



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Telecommunications and**  
**Information Administration**  
INTERDEPARTMENT RADIO ADVISORY COMMITTEE  
Washington, D.C. 20230

JUL 31 2014

Ms. Mindel De La Torre  
Chief of the International Bureau  
Federal Communications Commission  
445 12<sup>th</sup> Street SW  
Washington, DC 20554

Dear Ms. De La Torre:

The National Telecommunications and Information Administration (NTIA) on behalf of the Executive Branch agencies, approves the release of revisions for the draft Executive Branch proposals for WRC-15 agenda items 1.6.1, 1.6.2, and a draft Executive Branch proposal for WRC-15 agenda item 10. NTIA proposes further no change proposals to the table of allocations for agenda items 1.6.1 and 1.6.2. NTIA also proposes modifying Resolution 806 (WRC-15), to add an agenda item for 5 GHz RLAN in the 5350-5470 MHz frequency range to WRC-19.

NTIA considered the federal agencies' input toward the development of U.S. proposals for WRC-15. NTIA forwards this package for your consideration and review by your WRC-15 Advisory Committee. Mr. Charles Glass is the primary contact from my staff.

Sincerely,

Karl B. Nebbia  
Associate Administrator  
Office of Spectrum Management

## UNITED STATES OF AMERICA

### DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE

**Agenda Item 1.6.1:** *to consider possible additional primary allocations, to the fixed-satellite service (Earth-to-space and space-to-Earth) of 250 MHz in the range between 10 GHz and 17 GHz in Region 1; and review the regulatory provisions on the current allocations to the fixed-satellite service (FSS) within each range, taking into account the results of ITU-R studies, in accordance with Resolutions 151 (WRC-12)*

**Background Information:** The 13.25-13.4 GHz frequency band has allocations to the Earth exploration-satellite service (EESS) (active), the aeronautical radionavigation service (ARNS) and the space research service (active) on a primary basis in all three ITU regions subject to Radio Regulation Nos. 5.497, 5.498A, and 5.499.

ITU-R sharing studies demonstrate that the proposed fixed-satellite service (FSS) (space-to-Earth) links will interfere with the ARNS in the bands 13.25-13.4 GHz. The studies show that the ARNS transmissions would cause interference into the FSS earth station receivers.

The 13.4-13.75 GHz frequency band has allocations to the Earth exploration-satellite service (active), the radiolocation service and the space research service (active) on a primary basis in all three ITU regions. RR No. 5.501A indicates that the use of the band 13.4-13.75 GHz by the space research service on a primary basis is limited to active spaceborne sensors. Other uses of the band by the space research service are on a secondary basis. RR Nos. 5.499, 5.500, 5.501, and 5.501B apply.

ITU-R sharing studies demonstrate that the proposed fixed-satellite service (FSS) (Earth-to-space) links in the 13.25-13.75 GHz bands will interfere with existing authorized services in the bands 13.25-13.4 GHz and 13.4-13.75 GHz. The sharing studies' results show that EESS (active) altimeter measurements of lakes, reservoirs, and coastal areas will be lost over a large area of the Earth spanning over all three ITU regions. Mitigation techniques sufficient to protect the EESS (active) altimeters operating in the current allocations may impose severe if not impractical restrictions on new FSS systems that might operate in this band.

The 14.5-15.35 GHz frequency range has allocations to the fixed and mobile radio services on a primary basis in all three ITU regions. The frequency band 14.5-14.8 GHz also has an allocation to fixed-satellite service on a primary basis in all three ITU regions subject to Radio Regulation No. 5.510. No. 5.510 limits FSS use to feeder links for the broadcasting satellite service outside Europe, which are subject to the Appendix 30A Broadcast Satellite Plan and associated procedures. The space research service has an allocation on a secondary basis in the frequency band 14.5-15.35 GHz in all three regions. Aeronautical mobile data links currently operate in the 14.5-15.35 GHz band under the mobile service (MS) allocation, the parent service to aeronautical mobile service (AMS).

The band 15.4-17.0 GHz has allocations to the radiolocation service (RLS) on a primary basis in all three Regions and to the aeronautical radionavigation service on a primary basis in all three Regions. Some Administrations will operate airborne synthetic aperture radars worldwide as part of the global RLS allocation in the band 15.4-17 GHz. Some Administrations also operate

an airport surface detection system on a co-primary basis with the primary RLS in the band 15.7-16.2 GHz.

ITU-R sharing studies demonstrate that the proposed FSS (Earth-to-space) links in the 10.0-17.0 GHz bands will interfere with existing authorized services in the bands 14.5-15.35 GHz and 15.4-17.0 GHz. The sharing studies' results show that in order to protect the AMS receivers operating in the band 14.5-15.35 GHz band, there is a required separation distance of up to 577 km (not accounting for terrain obstruction). The studies also show that in order to protect radiolocation stations operating in the band 15.4-17.0 GHz, a separation distance of up to 420 km (not accounting for terrain obstruction) is required. Given the large, required separation distances around AMS and RLS receivers' operational area and the mobile nature of AMS/RLS airborne receiver, the ubiquitous deployment of FSS transmitters would make mitigation and coordination approaches to permit sharing with the FSS very difficult or impractical. In addition, FSS space station receivers in the geostationary satellite orbit may be subject to unacceptable levels of interference from existing operations in these bands.

With respect to FSS downlinks from Region 1 operating in the band 15.4-17.0 GHz, ITU-R studies indicate radiolocation stations in Region 2 operating in the band 15.4-17.0 GHz may receive unacceptable levels of interference from FSS space stations in the geostationary satellite orbit and FSS downlink earth stations may receive unacceptable levels of interference from airborne stations beyond the radio horizon. Mitigation techniques sufficient to protect the systems operating in the current allocations may impose severe if not impractical restrictions on new FSS systems that might operate in this band.

With respect to FSS downlinks from Region 1 operating in the band 13.4-13.75 GHz, ITU-R studies indicate that EESS (active) systems operating across all three ITU regions in the band 13.4-13.75 GHz will not be unduly constrained. Therefore, operations of U.S. EESS (active) assets operating in the 13.4-13.75 GHz band on a global basis would not be adversely affected by an ITU Region 1 FSS (s-E) allocation in the 13.4-13.75 GHz band.

**Proposal:**

**ARTICLE 5**

**Frequency allocations**

**Section IV – Table of Frequency Allocations  
(See No. 2.1)**

**NOC** USA/1.6.1/1

**11.7-14 GHz**

Allocation to services		
Region 1	Region 2	Region 3
13.25-13.4	EARTH EXPLORATION-SATELLITE (active) AERONAUTICAL RADIONAVIGATION 5.497 SPACE RESEARCH (active) 5.498A 5.499	

**Reasons:** ITU-R studies indicate a potential for interference into existing EESS (active) systems from FSS (E-s). ITU-R studies indicate a potential for interference between the proposed FSS (s-E) and the existing ARNS systems.

**NOC** USA/1.6.1/2

**11.7-14 GHz**

Allocation to services		
Region 1	Region 2	Region 3
13.4-13.75	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH 5.501A Standard frequency and time signal-satellite (Earth-to-space) 5.499 5.500 5.501 5.501B	

**Reasons:** ITU-R studies indicate a potential for interference into existing EESS (active) systems from FSS (Earth-to-space). EESS (active) systems would not be adversely impacted if Region 1 were to implement FSS (space-to-Earth) links in this band. This NOC proposal applies only with regard to the FSS (Earth-to-space) direction.

**NOC** USA/1.6.1/3

**14-15.4 GHz**

Allocation to services		
Region 1	Region 2	Region 3
14.5-14.8	FIXED FIXED-SATELLITE (Earth-to-space) 5.510 MOBILE Space research	
14.8-15.35	FIXED MOBILE Space research 5.339	

**Reasons:** ITU-R studies indicate a potential for interference into existing MS and AMS systems.

**NOC** USA/1.6.1/4

**15.4-18.4 GHz**

Allocation to services		
Region 1	Region 2	Region 3
15.4-15.43	RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION 5.511D	

<b>15.43-15.63</b>	FIXED-SATELLITE (Earth-to-space) 5.511A RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION 5.511C
<b>15.63-15.7</b>	RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION 5.511D
<b>15.7-16.6</b>	RADIOLOCATION 5.512 5.513
<b>16.6-17.1</b>	RADIOLOCATION Space research (deep space) (Earth-to-space) 5.512 5.513

**Reasons:** ITU-R studies indicate a potential for interference into existing RLS systems.

**SUP** USA/1.6.1/5

### RESOLUTION 151 (WRC-12)

**Allocations, to the fixed-satellite service  
(Earth-to-space and space-to-Earth)  
of 250 MHz in the range between 10 GHz and 17 GHz in Region 1**

**Reasons:** Consequential change to completion of the agenda item.

## UNITED STATES OF AMERICA

### DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE

**Agenda Item 1.6.2:** *to consider possible additional primary allocations, to the fixed-satellite service (Earth-to-space) of 250 MHz in Region 2 and 300 MHz in Region 3 within the range 13-17 GHz; and review the regulatory provisions on the current allocations to the fixed-satellite service within each range, taking into account the results of ITU-R studies, in accordance with Resolutions 152 (WRC-12)*

**Background Information:** The 13.25-13.4 GHz frequency band has allocations to the Earth exploration-satellite service (active), the aeronautical radionavigation service and the space research service (active) on a primary basis in all three ITU regions subject to Radio Regulation Nos. **5.497**, **5.498A**, and **5.499**.

The 13.4-13.75 GHz frequency band has allocations to the Earth exploration-satellite service (active), the radiolocation service and the space research service (active) on a primary basis in all three ITU regions. RR No. **5.501A** indicates that the use of the band 13.4-13.75 GHz by the space research service on a primary basis is limited to active spaceborne sensors. Other uses of the band by the space research service are on a secondary basis. RR Nos. **5.499**, **5.500**, **5.501**, and **5.501B** apply.

ITU-R sharing studies demonstrate that the proposed fixed-satellite service (FSS) (Earth-to-space) links in the 13.25-13.75 GHz bands will interfere with existing authorized services in the bands 13.25-13.4 GHz and 13.4-13.75 GHz. The sharing studies' results show that EESS (active) altimeter measurements of lakes, reservoirs, and coastal areas will be lost over a large area of the Earth spanning over all three ITU regions. Mitigation techniques sufficient to protect the EESS (active) altimeters operating in the current allocations may impose severe if not impractical restrictions on new FSS systems that might operate in this band.

The 14.5-15.35 GHz frequency range has allocations to the fixed and mobile radio services on a primary basis in all three ITU Regions. The 14.5-14.8 GHz frequency band also has an allocation to the fixed-satellite service on a primary basis in all three ITU Regions subject to Radio Regulation No. **5.510**. No. **5.510** limits FSS use to feeder links for the broadcasting satellite service outside Europe, which are subject to the Appendix **30A** Broadcast Satellite Plan and associated procedures. The space research service has an allocation on a secondary basis in the frequency band 14.5-15.35 GHz in all three regions. Aeronautical mobile data links currently operate in the 14.5-15.35 GHz band under the mobile service (MS) allocation, the parent service to aeronautical mobile service (AMS).

The 15.4-17.0 GHz band is allocated to the radiolocation service (RLS) on a primary basis in all three Regions and the 15.4-15.7 GHz band is also allocated to the aeronautical radionavigation service on a primary basis in all three Regions. Some Administrations will operate synthetic aperture radars worldwide as part of the global RLS allocation in the band 15.4-17 GHz. Some Administrations also operate an airport surface detection system on a co-primary basis with the primary RLS in the band 15.7-16.2 GHz.

ITU-R sharing studies demonstrate that the proposed FSS (Earth-to-space) links in the 13.0-17.0 GHz bands will interfere with existing services in the bands 14.5-15.35 GHz and 15.4-17.0 GHz. The sharing studies' results show that in order to protect the AMS receivers operating in the band 14.5-15.35 GHz, a separation distance of up to 577 km (not accounting for terrain obstruction) is required. The studies also show that in order to protect radiolocation stations operating in the band 15.4-17.0 GHz, a separation distance of up to 420 km (not accounting for terrain obstruction) is required. Given the large, required separation distances around AMS and RLS receivers' operational areas, and the mobile nature of AMS receiver/RLS airborne receiver, the ubiquitous deployment of FSS transmitters would make mitigation and coordination approaches to permit sharing with the FSS very difficult or impractical. In addition, ITU-R studies have yet to demonstrate how FSS space station receivers in the geostationary satellite orbit could mitigate unacceptable levels of interference from existing operations in these bands.

**Proposal:**

**ARTICLE 5**  
**Frequency allocations**

**Section IV – Table of Frequency Allocations**  
(See No. 2.1)

**NOC**      USA/1.6.2/1

**11.7-14 GHz**

Allocation to services		
Region 1	Region 2	Region 3
13.25-13.4	EARTH EXPLORATION-SATELLITE (active) AERONAUTICAL RADIONAVIGATION 5.497 SPACE RESEARCH (active) 5.498A 5.499	

**Reasons:** ITU-R studies indicate a potential for interference into existing EESS (active) systems.

**NOC**      USA/1.6.2/2

**11.7-14 GHz**

Allocation to services		
Region 1	Region 2	Region 3

<b>13.4-13.75</b>	EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH 5.501A Standard frequency and time signal-satellite (Earth-to-space) 5.499 5.500 5.501 5.501B
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**Reasons:** ITU-R studies indicate a potential for interference into existing EESS (active) systems.

**NOC** USA/1.6.2/3

### 14-15.4 GHz

Allocation to services		
Region 1	Region 2	Region 3
<b>14.5-14.8</b>	FIXED FIXED-SATELLITE (Earth-to-space) 5.510 MOBILE Space research	
<b>14.8-15.35</b>	FIXED MOBILE Space research 5.339	

**Reasons:** ITU-R studies indicate a potential for interference into existing MS and AMS systems.

**NOC** USA/1.6.2/4

### 15.4-18.4 GHz

Allocation to services		
Region 1	Region 2	Region 3
<b>15.4-15.43</b>	RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION 5.511D	
<b>15.43-15.63</b>	FIXED-SATELLITE (Earth-to-space) 5.511A RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION 5.511C	
<b>15.63-15.7</b>	RADIOLOCATION 5.511E 5.511F AERONAUTICAL RADIONAVIGATION 5.511D	
<b>15.7-16.6</b>	RADIOLOCATION 5.512 5.513	
<b>16.6-17.1</b>	RADIOLOCATION Space research (deep space) (Earth-to-space) 5.512 5.513	



**Reasons:** ITU-R studies indicate a potential for interference into existing RLS systems.

**SUP** USA/1.6.2/5

## RESOLUTION 152 (WRC-12)

**Allocations to the fixed-satellite service (Earth-to-space)  
of 250 MHz in Region 2 and 300 MHz in Region 3  
within the range 13-17 GHz.**

**Reasons:** Consequential change to completing the agenda item.

## UNITED STATES OF AMERICA

### DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE

**Agenda Item 10:** *to recommend to the Council, items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, in accordance with Article 7 of the Convention*

**Background Information:** Increasing demand for broadband data capacity is leading the industry to increasingly rely on opportunities for off-loading from traditional cellular networks onto Radio Local Area Network (RLAN) and small-celled wireless infrastructure. Additionally, there is strong demand for inexpensive, widely available, high-speed internet access and networking capabilities.

To address this demand for greater network data capacity, WRC-15 Agenda Item 1.1 considered additional primary mobile service allocations for terrestrial mobile broadband capabilities, including the possible expansion of RLAN use into the 5350-5470 MHz band.

Initial studies conducted in Joint Task Group (JTG) 4-5-6-7 indicated that sharing was not possible between RLANs and incumbent services in the 5350-5470 MHz band utilizing existing mitigation measures. The existing mitigation techniques studied included a 200 mW power limit, indoor restriction, and Dynamic Frequency Selection (DFS) designed for the 5150-5350 MHz and 5470-5725 MHz frequency bands. Additionally, the same ITU working parties began exploring possible new mitigation techniques to enable sharing between RLANs and incumbent services in the 5350-5470 MHz. Unfortunately, the WRC-15 study cycle provided insufficient time to complete the development and consideration of the proposed mitigation techniques and further study is required.

Given the increased demand for RLANs, along with the need to ensure protection of important incumbent services, the United States of America proposes a future WRC agenda item to continue the studies and consider additional mitigation measures that may enable sharing between RLANs and incumbent services in the 5350-5470 MHz band.

**Proposal:**

**MOD** USA/10/1

### RESOLUTION 806 (WRC-15)

#### Agenda for the 2019 World Radiocommunication Conference

The World Radiocommunication Conference (Geneva, 2015),

**ADD** USA/10/2

**1.[5 GHz]** to consider, in accordance with Resolution [5GHz] (WRC-2015), regulatory provisions and additional allocations to the mobile service in the 5350-5470 MHz band, taking into account the results of studies;

**Reasons:** To enable wide-band applications for RLAN at 5350-5470 MHz while ensuring protection of incumbent services.

## RESOLUTION [5GHz] (WRC-15)

**Consideration of a mobile service allocation and identification for the implementation of wireless access systems (WAS) including radio local area networks (RLAN) in the 5350-5470 MHz band**

The World Radiocommunication Conference (Geneva, 2003),

*considering*

- a) that since WRC-07 there has been tremendous growth in the demand for mobile broadband applications with multimedia capabilities;
- b) that in many developing markets the main delivery mechanism for broadband access is expected to be through mobile devices;
- c) that adequate and timely availability of spectrum and supporting regulatory provisions is essential to support future growth of mobile broadband systems;
- d) that the band 5 350-5 460 MHz is allocated worldwide on a primary basis to the Earth exploration-satellite service (active) (No. **5.448B**);
- e) that the band 5 350-5 460 MHz is also allocated worldwide on a primary basis to the space research service (active) (No. **5.448C**);
- f) that the band 5 350-5 460 MHz is allocated worldwide on a primary basis to the aeronautical radionavigation service (No. **5.449**);
- g) that the band 5 350-5 470 MHz is also allocated worldwide on a primary basis to the radio-location service (No. **5.448D**);
- h) that the band 5 460-5 470 MHz is allocated worldwide on a primary basis to the radionavigation service (No. **5.449**);
- i) that the band 5 460-5 470 MHz is also allocated worldwide on a primary basis to the EESS (active), SRS (active), and radiolocation service (No. **5.448D**);
- j) that there is a need to protect the existing primary services in the 5 150-5 350 MHz, 5350-5470 MHz, and 5 470-5 725 MHz bands;
- k) that studies have shown that sharing between incumbent services and mobile service applications in the frequency range 5 350-5 470 MHz is not possible with current mitigation techniques but may be possible if new or advanced mitigation techniques are developed that prove to be feasible and able to be fielded in commercially viable systems;
- l) that there is a need to specify operational restrictions for WAS, including RLANs, in the mobile service in the band 5 350-5 470 MHz in order to protect incumbent service systems;
- m) that the deployment density of WAS, including RLANs, will depend on a number of factors including intrasystem interference and the availability of other competing technologies and services,

*noting*

- a) that initial studies have begun in the ITU-R based on work for consideration of potential mobile allocations and identification for terrestrial mobile allocations under WRC-15 agenda item 1.1;
- b) that the regulatory provisions for RLANs to enable sharing in the frequency ranges 5150-5350 MHz and 5470-5725 MHz is insufficient to enable sharing in the 5350-5470 MHz frequency range;

*recognizing*

- a) that WAS, including RLANs, provide effective broadband solutions;
- b) that there is a need for administrations to ensure that WAS, including RLANs, meet the required mitigation techniques, for example, through equipment or standards compliance in conjunction with effective regulatory procedures,

*resolves*

that WRC-19 consider a mobile allocation and identification to WAS including RLAN in the 5350-5470 MHz frequency range while ensuring:

- 1 Protection of current and future deployments of incumbent services;
- 2 Consideration of effective operational requirements which can be implemented by WAS including RLAN to enable sharing with incumbent services,

*invites ITU-R*

to conduct, and complete in time for WRC-19, the appropriate studies leading to technical and operational recommendations to facilitate sharing between WAS including RLAN and the incumbent services.

## ATTACHMENT

### PROPOSAL FOR ADDITIONAL AGENDA ITEM FOR CONSIDERATION OF A MOBILE SERVICE ALLOCATION AND IDENTIFICATION FOR RLAN FOR THE IMPLEMENTATION OF WIRELESS ACCESS SYSTEMS INCLUDING RADIO LOCAL AREA NETWORKS IN THE 5350-5470 MHZ BAND

**Subject:** Proposed Future WRC Agenda Item for WRC-2019 for consideration of a mobile service allocation and identification for RLAN for the implementation of wireless access systems including radio local area networks in the 5350-5470 MHz band

**Origin:** United States of America

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*Proposal:* To consider a mobile service allocation and identification for RLAN for the implementation of wireless access systems including radio local area networks in the 5350-5470 MHz band.

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**Background/reason:**

Initial studies conducted in Joint Task Group (JTG) 4-5-6-7 indicated that sharing was not possible between RLANs and incumbent services in the 5350-5470 MHz band utilizing existing mitigation measures. The existing mitigation techniques studied included a 200 mW power limit, indoor restriction, and Dynamic Frequency Selection (DFS) designed for the 5150-5350 MHz and 5470-5725 MHz frequency bands. Additionally, the same ITU working parties began exploring possible new mitigation techniques to enable sharing between RLANs and incumbent services in the 5350-5470 MHz. Unfortunately, the WRC-15 study cycle provided insufficient time to complete the development and consideration of the proposed mitigation techniques and further study is required.

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**Radiocommunication services concerned:** Earth Exploration-Satellite Service (active), Space Research Service (active), Aeronautical Radionavigation, Radiolocation and Radionavigation

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**Indication of possible difficulties:** None foreseen.

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**Previous/ongoing studies on the issue:** Studies are underway in WP 5A, WP 5B and WP 7C to examine mitigation techniques. JTG 4-5-6-7 conducted initial sharing studies during WRC-15 study cycle.

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**Studies to be carried out by:** SG 5 | **with the participation of:** SG 7

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**ITU-R Study Groups concerned:** SG 5 and SG 7

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**ITU resource implications, including financial implications (refer to CV126):** Minimal

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**Common regional proposal:** Yes/No

**Multicountry proposal:** Yes/No

*Number of countries:*

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**Remarks**