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| **41 MEETING OF PERMANENT****CONSULTATIVE COMMITTEE II:****RADIOCOMMUNICATIONS****May 22 to 26, 2023****Mexico City, Mexico** | **OEA/Ser.L/XVII.4.2.41****CCP.II-RADIO /doc. /23****01 May 2023****Original: English** |
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|  | **PROPOSALS FOR THE WORK OF THE CONFERENCE AGENDA ITEM 1.9** |  |
|  | **(Item on the Agenda: 3.1 (SGT-2))** |  |
|  | **(Document submitted by the administration of the United States of America)** |  |

**Impact on the sector:**

This document supports the work of CITEL’s PCC.II Working Group for WRC under 3.1 of the agenda.

**Executive Summary:**

This contribution is a preliminary proposal in relation to WRC-23 agenda item 1.9. This proposal includes modifications to Appendix 27 of the Radio Regulations to accommodate new wideband HF digital systems for greater aircraft connectivity and function.

**UNITED STATES OF AMERICA**

# **PROPOSALS FOR THE WORK OF THE CONFERENCE**

**AGENDA ITEM 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 (route) service and ensure coexistence of current HF systems alongside modernized HF systems, in accordance with Resolution* ***429 (WRC-19)****.*

**BACKGROUND INFORMATION**:

Aeronautical mobile (R) service (AM(R)S) frequency bands in the range 2 850 – 22 000 kHz are used for long-distance aeronautical communications in remote and oceanic areas. These aeronautical High Frequency (HF) channels are used for Air Traffic Control (ATC) communications to aircraft for most oceanic areas and are mandated as a minimum equipment needed for an aircraft to enter these areas by many international Civil Aviation authorities.

The last substantive review of Appendix **27** of the ITU Radio Regulations was performed in 1982. Aviation is considering new technologies to significantly improve capacity, connectivity, and quality of service for aviation HF data and voice. This includes a means to digitally combine non-contiguous HF channels together to effectively form a wideband HF system for greater aircraft connectivity and function. However, it is essential any new HF technology does not constrain or interfere with the existing regional aeronautical HF networks.

**Proposals**:

APPENDIX 27 (REV.WRC‑19)\*

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 USA/AI 1.9/1

27/18A Individual contiguous or non-contiguous channels complying with the provisions of the present Plan1 may be aggregated to provide wideband communication.

**Reason**: Provides a provision in Appendix 27 that allows individual HF channels to be aggregated.

ADD USA/AI 1.9/2

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).

**Reason**: Ensures the mechanism for the individual HF channels to be aggregated maintains compatibility with the existing aeronautical HF systems.

**C – Classes of emission and power**

#  1 Classes of emission

MOD USA/AI 1.9/3

## 27/57 1.1 Telephony – amplitude modulation:

 − double sideband A3E[[1]](#footnote-1)\*

 − single sideband, full carrier H3E\*

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

**Reason**: Allows for new signal modulation types.

MOD USA/AI 1.9/4

##  1.2 Telegraphy and data transmission

**Reason**: Update title to reflect the use of data.

MOD USA/AI 1.9/5

### 27/58 1.2.1 Amplitude modulation:

 − telegraphy without the use of a modulating audio frequency (by on‑off keying) A1A, A1B[[2]](#footnote-2)\*\*

 – 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

**Reason**: Allows for new signal modulation types while maintaining the necessary conditions to be compatibility with existing aeronautical HF systems.

#  2 Power

MOD USA/AI 1.9/6

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, A3E\*, H3E\*(100% modulation) | Aeronautical stations Aircraft stations | 6 kW400 W |
| J2E, J7E, J9E, J2B, J2D, J7B, J7D, J9B, J9D | Aeronautical stations Aircraft stations | 6 kW400 W |
| Other emissions such asA1A, A1B, F1B | Aeronautical stations Aircraft stations | 1.5 kW100 W |
| \* A3E and H3E to be used only on 3 023 kHz and 5 680 kHz. |

**Reason**: Updates the new modulation types to the appropriate peak envelope power levels.

SUP USA/AI 1.9/7

RESOLUTION 429 (WRC-19)

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

**Reason**: Work on agenda item has been completed.

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1. \* A3E and H3E to be used only on 3 023 kHz and 5 680 kHz. [↑](#footnote-ref-1)
2. \*\* 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-2)