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| **U.S. Radiocommunications Sector**  **Fact Sheet** | |
| **Working Party:** ITU-R WP 5B | **Document No:** USWP5B |
| **Ref:** 5B/225 Annex 04 | **Date:** 3 March, 2021 |
| Document Title: Working document towards draft CPM text for WRC-23 agenda item 1.9 | |
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| **Purpose/Objective:** To provide initial input for CPM text for Agenda Item 1.9 | |
| **Abstract:** This document will propose initial text for how the WRC may address Agenda Item 1.9, focusing on an overlay approach to the current Appendix 27 text. | |
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| **Radiocommunication Study Groups** |  |
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| Annex 4 to the Working Party 5B Chairman’s Report | |
| working document towards  Draft CPM Text for WRC-23 agenda item 1.9 | |
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CHAPTER 2

Aeronautical and maritime issues

(Agenda items 1.6, 1.7, 1.8, 1.9, 1.10, 1.11)

Agenda item 1.9 of Chapter 2

**WP 5B /** **WP 3L, WP 3M, WP 6A**

*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)**;

Resolution**429 (WRC‑19)** Consideration of regulatory provisions for updating Appendix 27 of the Radio Regulations in support of aeronautical HF modernization

2/1.9/1 Executive summary

For many decades HF voice communications has been the Long Range Communications System that has kept aircraft in contact with controlling agencies in oceanic airspace and other remote regions of the world. As much of these legacy communications have moved and continue to migrate to satellite-based data communications, the HF spectrum is seeing less and less utilization as a spectral resource. As the spectrum becomes underutilized, it becomes less and less intrusive to realign use of that resource with advances in technology that would bring utility back to this protected portion of the spectrum. This agenda item seeks to update Appendix 27 Radio Regulations such that the 3 kHz channel construct of the Appendix remains intact, but that multiple 3 kHz channels, either contiguous or non-contiguous, could be bonded together, to utilize advanced waveforms, and bring new utility to this resource.

*[Text of the executive summary, not more than half a page of text to describe briefly the purpose of the agenda item, summarize the results of the studies carried out and, most importantly, provide a brief description of the method(s) identified that may satisfy the agenda item]*

2/1.9/2 Background

Historically, HF Radio communications has been recognized as the long-range communication system by default for safe, efficient air travel over long range routes beyond the range of ground-based VHF radios. However, technology now provides for satellite communications (Inmarsat and Iridium specifically for aeronautical use) which have also been recognized by regulatory authorities for use in long range communications. The movement, however, to rely solely on satellite-based communications is not without risk. Terrestrial and celestial systems work well together in a complementary and synergistic fashion to offer better performance, reliability and availability than either system alone.

Communications users should recognize that having both a celestial as well as a terrestrial means of long-range communication provides diversity and synergy that offers increased availability, reliability and security.

It is acknowledged that current HF voice technology suffers from noise and propagation effects that require skilled and knowledgeable radio operators on the ground to provide reliable HF communications, and that today’s HFDL does not have the throughput required to sufficiently satisfy the communication needs to today’s automation systems. The need for reduced separation has been much discussed and documented in the standards material from ICAO that defines communications standards for reduced lateral and longitudinal separation. To meet these criteria, data rates need to be increased, latency of packet acknowledgements must be reduced, and availability increased from the current HFDL system performance.

In order for the HF aeronautical spectrum to maintain value into the future, Appendix 27 of the ITU Radio Regulations needs to be updated to allow for the applications of advanced techniques, specifically advanced waveforms and the use of multiple 3 kHz channels simultaneously, in order to enable the transmission of increased data rates required by the automation systems of today and tomorrow.

*[Text of the background, not more than half a page of text to provide general information in a concise manner, in order to describe the rationale of the agenda items (or issue(s))]*

2/1.9/3 Summary and Analysis of the results of ITU-R studies

*[This section should contain a summary of the technical and operational studies performed within ITU-R, including a list of relevant ITU-R Recommendations. Depending on the agenda item, this section could be divided in two parts, one part dealing with the summary and the other part dealing with the analysis.  
The results of the ITU-R studies should also be analysed with respect to the possible methods of satisfying the agenda item, and presented in a concise manner.]*

2/1.9/4 Methods to satisfy the agenda item[[1]](#footnote-2)1

*[This section should contain the brief description of the Method or Methods to satisfy the agenda item as per section A2.4 of Annex 2 to Resolution ITU-R 2-8]*

2/1.9/4.1 Method A: [title of Method A, if any][[2]](#footnote-3)2

*The method to satisfy the agenda item, pending satisfactory demonstration of protection criteria and sharing studies, would be to edit Appendix 27 of the Radio Regulations to allow for advanced waveforms and simultaneous use of contiguous or non-contiguous HF channel assignments.*

2/1.9/4.2 Method B: [title of Method B, if any]

*[Text describing the second method to satisfy the agenda item]*

*[Additional sections with text describing other methods to satisfy the agenda item, if any]*

2/1.9/5 Regulatory and procedural considerations

*[Example(s) of regulatory text relating to the Method(s) to satisfy the agenda item]*

2/1.9/5.1 For Method A: [title of Method A, if any]

*[Example(s) of regulatory text for the first method to satisfy the agenda item]*

2/1.9/5.2 For Method B: [title of Method B, if any]

*[Example(s) of regulatory text for the second method to satisfy the agenda item]*

*[Additional sections with example(s) of regulatory text for the other methods to satisfy the agenda item, if any].*

1. 1 If a single Method is proposed to satisfy a given agenda item, it does not need to bear a number as it would be the only **Method to satisfy the agenda item**, in both Sections **N/1.xy/4** and **N/1.xy/5**. [↑](#footnote-ref-2)
2. 2 If alternatives are proposed to a given Method, they could be described as Sub-Methods in new sub-sections, e.g. Sub-Method A1 (to Method A) in sub-section **N/1.xy/4.1.1** and Sub-Method A2 (to Method A) in sub-section **N/1.xy/4.1.2**. [↑](#footnote-ref-3)