

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of	)	
	)	Call Sign(s):
EarthTraq Corporation	)	
	)	
Application for License of EarthTraq	)	File No. 0839-EX-CN-2026
Corporation and the ET-02	)	
Non-Geostationary Satellite System	)	

APPLICATION FOR LICENSE OF EARTHTRAQ CORPORATION AND ET-02 SYSTEM

EarthTraq Corporation (“EarthTraq”), in accordance with Part 5 of the Federal Communications Commission’s (“Commission”) rules, hereby files this application requesting experimental authorization for EarthTraq Corporation’s ET-02 Non-Geostationary Orbit (“NGSO”) satellite system. EarthTraq will demonstrate satellite-based geolocation of land based and sea based lower power sensors from low Earth orbit using the ET-02 system, scheduled to launch no earlier than December 2026.

Consistent with the information required by the Commission’s Rules, EarthTraq has also provided a completed Form 442, Technical Narrative, Orbital Debris Assessment Report (ODAR) and ITU supporting documents. EarthTraq specifically seeks authorization for use of the Earth Exploration Satellite Service’s 460 MHz to 470 MHz Band and 8025 MHz to 8400 MHz Band, the Fixed Service’s 2400-2500 MHz Band, and the Mobile-Satellite Service’s 1610 MHz to 1626.5 MHz Band on an experimental basis.

I. INTRODUCTION

A. EARTHTRAQ CORPORATION BACKGROUND

EarthTraq is a U.S.-owned, venture-backed company that is making it possible to track anything, anywhere, for almost no cost. The company operates a full-stack spacecraft with autonomous small satellite clusters that track objects and natural resources completely independently of GPS or any other telecom infrastructure. The end goal is delivering a global, low-latency geolocation and environmental-data service for scientific, industrial, and humanitarian use cases.

B. ET-02 DESCRIPTION

1. ET-02 SPACECRAFT SYSTEM OVERVIEW

As part of the overall goal of demonstrating satellite-based geolocation of land and sea based low power sensors, this mission aims to demonstrate EarthTraq's spacecraft technology in low Earth orbit and the ability to operate for a mission duration of two years.

The ET-02 spacecraft system consists of four (4) small spacecraft¹, rectangular in shape, working in combination with each other to perform the mission goals. Dimensions of the spacecraft are 226.3 mm x 340.5 mm x 27.4 mm with solar arrays stowed, and 226.3 mm x 937 mm x 23.5 mm with solar arrays deployed. The mass of each spacecraft is 3.25 kg at launch and does not have propulsive capabilities onboard, leading to a constant mass of spacecraft throughout the entire mission.

¹ The four spacecraft are sub designated as ET-SAT005, ET-SAT006, ET-SAT007, ET-SAT008

2. FREQUENCY PLAN

a. Service Class Definition

The ET-02 spacecraft system is defined as an Earth Exploration Satellite Service's under the International Telecommunications Union's Radio Regulations². As the ET-02 spacecraft system will demonstrate satellite-based geolocation of land and sea based low power sensors and perform demonstrations for various US Civil Agencies, this system qualifies under Earth Exploration Satellite Service.

b. UHF Downlink

The ET-02 spacecraft requests use the 460-470 MHz Earth Exploration-Satellite Service Band for space-to-Earth downlink telemetry. Pursuant to 47 CFR § 2.106(b)(289)³ and 47 CFR § 2.106(c)(289)(i)⁴, the ET-02 spacecraft qualifies for use of this band on a secondary basis. EarthTraq acknowledges that usage of this band is on a secondary basis with respect to the fixed and mobile services and are committed to not causing harmful interference to other stations within this band and will take all necessary steps to mitigate any interference if it does occur.

c. X Band Downlink

EarthTraq also requests use of the Earth Explorations Satellite Service's 8025 MHz to 8400 MHz Band ("X Band"). The 8025-8400 MHz frequency band is allocated to Earth-Exploration Satellites Services ("EESS"), Fixed, Fixed-Satellite and Mobile in all ITU regions on a primary basis. For United States applicants however, operations are limited to federal operators and use by commercial operators is subject to 47 CFR § 2.106(c)(258), which states

² See ITU Radio Regulations, Paragraph 1.51

³ "Earth exploration-satellite service applications, other than the meteorological-satellite service, may also be used in the bands 460-470 MHz and 1690-1710 MHz for space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table."

⁴ "In the band 460-470 MHz, space stations in the Earth exploration-satellite service (EESS) may be authorized for space-to-Earth transmissions on a secondary basis with respect to the fixed and mobile services... The power flux density produced at the Earth's surface by any space station in this band shall not exceed $-152 \text{ dBW/m}^2/4 \text{ kHz}$ "

“[i]n the bands 8025-8400 MHz and 25.5-27 GHz, the Earth exploration-satellite service (space-to-Earth) is allocated on a primary basis for non-Federal use. Authorizations are subject to a case-by-case electromagnetic compatibility analysis.” As EarthTraq is a non-Federal user intending to operate its downlink in a manner similar to other EESS operations, use of this band is compatible with current and future users.

d. S Band Crosslink

EarthTraq requests use of the Fixed Service’s 2400 to 2500 MHz Band for use as an inter-satellite link, operating under the Industrial, Scientific and Medical (ISM) regulations. This link is currently allocated for ISM communications on a non-interference basis. EarthTraq requests access to this band in order to operate an 802.11 Wi-fi like inter-satellite link between the ET-02 spacecraft.

e. L Band Downlink

EarthTraq requests use of the Mobile-Satellite Service’s 1610 to 1626.5 MHz Band, via use of the Iridium network of spacecraft.⁵ This link is currently allocated for Space to Earth communications on a secondary basis. EarthTraq requests access to this band, in coordination with Iridium Satellite LLC, with a companion license to be filed by Iridium Satellite LLC in conjunction with this application.

3. LAUNCH SCHEDULE

The ET-02 system spacecraft is scheduled to launch no earlier than December 1st, 2026, as part of a CubeSat deployment system on board the launch vehicle. The ET-02 system will be deployed from Maverick Space System’s NLAS 6U CubeSat deployment system roughly 60-90 minutes after launch. The ET-02 system will deploy from the NLAS 6U CubeSat deployment

⁵ Specifically, the HIBLEO-2 system (FCC Callsign S2110)

system, and after a delay agreed upon with the launch provider based on other deployments (to avoid any recontact issues with any other objects) the ET-02 system will separate into the four spacecraft.

II. GRANT OF THIS APPLICATION WILL SERVE THE PUBLIC INTEREST

The grant of this application will serve the public interest by providing a novel way to measure characteristics of the Earth and its natural phenomena. By using small spacecraft to geolocate previously existing field sensors that measure soil moisture, coastal erosion, glacier velocity, wildlife migration, and other natural phenomena instead of terrestrial based systems, more consistent data can be collected from these sensors to provide scientists more complete data to work with in a timelier fashion than current terrestrial based systems. Agencies such as the National Oceanic and Atmospheric Administration (NOAA) could use this system once demonstrated to obtain more consistent data regarding weather patterns from remote locations to help inform the public of impending weather. The United States Geological Survey (USGS) could use this system once demonstrated to access remote geological sensors to obtain data on remote fault lines to better predict earthquakes. The Bureau of Ocean Energy Management (BOEM) could use this system, once demonstrated, to monitor coastal shoreline erosion and soil moisture, helping predict and inform the public about shoreline degradation and landslides. The ability to measure these characteristics of the Earth and its natural phenomena using low power sensors affects public safety, security, and science. Thus, enabling a new and novel system to measure these low power sensors from space instead of terrestrial systems will immensely benefit the public interest.

III. ADDITIONAL MATTERS

A. Eligibility and Operational Requirements

1. System Eligibility (47 CFR § 5.3)

The ET-02 spacecraft system is eligible for a Part 5 experimental license under subset (e) of Section 5.3 (“Technical demonstrations of equipment or techniques”). The ET-02 system is the first of its kind with ability to perform satellite-based geolocation of land based and sea based lower power sensors from low Earth orbit. Following upon the successful launch and deployment of ET-01⁶ to sun synchronous orbit, the ET-02 system is the first to demonstrate the technology’s ability to operate in a low-inclination orbit, providing different challenges as compared to ET-01 and thus the need to demonstrate new techniques that ET-01 did not employ. The end goal of a successful demonstration leads to follow-on operational missions that will fall under Part 100 licensing once proven.

2. Special provisions for satellite systems (47 CFR § 5.64)

Pursuant to 47 CFR §5.64, the ET-02 system conforms to all provisions set forth for satellite systems certification:

(a) EarthTraq certifies that construction is entirely at the applicant's risk and does not entitle the applicant to any assurances that its proposed experiment will be subsequently approved or regular services subsequently authorized. EarthTraq requests to use this notice, along with all further documentation submitted with this application as formal notice of its plans to construct at its own risk.

(b) EarthTraq submits the following information as requested by Section 5.64 (and found in other documents or attachments as referenced):

⁶ See FCC ELS File Number 1072-EX-CN-2025

(1) EarthTraQ has assessed and eliminated any amount of debris released in a planned manner during normal operations. By design, the ET-02 spacecraft will release no operational debris. More detail can be found in Section 3 of the attached Orbital Debris Assessment Report.

(2) EarthTraQ has assessed and limited the probability that the space station will become a source of debris by collision with small debris or meteoroids that would cause loss of control and prevent disposal. More detail can be found in Section 5 of the attached Orbital Debris Assessment Report.

(3) EarthTraQ has assessed and limited the probability during and after completion of mission operations, of accidental explosions or of release of liquids that will persist in droplet form. No debris will be generated in an accidental explosion resulting from the conversion of energy sources on board the ET-02 spacecraft into energy that fragments the spacecraft. More detail can be found in Section 4 of the attached Orbital Debris Assessment Report.

(4A) EarthTraQ has assessed and limited the probability of the space station(s) becoming a source of debris by collisions with large debris or other operational space stations. The probability of a collision between the ET-02 spacecraft and any other large object (10 centimeters or larger) during the lifetime of the spacecraft is less than the required 0.001 as calculated using current NASA Debris Assessment Software (DAS) version 3.2.7. More detail can be found in Section 5 of the attached Orbital Debris Assessment Report.

(4B) EarthTraQ has assessed and limited the probability of the Spacecraft becoming a collision risk by coordinating with the 18th Space Defense Squadron, the federal organization responsible for space situational awareness. Regular collision avoidance (“COLA”) screening is done in conjunction with the Spacecraft to ensure it will not collide with other stations on orbit,

and all necessary actions to avoid collisions will be taken by EarthTraQ upon notice from the 18th Space Defense Squadron.

(4C) The Spacecraft is designed to operate at 500 km and will stay above all inhabitable spacecraft during all operations. At the end of the mission, the ET-02 spacecraft system will continue to decay naturally, with EarthTraQ working in conjunction with the 18th Space Defense Squadron and NASA's Trajectory Operations & Planning Officer (TOPO) to change ET-02 system's cross sectional area in order to increase or reduce drag if a potential conjunction with any inhabitable spacecraft and also reduce probability of collision.

(4D) The ET-02 spacecraft does not have on-orbit station keeping capability. More detail regarding the anticipated evolution over time of the orbit of the satellite can be found in Section 5 of the attached Orbital Debris Assessment Report.

(4E) EarthTraQ certifies that upon receipt of a space situational awareness conjunction warning, EarthTraQ, as the operator, will review and take all possible steps to assess the collision risk, and will mitigate the collision risk if necessary following the guidance provided in the 18th Space Defense Squadrons "Handbook for Operators v1.7".

(5) The ET-02 spacecraft system is trackable as confirmed by the 18th Space Defense Squadron and is already registered in their system, with their confirmation of such attached as an Exhibit to this application. The ET-02 spacecraft will also be identifiable by a unique signal-based telemetry marker distinguishing it from other space stations or space objects based on frequency and packet formats. EarthTraQ plans to share information regarding initial deployment, ephemeris, and/or planned maneuvers with the 18th Space Control Squadron or successor entity, other entities that engage in space situational awareness or space traffic

management functions, and/or other operators. The procedure used for sharing and updating information is outlined in the 18th Space Defense Squadrons “Handbook for Operators v1.7”.

(6) The ET-02 spacecraft system will not perform any proximity operations, thus no debris generation will result from proximity operations.

(7) The ET-02 spacecraft system is designed to be disposed of by passive uncontrolled reentry. A Post Mission Disposal Maneuver will not be able to be performed, but DAS simulations predict an orbital lifetime of 2 years before the ET-02 system atmospherically reenters passively, which is less than the 5 year requirement for reentry after end of mission per 47 CFR § 5.64(b)(7)(iv)(A) assuming 3 years of mission operations. Further, the risk to human casualty is calculated as zero (0), which is better than the requirement of 1:10,000. More detail can be found in Section 6 of the attached Orbital Debris Assessment Report.

3. License Period (47 CFR § 5.71)

EarthTraq requests a license period of three (3) years, or 36 months. While the nominal mission duration is two (2) years from launch, three years is requested in order to cover unforeseen launch delays in order to not have to burden the Commission every time the launch is delayed, if this does occur. If requested, EarthTraq will be glad to inform the Commission at the end of the mission as required, in order to ensure the license period is only three years of operational time per 47 CFR § 5.81.

4. Non-interference criterion (47 CFR § 5.84)

The ET-02 spacecraft can be commanded from the ground to immediately cease transmissions and EarthTraq Corporation will have the capability to eliminate harmful interference when required under the terms of this license or other applicable regulations.

B. ITU Cost Recovery

EarthTraq Corporation is aware that, per actions taken at the 1998 Plenipotentiary Conference and as modified by the ITU Council in 2005, the ITU charges processing fees for satellite network filings to prevent “warehousing” of spectrum. Therefore, all applicants are responsible for all fees charged by the ITU regarding their application. EarthTraq is aware of this requirement and accepts responsibility to pay all ITU cost recovery fees associated with this application. Such fees and invoices may be sent to the contact representative listed in the attached ITU Cost Recovery Letter.

IV. REQUESTS FOR WAIVER

EarthTraq respectfully requests waiver of the frequency allocation regulations along with this application. The Commission may waive any of its rules if there is “good cause” to do so.⁷ Waiver is also appropriate where “special circumstances warrant a deviation from the general rule” and “such deviation will serve the public interest” better than strict adherence to the rule.⁸ Previously, the Commission has granted a waiver of its rules if the requested relief would not undermine the objective of the rule in question and would otherwise serve the public interest.⁹ The Commission may also consider potential hardship, equity, or policy implementation factors as part of its review.¹⁰ It is with this background that EarthTraq is requesting waiver of 47 C.F.R. § 2.106 (Table of Frequency Allocations) for this application to permit the use of Mobile-Satellite Service’s 1610 to 1626.5 MHz Band and the Fixed Service’s 2400 to 2500 MHz Band.

The proposed usage of the Mobile-Satellite Service’s band is on a non-conforming, but non-interfering, basis. Waiver of the Mobile-Satellite Service’s 1610 to 1626.5 MHz Band is

⁷ 47 C.F.R. § 1.3

⁸ *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990) (*Northeast Cellular*).

⁹ See *WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969) (*WAIT Radio*) and See *Northeast Cellular*, 897 F.2d at 1166

¹⁰ See *WAIT Radio*, 418 F.2d at 1159

requested for Space-to-Space operations of the link in order to accurately track each spacecraft on-orbit during operations, allowing better commandability and control of the spacecraft system to observe remote Earth based sensors with low latency. Operations of this link and analysis showing how use of this link in this manner will not cause interference to current and future users is shown in the attached Technical Narrative as an Exhibit to this application.

The proposed usage of the Fixed Service's 2400 to 2500 MHz Band is on a non-conforming, but non-interfering, basis, consistent with 47 C.F.R. § 2.106 Footnote 5.150.¹¹ EarthTraq understands and certifies that use of this band will conform to Footnote 5.150, and will ensure that radiation from equipment used in this frequency band is minimal and that, outside the bands designated for use by this equipment, radiation from such equipment is at a level that does not cause harmful interference to a radiocommunication service and, in particular, to a radionavigation or any other safety service operating in accordance with the provisions of the ITU Radio Regulations, per Article 15.13. Further, there is precedent from previous Commission grants for use of this band for inter-satellite links, and EarthTraq will work to coordinate with any Administration wishing to coordinate use of this link as notified to the ITU.

V. OTHER MATTERS

A. Previous EarthTraq Licenses

The Commission has previously granted EarthTraq Corporation authority to operate the ET-01 system under ELS File Number 1072-EX-CN-2025.

¹¹ The following bands [...] are also designated for industrial, scientific and medical (ISM) applications. Radiocommunication services operating within these bands must accept harmful interference which may be caused by these applications. ISM equipment operating in these bands is subject to the provisions of No. 15.13.

VI. CONCLUSION

This Application, along with all attached documentation and databases containing appropriate diagrams and details, outlines EarthTraq Corporation's ET-02 spacecraft system Radio Frequency system and provides the necessary information to review compatibility of the system with other current (and future) users. EarthTraq Corporation specifically seeks authorization for use of the Earth Exploration Satellite Service's 460 MHz to 470 MHz Band and 8025 MHz to 8400 MHz Band, the Fixed Service's 2400-2500 MHz Band, and the Mobile-Satellite Service's 1610 MHz to 1626.5 MHz Band on an experimental basis, in accordance with Part 5 of the Commission's rules.

Attachments:

Technical Narrative

Orbital Debris Assessment Report

ITU SpaceCap

ITU GIMS

ITU Cost Recovery Letter

Respectfully submitted,

Max Holliday

/s/

EarthTraq, Corporation