

Before the
NATIONAL TELECOMMUNICATIONS & INFORMATION ADMINISTRATION
Washington, D.C. 20230

In the Matter of)
)
Implementation of the National Spectrum) FR Doc. 2023-26810
Strategy)

January 2, 2024

COMMENTS OF ASTROSCALE U.S. INC.

Astroscale U.S. Inc. (“Astroscale U.S.”) hereby submits comments to the National Telecommunications and Information Administration (“NTIA”) in the above-reference proceeding.¹ Astroscale U.S. celebrates the recent release of the National Spectrum Strategy, and thanks NTIA for the opportunity to provide input towards creation of an Implementation Plan.²

I. Introduction

The exploration and use of space is the province of all mankind.³ Commercial use of space to-date has largely focused on transmitting data around the globe. But the world is entering a new chapter. In-space servicing, assembly, and manufacturing (ISAM) technologies, and the missions they support, will enable exploration and use of space in ways not yet imagined; in ways that can energize a nation.

¹ Implementation of the National Spectrum Strategy, Notice of Opportunity for Public Input, 88 Fed. Reg. 85266 (Dec. 7, 2023).

² EXEC. OFF. OF THE PRESIDENT, NATIONAL SPECTRUM STRATEGY (2023), https://www.ntia.gov/sites/default/files/publications/national_spectrum_strategy_final.pdf [*hereinafter* Nat’l Spectrum Strat.]; Modernizing United States Spectrum Policy and Establishing a National Spectrum Strategy, 88 Fed. Reg. 80079-84 (Nov. 17, 2023).

³ Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, art. I (1967), 610 U.N.T.S. 205, 18 U.S.T. 2410.



II. Implementation Plan Outcomes to Support ISAM

Astroscale U.S. applauds the release of the new National Spectrum Strategy and its recognition of innovative in-space services.⁴ “The Nation benefits from increased in-space capabilities and reduced costs made possible by current and emerging private space actors.”⁵ Moreover, in-space servicing capabilities pave the way for a sustainable space environment, enabling end-of-life services to remove failed satellites or active debris removal to remediate large derelict debris.⁶ To support NTIA in preparation of a national Implementation Plan, Astroscale U.S. offers three suggestions for outcomes under the Strategic Objectives.

A. The Implementation Plan Should Determine Whether Spectrum Bands May be Repurposed for ISAM Use Under Strategic Objective 1.2

Strategic Objective 1.2, *Ensure spectrum resources are available to support private sector innovation now and into the future*, specifically recognizes the increasing need for satellite-based spectrum, including ISAM missions.⁷ Accordingly, the Implementation Plan should establish a specific outcome addressing non-Federal ISAM spectrum resource availability, including consideration of the five candidate spectrum bands for study.

Astroscale U.S. suggests that the Implementation Plan establish the following near-term (within 1-3 years) outcome to address ISAM spectrum needs, support industry development, and overall advance space sustainability:

1.2.x – Define spectrum resources for non-Federal in-space servicing, assembly, and manufacturing now and into the future.

1.2.x.1 – Determine whether 7250-7750 MHz, internationally allocated to the Fixed-Satellite Service (FSS) downlink, could be reallocated for shared non-Federal in-space servicing, assembly, and manufacturing FSS operations.

⁴ See Nat’l Spectrum Strat., *supra* note 2, at 3-4, 10.

⁵ EXEC. OFF. OF THE PRESIDENT, UNITED STATES NOVEL SPACE ACTIVITIES AUTHORIZATION AND SUPERVISION FRAMEWORK at 3 (2023), <https://www.whitehouse.gov/wp-content/uploads/2023/12/Novel-Space-Activities-Framework-2023.pdf>.

⁶ See generally NAT’L SCI. & TECH. COUNCIL, EXEC. OFF. OF THE PRESIDENT, NATIONAL ORBITAL DEBRIS RESEARCH AND DEVELOPMENT PLAN (Jan. 2021), <https://trumpwhitehouse.archives.gov/wp-content/uploads/2021/01/National-Orbital-Debris-RD-Plan-2021.pdf> (discussing debris mitigation and remediation).

⁷ Nat’l Spectrum Strat., *supra* note 2, at 4.

- 1.2.x.2 – Determine whether 7900-8400 MHz, internationally allocated to the FSS uplink, could be reallocated for shared non-Federal in-space servicing, assembly, and manufacturing FSS operations.
- 1.2.x.3 – Determine what portions of the 18.1-18.6 GHz band could support expanded use by non-Federal ISAM inter-satellite links, recognizing 2023 World Radiocommunication Conference outcomes.⁸

The referenced 7-8 GHz bands are proposed to be studied for ISAM use because they include international allocations to the FSS, a radiocommunication service understood to proper for ISAM spectrum operations.⁹ Additionally, ISAM missions are uniquely able to share spectrum and could potentially reach acceptable sharing arrangements to accommodate existing Federal operations.¹⁰

B. The Implementation Plan Should Include Collaboration with ISAM Organizations under Strategic Objective 3.1

Strategic Objective 3.1, *Improve spectrum efficiency and bolster coexistence by facilitating investments in new and emerging technologies*, seeks to expand a “designed to share whenever feasible” mindset. This Objective includes consideration of technology procurement, regulatory modernization and spectrum management regimes, and even advancement of U.S. approaches and technologies before global standards bodies. Private-sector engagement is critical for the desired technical collaboration and uptake under this Objective.

Astroscale U.S. urges NTIA to consider the role of industry organizations with private-sector members when implementing Strategic Objective 3.1. Industry organizations serve as a conduit for engagement with multiple non-Federal stakeholders that may otherwise not participate in collaborative processes, given resource or other constraints. Specifically, Astroscale U.S. notes that CONFERS is a leading ISAM industry organization with a record of supporting technology,

⁸ A Resolution was adopted under WRC23 Agenda Item 1.17 to enable non-GSO and GSO use of the frequency bands 18.1-18.6 GHz by the inter-satellite service. *See* ITU-R, WORLD RADIOCOMMUNICATION CONFERENCE 2023 (WRC-23): PROVISIONAL FINAL ACTS, at 529, https://www.itu.int/dms_pub/itu-r/opb/act/R-ACT-WRC.15-2023-PDF-E.pdf (last accessed Jan. 2, 2024).

⁹ *See, e.g.* Comments of the Aerospace Corporation, FCC IB Docket Nos. 22-271 & 22-272, at 11-14 (Oct. 21, 2022) (noting the FCC has licensed ISAM missions under 47 CFR Part 25 in the FSS).

¹⁰ *See, e.g.*, Comments of Astroscale U.S. Inc., FCC IB Docket Nos. 22-271 & 22-272, at 23-4 (Oct. 31, 2022) (discussing coordination mechanisms for ISAM operations).



regulatory, and global standards conversations.¹¹ Accordingly, Astroscale U.S. suggests the following outcome for inclusion in the Implementation Plan:

- 3.1.x – Identify industry organizations that support in-space servicing, assembly, and manufacturing, and establish a long-term engagement strategy with them to facilitate investments in new and emerging technologies.

Industry organizations with private-sector members will be key ongoing contributors to national spectrum innovation.

C. The Implementation Plan Should Use Space and Orbital Debris-Related Topics to Invigorate the Spectrum Workforce under Pillar 4

To close, Astroscale U.S. would like to offer a suggestion addressing workforce preparation under the last Pillar of the National Spectrum Strategy.

Space is a place of imagination, growth, and passion. From young to old, talking about space is a surefire way to capture an audiences' attention. Even the National Spectrum Strategy leverages the word “moonshot.” Space-mission case studies are ideal to demonstrate the complexities and challenges of spectrum management, and the rewards of deeply technical work, while also intriguing and invigorating a workforce. Accordingly, Astroscale U.S. would suggest the following outcomes for the Implementation Plan:

- 4.1.x – In the near-term, identify fellowships, internships, and other opportunities for students to get hands-on experience at the intersection of space and spectrum; maintain an online job board with opportunities.
- 4.2.x – Create an ongoing cadence of engagements between Federal personnel, including spectrum managers, policymakers, legislators, and regulators, with space companies to discuss near-term and future operations and enhance decision-maker understanding.
- 4.3.x – In the near- to medium-term, develop a public-service outreach initiative that explores materials related to space, spectrum, politics, and orbital debris.
 - 4.3.x.1 – Leverage ITU-R Resolution 74, *Activities related to the sustainable use of radio-frequency spectrum and associated satellite-orbit resources used by space services*, to engage non-experts by exploring intersections of orbital

¹¹ See *CONFERS Resources & Publications*, CONFERS (2020), <https://satelliteconfers.org/publications/> (including publications in progress through AIAA and contributions to ISO standards).



debris, sustainability, technology, politics, and spectrum, including publishing timely reports on ITU-R work and highlighting how technical inputs translate into real-world results.

Spectrum education and engagement should not be silo'd, but built using relationships and interconnections with other sectors of interest. Space, for instance.

III. Conclusion

A thriving domestic in-space servicing, assembly, and manufacturing industry will create jobs, further U.S. national interests, and support safe and reliable space operations. The forthcoming Implementation Plan can strengthen U.S. leadership in ISAM by including outcomes that define available spectrum and study spectrum for non-Federal use, incorporate collaboration with trade organizations, and incentivize spectrum engagement using space-related topics.

Astroscale U.S. thanks NTIA for this opportunity to provide input to our Nation's continuing legacy of boundless space and spectrum innovation.

Respectfully submitted,

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