



# PUBLIC NOTICE

Federal Communications Commission  
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DA 21-1235

Released: September 30, 2021

## INTERNATIONAL BUREAU SEEKS COMMENT ON RECOMMENDATIONS APPROVED BY THE WORLD RADIOCOMMUNICATION CONFERENCE ADVISORY COMMITTEE

IB Docket No. 16-185

Comments Due: October 14, 2021

On September 28, 2021, the World Radiocommunication Conference Advisory Committee (WRC-23 Advisory Committee or WAC) approved and provided for Commission consideration of its draft recommendations on certain issues that will be considered by the 2023 World Radiocommunication Conference (WRC-23). These recommendations are attached to this Public Notice (Attachment A).

Based upon an initial review of the draft recommendation forwarded to the Commission, the International Bureau, in coordination with other Commission Bureaus and Offices, tentatively concludes that we can generally support most of the content attached in the WRC-23 Advisory Committee draft recommendation. We seek comment on the draft recommendation provided by the WRC-23 Advisory Committee (Attachment A).

The comments provided by interested parties will assist the FCC in its upcoming consultations with the U.S. Department of State and NTIA in the development of U.S. positions for WRC-23. The recommendations that are attached to this Public Notice may evolve in the course of interagency discussions as we approach WRC-23 and, therefore, does not constitute a final U.S. Government position on any issue.

The deadline for comments on the proposed recommendations is **October 14, 2021**. It is necessary that all comments be received by **October 14, 2021**, in order to allow sufficient time to finalize the U.S. position before commencement of regional WRC-23 preparatory meetings. All comments are to reference **IB Docket No. 16-185** and to specific recommendations by WAC document number.

Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments on or before **October 14, 2021**. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS). See *Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: <http://apps.fcc.gov/ecfs/>.
- Paper Filers: Parties who choose to file by paper must file an original and one copy of each filing.
  - Filings can be sent by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.
  - Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9050 Junction Drive, Annapolis Junction, MD 20701.U.S.
  - Postal Service first-class, Express, and Priority mail must be addressed to 45 L Street, N.E., Washington DC 20554
- Effective March 19, 2020, and until further notice, the Commission no longer accepts any hand or messenger delivered filings. This is a temporary measure taken to help protect the health and safety of individuals, and to mitigate the transmission of COVID-19.<sup>1</sup>
- During the time the Commission's building is closed to the general public and until further notice, if more than one docket or rulemaking number appears in the caption of a proceeding, paper filers need not submit two additional copies for each additional docket or rulemaking number; an original and one copy are sufficient.

*People with Disabilities:* To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to [fcc504@fcc.gov](mailto:fcc504@fcc.gov) or call the Consumer and Governmental Affairs Bureau at 202-418-0530 (voice), 1-888-835-5322 (tty).

**In addition, one copy of each pleading must be sent to:** Dante Ibarra, Designated Federal Official, Global Strategy and Negotiation Division, International Bureau, 45 L Street, N.E., Washington, D.C. 20554; email: [WRC-23@fcc.gov](mailto:WRC-23@fcc.gov).

The complete texts of these recommendations are available by accessing the FCC's WRC-23 web site at: [www.fcc.gov/wrc-23](http://www.fcc.gov/wrc-23). Filings and comments are also available for public inspection and copying during regular business hours at the FCC Reference Information Center, Portals II, 45 L Street, N.E., Washington, D.C. 20554.

For further information, please contact Dante Ibarra at (202) 418-0610 or by email at: [WRC-23@fcc.gov](mailto:WRC-23@fcc.gov).

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<sup>1</sup> See *FCC Announces Closure of FCC Headquarters Open Window and Change in Hand-Delivery Policy*, Public Notice, 35 FCC Rcd 2788 (2020).

## ATTACHMENT (A)

**UNITED STATES OF AMERICA**  
**DRAFT PRELIMINARY VIEWS ON WRC-23**

**AGENDA ITEM 1.12:** to conduct, and complete in time for WRC-23, studies for a possible new secondary allocation to the Earth exploration-satellite (active) service for spaceborne radar sounders within the range of frequencies around 45 MHz, taking into account the protection of incumbent services, including in adjacent bands, in accordance with Resolution **656 (Rev.WRC-19)**;

**BACKGROUND:** WRC-23 will consider the results of studies on spectrum needs for a possible new secondary allocation to the Earth exploration-satellite (active) service for spaceborne radar sounders with the range of frequencies around 45 MHz, taking into account the protection of incumbent services. The frequency range 40-50 MHz is currently allocated, and widely used by, the fixed, mobile, and broadcasting services on a primary basis, as well as being allocated on primary basis in portions of the band to the aeronautical radionavigation service (No. **5.160**) and radiolocation service limited to oceanographic radars (No. **5.161A**) in some countries. It is also adjacent to a primary allocation to the amateur service in Regions 2 and 3, and some countries in Region 1. Secondary allocations in portions of the 40-50 MHz band include the space research service, radiolocation service (No. **5.161** and No. **5.162A** (limited to wind profiler radars). Sharing studies will need to be conducted with those services operating on a primary and secondary basis (taking account No. **5.31c**) in the frequency range 40-50 MHz, as well as primary amateur operations in the adjacent band.

A secondary allocation around 45 MHz would provide the science community the ability to provide radar maps of subsurface scattering layers with the intent to locate water/ice/deposits. The sounding radars are intended to be utilized only in either uninhabited or sparsely populated areas of the globe, with particular focus on deserts and polar ice fields, and only at night-time from 3 a.m. to 6 a.m. locally. Taking into account the high investment cost associated with this type of sensor observations in the 40-50 MHz band, the number of spaceborne radar sounder missions operating simultaneously is expected to remain very few; perhaps only one, or two, in number.

**U.S. VIEW:** The United States supports studies and possible consideration of a new allocation to the Earth exploration-satellite (active) service on a secondary basis within the frequency range 40-50 MHz. Such consideration would need to take into account the results of studies on spectrum needs and sharing studies, and the need to provide protection and to not impose constraints on incumbent services in this frequency range and adjacent frequency bands.

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**UNITED STATES OF AMERICA**  
**DRAFT PRELIMINARY VIEWS ON WRC-23**

**AGENDA ITEM 1.17:** to determine and carry out, on the basis of the ITU-R studies in accordance with Resolution **773 (WRC-19)**, the appropriate regulatory actions for the provision of inter-satellite links in specific frequency bands, or portions thereof, by adding an inter-satellite service allocation where appropriate.

**BACKGROUND:** WRC-23 is considering taking appropriate regulatory actions for the provision of satellite-to-satellite links, including new ISS allocations, as appropriate in the frequency ranges 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz, and 27.5-30 GHz to facilitate relaying data from non-geostationary (non-GSO) space stations through satellite networks in the fixed-satellite service.

The 11.7-12.7 GHz frequency range is allocated to the fixed, mobile, broadcasting, broadcasting-satellite, and fixed-satellite services on a primary basis. The 18.1-18.6 GHz, 18.8-19.7 GHz, and 27.5-29.5 GHz frequency ranges are allocated to the fixed, mobile, and fixed-satellite services on a primary basis, with particular Radio Regulation provisions for non-GSO mobile-satellite service (MSS) feeder links in the 19.3-19.7 GHz and 29.1-29.5 MHz frequency bands. The 19.7-20.2 GHz and 29.5-30 GHz frequency bands are allocated to the fixed-satellite and mobile-satellite services on a primary basis. There is an adjacent band primary allocation to the Earth-exploration satellite service (passive) in 18.6-18.8 GHz. Studies will need to be conducted on the technical and operational characteristics, spectrum needs, and protection, sharing and potential compatibility between satellite-to-satellite links and the allocated primary services in the frequency ranges and adjacent bands specified in Resolution **773 (WRC-19)**. These studies are underway in the ITU.

**DISCUSSION:** Space station operations in low-Earth orbit are increasing at a rapid rate for scientific, academic, and commercial purposes. These stations vary in size from as large as the International Space Station to as small as single unit cubesats<sup>2</sup> and have wide ranging data requirements. Users of these systems require moving data from space to Earth, or other satellite terminal locations in an efficient, fast, and cost-effective manner.

In light of the above, satellite manufacturers are developing technologies addressing this need, including the possible use of satellite-to-satellite links with transmissions limited to the same direction of transmission (e.g., Earth-to-space or space-to-Earth) of the GSO or non-GSO FSS service providers' space station.

Consequently, there is a need for developing technical and operational characteristics that could allow for different types of space stations that plan to provide satellite-to-satellite transmissions in the referenced frequency bands. The technical and operational characteristics, including spectrum requirements, off-axis equivalent isotropically radiated power (e.i.r.p.) values and out-of-band emission limits for transmissions between space stations will also need to be studied. Any approach taken must ensure the protection of services to which the referenced frequency bands are allocated on a primary basis, without imposing regulatory or technical constraints on those services.

**U.S. VIEW:** The United States supports studies called for under Resolution **773 (WRC-19)**, including assessing the spectrum requirements, development of technical and operational characteristics, conducting sharing and compatibility with a view to ensuring the protection of, and without imposing additional regulatory or technical constraints on primary allocated services in these bands. The United States is also of the view that the studies of satellite-to-satellite operations for consideration under this agenda item should be limited to links operating in the same direction of transmission as provided in the current allocations for the fixed-satellite service in the frequency bands under consideration. Based on the results of these studies, the United States supports the consideration of appropriate technical and regulatory provisions at WRC-23 to address Resolution **773 (WRC-19)** in the frequency bands 11.7-12.7 GHz, 18.1-18.6 GHz, 18.8-20.2 GHz, and 27.5-30 GHz, or portions thereof.

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<sup>2</sup> A single unit cubesat has the dimensions of 10x10x10 centimeters and typical mass less than 2 kilograms.

**UNITED STATES OF AMERICA**  
**DRAFT PRELIMINARY VIEWS ON WRC-23**

**AGENDA ITEM 9.1 Topic A:** to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the ITU Convention on the activities of the ITU Radiocommunication Sector since WRC-19:

- In accordance with Resolution **657 (Rev.WRC-19)**, review the results of studies relating to the technical and operational characteristics, spectrum requirements and appropriate radio service designations for space weather sensors with a view to describing appropriate recognition and protection in the Radio Regulations without placing additional constraints on incumbent services;

**BACKGROUND:** Space weather refers to the physical processes occurring in the space environment that ultimately affects human activities on Earth and in space. Space weather is influenced by the solar wind and the interplanetary magnetic field (IMF) carried by the solar wind plasma. These disturbances can result in a hazardous radiation environment for satellites and humans at high altitudes, ionospheric disturbances, geomagnetic field variations, and the aurora. These effects can in turn impact a number of services and infrastructure located on the Earth's surface, airborne, or in Earth orbit. Disturbances in the ionosphere and atmosphere have important impacts on radio communication, satellite navigation systems and heat the atmosphere which increases the atmospheric drag experienced by LEO satellites, including the International Space Station. Radionavigation-satellite service (RNSS) signals, which are used for a growing number of precision positioning, navigation, and timing applications, as well as for sounding the atmosphere using radio-occultation, are affected by space weather as they propagate through the ionosphere.

The ITU-R has undertaken the study of the technical and operational characteristics and spectrum requirements of spectrum-reliant space weather sensor systems. Specific study efforts underway in response to the requirements in Resolution **657 (Rev.WRC-19)** include:

- 1) document technical and operational characteristics, including development of sensor protection requirements, on specific receive-only space weather sensor types which need to be protected,
- 2) to determine if receive-only space weather sensors shall be designated as applications of the Metads service; to determine the appropriate radiocommunication service, if any, for cases where it is determined that receive-only space weather sensors do not fall under the Metads service;
- 3) conduct sharing studies with incumbent systems operating in various frequency bands used by receive-only space weather sensors (within select ranges of 10 MHz-15 500 MHz) with the objective of determining potential regulatory provisions for their appropriate recognition in the Radio Regulations, while not placing additional constraints on incumbent services,

Resolution 657 (**Rev.WRC-19**) is also on the preliminary agenda for WRC-27 and will be further considered at WRC-23 based on the results of studies.

**U.S. VIEW:** The United States is of the view that changes to the Radio Regulations are outside the scope of Agenda Item 9.1. The United States supports conducting the studies called for in Resolution **657 (Rev.WRC-19)** and will contribute to the work required under the Resolution.

**UNITED STATES OF AMERICA**  
**DRAFT PRELIMINARY VIEWS ON WRC-23**

**AGENDA ITEM 9.1 Topic D:** to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the ITU Convention on the activities of the ITU Radiocommunication Sector since WRC-19:

- Protection of EESS (passive) in the frequency band 36-37 GHz from non-GSO FSS space stations operating in the frequency band 37.5-38 GHz (space-to-Earth);

**BACKGROUND:** WRC-19, at its 12<sup>th</sup> Plenary session, approved Document 535 from the Plenary Ad Hoc Group which stated that a preliminary study under WRC-19 Agenda Item 1.6 regarding the protection of EESS (passive) sensors operating in the 36-37 GHz from non-GSO FSS space stations was submitted to the ITU-R. This preliminary study, which focused on high-density and low-altitude FSS constellations, concluded that it may be necessary for FSS non-GSO space stations operating in the frequency band 37.5-38 GHz to not exceed a maximum out-of-band e.i.r.p. of  $-34$  dBW/100 MHz, for all angles greater than 71.4 degrees from nadir. The study considered that a low-altitude non-GSO FSS space station is one that operates below the altitude of the EESS (passive) sensor. Furthermore, interference from non-GSO FSS space stations into the cold calibration channel of EESS (passive) sensors operating in the frequency band 36-37 GHz has not been studied. Consequently, WRC-19 invited the ITU-R to conduct further study of these topics and develop Recommendations and/or Reports, as appropriate, and report back to WRC-23. Because this work falls under Agenda Item 9.1, WRC-23 will take no regulatory action. Furthermore, it was agreed by WRC-19 that no modifications to Resolution **750 (Rev WRC-19)** are to be considered under these studies since the frequency band 36-37 GHz is not referenced in No. **5.340**.

The 36-37 GHz band is used by passive sensor missions. Measurements taken in this band augment weather forecasting, climatological, and topographic capabilities through the estimation of properties of rain rate, snow and sea ice morphology, lake ice, snow water content, and oil slicks.

**U.S. VIEW:** The United States is of the view that changes to the Radio Regulations are outside the scope of Agenda Item 9.1. The United States supports further study to determine if it is necessary and feasible for non-GSO FSS stations (space-to-Earth) operating in 37.5-38 GHz as part of high-density and low-altitude FSS constellations to not exceed a maximum out-of-band EIRP of  $-34$  dBW/100 MHz, for all angles greater than 71.4 degrees from nadir, into EESS (passive) operations in 36-37 GHz. The United States endorses the agreement of WRC-19 that no modifications to Resolution **750 (Rev WRC-19)** are to be considered under these studies since the frequency band 36-37 GHz is not referenced in No. **5.340**.

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**UNITED STATES OF AMERICA**  
**DRAFT PRELIMINARY VIEWS ON WRC-23**

**Agenda Item 7:** to consider possible changes, and other options, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, an advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution 86 (Rev.WRC-07) to facilitate rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit.

**BACKGROUND:** Resolution **86 (Rev. Marrakesh, 2002)** requested that WRC-03 and subsequent WRC's review and update the advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks. The objective is to simplify or otherwise improve the process and provide the Radiocommunication Bureau (BR) and administrations with cost savings while maintaining the guiding principles outlined in the Constitution and the Radio Regulations.

WRC-03 identified in Resolution **86 (WRC-03)** the scope and the criteria to be used for the implementation of Resolution **86 (Rev. Marrakesh, 2002)**. WRC-07 amended Resolution **86 (WRC-03)** to simplify and eliminate redundant elements. Resolution **86 (Rev. WRC-07)** invites future Conferences to consider any proposals which deal with deficiencies and improvements in the relevant procedures of the Radio Regulations for frequency assignments pertaining to space services which have either been identified by the Radio Regulations Board and included in the Rules of Procedure or by administrations or the BR. Future Conferences should ensure that these procedures and the related Appendices of the Radio Regulations reflect the latest technologies.

WRC-19 contributed to these improvements by implementing changes and clarifications to Articles **9, 11** and **13** of the Radio Regulations, and adopting associated Resolutions. WRC-19 adopted provisions relating to the bringing into use (BIU) and bringing back into use (BBIU) of frequency assignments to non-GSO satellites systems, and established implementation milestones for the deployment of non-GSO constellations operating in some specific services and bands. WRC-19 also identified several Topics to be further examined under WRC-23 agenda item 7 by the ITU-R prior to consideration by WRC-23. In addition, proposals for additional topics to be included under WRC-23 agenda item 7 have been considered in ITU-R. At present, six Topics have been agreed to be studied including:

- Topic A: Tolerances for certain characteristics of of non-GSO space stations in the FSS, BSS, and MSS
- Topic B: Non-GSO BIU post milestone procedure
- Topic C: Protection of geostationary satellite networks in the mobile-satellite service operating in the 7/8 and 20/30 GHz bands from emissions of non-geostationary satellite systems operating in the same frequency bands and identical directions
- Topic D: Modifications to Annex 1 to Appendix 4 of RR Appendix 30B
- Topic E: Improved procedures in Appendix 30 B for new Member States.
- Topic F: Excluding uplink service area in AP30A for R1&3 and AP30B

Other topics may be identified as the 2019-2023 study cycle progresses.

**U.S. VIEW:** With respect to WRC-23 AI 7, Topic A (non-GSO tolerances), the United States supports the study into the need for such tolerances, and is of the view that the study of tolerances for the characteristics of notified orbital planes for non-GSO FSS, BSS, and MSS systems should be limited to the four parameters identified in the minutes of the Plenary of WRC-19: inclination of the orbital plane, the altitude of the apogee of the space station, the altitude of the perigee of the space station and the argument of the perigee of the orbital plane. Based on the results of these studies, allowable differences between the orbital characteristics of the notified orbital plane, as defined in No. **11.44C.1**, and the actual deployed orbital plane of a non-GSO space station may be able to be determined.

As for the remaining five Topics already identified by ITU-R for study under WRC-23 agenda item 7, as well as additional topics that may emerge before the deadline for consideration of new agenda item 7 Topics for WRC-23, the United States will establish its position on each independently, as appropriate.