks and concerns on specific current 5G C-Band deployment and upcoming roll-out plan(s).

The information is made available to you for information purposes only. For the full disclaimer, please click to see the [IATA Legal Notice & Disclaimer](#)

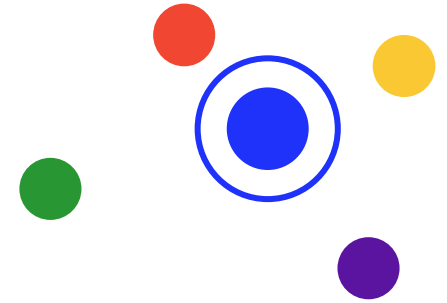


Schedule for New Radio Altimeter Standard



- Q4 2022: RTCA/EUROCAE – Definition for the RF interference environment
- 2022: ICAO guidance materials for States on 5G deployments
- Q4 2023: RTCA/EUROCAE - Minimum Operational Performance Standards (MOPS) for new radio altimeters
- 2023: ICAO SARPS development for new radio altimeters (expected an amendment of ICAO Annex 10)
- 2024+: Joint aviation engagement with ITU on reviewing relevant part of IT-R recommendations and ITU Radio Regulations

Current Status – Regional Updates



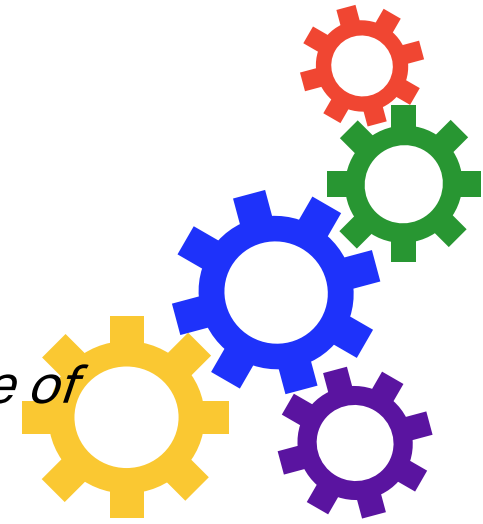
Africa & Middle East

Arab Civil Aviation Organization (ACAO) Air Navigation Committee endorsed the following recommendations:

- ✓ Urge **the member states of the organization to take appropriate measures to reduce the impact of the installation of 5G cellular networks** on the movement of aircraft in coordination with the concerned authorities of each country (national telecommunications regulatory bodies)
- ✓ Task the General Administration of ACAO in coordination with the recently **established 5G Working Group** by ICAO Middle East Regional Office to work on the **development of a mechanism at the national and regional levels to report and analyze interference** reports resulting from the use of 5G networks
- ✓ Urge member states to support ICAO's position during the 2023 World Telecommunications Conference WRC-23 meeting to be held on 2023 through coordination with the national telecommunication's regulatory bodies of each member state .

Next Steps in Spectrum

- **Upcoming:** ICAO 41st Assembly – September 2022
 - IATA Paper on *“Strengthen Protection and Encourage Efficient Aviation Use of Aeronautical Spectrum Resource”*
- **Upcoming:** Preparation for World Radiocommunication Conference (WRC) – Nov 2023
 - [Aviation Positions for WRC-2023 recognized by ICAO](#)
 - Continuing IATA engagements at ITU-R WP5B



Medium-to-Long Term

- Broadening engagements in standard setting activities, including at ITU and ICAO – **minimizing future spectrum conflicts.**
- Advocating airlines preference with OEMs on robustness of future avionic and aircraft designs to be suitable competitive and uncertain spectrum environment

Next Steps in Spectrum/Middle East

- **Action group** established .Tasked to develop guidance material on safeguarding measures to protect RA from potential harmful interference from 5 G C –band .

Guidance includes 4 Chapters;

- **Chapter 1:** Background on 5 G and frequency ban allocation
- **Chapter 2:** Potential impact of 5 G on RA during aircraft operations
- **Chapter 3:** Safeguarding measures adopted at regional & global levels for use of 5 G networks / Short & Long-Term solutions
- **Chapter 4 :** methodologies for defining safeguarding measures for aerodromes & Heliports

Thank you

