



ASSEMBLY — 42ND SESSION

TECHNICAL COMMISSION

Agenda Item 24: Aviation Safety and Air Navigation Priority Initiatives

SUPPORT OF THE ICAO POLICY ON RADIO FREQUENCY (RF) SPECTRUM MATTERS

(Presented by the Council of ICAO)

EXECUTIVE SUMMARY

Growing pressures on frequency spectrum used by safety critical aeronautical communications, navigation, and surveillance (CNS) systems pose a challenge for aviation. In the International Telecommunication Union (ITU) World Radiocommunication Conference (WRC) process, the unique safety critical nature of aviation requires national aviation authorities and industry to actively engage with their national radio regulatory authorities to ensure that national positions reflect aviation requirements to the maximum extent possible, during the development of State and regional positions for the ITU WRCs. Failure to do so may result in loss of critical functions necessary for maintaining the current level of aviation safety.

Action: The Assembly is invited to urge States:

- to fully implement Assembly Resolution 41-7: Support of the ICAO policy on radio frequency spectrum matters; and
- to ensure that national aviation authorities actively engage and strongly advocate for aviation requirements with their national radio regulatory authorities and participate in ITU Radiocommunication Sector (ITU-R) and regional WRC preparatory activities as well as the WRC in 2027.

<i>Strategic Goals:</i>	This working paper relates to the Strategic Goal <i>Every Flight is Safe and Secure</i> .
<i>Financial implications:</i>	ICAO: The activities referred to in this paper will be undertaken subject to the resources available in the 2026-2027-2028 Regular Budget and from extra budgetary contributions. States: In the context of the high priority given by Assembly Resolution A41-7, States are requested to budget for their activity.
<i>References:</i>	Doc 10184, <i>Assembly Resolutions in Force (as of 7 October 2022)</i> Doc 9718, <i>Handbook on Radio Frequency Spectrum Requirements for Civil Aviation, Volume I — ICAO spectrum strategy, policy statements and related information</i> A42-WP/23-TE/3 — <i>Aviation Safety and Air Navigation Key Initiatives and Activities</i> State letter E 3/5-25/65

1. INTRODUCTION

1.1 The radio spectrum is a scarce natural resource with finite capacity for which demand is constantly increasing. Aeronautical radio services are recognized internationally to be prime users of radio frequencies, without which aircraft operation would not be capable of meeting the global demand for safe, efficient and cost-effective transport. The recent State letter E 3/5-25/65¹ attaches the approved ICAO Position on the various items to be decided upon during the upcoming International Telecommunication Union (ITU) World Radiocommunication Conference (WRC) in 2027 (WRC-27). The ICAO Position aims at protecting aeronautical spectrum for all radiocommunication and radionavigation systems used for ground facilities and on board aircraft.

1.2 One of the items on the agenda for WRC-27 (Agenda Item 1.7²) looks into identifying or reallocating additional spectrum for international mobile telecommunications (IMT) in the frequency band 4 400-4 800 MHz, which is adjacent to the band used by aeronautical radio altimeters, operating at 4 200-4 400 MHz³. Radio altimeters (RAs) are safety critical equipment which provide an accurate, independent and absolute measurement of the minimum distance to the Earth's surface below an aircraft. The RAs are integrated into a number of safety critical aircraft functions⁴ and support pilots during critical phases of flights, ensuring adequate clearance from obstacles and terrain. Should the aviation sector fail to protect the frequency band used by RAs, this will seriously degrade performance of RAs, resulting in a critical impact on the safety of air operations globally.

2. DISCUSSION

2.1 Predictions of future demand for spectrum indicate a continuing rate of increase for all users and radio services and facilities that utilize radio waves as the world economies progressively expand. The competition among all users for the spectrum available is hence expected to intensify in the years ahead. In this competitive situation, even a user holding a spectrum allocation will not have an automatic right to retain that radio frequency (RF) spectrum, as a decision by an ITU WRC may require that spectrum be removed from any radio service to meet a superior justified demand for other radio services. Aviation is only one of many such competitors.

2.2 Aeronautical systems utilize frequency bands that are attractive to other users due to their propagation characteristics, their generally worldwide allocations and resultant benefits in equipment design. Many of these users are global industries delivering significant economic benefits that are well understood by governments. The potential revenues for such sectors are often directly quantifiable in terms of their overall spectrum allocation. However, unlike other sectors, the spectrum used for aeronautical systems is intended towards ensuring safety, rather than being directly related to revenue generation. Thus, the quantification of the cost benefit of aviation spectrum bandwidth can become challenging.

2.3 Recognizing that, as ICAO participates in the ITU WRC in an observer capacity, the reflection of the ICAO Position in WRC outcomes depends on support from ITU member administrations. States are urged to ensure, to the maximum extent possible, that their delegations to regional WRC

¹ ICAO Position on items of interest to aviation on the agenda of the International Telecommunication Union (ITU) World Radiocommunication Conference (2027) (WRC-27) (E 3/5-25/65)

² Studies on sharing and compatibility and development of technical conditions for the use of International Mobile Telecommunications (IMT) in the frequency bands 4 400-4 800 MHz, 7 125-8 400 MHz (or parts thereof), and 14.8-15.35 GHz taking into account existing primary services operating in these, and adjacent, frequency bands

³ The frequency band 4 200-4 400 MHz is allocated to the aeronautical radionavigation Service (ARNS) reserved exclusively for radio altimeters. This band is also allocated to the aeronautical mobile (route) service (AM(R)S) and used by the wireless avionics intra-communications (WAIC). WAIC systems provide safety related wireless communication between two points onboard a single aircraft.

⁴ Such systems include, but are not limited to the flight control system, automated landing, terrain awareness warning system, airborne collision avoidance systems, and wind shear detection and recovery applications.

preparatory conferences, ITU study groups and WRCs include experts from their civil aviation authorities and other civil aviation stakeholders who are fully prepared to represent aviation interests.

2.4 The safety of air operations is dependent on the availability of reliable communications, navigation and surveillance services. Current and future communication, navigation, and surveillance/air traffic management (CNS/ATM) systems are highly dependent upon the availability of sufficient, and suitably protected radio spectrum that can support aeronautical safety systems.

2.5 The aeronautical RA is one example of a safety critical aeronautical system. Any disruption to or degradation of RA performance due to insufficient protection against interference would have immediate and wide-ranging consequences for aviation safety and for States. These include increased operational risks during critical phases of flight such as take-off and landing, or the delivery of essential services including emergency medical transport, search and rescue and law enforcement operations. These operational risks are exacerbated by the automation dependency on RA for flight path manoeuvring, especially in low-visibility conditions, obstacle-rich and terrain constrained environments. RAs are a key component for aircraft operating into and out of major hubs and regional airports where precision approach procedures are widely used to safely manage arrivals and departures. In addition, States may face significant economic repercussions resulting from reduced air traffic capacity, necessary fleet modifications and infrastructure adjustments when RAs are not adequately protected from interference. Furthermore, the lack of adequate and harmonized regulatory safeguards could expose States to reputational and legal liability should preventable incidents or accidents occur.

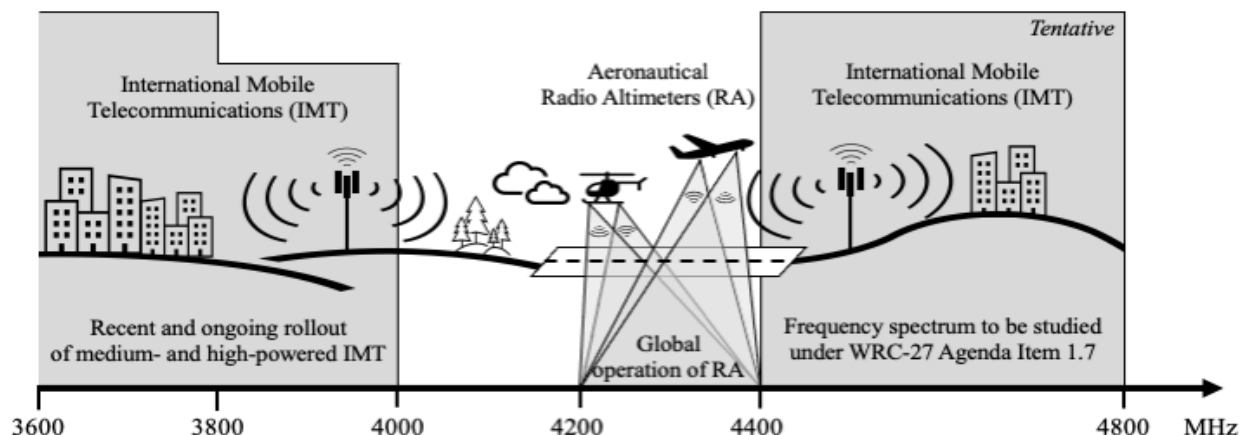


Figure 1. Potential identification or allocation at WRC-27 Agenda Item 1.7 (4 400-4 800 MHz)

2.6 The ITU Radio Regulations, updated through the WRCs every four years, govern frequency management. For the upcoming WRC-27, studies under Agenda Item 1.7 address a potential identification or reallocation of the frequency band immediately above the RA band (4 200-4 400 MHz) to international mobile telecommunications (see figure 1 below). Preparatory studies which accurately reflect the full extent of the aviation operational environment for the use of RA are required to determine any necessary conditions and mitigation measures required to ensure appropriate protection of the RA. Should the outcome of this agenda item facilitate use by IMT in the frequency band 4 400-4 800 MHz without sufficiently protecting the operation of RAs, this will result in the serious degradation of their performance in supporting safety critical functions.

2.7 Aviation experts are currently underrepresented in WRC-27 preparatory studies⁵, conducted within the ITU Radiocommunication Sector (ITU-R), as well as regional preparations, risking a

⁵ ITU-R Working Party 5B – Maritime mobile service including the Global Maritime Distress and Safety System (GMDSS), the aeronautical mobile service and the radiodetermination service; ITU-R Working Party 5D – IMT Systems.

lack of awareness among national radio regulators regarding the associated safety implications. In this context, reference is made to Assembly Resolution A41-7: Support of the ICAO policy on radio frequency spectrum matters. (A42-WP/23.TE/3 refers)

3. CONCLUSION

3.1 Assembly Resolution A41-7, in addition to instructing the Council and the Secretary General to ensure that the resources necessary to support increased participation by ICAO to international and regional spectrum management activities be made available, it also urges Member States, international organizations and other civil aviation stakeholders to firmly support the ICAO frequency spectrum strategy and the ICAO position at WRCs as well as regional and other international activities conducted in preparation for WRCs.

3.2 As evidenced by currently ongoing ITU-R deliberations on WRC-27 Agenda Item 1.7, the unique safety critical nature of aviation requires national aviation authorities and industry to actively engage with national radio regulatory authorities to ensure that their national positions reflect aviation requirements to the maximum extent possible, during the development of State and regional positions for the ITU WRCs. Should States fail to step up and actively provide expert representation and advice, in addition to ICAO's participation, this may result in unsustainable loss of critical functions necessary for maintaining the current level of safety in aviation.

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