Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
REFLECT ORBITAL INC.	)	File No. SAT-LOA-2025_____
	)	
Application for Authority to Construct, Launch, and Operate a Non-Geostationary Orbit Satellite in the Space Operation and Space Research Services	)	Call Sign:_____

APPLICATION

Reflect Orbital Inc. ("Reflect Orbital"), respectfully requests Federal Communications Commission ("Commission") authority to launch and operate one non-geostationary orbit ("NGSO") satellite ("EARENDIL-1") in the space operations service ("SOS") and space research service ("SRS").[1] EARENDIL-1 will use UHF and S-band for telemetry, tracking, and command (TT&C). The spacecraft will downlink data about the health and performance of a novel payload in the X-band. With a scheduled launch date of no-earlier-than April 24, 2026, the requested license need-by date is **February 9, 2026**.

Pursuant to Section 25.114 of the Commission's rules, a completed Form 312, Schedule S, Technical Annex, Orbital Debris Assessment Report ("ODAR"), and Ownership Exhibit are included in this application (the "Application").[2] Reflect Orbital will provide the Commission the required ITU documentation under separate cover.[3]

[1] 47 C.F.R. § 25.114.

[2] *Id*.

[3] 47 C.F.R. § 25.111.

I. SYSTEM DESCRIPTION

A. Space Segment

EARENDIL-1 is a 142 kg spacecraft designed to reflect sunlight to a designated target on the ground with a deployable, highly specular thin-film reflector. The reflector is motorized and steerable to ensure reflected light is only visible in the targeted area. Reflect Orbital will operate EARENDIL-1 at a target altitude of 600-650 km. A complete technical description of the spacecraft is included in the attached ODAR.

The satellite is manifested for launch on a SpaceX rideshare mission, currently scheduled for no earlier than April 24, 2026.

B. Frequency Plan and Spectrum Sharing

EARENDIL-1 operates on the radiofrequency bands outlined in the table below. Satellite transmissions can be turned on and off by ground telecommand in compliance with Commission rules.[4]

Table 1 Frequency Bands, Direction, and Use

Frequency Band	Link Direction	Use
401-402 MHz	space-to-Earth	Telemetry Downlink
2025-2110 MHz	Earth-to-space	Command Uplink
2200-2290 MHz	space-to-Earth	Telemetry Downlink
8450-8500 MHz	space-to-Earth	Payload Downlink

The 401-402 MHz band is allocated internationally and in the United States for SOS (space-to-Earth) on a primary basis.[5] The SOS supports "the operation of spacecraft, in particular

[4] *See generally* Technical Annex; 47 C.F.R. § 25.207.

[5] *See* 47 C.F.R. § 2.106.

space tracking, space telemetry and space telecommand."[6] Reflect Orbital will use the 401-402 MHz band for TT&C downlink, consistent with the definition of SOS.

The 2025-2110 MHz band is allocated internationally and to Federal users in the United States for SOS and SRS (Earth-to-space) on a primary basis.[7] For non-Federal users, the 2025-2110 MHz band hosts a secondary SOS (Earth-to-space) allocation and a secondary SRS (Earth-to-Space) allocation, subject to certain conditions.[8] SRS covers transmissions "in which spacecraft or other objects in space are used for scientific or technological research purposes."[9] Reflect Orbital will use the 2025-2110 MHz band for TT&C uplink and to deploy and test the functionality of its steerable reflector, consistent with the definition of SOS and SRS. Reflect Orbital will coordinate with primary users in the band and will not cause harmful interference to systems operating in accordance with the Table of Frequency Allocations.[10]

The 2200-2290 MHz band is allocated internationally and to Federal users in the United States for SOS and SRS (space-to-Earth) on a primary basis.[11] Reflect Orbital will only communicate with coordinated earth stations outside the United States in this band, including the

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[6] ITU RR No. 1.23; 47 C.F.R. § 2.1.

[7] 47 C.F.R. § 2.106.

[8] *Id.* at n.US94 (limiting non-Federal Space Operation service in the 2025-2110 MHz band to "telecommand use for pre-launch testing and space launch operations" and requiring coordination with NTIA and non-federal fixed and mobile stations); 47 C.F.R. § 2.106 n.US347 (authorizing Space Research service in the 2025-2110 band "subject to such conditions as may be applied on a case-by-case basis").

[9] 47 C.F.R. § 2.106.

[10] *See id.* at n.347.

[11] 47 C.F.R. § 2.106.

sites listed in the Technical Annex.[12] Reflect Orbital will coordinate its operations in this band with Federal operators to ensure no harmful interference.

The 8450-8500 MHz band is allocated internationally and for Federal users in the United States for SRS (space-to-Earth) on a primary basis, and for non-Federal users on a secondary basis.[13] Reflect Orbital will use the 8450-8500 MHz band to transmit data regarding the deployment and functionality of its novel reflector and to downlink satellite health and operational data, consistent with the definition of SRS. Reflect Orbital will coordinate with co-primary users in the band and will not cause harmful interference to other systems operating in accordance with the Table of Frequency Allocations.

Spectrum sharing in the requested frequencies is possible because the satellite (along with co-frequency satellites in other similarly situated systems) will only transmit and receive for short periods of time while visible to a receiving or transmitting earth station. Given these circumstances, inline interference is unlikely to occur. Nevertheless, in the event such inline events are likely, Reflect Orbital will coordinate with other co-frequency satellite operators to ensure satellite transmissions do not overlap. In the event harmful interference is reported by an authorized user in a primary allocation operating in accordance with the Table of Frequency Allocations in bands where EARENDIL-1 is secondary, the spacecraft will immediately cease transmissions until such interference event is resolved.

C. Ground Segment

Reflect Orbital will use the ground station networks identified in the Technical Annex. Reflect Orbital may expand its future ground station network to include stations inside and/or

[12] Reflect Orbital may coordinate additional non-U.S. earth station locations, on an as-needed basis to support optimal communications with the EARENDIL-1 spacecraft.

[13] 47 C.F.R. § 2.106.

outside the United States as required by commercial demands. Reflect Orbital will coordinate all such ground stations with Federal spectrum managers in the relevant bands prior to operating any such stations.

II. PUBLIC INTEREST

Reflect Orbital's first satellite—EARENDIL-1—will serve as a crucial testbed for the development and use of space-based reflectors to address critical government, commercial, and humanitarian needs. Through the use of space-based reflectors, abundant sunlight can be intentionally directed to specific locations at specific times,[14] enabling Reflect Orbital to (1) augment energy projects by extending usable hours for solar cells to collect energy; and (2) provide an illumination solution for critical operations.

Reflect Orbital's innovative approach to energy augmentation and illumination has generated significant interest from commercial and government partners. As a result, the EARENDIL-1 mission is fully funded.[15] Reflect Orbital's innovative offering has also garnered substantial interest from the public, receiving over 250,000 applications for service. The prospective customer solicitations provided Reflect Orbital valuable input of potential public benefits that have informed and shaped the company's priorities for testing during this pathfinding mission.

For these reasons, grant of the Application is consistent with the Commission's goals, including to efficiently utilize spectrum to foster novel uses for satellite technologies. Reflect

[14] The reflectors do not alter or interrupt naturally occurring sunlight or solar patterns in any way.

[15] *See, e.g.*, Tereza Pultarova, *Mirrors in Space Could Boost Solar Power Production on Earth. Here's How*, Space.com (Apr. 24, 2024), available at https://www.space.com/orbiting-mirror-boost-solar-power-production.

Orbital respectfully requests the Commission expeditiously grant this Application in the public interest.

III. WAIVERS

The Commission may waive any of its rules where there is "good cause" to do so.[16] In general, waiver is appropriate if (i) special circumstances warrant a deviation from the general rule; and (ii) such deviation would better serve the public interest than would strict adherence to the rule.[17] The Commission will generally grant a waiver of its rules if the relief requested would not undermine the policy objective of the rule in question and would otherwise serve the public interest.[18]

A. Modified Processing Round Rules

Reflect Orbital requests that its application be processed pursuant to the first-come, first-served procedure adopted for "GSO-like satellite systems" pursuant to Section 25.158.[19] To the extent necessary to allow for such processing, Reflect Orbital requests waiver of Sections 25.156 and 25.157 of the Commission's rules, which provide for the processing of "NGSO-like satellite systems" under a modified processing round framework.[20] The Commission has routinely granted such requests for similarly situated applicants where, as in this Application, applicants

[16] See 47 C.F.R. § 1.3; *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164 (D.C. Cir. 1990); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969).

[17] *See Northeast Cellular*, 897 F.2d at 1166.

[18] *See WAIT Radio*, 418 F.2d at 1157.

[19] *See* 47 C.F.R. § 25.158.

[20] *See* 47 C.F.R. §§ 25.156, 25.157.

demonstrated that they could coordinate transmissions with other co-frequency systems and their operations would not preclude future entrants from using the same spectrum.[21]

As demonstrated above, EARENDIL-1 can share spectrum with existing and future operators. EARENDIL-1 does not require full-time system availability and will transmit and receive only in short periods of time while visible to limited receiving/transmitting earth stations. For harmful interference to occur, both EARENDIL-1 and another co-frequency satellite would have to be visible and transmitting to or receiving from the same ground station using the same frequencies at the exact same time. In such an unlikely event, any resulting inline interference could be avoided through coordination. Reflect Orbital commits to coordinating with authorized co-frequency systems.

B. Default Service Rules

To the extent necessary, Reflect Orbital requests waiver of the default service rules.[22] The default service rules apply in the event the Commission has not adopted band-specific rules. The Commission has routinely waived this requirement where compliance with the technical requirements of the Commission's Part 2 and 25 rules and ITU Radio Regulations provide sufficient protection from harmful interference.[23] As demonstrated herein, such waiver is

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[21] *See*, *e.g.*, Spire Global Inc., Stamp Grant with Conditions, ICFS File Nos. SAT-MOD-20200603-00065, SAT-MPL-20200618-00078, Condition 25 (Nov. 9, 2022); Planet Lab PBC, Stamp Grant with Conditions, ICFS File No. SAT-MOD-20220421-00042, Condition 13 (reissued Sept. 28, 2023).

[22] *See* 47 C.F.R. § 25.217(b).

[23] *See Space Imaging, LLC*, Declaratory Order and Order and Authorization, DA 05-1940, ¶¶ 23-25 (IB 2005); *DigitalGlobe, Inc*., Order and Authorization, 20 FCC Rcd 15696 ¶¶ 1, 15 (2005); *see also Planet Labs PBC*, Stamp Grant with Conditions, ICFS File No. SAT-MOD-2015-0802-0053 (granted Sept. 15, 2016); *Planet Labs PBC.*, Stamp Grant with Conditions, ICFS File No. SAT-LOA-20130626-0087 (granted Dec. 3, 2013); *Spire Global Inc.*, Stamp Grant with Conditions, ICFS File No. SAT-LOA-20151123-00078 (Mar. 18, 2016) (granted in part).

appropriate because Reflect Orbital commits to satisfying the Commission's technical requirements and applicable ITU Radio Regulations. Reflect Orbital further commits to coordinate with co-frequency and adjacent band operators to prevent harmful interference.

C. Application Processing

To the extent necessary, Reflect Orbital requests waiver of the Commission's application processing requirements. The Commission may dismiss submissions if they contain incomplete information or internal inconsistencies.[24] Even in these cases, however, the Commission's rules provide that the Commission may accept a defective application if accompanied by an appropriate waiver request.[25] Reflect Orbital requests that in the event additional information or explanation is deemed necessary, the Commission permit Reflect Orbital to supplement its application accordingly. Grant of such waiver would efficiently utilize Commission resources, avoid unduly harsh outcomes, and enable concerns to be addressed on an issue-by-issue basis.

IV. OTHER MATTERS

A. NOAA Authorization

Reflect Orbital's satellite does not require a private remote sensing space system license from NOAA's National Environmental Satellite, Data, and Information Service based on the services described herein.

B. ITU Compliance

Pursuant to Section 25.111 of the Commission's rules, Reflect Orbital acknowledges the Commission will submit filings to the ITU on Reflect Orbital's behalf and that Reflect Orbital is responsible for any and all fees charged by the ITU for such filings.[26] Reflect Orbital will provide

[24] *See* 47 C.F.R. § 25.112(a).

[25] *See* 47 C.F.R. § 25.112(b)(1).

[26] *See* 47 C.F.R. § 25.111.

the Commission with the appropriate electronic files for submission to the ITU under separate cover.

C. Ownership Information

Reflect Orbital's ownership structure appears in the Attachment to this Narrative.

V. CONCLUSION

For all the reasons set forth herein, Reflect Orbital respectfully requests prompt action by the Commission on the Application.

Respectfully submitted,

/s/ Ben Nowack

Jodi A. Goldberg

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12727 S. Van Ness Ave.
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July 31, 2025

ATTACHMENT (OWNERSHIP INFORMATION)

Reflect Orbital Inc. ("Reflect Orbital") is a California-based corporation organized under the laws of Delaware. The following are shareholders with 10% or more of the equity and/or voting stock in Reflect Orbital:

Name: Ben Nowack
Address: 12727 S Van Ness Ave, Hawthorne, CA 90250
Ownership: 28% voting and equity interest

Name: Sequoia Capital
Address: 2800 Sand Hill Road, Suite 101, Menlo Park, CA 94025
Ownership: 17.18% voting and equity interest

SC US (TTGP), Ltd. ("SC GP") has an approximately 17.8% fully diluted, aggregated, indirect ownership interest (voting/equity) in Reflect Orbital. SC GP, a Cayman Island limited liability corporation, is the general partner of each of the following entities (the "SC Entities"), each of which have investments in Reflect Orbital: (1) SC US/E Venture Fund XVIII Management, L.P., a Cayman Island limited partnership, holds a 8.55% ownership interest, as nominee; (2) SC US/E Seed Fund V Management, L.P., a Cayman Island limited partnership, holds a 8.55% ownership interest, as nominee; and (3) SC US/E Ecosystem Fund I Management, L.P., a Cayman Island limited partnership, indirectly holds a 0.07% ownership interest, as the general partner of Scout Fund VII, LP, a Delaware limited partnership. The ultimate controlling persons of SC GP are Roelof Botha, Alfred Lin, and Patrick Grady, all U.S. citizens. The address of SC GP, the SC Entities, Roelof Botha, Alfred Lin, and Patrick Grady is 2800 Sand Hill Road Suite 101 Menlo Park, CA 94025.

Name: Lux Capital
Address: 920 Broadway, 11th Floor, New York, NY 10010
Ownership: 15.8% voting and equity interest

Lux Ventures VIII, L.P. ("LV8") has an approximately 15.8% ownership interest (voting/equity) in Reflect Orbital. LV8 is a Delaware limited partnership headquartered at 920 Broadway, 11th Floor, New York, NY 10010. Lux Venture Partners VIII, LLC, a Delaware limited liability company ("LV8GP"), is the General Partner of LV8. LV8GP is owned and controlled by Josh Wolfe and Peter Hébert, both US-citizens. The address for Mr. Wolfe and Mr. Hébert is the same as LV8.

Name: Starship Ventures
Address: 1225 4th #833 San Francisco, CA 94158
Ownership: 14.6% voting and equity interest

Starship Ventures GP I LLC ("Starship GP") has an approximately 14.6% fully diluted, aggregated, indirect ownership interest (voting/equity) in Reflect Orbital. Starship GP, a Delaware limited liability company, is the Manager and General Partner of each of the following entities (the "Starship Entities"), each of which directly hold investments in Reflect Orbital: (1) Starship Ventures SPV IX, a series of Starship Ventures Opportunities LLC holds a 1.2% ownership

interest; (2) Starship Ventures SPV XII, a series of Starship Ventures Opportunities LLC holds a 3.6% ownership interest; (3) Starship Ventures SPV XVII, a series of Starship Ventures Opportunities LLC holds a 1.1% ownership interest; and (4) Starship Ventures Fund II LP holds a 8.7% ownership interest. The remaining 20% of Starship GP is owned by Hugo Peterson, a UK citizen. All of the Starship Entities are established in Delaware. Starship GP is 80% owned and managed by Sean Hoge, a U.S. citizen. The address for Starship GP, the Starship Entities, and Mr. Hoge is 461 2nd St. #656 San Francisco, CA 94107. Mr. Peterson's address is 2177 3rd St #608, San Francisco, CA 94107.

The following individuals are the directors of Reflect Orbital:

Name	Citizenship
Ben Nowack	US
Tristan Semmelhack	US
Josh Wolfe	US
Shaun Maguire	US

The following individuals are the officers of Reflect Orbital:

Name	Title	Citizenship
Ben Nowack	CEO & Co-Founder	US
Tristan Semmelhack	CTO & Co-Founder	US

All of the directors and officers of Reflect Orbital may be reached at the following address:

12727 S. Van Ness Ave.
Hawthorne, CA 90250