NTIA Report 25-01

18 GHz Band Report

Prepared Jointly By
The National Telecommunications and Information Administration
The National Aeronautics and Space Administration

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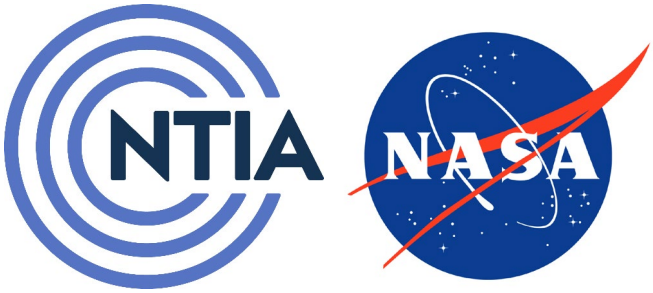

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March 2025

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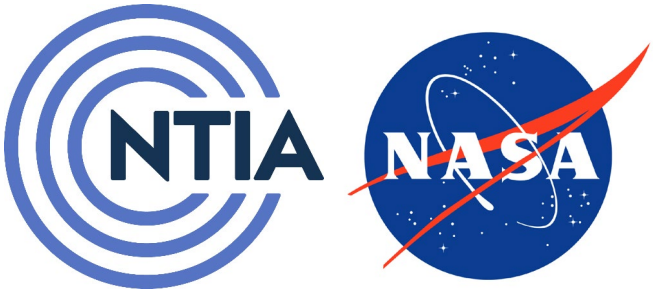

EXECUTIVE SUMMARY

As directed by the 2023 National Spectrum Strategy (NSS), the frequency band 18.1-18.6 GHz (the "18 GHz band") was identified for study for expanded federal and non-federal satellite operations, consistent with the United States position at the International Telecommunication Union's (ITU's) 2023 World Radiocommunication Conference (WRC-23). WRC-23 concluded on December 23, 2023, adding co-primary space-to-space allocations for the intersatellite service (ISS) in this band.

The federal agencies – the National Aeronautics and Space Administration (NASA), the Department of Defense (DOD) and the National Telecommunications and Information Administration (NTIA) – have completed their study on allocating this band domestically. The study supports allocations to the ISS going forward, with limits on federal use and protections for incumbent services. In addition, the Federal Communications Commission (FCC) issued a public notice on allocating the 18 GHz band to space-to-space use and received support for moving forward.[1]

Based on the federal study and the FCC's public notice process, this report makes the following recommendations:

1. The FCC should issue a *notice of proposed rulemaking* to propose the allocations and service rules for the new use of the 18 GHz band for the ISS and then move quickly to adopt a *report and order*.

2. The FCC should implement the WRC-23 outcome by adding new, co-primary allocations for the ISS in the 18.1-18.6 GHz band in the United States Table of Frequency Allocations ("Table of Allocations") for both federal and non-federal use and add a new U.S. footnote to ensure protection of existing systems.

3. The FCC also should adopt a new U.S. footnote to the Table of Allocations to ensure that the use of space-to-space links in this band for federal systems is limited to communications with a non-federal network or system for space relay purposes.

4. The NTIA Manual of Regulations and Procedures for Federal Radio-Frequency Spectrum Management should be revised to reflect equivalent power flux density/power flux density (ePFD/PFD) limits needed to protect incumbent operations at the time these recommended allocation changes are made.

[1] See FCC Public Notice, GN Docket No. 24-248, Seeking information on sharing in the 18 GHz band in connection with the National Spectrum Strategy Implementation Plan, released August 16, 2024, available at https://docs.fcc.gov/public/attachments/DA-24-815A1.pdf.

18 GHz Band Report

The National Spectrum Strategy (NSS) called for a study of the 18.1-18.6 GHz (18 GHz) band for expanded federal and non-federal satellite operations. This is consistent with the U.S. position at the 2023 World Radiocommunication Conference (WRC-23), which added space-to-space allocations to this band (along with other bands). The NSS noted that Fixed Satellite Service downlink operations are currently authorized in the band and non-federal Fixed Service is authorized in the 18.1-18.3 GHz segment of the band.

The 18 GHz band was extensively studied in preparation for WRC-23 for space-to-space allocations to ensure any such allocation would protect incumbent and adjacent services.[2] On December 23, 2023, WRC-23 concluded and, consistent with the U.S. position, allocations for the intersatellite service (ISS) were adopted in the 18 GHz band, along with certain protections for incumbent services. Shortly thereafter, on March 12, 2024, the NSS Implementation Plan was adopted. It provided a road map for the federal agencies to move forward with the creation of a working group to complete the 18 GHz band studies and to release a report by May 2025.

The 18 GHz band working group was formed earlier this year, consisting of the National Aeronautics and Space Administration (NASA), the Department of Defense (DOD), and the National Telecommunications and Information Administration (NTIA) to consider the need for a domestic allocation of the 18 GHz band to the ISS. As part of this process, the working group developed several use cases, eventually focusing on the commercial replacement for NASA Space-to-Space links case. As NASA will not be building any more Tracking and Data Relay Satellites (TDRS), it needs a way to meet intersatellite data link requirements for future missions. New federal and non-federal ISS allocations in this band will provide regulatory certainty to support the development of commercial services to meet NASA's future needs. This aligns with Congress's direction to NASA to utilize commercial space services whenever possible and to encourage the growth of the commercial space industry.[3] The 18 GHz band could also be used to support other federal missions where intersatellite links are required in the satellite Ka band.

To address these use cases, the working group developed the following observations:

Observation #1 – New Co-Primary International Allocation for Inter-Satellite Service

At WRC-23, new, co-primary allocations for the ISS in the 18 GHz band were added to the International Table of Frequency Allocations to support increasing missions in space. To support federal use of commercial service, ISS allocations to both the federal and non-federal

[2] The 18 GHz band is allocated on a co-primary basis to the fixed, mobile and fixed satellite services. The Radio Astronomy service does not have any allocations, but uses these bands on an opportunistic basis per ITU-R RA.769. The addition of intersatellite service links is expected to have a lesser impact on RAS than other services co-primary in the band.

[3] *See* 51 USC 20301(b)(2)(C) and (D).

allocation tables for the 18 GHz band are needed, as reflected below (changes highlighted in yellow). Additionally, the new international footnote 5.521A will need to be added to the U.S. Table of Frequency Allocations ("Table of Allocations") to ensure proper regulatory protection for incumbent systems.[4]

The table below reflects how the FCC could implement the new allocations. The table shows the new ISS allocations as primary in the non-federal column of the Table of Allocations. However, given that the Fixed Satellite Service (FSS) is currently secondary in the 18 GHz band, the FCC may need to evaluate whether to elevate the FSS allocations to primary or have ISS allocations as secondary consistent with the existing secondary FSS allocations.

[4] Radio Regulations 5.521A: For use of the frequency bands 18.1-18.6 GHz, 18.8-20.2 GHz and 27.5-30 GHz, or parts thereof, by space stations in the inter-satellite service, Resolution 679 (WRC-23) shall apply. Such use is limited to space research, space operation and/or Earth exploration-satellite applications, and also transmissions of data originating from industrial and medical activities in space. When using these frequencies, administrations shall ensure that this inter-satellite service is used only for the aforementioned purposes and is not subject to coordination under No. 9.11A. For use of the frequency bands 18.1-18.6 GHz, 18.8-20.2 GHz, 27.5-29.1 GHz and 29.5-30 GHz by space stations, the allocation is limited to inter-satellite links between non-geostationary satellites or between non-geostationary satellites and geostationary satellites. For use of the frequency band 29.1-29.5 GHz by space stations, the allocation is limited to inter-satellite links between non-geostationary satellites and geostationary satellites. No. 4.10 does not apply. (WRC-23).

Table 1: Proposed Changes to U.S. Table of Frequency Allocations

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
…			…	…	…
17.7-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE	17.7-17.8 FIXED FIXED-SATELLITE (space-to-Earth) 5.517 (Earth-to-space) 5.516 BROADCASTING-SATELLITE Mobile 5.515	17.7-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE	17.7-17.8 US334 G117	17.7-17.8 FIXED FIXED-SATELLITE (Earth-to-space) (space-to-Earth) NG527A US334 NG58	Satellite Communications (25) TV Broadcast Auxiliary (74F) Cable TV Relay (78) Fixed Microwave (101)
	17.8-18.1 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A (Earth-to-space) 5.516 MOBILE 5.519		17.8-18.1 FIXED-SATELLITE (space-to- Earth) US334 G117 US519	17.8-18.1 FIXED Fixed-satellite (space-to-Earth) NG527A US334 US519	
18.1-18.4 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B (Earth-to-space) 5.520 INTER-SATELLITE 5.521A MOBILE			18.1-18.3 FIXED-SATELLITE (space-to- Earth) US334 G117 INTER-SATELLITE 5.521A	18.1-18.3 FIXED Fixed-satellite (space-to-Earth) NG527A	

5.519 5.521	US519	INTER-SATELLITE 5.521A US334 US519	
	18.3-18.6 FIXED-SATELLITE (space-to- Earth) US334 G117 INTER-SATELLITE 5.521A	18.3-18.6 FIXED-SATELLITE (space-to-Earth) NG527A INTER-SATELLITE 5.521A	Satellite Communications (25)
18.4-18.6 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A 5.516B INTER-SATELLITE 5.521A MOBILE	US139	US139 US334	

Observation #2 – Limitation to Military Service Does Not Apply to ISS

The current U.S. Table of Allocations includes footnote G117 for the 18 GHz band, which limits federal FSS operations to military systems only. ISS is a different service class and not subject to G117. However, the federal agencies prefer to implement a footnote that would limit new U.S. federal intersatellite links to operations with a non-federal station. This new footnote would maintain the intent of G117 while also making available the band for all federal operations and the envisioned commercial service to other federal agencies such as NASA. Accordingly, this change should be made as part of the allocation process.

Observation #3 – Updates to Chapter 8 of the NTIA Manual

Section 8.2.36 of the NTIA Manual of Regulations and Procedures for Federal Radio-Frequency Spectrum Management (NTIA Manual) will need to be updated to include the power flux density limits for the ISS in the 18 GHz band. This will ensure the NTIA Manual accounts for the limitations agreed upon at WRC-23. NTIA should do this in conjunction with the FCC's updates to the U.S. Table of Frequency Allocations.

Observation #4 – Updates to Service Rules

Service rules should be adopted concurrently as changes are made to the Table of Allocations. The reports used in the WRC-23 process have not been evaluated through the FCC public notice and rulemaking process to address issues such as other allocated services, coordination mechanisms, and power usage in the band. Accordingly, the FCC may want to examine these issues in a proceeding before adopting final rules.

As the NSS studies were ongoing, on August 18, 2024, the FCC released a public notice seeking information on implementing the 18 GHz band as part of the NSS. Only one party, the Satellite Industry Association, filed comments supporting allocating the 18 GHz band to the ISS.[5]

Recommendations

Based on the study performed, NASA and NTIA make the following recommendations regarding allocations of the 18 GHz band to the ISS:

1. The FCC should issue a *notice of proposed rulemaking* to propose the allocations discussed in Observation 1 of this report, and also the service rules for this new use of the 18 GHz band, and then move to adopt a *report and order*.

2. The FCC should implement the WRC-23 outcome by adopting new, co-primary allocations for the ISS in the 18 GHz band in the U.S. Table of Frequency Allocations for both federal and non-federal use. The allocation changes should include a new U.S. footnote to ensure protection of existing systems. For the non-federal ISS allocations, the FCC should seek comment as to whether they should be primary or secondary. We recommend co-primary allocations in the federal table.

3. The FCC should adopt a new U.S. footnote to the Table of Allocations to ensure that the use of space-to-space links in this band for federal systems is limited to communications with a non-federal network or system for space relay purposes.

4. The NTIA Manual should be revised to reflect equivalent power flux density/power flux density (ePFD/PFD) limits needed to protect incumbent operations at the same time the Table of Allocations is amended to allocate the 18 GHz band for federal ISS use.

[5] Satellite Industry Association, Comments, GN Docket No. 24-248 (rec. Sept. 5, 2024).