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| A close up of a sign  Description automatically generated | **World Radiocommunication Conference (WRC-23) Dubai, 20 November - 15 December 2023** | |  |
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| PLENARY MEETING | | **Addendum 9 to Document 59-E** | |
|  | | **20 October 2023** | |
|  | | **Original: Spanish** | |
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| Cuba | | | |
| PROPOSALS FOR THE WORK OF THE CONFERENCE | | | |
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| Agenda item 1.9 | | | |

1.9 to review Appendix **27** of the Radio Regulations and consider appropriate regulatory actions and updates based on ITU‑R studies, in order to accommodate digital technologies for commercial aviation safety-of-life applications in existing HF bands allocated to the aeronautical mobile (R) service and ensure coexistence of current HF systems alongside modernized HF‑systems, in accordance with Resolution **429 (WRC‑19)**;

Introduction

The HF band is the only terrestrial service that can provide ubiquitous communication coverage for aircraft, being the long-range communication system that facilitates safe and efficient long-haul air traffic, needed by a large number of aviation regulatory bodies to ensure the safety and regularity of flight communications over the ocean and in polar and remote areas. Access to the various frequency bands in the range 2 850-22 000 kHz that are assigned to the aeronautical mobile service (route) (AMS(R)) is therefore essential.

The development of advanced digital techniques, including new waveforms, makes possible the aggregation of independent 3 kHz channels (contiguous or non-contiguous) for wideband links. This can be used for simultaneous voice and data transmission, improving the capabilities, connectivity and quality of HF communication systems.

Thanks to advances in digital technology and the recognized potential of the HF band for the aeronautical domain, it is possible to increase the speed of data and digital voice communications. The aviation sector could use these advances to provide new capabilities for aircraft and to facilitate reliable, available and uninterrupted communications.

Given the above, our Administration considers that Appendix **27** of the Radio Regulations needs to be modified so as to introduce the new digital wideband systems in accordance with Resolution **429** **(WRC-19)**, and to that end is submitting the following proposals to the World Radiocommunication Conference.

Proposals

APPENDIX 27 (REV.WRC‑19)[[1]](#footnote-1)\*

Frequency allotment Plan for the aeronautical mobile (R)  
service and related information

PART I – General provisions

Section II – Technical and operational principles used  
for the establishment of the Plan of allotment of frequencies  
in the aeronautical mobile (R) service

**A – Channel characteristics and utilization**

# 2 Frequencies allotted

ADD CUB/59A9/1#1633

27/18A Individual contiguous or non-contiguous channels complying with the provisions of the Plan3 contained in this Appendix may be aggregated to provide wideband communication without changing the Plan of individual channels.

ADD CUB/59A9/2#1634

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3 27/18A.1 In particular the provisions related to the protection (Part I, Section II B), to power limits (Nos. **27**/60 and **27**/61), to class of emissions (No. **27**/58), to out-of-band spectrum mask (No. **27**/74), to assigned frequency (No. **27**/75), and to channel spacing (No. **27**/11).

**C – Classes of emission and power**

# 1 Classes of emission

MOD CUB/59A9/3#1635

## **27**/57 1.1 Telephony – amplitude modulation:

− double sideband A3E[[2]](#footnote-2)\*

− single sideband, full carrier H3E\*

− single sideband, suppressed carrier J3E, J2E, J7E, J9E

MOD CUB/59A9/4#1636

## 1.2 Telegraphy and data transmission

MOD CUB/59A9/5#1637

## **27**/58 1.2.1 Amplitude modulation:

− telegraphy without the use of a modulating audio frequency (by on‑off keying) A1A, A1B[[3]](#footnote-3)\*\*

– telegraphy by the on-off keying of an amplitude modulating audio frequency or audio frequencies or by the on-off keying of the modulated emission and including selective calling, single sideband, full carrier H2B

– multichannel voice frequency telegraphy, single sideband, suppressed carrier J7A

– telegraphy or data transmissions using any other single sideband, suppressed carrier modulation, under the condition that the reference frequency of the concerned transmission corresponds to the list of carrier (reference) frequencies (No. **27**/18) and its occupied bandwidth does not exceed the upper limit of J3E emissions (No. **27**/12), i.e. 2 800 Hz for each individual channel J2B, J2D, J7B, J7D, J9B, J9D

# 2 Power

MOD CUB/59A9/6#1638

27/60 2.1 Unless otherwise specified in Part II of this Appendix, the peak envelope powers supplied to the antenna transmission line shall not exceed the maximum values indicated in the Table below; the corresponding peak effective radiated powers being assumed to be equal to two-thirds of these values.

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| Class of emission | | Stations | Maximum peak envelope power |
| H2B, J3E, J7A, J2E, J7E, J9E, J2B, J2D, J7B, J7D, J9B, J9D A3E\*, H3E\* (100% modulation) | | Aeronautical stations Aircraft stations | 6 kW 400 W |
| Other emissions such as A1A, A1B, F1B | | Aeronautical stations Aircraft stations | 1.5 kW 100 W |
| \* A3E and H3E to be used only on 3 023 kHz and 5 680 kHz. | | |

Note: the “(100% modulation)” may require additional clarification.

**Reasons:** Inclusion in Appendix **27** of the relevant part of the Rules of Procedure and explicit recognition of the aggregation of single channels for wideband digital communications.

SUP CUB/59A9/7#1639

RESOLUTION 429 (WRC-19)

Consideration of regulatory provisions for updating Appendix 27 of the Radio Regulations in support of aeronautical HF modernization

**Reasons:** Considered to be no longer necessary.

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1. \* *Note by the Secretariat*: This edition of Appendix **27** incorporates editorial amendments to the Appendix **27** Aer2 as adopted by the WARC‑Aer2.

   The references in Appendix **27** now conform to the new numbering scheme of the Radio Regulations. In addition, the text of Appendix **27** contains updated definitions of the relevant aeronautical areas conforming with the new geographical situation reflecting the political changes since 1979. It also contains updated references to the classes of emissions in accordance with Article **2**.      (WRC‑03) [↑](#footnote-ref-1)
2. \* A3E and H3E to be used only on 3 023 kHz and 5 680 kHz. [↑](#footnote-ref-2)
3. \*\* A1A, A1B and F1B are permitted provided they do not cause harmful interference to the classes of emission H2B, J3E, J2E, J7E, J9E, J7A, J2B, J2D, J7B, J7D, J9B, and J9D. In addition, AlA, A1B and FlB emissions shall be in accordance with the provisions in Nos. **27**/70 to **27**/74 and care should be taken to place these emissions at or near the centre of the channel. However, a modulating audio frequency is permitted with single sideband transmitters, where the carrier is suppressed in accordance with No. **27**/69. [↑](#footnote-ref-3)