

# FCC SPECTRUM DEVELOPMENTS

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CORF Meeting  
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# I. Satellite Spectrum – 12.7/42/52 GHz and W-Band

## **FCC NPRM 5/28/2025**

FCC seeks comments on additional spectrum for satellite communications:

- 12.7 GHz Band (12.7-13.25 GHz)
- 42 GHz Band (42.0-42.5 GHz)
- 51.4-52.4 GHz band (52 GHz band)
- “W-band” frequencies (92.0-94.0 GHz, 94.1-100 GHz, 102.0-109.5 GHz, and 111.8-114.25 GHz).

### 12.7-13.25 GHz band

- Currently allocated to fixed service (FS), FSS uplinks, and MS
- Also used as receive only at Deep Space Network (DSN) at Goldstone
- Adjacent 13.25-13.4 GHz band - secondary allocations for EESS (active) and space research (active).
- No allocations for RAS band, but FNPRM notes opportunistic use by RAS

# I. Satellite Spectrum – 12.7/42/52 GHz and W-Band

**NPRM: Downlinks? Expand uplinks? Use for ESIM uplinks?**

CORF COMMENTS:

-Use coordination zones based on ITU-R RA.769. - refer to Starlink coordination with NRAO.

-For ESIMS, 12.7-12.75 GHz uplinks should not be a significant problem, but avoid downlinks.

# I. Satellite Spectrum – 12.7/42/52 GHz and W-Band

## 42-42.5 GHz Band

- Allocated to FS and MS, but not used.
- Upper adjacent 42.5-43.5 GHz band is allocated to RAS on a primary basis and to the Federal FS, FSS (E-s), and MS

### **NPRM: Satellite downlinks, uplinks vs. terrestrial fixed?**

How to protect adjacent RAS? Prior proposal for MS use of 42 GHz, FCC proposed to require protection of RAS bands through geographic separation and emission limits.

NPRM notes that CORF supports use of ITU-R.RA 769

### **CORF COMMENTS:**

- FSS uplinks – coordination distance table provided
- FSS Downlinks: coordination requirements consistent with ITU-R RA.769 and efpd methodology in recommendation ITU-R S.1586-1.
- Downlink beam footprints are a critical factor in addition to geographic separation. Coordination should be based on requiring downlink protection in aggregate as well as individually, at the location of protected RAS observatory sites.*

# I. Satellite Spectrum – 12.7/42/52 GHz and W-Band

## 52 GHz – Uplinks

-51.4-52.4 GHz band currently allocated to terrestrial fixed and mobile services.

-Neighboring 52.6-54.25 GHz band allocated to EESS (passive) and subject to Footnote US246 - “No station shall be authorized to transmit in” that band and certain others.

NPRM seeks comments on “whether limits on unwanted power emissions could ensure NGSO compatibility with EESS (passive) in the 52.6-54.25 GHz band.”

## W Band

Proposed satellite uplinks: 92.0-94.0 GHz, 94.1-100 GHz, 102.0-109.5 GHz, and 111.8-114.25 GHz.

-92-94.0, 94.1-95.0 GHz -- allocated to terrestrial Fixed and Mobile, Radiolocation and RAS.

Subject to Footnote US161 - “assignments to allocated services shall be coordinated” with the major RAS observatories.

Subject to Footnote US342 - “all practicable steps shall be taken to protect the radio astronomy service from harmful interference.”

-94.0-94.1 GHz - allocated to EESS (active), Radiolocation, Space Research, with a secondary allocation to RAS.

-95-100 GHz is allocated to RAS, along with Fixed, Mobile, Radiolocation and Radio Navigation-Satellite. Subject to Footnote US342.

-102-109.5 GHz is allocated to RAS, along with Fixed, Mobile and Space Research. Subject to US342.

-111.8-114.25 GHz is allocated to RAS, Space Research, and Fixed/Mobile. Subject to Footnote US342.

**Surrounding almost all of the above bands are allocations to RAS and EESS.**

# I. Satellite Spectrum – 12.7/42/52 GHz and W-Band

## 52 GHz and W-Band

CORF COMMENTS (7/28/25):

-Protecting RAS from downlinks: coordination based on experience of NRAO/Starlink

-Uplinks: NRQZ and coordination zones

EESS:

-Detailed discussion of limiting out of band emissions per ITU-R RS.2017.

-Attention to harmonics, particularly 183 GHz.

*Supportive comments filed by AAS, AMS, IEEE/GRSS*

## II. New Satellite Rules

**NPRM released 10/2025, proposing replacement set of satellite rules:** make it easier to file applications for satellites and earth stations, and to speed up the processing of such applications

Generally, rules protecting RAS are duplicated in new rules.

### **BUT:**

§ 25.228(j)(3) of the existing rules provides that *Earth stations in motion* in the 14.47-14.5 GHz (uplink) frequency band in the vicinity or within radio line of sight of RAS observatories are *subject to coordination with the NSF*. There does not appear to be an equivalent in the new proposed rules.

Unclear if inadvertence, or if purposeful.

Rule for ancillary terrestrial components (ATC) of MSS at 1610-1626.5 MHz/2483.5-2500 MHz bands appears to be missing a few key words. Proposed text requires that ATC mobile terminals “Meet the requirements contained to protect radio astronomy service (RAS) observations in the 1610.6-1613.8 MHz band from harmful interference...” There appears to be something missing after “contained”.

*This appears to be inadvertent typo.*

## II. New Satellite Rules

### **CORF Comments (1/2026):**

-Insert equivalent to prior rule on protection of RAS from 14 GHz ESIMs

-Correct typo

Supportive Reply Comments filed by AAS.

### III. Upper C-band – Protection of RAS

**NPRM (11/2025):** Seeks comments on options for reconfiguring the “Upper C-band” (3.98-4.2 GHz) in the contiguous United States to provide additional spectrum for commercial terrestrial wireless services.

-Currently primarily used for satellite downlinks

-FCC proposes to add a primary mobile, except aeronautical mobile, allocation to whatever portion of the 4.0–4.2 GHz band they reconfigure.

-Reallocated band could be used for mobile, fixed, and Internet of Things

-NPRM notes that RAS operates in this band on an opportunistic basis:

*should FCC take steps to facilitate coordination between wireless operations in the band and operations at these RAS sites?*

### III. Upper C-band – Protection of RAS

#### CORF Comments (2/18/26):

-Discuss current and future observations at 4 GHz

-Protection of RAS:

- >NRQZ coordination

- >Traditional coordination with other observatories

- >Experiment with dynamic coordination -- note NSF's NRDZ project

- >discuss NRAO's *Operational Data Sharing* (ODS) system - enables radio telescopes to *share observation parameters* with satellite constellation operators in machine readable form online in *near real time* through an application programming interface (API).

Operators can use this information to adjust their downlink transmission to *reduce or mitigate* the level of potential interference to the telescopes.

### III. Upper C-band – Protection of RAS

#### **CORF Comments (2/18/26):**

#### **-Possible Negative Impact on Weather Forecasting**

FCC proposal could impact the satellite communications at 4.02 GHz used to relay NWS products, satellite imagery, radar data, and model outputs to many users.

Shifting satellite ops to a higher-frequency band may not be feasible if that higher-frequency band has outages during severe precipitation events.

## IV. Implementation of WRC-19 1.6/18/50 GHz

**FCC NPRM (12/25)** proposes to amend the FCC's rules to implement into the U.S. Table of Allocations specific allocation decisions from the *WRC-19 Final Acts*.

NPRM proposes to:

-Address ESIMs communicating with GSO FSS space stations at the 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) frequency bands.

-*Limit the unwanted emissions power in the 50.2-50.4 GHz passive band* from FSS earth station uplinks that transmit in the adjacent bands 49.7-50.2 GHz and 50.4-50.9 GHz.

-Allocate the 1621.35-1626.5 MHz band to maritime mobile-satellite service downlinks, subject to four footnotes in the U.S. Table which would *protect RAS in the 1610.6-1613.8 MHz band from harmful interference*.

## IV. Implementation of WRC-19 1.6/18/50 GHz

### 1.6 GHz

-WRC action designed to facilitate Global Maritime Distress and Safety System (GMDSS) -- an internationally recognized distress and radio communication safety system that has been in place for several decades.

-RAS has co-primary allocation at 1610.6-1613.8 GHz

-NPRM proposes to split existing 1613.8-1626.5 MHz MSS uplink band into two bands (1613.8-1621.35 MHz and 1621.35-1626.5 MHz) and *add a primary maritime MSS downlink allocation in the 1621.35-1626.5 MHz band subject to conditions in four new footnotes.*

-Proposed Footnote 5.208B provides that WRC-19 Res. 739 (*protection of RAS from neighboring active services*) applies.

**CORF Comments support implementation of this new footnote.**

## IV. Implementation of WRC-19 1.6/18/50 GHz

### ESIMs at 17.7 – 19.7 GHz

-Allocation for EESS(passive) at 18.6-18.8 GHz

-NPRM proposes to add footnote 5.517A to the 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) frequency bands of the U.S. Table.

-Footnote 5.517A: “the operation of earth stations in motion (ESIMs) communicating with geostationary orbit fixed-satellite service (GSO FSS) space stations in the 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) frequency bands *shall be subject to the application of Resolution 169 (WRC-23)*:

ESIMs are subject to the same power flux density (PFD) limits as the FSS in these bands. At 18.6–18.8 GHz, *this limits FSS downlinks to a PFD that protects EESS measurements in a typical footprint from having error budgets dominated by isotropically scattered reflections from satellite downlinks.*

-CORF supports use of Footnote 5.517A but notes this protection of EESS at 18.6–18.8 GHz is the *minimum of what is required and the FCC should consider enhancing the protection further* to ensure the veracity of EESS measurements in the case of multiple ESIMs in a single EESS footprint.

## IV. Implementation of WRC-19 1.6/18/50 GHz

### Protection of Remote Sensing at 50.2-50.4 GHz

-EESS (passive) has a primary allocation at 50.2-50.4 GHz.

Footnote US246 provides that “No station shall be authorized to transmit” in that band (and certain other ones).

-NPRM proposes to modify Footnote US156 to reflect *WRC-19’s revision of the limits for unwanted emissions into the 50.2-50.4 GHz passive band from FSS earth station uplinks* that transmit in the 49.7-50.2 GHz and 50.4-50.9 GHz bands.

-Footnote US156 currently states that for such uplinks, the unwanted emissions power in the band 50.2-50.4 GHz *shall not exceed -20 dBW/200 MHz* (measured at the input of the antenna), except that the maximum unwanted emissions power may be increased to -10 dBW/200 MHz for earth stations having an antenna gain greater than or equal to 57 dBi.

### **New Proposal:**

NGSO Earth Stations (>2021): *-42 dbW to -35 dbW* depending on elevation angle

GSO Earth Stations (>2024): *-45 dbW to -30 dbW* depending on elevation angle

## IV. Implementation of WRC-19 1.6/18/50 GHz

### Protection of Remote Sensing at 50.2-50.4 GHz

**CORF comments** *support implementation of stricter limits* in proposed modification to U.S. Footnote 156, but note that *further protection might be warranted* considering the expected proliferation and increased spatial density of Earth stations and increased number of uplink beams per station.

-Calculations show that the proposal will in most cases result in received power levels *above maximum* unwanted emission levels stated in ITU RS.2017.

-These limits consider only a single uplink station and single uplink beam -- problem is expected to become worse with increased deployment density.

-Thus, while CORF supported the spirit of the proposal in the NPRM as providing some protection for EESS at 50.2–50.4 GHz, CORF suggested the *FCC consider lowering the limits to meet the ITU RS.2017* levels and also consider the impact of potential *aggregate emissions*.

## V. 6 GHz Devices

On going proceeding over years for unlicensed devices.

### Background

- Spectrum for unlicensed *outdoor telecommunications*, and for *indoor* use with *consumer* WiFi and similar devices.
- Unlicensed uses are in so called U-NII bands, that overlay bands for licensed operations

## V. 6 GHz Devices

Sub-band	Frequency Range (GHz)	Primary Allocation	Predominant Licensed Services
U-NII-5	5.925-6.425	Fixed FSS	Fixed Microwave FSS (uplinks)
U-NII-6	6.425-6.525	Mobile FSS	Broadcast Auxiliary Service Cable Television Relay Service FSS (uplinks)
U-NII-7	6.525-6.875	Fixed FSS	Fixed Microwave FSS (uplinks/downlinks)
U-NII-8	6.875-7.125	Fixed Mobile FSS	Fixed Microwave Broadcast Auxiliary Service Cable Television Relay Service FSS (uplinks/downlinks) (6.875-7.075 GHz only)

## V. 6 GHz Devices

CORF's interest:

Footnote US342 -- FCC to take “all practicable steps” to protect radio astronomy observations *at 6.650-6.6752 GHz* ( in the “U-NII-7” band).

Footnote RR 5.458 protection for EESS at 6425-7075 MHz and 7075-7250 MHz over oceans:  
“Administrations should *bear in mind the needs* of the [EESS] in their future planning of the bands *6425-7025 MHz and 7075-7250 MHz.*” (U-NII 6-8 bands)

**A number of orders in this proceeding have provided protections to RAS and EESS, pursuant to CORF's recommendations.**

## V. 6 GHz Devices

### 4<sup>th</sup> Report/Order and 3<sup>rd</sup> FNPRM (1/2026)

#### Order:

- Permits *geofenced variable power* (GVP) devices to operate in the U-NII-5 (5.925-6.425 GHz) and U-NII-7 (6.525- 6.875 GHz) portions of the 6 GHz band.
- GVP devices will operate with up to 11 dBm/MHz PSD and 24 dBm EIRP.
- GVP devices will be *prohibited from operating at 6650-6672 MHz inside of certain RAS exclusion zones* (GBT, VLA, VLBA, OVRO, ATA and Arecibo), per CORF recommendation.
- To protect EESS, *no use of U-NIII-7 on oil platforms in the “ocean”*, but allow such use within 12 miles of US coast line. Such use also permitted in large inland bodies of water, such as the Great Lakes.

## V. 6 GHz Devices

### 4<sup>th</sup> Report/Order and 3<sup>rd</sup> FNPRM (1/2026)

#### **FNPRM:**

- FCC proposes to allow use of so called “Low Power Indoor” (“LPI”) 6 GHz devices on “cruise ships” in the ocean. [14 dBm EIRP and -5 dBm/MHz EIRP power spectral density]
- Overturns a prior decision by the FCC (based on CORF Comments) to prohibit such use.
- Based on Cisco filing that the thick metal walls of “cruise ships” will attenuate the signals of the LPI devices. (Notwithstanding the existence of openings and windows in those walls)
- FCC seeks comments on definition of “Cruise Ship” and the impact on EESS.

#### **CORF working on Reply Comments**

## VI. SpaceX/Starlink Authorization Order

**(1/2026)**

-FCC authorized SpaceX to deploy and operate 7,500 second-generation (Gen2) Starlink satellites. This is in addition to the 7,500 satellites that SpaceX was previously authorized to operate.

-Order addressed only a *portion* of SpaceX's broader 2020 application for 30,000 next-generation satellites. *FCC deferred a decision on the remaining 15,000* proposed satellites, specifically those intended for orbits above 600 kilometers.

-To support higher data throughput rates, FCC authorized SpaceX to operate across a *broader range of frequencies*, including the Ku- and Ka-bands for user links, and the V-, E-, and W-bands for gateway operations.

-Order also authorizes SpaceX to use *lower orbital shells* -- altitudes ranging from 340 kilometers to 485 kilometers.

## VI. SpaceX/Starlink Authorization Order

**(1/2026)**

Here are the frequency bands in which SpaceX is authorized to operate:

Ku-Band:

10.7-12.7 GHz (down)

12.7-12.75 GHz (Up)

12.75-13.25 GHz (Up)

13.75-14.0 GHz (Up)

14.0-14.5 GHz (Up)

14.5-14.75 GHz (Up)

14.75-14.8 GHz (Up)

15.43-15.63 GHz (Up)

Ka-Band:

17.3-17.8 GHz (down) and (Up)

17.8-18.6 GHz (down)

18.6-18.8 GHz (down)

19.3-19.7 GHz (down)

19.7-20.2 GHz (down)

24.75-25.25 GHz (Up)

27.5-29.1 GHz (Up)

29.1-29.5 GHz (Up)

29.5-30.0 GHz (Up)

## VI. SpaceX/Starlink Authorization Order

### V-Band:

37.5-42.0 GHz (down)

42.0-42.5 GHz (down) (outside the U.S. only)

47.2-50.2 GHz (Up)

50.4-51.4 GHz (Up)

51.4-52.4 GHz (Up)

### E-Band:

71.0-76.0 GHz (down)

81.0-86.0 GHz (Up)

### W-Band:

92.0-94.0 GHz (Up)

94.1-95.0 GHz (Up)

95.0-100.0 GHz (Up)

102.0-109.5 GHz (Up)

111.8-114.25 GHz (Up)

## VI. SpaceX/Starlink Authorization Order

In addition to traditional broadband services, SpaceX authorized to provide direct-to-cell connectivity *outside* the United States.

*Inside the U.S.*, SpaceX was *previously authorized* to provide “supplemental coverage from space” (SCS) in cellular-adjacent frequencies, in partnership with T-Mobile.

This capability allows standard smartphones to access text and emergency services in *remote locations* where terrestrial cellular towers are unavailable.

Supplemental Coverage from Space (SCS) Frequencies (within the U.S.):

1910-1915 MHz (Up)

1990-1995 MHz (down)

## VI. SpaceX/Starlink Authorization Order

### ***Prior Starlink SCS Authorization Order (Dec. 2024) – Protection of Passive Services***

-SpaceX: Stated that it recently reached a coordination agreement with NSF, and the parties continue to collaborate in good faith to extend that agreement to cover SpaceX's application to enable T-Mobile to provide SCS to its subscribers.

-FCC *conditions grant on SpaceX's continued coordination* with both the NSF and NRAO, and compliance with any resulting coordination agreements. *Requires that "that SpaceX also respects the NRQZ while providing SCS."*

-*First coordination of satellite operations in the NRQZ.* (Also required to coordinate 10.6-10.7 GHz links in NRQZ)

-Starlink must also *coordinate links*: 1.9 GHz Earth stations, 14.47-14.50 GHz (w/NSF), 48-49 GHz, 81-86 GHz (w/NSF); *limit OOB*E into 50.2-50.4 GHz (EESS), and take all prac. steps to protect RAS.

## VII. Proposed Use of EESS Bands for Commercial Space Operations

### ***3/2026 – Draft NPRM***

-FCC seeking comments on making new spectrum available for various space services such as *upgrading, relocating, and servicing satellites; manufacturing pharmaceuticals in space; building private inhabitable spacecraft; and conducting private robotic missions to the surface of the Moon:*

#### **“Emergent Space Operations”**

-Since these are not satellite services, this may require spectrum from bands *other than those already dedicated to satellite services, such as Fixed Satellite Service.*

-FCC proposes to “clarify” that spectrum used to support emergent services may fall within existing service allocations, including the EESS.

## VII. Proposed Use of EESS Bands for Commercial Space Operations

**3/2026 – Draft NPRM**

2024 - related proceeding looked at finding spectrum for communications links for space stations engaged in *in-space servicing, assembly, and manufacturing* (“ISAM”). Asked whether spectrum allocated for EESS should be used for ISAM links.

-CORF comments urged the FCC not to open up spectrum allocated for EESS(passive) to ISAM operations, while taking no position at that time regarding use of EESS communication bands (or those bands allocated EESS (active)) for ISAM.

CORF: carefully consider the potential for OOB and spurious emissions (particularly harmonics) from orbiting ISAM services into neighboring EESS (passive) bands.

## VII. Proposed Use of EESS Bands for Commercial Space Operations

### ***3/2026 – Draft NPRM***

-New NPRM -- FCC acknowledges CORF's concerns stated in its prior comments in the ISAM proceeding.

-NPRM also acknowledges the “stringent” EESS interference standard in ITU-R RS.2017 that was cited by CORF.

-But NPRM suggests that active EESS operations have shown the ability to share spectrum with other active services, --- merely allowing active users to apply for use of passive bands would not wipe out passive use in such bands.

“Although we certainly take seriously any potential for harmful interference to existing [EESS] users, we tentatively conclude that we need not preemptively exclude the EESS allocations from case-by-case consideration altogether at this time. We seek comment on this tentative conclusion.”

## VII. Proposed Use of EESS Bands for Commercial Space Operations

### ***3/2026 – Draft NPRM***

-NPRM also proposes to allow applications for use of spectrum allocated to the Space Research Service, particularly if the applicant is funded by NASA or other federal agencies.

-NPRM looks at providing spectrum at 2.3 GHz for emergent space operations, and asks whether there should be any restrictions on such use, and specifically raises a question regarding the NASA Goldstone Deep Space Communications Complex: is there a need to protect radio astronomy at that site from harmful interference at 2305-2320 MHz?

NPRM to be adopted by FCC on March 26<sup>th</sup>

QUESTIONS?

THANKS!

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