

ICAO WRC-23 PREPARATORY WORKSHOP

AI 1.9: WIDEBAND DIGITAL HF COMMUNICATION

Date: 07/02/2023

Authors:

Jérôme André

jerome.andre@anfr.fr

01 | Background

02 | Main elements of the proposed method

03 | Draft ICAO position

01 | Background



2/1.9/4.1 Method A: No change

It may be considered that the current version of RR Appendix **27** does not preclude the digital HF communication for the relevant type of classes. This method could support some applications. In this method, the suppression of Resolution **429 (WRC-19)** is also proposed (see section 2/1.9/5.3).

2/1.9/4.2 Method B: Inclusion of the relevant part of the Rules of Procedure relating to RR Appendix 27 into the Radio Regulations and the introduction into RR Appendix 27 of other provisions related to wideband digital communications

This agenda item could be the opportunity to include in RR Appendix **27** the relevant part of current text of the Rules of Procedures and make other changes to this Appendix on the use of wideband digital emissions. Should this method be agreed by WRC-23, then appropriate action needs be taken in regards with the Rules of Procedure relating to RR Appendix **27**. In this method, the suppression of Resolution **429 (WRC-19)** is also proposed (see section 2/1.9/5.3).

02 | Main elements of the proposed method

2 Frequencies allotted

ADD

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.

ADD

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).

02 | Main elements of the proposed method

1 Classes of emission

MOD

27/57

1.1 Telephony – amplitude modulation:

- double sideband
- single sideband, full carrier
- single sideband, suppressed carrier

A3E*

H3E*

J3E, J2E, J7E, J9E

02 | Main elements of the proposed method

- 27/58 **1.2.1 Amplitude modulation:**
- telegraphy without the use of a modulating audio frequency (by on-off keying) A1A, A1B**

* A3E and H3E to be used only on 3 023 kHz and 5 680 kHz.

** A1A, A1B and F1B are permitted provided they do not cause harmful interference to the classes of emission H2B, J3E, J2E, J7E, J9E, J7AB, J2B, J2D, J7B, J7D, J9B, and J9D and ~~JXX~~. In addition, A1A, A1B and F1B 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.

-
- 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 J7BA
 - ~~– other transmissions such as automatic data transmission, single sideband, suppressed carrier JXX~~
 - 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

02 | Main elements of the proposed method

Differents options

MOD

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.

Class of emission	Stations	Maximum peak envelope power
H2B, J3E, J7 AB , JXX 2 A3E*, H3E* (100% modulation)	Aeronautical stations Aircraft stations	6 kW 400 W
J2E, J7E, J9E, J2B, J2D, J7B, J7D, J9B, J9D	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.

Class of emission	Stations	Maximum peak envelope power
H2B ⁽¹⁾ , J3E, J7 AB , JXX 2 , J2E, J7E, J9E, J2B, J2D, J7B, J7D, J9B, J9D A3E* ⁽¹⁾ , H3E* ⁽¹⁾ (100% modulation)	Aeronautical stations Aircraft stations	6 kW 400 W (for H2B, A3E and H3E classes of emission this power is measured at 100% modulation (the concerned classes still need to be confirmed))
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.

⁽¹⁾ that during implementation, administrations are encouraged to limit the power of each carrier to 6 dB lower than the maximum peak envelope power.

03 | Draft ICAO Position

ICAO Position:

~~To support ITU R studies as called for by Resolution 429 (WRC 19).~~

~~To support, if needed based on agreed studies, if needed, the necessary modification of Appendix 27 to the Radio Regulations for operating that will enable digital the introduction of HF wideband aeronautical communication systems in a manner fully compatible with existing aeronautical HF services without causing interference or assignment modification unless agreed to by affected member states. Those systems shall be operated in accordance with international Standards and Recommended Practices and procedures established in accordance with the Convention on International Civil Aviation.~~

~~To support, based on agreed studies, the necessary modification of Appendix 27 to the Radio Regulations that will enable the introduction of HF wideband aeronautical communication systems. Those systems shall be operated in accordance with international Standards and Recommended Practices and procedures established in accordance with the Convention on International Civil Aviation.~~

Agence nationale des fréquences

T. +33 (0)1 45 18 72 72 78, avenue du Général de Gaulle
F. +33 (0)1 45 18 73 00 94707 MAISONS-ALFORT CEDEX

www.anfr.fr

Rejoignez-nous sur



[/anfr](#)