

Federal Communications Commission

Spectrum Abundance for Weird Space Stuff

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Spectrum Accessibility for Emergent Space Operations

Telemetry, tracking, and command (TT&C) functions are essential to operating any spacecraft, and operators require access to the radio spectrum to conduct them.

There is limited spectrum access flexibility for emergent space operations,¹ an umbrella term for commercial space activities that utilize radio spectrum for command and communication functions but are not traditional communications satellites.² The current rules governing spectrum access are not well-suited to emergent space operations nor to fostering U.S. space entrepreneurship and innovation, especially in the context of increasing competition from China and Russia.³

The FCC acknowledges that current processes are better suited to regulating and approving traditional space operations typically designed to provide broad, general services — like radio — than to supporting the testing of new, more mission-specific and privatized innovations, such as specialized habitable spacecraft for private individuals or robotic lunar missions.⁴ But today, the U.S. space economy is increasingly driven by unique, mission-focused innovations, including data collection and privately funded operations — such as Blue Origin launching celebrities into space⁵ — that often do not provide broad public communications services in the traditional sense.⁶

As this becomes the new norm and the U.S. space economy continues to expand, the FCC must establish a formal licensing and spectrum authorization process tailored specifically to emergent space operations. Motivated American entrepreneurs, who are engineering 21st-century space technologies, face growing competition from China and Russia.⁷ They should not also be constrained by legacy federal processes.

Current Regulations and Processes Are Ill-Suited to Facilitate Emergent Space Operations

Existing FCC regulations are tailored to traditional communications satellites, creating both spectrum scarcity for TT&C operations and an inefficient approval process for allocating

¹ Federal Communications Commission, “Spectrum Abundance for Weird Space Stuff,” Federal Register 91, no. 68 (April 9, 2026), paragraph 39. (<https://www.federalregister.gov/d/2026-06865/p-39>)

² Federal Communications Commission, “Spectrum Abundance for Weird Space Stuff,” para. 3. (<https://www.federalregister.gov/d/2026-06865/p-3>)

³ Jack Burnham, “Showcasing Advanced Space Capabilities: China Displays ‘Dogfighting’ Maneuvers in Low Earth Orbit,” *Foundation for Defense of Democracies*, March 21, 2025. (https://www.fdd.org/analysis/policy_briefs/2025/03/21/showcasing-advanced-space-capabilities-china-displays-dogfighting-maneuvers-in-low-earth-orbit)

⁴ Federal Communications Commission, “Spectrum Abundance for Weird Space Stuff,” paragraphs 1-3. (<https://www.federalregister.gov/d/2026-06865/p-20>)

⁵ Samantha Mathewson, “Not Just Katy Perry: Here Are the Celebrities Blue Origin Has Launched to Space,” *Space.com*, April 13, 2025. (<https://www.space.com/space-exploration/private-spaceflight/not-just-katy-perry-here-are-the-celebrities-blue-origin-has-launched-to-space>)

⁶ Federal Communications Commission, *Space Modernization for the 21st Century, FCC Fact Sheet, SB Docket No. 25-306, October 7, 2025*. (<https://docs.fcc.gov/public/attachments/DOC-415048A1.pdf>)

⁷ Emmerson Overell, “Houston, Americans Are Headed Back to the Moon,” *Foundation for Defense of Democracies*, March 27, 2026. (<https://www.fdd.org/analysis/2026/03/27/houston-americans-are-headed-back-to-the-moon>)

spectrum to nontraditional spacecraft.⁸ TT&C spectrum is largely unavailable on a standalone basis — absent a separately authorized radiocommunications service — yet many companies developing emergent space assets, such as habitable spacecraft, do not provide such a service. As a result, these applicants often do not fit neatly into the FCC’s traditional regulatory framework, which generally evaluates applicants based on established service categories, such as radio, telecommunications, or television broadcasting services. Instead, many emergent space applications appear *sui generis* and are reviewed on a case-by-case basis that can be unpredictable and at times lengthy, rather than moving through a more stable and standardized processing timeline.

When the Commission does permit standalone TT&C access, it typically does so through a case-by-case review process that is slow and unpredictable — ill-suited for the pace and demands of the rapidly expanding U.S. space economy.⁹ Even where standalone TT&C spectrum may be available, these bands are often already heavily congested by government and military operators.

Moreover, the FCC is not the only agency whose regulatory processes affect emergent space operations. The Commission oversees nonfederal spectrum access and regulates communications and spectrum-related aspects of commercial space operations, including companies such as AT&T, SiriusXM, Blue Origin, and SpaceX. The National Telecommunications and Information Administration (NTIA) manages spectrum for U.S. federal agencies operating space assets, including the Pentagon, NASA, intelligence agencies, and other government actors.

Although the FCC and the NTIA signed an updated Memorandum of Understanding (MOU) in 2022 to improve information sharing, spectrum planning, and dispute resolution, there is still no centralized or formalized coordination framework integrating the FCC, the NTIA, federal agencies such as NASA and the Pentagon, and private space operators into a unified communication and coordination process. This becomes particularly problematic when commercial operators may be operating adjacent to sensitive federal space systems and are expected to coordinate accordingly but lack a standard mechanism for doing so.¹⁰ Without a formal communication and information-sharing framework for spectrum coordination between federal and nonfederal space operators, coordination between parties could face unnecessary delays and bureaucratic hurdles.

The lack of a formalized government-wide coordination mechanism — one that brings together all these actors — also means there is no centralized public-private information-sharing hub focused on identifying and addressing adversarial threats to federal and commercial assets, particularly as they relate to spectrum operational security. This shortcoming is increasingly untenable as strategic competition in outer space intensifies with China and Russia.¹¹

⁸ Ibid.

⁹ Ibid.

¹⁰ Federal Communications Commission and National Telecommunications and Information Administration (NTIA), “Memorandum of Understanding Between the FCC and NTIA on Spectrum Coordination,” June 2022. (<https://www.fcc.gov/document/mou-between-fcc-and-ntia-spectrum-coordination>)

¹¹ RADM (Ret.) Mark Montgomery, “Data Centers, Telecommunications Networks, and Space-Based Systems: Modernizing DHS’s SRMA Role for the Communications and IT Sectors,” *Foundation for Defense of Democracies*, April 29, 2026. (<https://www.fdd.org/analysis/2026/04/29/data-centers-telecommunications-networks-and-space-based-systems>)

Select Underutilized Spectrum Bands Are Well-Suited for Emergent Space TT&C Operations

There are several spectrum bands that are well suited for use by emergent space operations but currently underutilized. Expanding access to these bands will require coordination with private operators as well as with federal partners.

SiriusXM holds exclusive FCC licenses for the 2320-2345 MHz band in the United States.¹² With no primary federal allocations inside of the band, it offers opportunities for expanded spectrum utilization. The 2320-2345 MHz band is also in close proximity to the 2025-2110 MHz (Earth-to-space) and 2200-2290 MHz (space-to-Earth) bands that are already used for U.S. government space operations, suggesting that it would be ideal for expansion to include TT&C functions.¹³

The 2320-2345 MHz band is relatively “clean” compared to adjacent bands in that it has one primary stakeholder (SiriusXM), no primary federal allocations, and relatively limited federal constraints. This makes potential coordination easier to manage compared to other bands that are already congested with federal operators and/or multiple private entities. However, other bands — even though they are more populated with a wider variety of users and therefore are more complicated to coordinate — remain important opportunities for expanding access to underutilized spectrum for emergent space operators. The 2315-2320 MHz, 2345-2350 MHz, 2305-2315 MHz, and 2350-2360 MHz bands are still worth considering, even if doing so would require coordination with federal entities beyond the FCC, including the NTIA, the Pentagon, and/or NASA, due to sensitive federal operations within or adjacent to these bands. When accessing these more congested bands, emergent space operators would likely face stricter technical safeguards, geographic coordination zones, and more intensive interagency coordination in order to ensure safety for all operators.

There is also significant opportunity in rural and offshore areas where major corporations hold spectrum licenses but provide limited service. For example, AT&T — which holds licenses to segments within the 2305-2315 MHz and 2350-2360 MHz bands¹⁴ — and SiriusXM — which holds licenses within the 2315-2320 MHz, 2320-2345 MHz, and 2345-2350 MHz bands¹⁵ — provide limited-service coverage in areas such as northern Alaska, Hawaii, and U.S. territories and possessions throughout the Indo-Pacific. These regions are both strategically advantageous for space operations and comparatively underutilized, creating an opportunity for the FCC to expand access and allow emergent space operators to leverage otherwise underused spectrum.

Recommendations

¹² Federal Communications Commission, “Spectrum Abundance for Weird Space Stuff,” paragraph 69. (<https://www.federalregister.gov/d/2026-06865/p-69>)

¹³ Ibid., paragraph 68. (<https://www.federalregister.gov/d/2026-06865/p-68>)

¹⁴ Ibid., paragraph 97. (<https://www.federalregister.gov/d/2026-06865/p-97>)

¹⁵ Ibid., paragraph 91. (<https://www.federalregister.gov/d/2026-06865/p-91>)

With competition in outer space intensifying and the global space economy projected to reach \$1.8 trillion by 2035, the Commission must empower U.S.-based space entrepreneurs by expanding spectrum access and improving the efficiency and standardization of approval processes for emergent space operations.¹⁶ To do so, the FCC should adopt a modernized framework that better reflects the rapidly evolving space industry and accommodates both traditional and nontraditional operations while limiting unnecessary interference and increasing collaboration among all parties — federal and private.

Recommendations Regarding Streamlining Operations and Increasing Coordination

- **The FCC should adopt its proposed “licensing assembly line” concept for emergent space technologies and establish the new licensing category of “variable trajectory spacecraft systems” to better support novel U.S. space technologies through a more predictable and expedited regulatory process.**¹⁷ Emergent space operators often apply for authorization based on specific innovations — such as orbital transfer vehicles and lunar landers — without providing a broad public service, resulting in slow and unpredictable case-by-case reviews. To better support U.S. space entrepreneurs, the FCC should establish a formalized and streamlined application process for emergent space operators that includes providing approximate timelines for application stages and standardized requirements so that applicants understand the criteria by which their applications will be evaluated.¹⁸
- **The FCC should permit nonfederal operations funded or contracted by the U.S. government or military to apply for authorization to utilize spectrum bands allocated for federal space radiocommunication service (SRS) use.** The FCC should amend the U.S. Table of Frequency Allocations — which is jointly managed by the FCC and the NTIA and governs spectrum allocation between federal and nonfederal space operators — by adding a footnote clarifying that such operations fall within the definition of SRS when supporting government missions. If a private company is deploying emergent space assets in support of a federal research initiative or operational requirement — and/or receiving U.S. government funding — those specific assets should be eligible to seek authorization to utilize federal SRS spectrum. The footnote should also require that these entities coordinate with, and obtain appropriate authorization if needed from, the NTIA to ensure protection of federal SRS operators from harmful interference.¹⁹

¹⁶ World Economic Forum and McKinsey & Company, *Space: The \$1.8 Trillion Opportunity for Global Economic Growth* (Geneva: World Economic Forum, 2024). (https://www3.weforum.org/docs/WEF_Space_2024.pdf); Frank Cilluffo, RADM (Ret.) Mark Montgomery, Sharon Cardash, and Kelsey Shields, *Time to Designate Space Systems as Critical Infrastructure* (Cyber Solarium Commission 2.0, April 2023). (https://cybersolarium.org/wp-content/uploads/2023/04/CSC2.0_Report_SpaceCriticalInfrastructureSector.pdf)

¹⁷ Jack Burnham and Sophie McDowall, “How the U.S. Can Stay Ahead of China in Space,” *The Cipher Brief*, November 3, 2025. (<https://www.thecipherbrief.com/space-race-china>)

¹⁸ RADM (Ret.) Mark Montgomery, Craig Singleton, Jack Burnham, and Sophie McDowall, “Space Modernization for the 21st Century,” *Foundation for Defense of Democracies*, October 28, 2025. (<https://www.fdd.org/analysis/2025/10/28/space-modernization-for-the-21st-century>)

¹⁹ Federal Communications Commission, “Spectrum Abundance for Weird Space Stuff,” paragraph 32. (<https://www.federalregister.gov/d/2026-06865/p-32>)

- **The FCC should consider establishing an information-sharing, communication, and coordination mechanism that includes the FCC, NASA, the NTIA, the Pentagon, other relevant federal parties, and emergent space operators — primarily those funded and/or contracted by the U.S. government or operating in close proximity to sensitive U.S. space facilities.** Creating a clear pathway for private companies to engage directly with relevant government entities — and with the FCC, which governs public spectrum regulation — would help protect all users operating within or adjacent to federal bands from harmful interference and avoid inadvertently disrupting one another’s operations. This mechanism could also serve as a space threat and information-sharing hub, strengthening public-private collaboration across the space domain.

Recommendations Regarding 2320-2345 MHz

- **The FCC should create a secondary allocation for space operation service (SOS) — an SRS category that covers TT&C or communications used solely to operate and control spacecraft, not to provide services to users.** Establishing a secondary SOS allocation would open much-needed spectrum access to emergent space operators. However, alongside creating a secondary SOS TT&C allocation, the FCC should establish a framework that protects SiriusXM licenses and operations while also prioritizing expediting spectrum access for new space actors.
- **The FCC should allow a secondary market for U.S.-based SOS TT&C operations and establish a de facto-style leasing and approval framework.** Under this approach, SiriusXM would be permitted to lease spectrum to third parties while the FCC retains authority over approval and oversight of lessees. A de facto leasing model is also beneficial for large or longer-term arrangements, enabling stable and sustained space operations. In practice, applications would primarily involve uplinks, as SiriusXM uses this band mainly for downlinks across the United States and Canada.²⁰ However, its coverage is uneven, with limited downlink service in geostrategically advantageous areas for space operations such as northern Alaska, Hawaii, and U.S. territories and possessions in the Indo-Pacific.²¹ Lessees operating from these locations could also be considered for downlink approval, where there is minimal risk of interference with SiriusXM operations. To protect SiriusXM, the FCC should impose strict geographic limitations and enforce penalties for unauthorized transmissions — particularly downlinks — outside approved areas. The FCC should also require that any U.S.-based Earth station applicants include written approval from SiriusXM, clearly specifying the authorized direction of use (uplink or downlink), along with requirements for continued coordination. The FCC should also state that SiriusXM is permitted to pursue private leasing arrangements — including financial compensation — for providing expedited spectrum access to emergent space operators.²²
- **The FCC should permit applications for SOS TT&C operations in the 2320-2345 MHz band based outside of the United States.** If the FCC adopts a secondary SOS

²⁰ Ibid., paragraph 67. (<https://www.federalregister.gov/d/2026-06865/p-67>)

²¹ Ibid., paragraph 70. (<https://www.federalregister.gov/d/2026-06865/p-70>)

²² Ibid., paragraph 78. (<https://www.federalregister.gov/d/2026-06865/p-78>)

TT&C allocation, U.S. space companies using ground stations abroad — such as in Australia and Europe — could apply directly to the FCC for authorization without requiring coordination with SiriusXM, as these operations would likely not interfere with its services.²³ This approach would create a clear pathway for emergent space operators to leverage foreign uplinks, and potentially limited downlinks where interference concerns are minimal, while expanding overall spectrum access.

Recommendations Regarding 2315-2320 MHz and 2345-2350 MHz

- **Should the FCC pursue expanding access to these bands, a similar secondary SOS TT&C allocation and a de facto-style leasing and approval framework should be established for the 2315-2320 MHz and 2345-2350 MHz bands, consistent with the approach previously proposed for the 2320-2345 MHz band, in addition to more stringent technical and geographic safeguards.** SiriusXM also holds licenses for these bands, and as a condition of FCC authorization, emergent space operators seeking access should be required to coordinate with and obtain approval from SiriusXM, including adhering to clear operational parameters that would likely limit use primarily to uplinks. Given the sensitivity of adjacent federal operations, the FCC should also require operators to adhere to strict technical controls, such as power limits (like maximum effective radiated power), directional antenna requirements that focus energy upward rather than outward, and stringent out-of-band emission limits to prevent interference with nearby systems.²⁴ These technical safeguards should be paired with geographic coordination zones around sensitive federal facilities, along with structured coordination among all relevant parties — the FCC, the NTIA, the Pentagon, NASA, and private operators.²⁵ In this context, the previously proposed information-sharing and coordination mechanism would be particularly valuable in minimizing interference, maintaining operational awareness, and ensuring safe and efficient spectrum use.

Recommendations Regarding 2305-2315 MHz and 2350-2360 MHz

- **If the FCC pursues expanding access to the 2305-2315 MHz and 2350-2360 MHz bands, it should adopt a similar approach to that proposed for the 2315-2320 MHz and 2345-2350 MHz bands, including establishing a secondary SOS TT&C allocation and de facto-style leasing and approval framework, alongside stringent technical and geographic safeguards.** Like requiring SiriusXM approval and coordination in the 2320-2345 MHz band, the FCC should require coordination and approval as a condition of authorization in these bands, including coordination with the NTIA, the Pentagon, and NASA, as applicable — especially for operations near sensitive federal sites or in adjacent bands. The same technical safeguards proposed for the 2315-2320 MHz and 2345-2350 MHz bands — such as power limits, directional antennas, and

²³ Ibid., paragraph 80 (<https://www.federalregister.gov/d/2026-06865/p-80>)

²⁴ National Telecommunications and Information Administration, *Best Practices for Designing Interference-Resilient RF Receiving Systems* (Washington, DC: NTIA, 2025). (<https://www.ntia.gov/sites/default/files/2025-08/best-practices-for-designing-interference-resilient-rf-receiving-systems.pdf>)

²⁵ Federal Communications Commission, “Spectrum Abundance for Weird Space Stuff,” paragraph 92. (<https://www.federalregister.gov/d/2026-06865/p-92>)

strict out-of-band emission controls — should also apply here to minimize interference and ensure safe spectrum operations.

- **Simultaneously, the FCC should prioritize flexibility in lower-risk geographic areas** where AT&T service is comparatively limited, including remote, rural, and offshore regions such as northern Alaska, Hawaii, and U.S. Indo-Pacific territories and possessions, where there is greater opportunity for spectrum expansion with minimal impact on existing operations. Consistent with previous recommendations, uplinks would likely serve as the primary use in these bands due to their lower interference risk, while downlinks could be considered on a limited, geographically constrained basis. In this context, the proposed information-sharing and coordination mechanism between government and private space entities would be particularly valuable in ensuring safe and efficient spectrum use across both federal and nonfederal operations.

Recommendations Regarding Intersatellite Links

- **Should the FCC allow licensed satellites and intersatellite links to provide TT&C and data downlinks to authorized emergent space operators, it should adopt a by-rule authorization framework while emphasizing coordination to minimize interference risks.** Requiring case-by-case modifications or additional approvals would unnecessarily slow and hinder private operators seeking access to space. At the same time, the FCC should require notification from both parties — the satellite operator and the emergent space operator — confirming mutual consent to transmitting and receiving communications, ensuring transparency for all parties without undermining flexibility. The FCC should also avoid enacting limits on frequency use; instead, licensed satellite operators are likely to be better positioned to manage their own spectrum use, coordinate access, and determine available capacity levels. To enable the U.S. space economy to grow and remain competitive, the FCC should prioritize flexibility and avoid overregulation.

Conclusion

The FCC must act to safely expand spectrum access and improve the efficiency and standardization of approval processes for emergent space operations. These steps will help protect and support the continued growth of America’s booming space economy (or “weird space stuff”) and sustain U.S. leadership in the Final Frontier.

Thank you for considering our comments. We look forward to seeing how our input is incorporated into the Commission’s ongoing work and regulations.