Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	
Orbital Sidekick, Inc.	)	File No.
	)	
Application for Authority to Launch and Operate a Non-Geostationary Satellite Orbit System in the Earth-Exploration Satellite Service	)	Call Sign:

APPLICATION

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APPLICATION

Orbital Sidekick, Inc. ("OSK") requests authority from the Federal Communications Commission (the "Commission") to launch and operate a six-satellite hyperspectral imaging non-geostationary orbit ("NGSO") constellation in Low Earth Orbit ("LEO"), known as Global Hyperspectral Observation Satellite ("GHOSt"). Pursuant to Sections 25.114 and 25.122 of the Commission's rules, a completed Form 312, Schedule S, and Technical Annex are included with this Application pursuant to the Commission's streamlined licensing procedures governing small satellites.[1]

I. BACKGROUND AND DESCRIPTION OF OSK SERVICES

OSK, a San Francisco, California operator of space-based hyperspectral monitoring sensors, provides innovative remote sensing solutions for a diverse set of industrial and governmental customers, including end users across the energy, surveying and extraction, agriculture, environmental monitoring, and defense sectors. OSK's proprietary analytics platform and hyperspectral payload architecture provide persistent space-based monitoring solutions powered by the Spectral Intelligence Global Monitoring Application (SIGMA™) platform, a

[1] 47 C.F.R. §§ 25.114, 25.122. S*ee also Streamlining Licensing Procedures for Small Satellites*, Report and Order, 85 Fed. Reg. 43711, 34 FCC Rcd 13077 (2019) ("Streamlined Licensing Order").

unique radiometric speciation and change detection capability that enables unparalleled target monitoring services for both commercial and defense users on a global scale. The SIGMA™ platform can apply computationally efficient change detection and supervised classification machine learning algorithms to detect differences in the spectral signatures of each pixel as a function of time, and allows OSK to correlate these changes to its ever-expanding spectral library to chemically classify the basis for that change. Examples of the kinds of data sets OSK provides its customers include protein content and evapotranspiration levels for crops, corrosion identification and leak detection for monitoring pipelines, accurate mineral surveying, environmental monitoring for various applications, and real-time road/rail infrastructure conditions.

The GHOSt constellation represents the next evolution of OSK's sensing capabilities and will allow OSK to scale its commercial product with larger coverage, reduced revisit times, better spatial resolution, and more spectral capability.[2] GHOSt will capture more than 400 spectral bands in the visible to shortwave infrared range of 400 – 2500 nm to feed OSK's SIGMA™ platform. Therefore, OSK respectfully requests the Commission expeditiously grant this streamlined application so that OSK may commence commercial operations and further expand its innovative offerings to its diverse set of customers.

[2] OSK does not hold any Commission authorizations. OSK previously filed an application substantially similar to the instant proposed operations, which was dismissed by the Commission on September 13, 2021. This revised application is responsive to the accompanying dismissal letter requesting certain corrections and additional information. In accordance with 47 C.F.R. § 1.1111, no application fee is submitted with this re-filed application. *See* Letter from Karl A. Kensinger, Chief, Satellite Division, FCC to Brian D. Weimer, Counsel to Orbital Sidekick, Inc., File No. SAT-LOA-20210520-00069, DA 21-1136 (Sept. 13, 2021).

II. DESCRIPTION OF SYSTEM FACILITIES AND OPERATIONS

A. Space Segment

The GHOSt mission will involve deploying a remote sensing constellation of small satellites with both radiofrequency and optical payloads. The satellite constellation will consist of six (6) technically identical satellites launched into a sun-synchronous orbital ("SSO") inclination in LEO.[3] The spacecraft bus is based on Astro Digital's flight-proven Corvus-XL smallsat platform and utilizes Astro Digital's heritage flight computer, attitude determination and control system, power, and communications subsystems. The payload for each satellite consists of a proprietary hyperspectral imager manufactured by OSK. Each satellite has external dimensions of 57.8 cm x 57.8 cm x 111.4 cm and a total mass of 91.4 kg.[4]

As described more fully in the accompanying orbital debris assessment report ("ODAR") and Technical Annex, each satellite is equipped with state-of-the-art hardware and software solutions to ensure safe and efficient mission operations. Each GHOSt satellite will be capable of making orbital adjustments and performing collision avoidance maneuvers by utilizing differential drag, but will not carry propulsive systems.[5]

The GHOSt system plans to operate in the radiofrequency bands outlined in the table below. Satellite downlink transmissions can be turned on and off by ground telecommand in compliance with Commission rules.[6]

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[3] The GHOSt-01 and GHOSt-02 satellites will each have one additional Ka-band antenna, known as a Lens Aided Horn, which has a lower peak gain. *See* Attachment B - Technical Annex, § A.3 ("Technical Annex").

[4] *See* Attachment C – Orbital Debris Assessment Report at 2-4 ("ODAR").

[5] ODAR at 8-9.

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

Type of Link and Transmission Direction	Frequency Ranges
EESS Downlink	25.5 – 27.0 GHz
EESS and TT&C Uplink	2025 – 2110 MHz
Inter-Satellite Service (Transmit)	1615 – 1617.5 MHz
Space Operations Service Downlink (TT&C)	400.15 – 401 MHz
GPS Signals	L1 C/A, L1C, L2C, L2P, L5

B. Orbital Information

The GHOSt satellites described in this application will operate at an altitude of 525 km in a SSO inclination.[7] The information below describes the anticipated orbital characteristics for the GHOSt constellation.

Orbital Plane Number	1	2	3
Number of Satellites within the Orbital Plane	2	2	2
Inclination Angle	97.5°		
Orbital Period	5708 seconds		
Apogee	525 km		
Perigee	525 km		
Argument of Perigee	0°		
Active Service Arc	-90° to 90°[8]		
Right Ascension of the Ascending Node	30°	330°	0°
Initial Phase Angles	<10° between each satellite [9]		
Local Time of Descending Node	1:30 PM	10:00 AM	10:00 AM

[7] The GHOSt spacecraft will be integrated and launched in pairs on a SpaceX Falcon 9 Rideshare vehicle, which will transport multiple mission payloads simultaneously. The GHOSt spacecraft will be deployed between 500 km and 550 km at the discretion of the launch service provider. The anticipated average altitude of the operational GHOSt spacecraft is 525 km in a circular SSO. *See* ODAR at 2; *see also* Schedule S.

[8] Although the GHOSt satellites are capable of transmitting throughout the entire orbit, they only transmit when visible to one of their Earth stations. *See* Technical Annex, §§ A.2.a. and A.7.

[9] Given that the satellites are launched two at a time from the same launch vehicle, the initial phase angles will be very small. Over time, the two satellites in a given plane will separate further within their respective orbital planes and eventually be separated by 180°. *See* Technical Annex, § A.2.a.

C. Ground Segment and Operations

The Mission Operations Center for GHOSt will be located at OSK's headquarters in San Francisco, California and at Astro Digital's facility in Santa Clara, California. Consistent with OSK's National Oceanic and Atmospheric Administration ("NOAA") license, the GHOSt constellation will be monitored at all times via automated and human systems, facilitating rapid response to any technical or regulatory concerns.[10]

OSK will conduct its mission operations through a network of ground stations that will initially consist of facilities in (i) Santa Clara, California; (ii) Tromsø, Norway, (iii) Svalbard, Norway, and (iv) Troll, Antarctica.[11] OSK may expand its ground station network over the course of the operational lifetime of the GHOSt constellation to include additional commercial stations either within or outside the United States and will seek to modify its authorization as conditions arise. OSK has initiated coordination efforts with Federal operators in its requested bands and will operate in accordance with the terms of any agreements.[12]

D. Launch Schedule

The GHOSt satellites will be launched in pairs using a secondary payload launch service. OSK currently anticipates an initial launch of GHOSt-01 and GHOSt-02 in Q2 2022. Based on current projections, OSK anticipates deploying the entire GHOSt constellation by Q4 2022.[13]

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[10] National Environmental Satellite Data and Information Service, NOAA Licensees (last visited Dec. 2, 2021), https://www.nesdis.noaa.gov/commercial-space/regulatory-affairs/licensing/noaa-licensees.

[11] *See* Technical Annex, § A.2.c.

[12] *See id.*, § A.7.c.

[13] *See* ODAR at 2.

III. SMALL SATELLITE CERTIFICATIONS

Consistent with the requirements for streamlined treatment under Section 25.122 of the Commission's rules, OSK hereby certifies that all of the GHOSt satellites to be operated pursuant to this requested authorization meet the following criteria:[14]

47 C.F.R. § 25.122 Criteria	GHOSt Compliance
(1) The space station(s) will operate only in non-geostationary orbit.	Compliant; NGSO LEO constellation.[15]
(2) The total in-orbit lifetime for any individual space station will be six years or less.	Compliant; Total in-orbit lifetime of 5.2 years.[16]
(3) The space station(s): (i) Will be deployed at an orbital altitude of 600 km or below; or (ii) Will maintain a propulsion system and have the ability to make collision avoidance and deorbit maneuvers using propulsion.	Compliant; Target altitude of 525 km, circular SSO.[17]
(4) Each space station will be identifiable by a unique signal-based telemetry marker distinguishing it from other space stations or space objects.	Compliant; The telemetry system allows each GHOSt satellite to be identified by a unique signal-based telemetry marker that will distinguish it from other space stations or objects.[18]
(5) The space station(s) will release no operational debris.	Compliant; The GHOSt satellites will not release any operational debris.[19]

[14] *See* 47 C.F.R. § 25.122. OSK is aware that the Commission recently added criteria for orbital debris mitigation. *See Mitigation of Orbital Debris in the New Space Age*, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 4156 (2020) (Appendix A); *Applications for Streamlined Small Space Station Authorization*, Amendment, 85 FR 52452 (rel. Aug. 25, 2020). Although this amendment is not yet effective, OSK certifies that the GHOSt constellation complies with the new requirements, including those outlined in certifications 13 and 14 of this section.

[15] *See* Schedule S; ODAR at 2-4.

[16] The Schedule S form only permits entry of whole numbers for duration of orbital lifetime. Therefore, following standard rounding practices, OSK has entered a value of "5" even though expected time in orbit will be 5.2 years. *See* Schedule S; *see also* ODAR at 2, 9-10.

[17] *Id*. at 2.

[18] *Id*. at 9.

[19] *Id*. at 5.

47 C.F.R. § 25.122 Criteria	GHOSt Compliance
(6) The space station operator has assessed and limited the probability of accidental explosions, including those resulting from the conversion of energy sources on board the space station(s) into energy that fragments the spacecraft.	Compliant; The probability of accidental explosions is less than 0.001.[20]
(7) The probability of a collision between each space station and any other large object (10 centimeters or larger) during the orbital lifetime of the space station is 0.001 or less as calculated using current National Aeronautics and Space Administration (NASA) software or other higher fidelity model.	Compliant; The probability of collision between each satellite and other large objects is 0.0000096.[21]
(8) The space station(s) will be disposed of post- mission through atmospheric re-entry. The probability of human casualty from portions of the spacecraft surviving re-entry and reaching the surface of the Earth is zero as calculated using current NASA software or higher fidelity models.	Compliant; Each GHOSt satellite will be disposed of through atmospheric re-entry. The human casualty risk is zero.[22]
(9) Operation of the space station(s) will be compatible with existing operations in the authorized frequency band(s). Operations will not materially constrain future space station entrants from using the authorized frequency band(s).	Compliant; Operations will be compatible with existing and future operators in the authorized frequency bands.[23]
(10) The space station(s) can be commanded by command originating from the ground to immediately cease transmissions and the licensee will have the capability to eliminate harmful interference when required under the terms of the license or other applicable regulations.	Compliant; GHOSt can be commanded to immediately cease transmissions and to eliminate harmful interference.[24]

[20] *Id*. at 5-8

[21] *Id*. at 8-9.

[22] *Id*. at 9-10.

[23] *See* § IV *infra*; *See also* Technical Annex, § A.7.

[24] *Id*., § A.9.

47 C.F.R. § 25.122 Criteria	GHOSt Compliance
(11) Each space station is 10 cm or larger in its smallest dimension.	Compliant; The smallest dimension on each GHOSt satellite is 57.8 cm.[25]
(12) Each space station will have a mass of 180 kg or less, including any propellant.	Compliant; Each GHOSt satellite will weigh 91.4 kg.[26]
(13) The probability that any individual space station will become a source of debris by collision with small debris or meteoroids that would cause loss of control and prevent disposal is 0.01 (1 in 100) or less.	Compliant; There is effectively no risk that any GHOSt satellite will become a source of debris by collision with small debris that would cause loss of control and prevent disposal.[27]
(14) Upon receipt of a space situational awareness conjunction warning, the licensee or operator will review and take all possible steps to assess the collision risk, and will mitigate the collision risk if necessary. As appropriate, steps to assess and mitigate the collision risk should include, but are not limited to: contacting the operator of any active spacecraft involved in such a warning; sharing ephemeris data and other appropriate operational information with any such operator; and modifying space station altitude and/or operations.	Compliant; OSK will review conjunction warnings, coordinate physical operations of the GHOSt spacecraft with any operator using similar orbits, and, if necessary, mitigate collision risks to minimize operational impacts.[28]

The Commission has categorically exempted systems operating under the streamlined small satellite applicants from the Part 25 processing round and default service requirements.[29] In lieu of the processing round rules, the Commission requires applicants to "(a) certify that operations of its satellites will not interfere with those of existing operators, [and] (b) certify that it will not materially constrain future operators from using the assigned frequency band(s)."[30]

[25] ODAR at 2.

[26] *Id*. at 3.

[27] *Id*. at 9.

[28] *Id*. at 8-9.

[29] *Streamlined Licensing Order*, ¶ 80.

[30] *Id.*, ¶ 81.

OSK herein certifies that the operations of its GHOSt constellation will not interfere with those of existing operators and that it will not materially constrain future operators from using the requested frequency bands.[31]

IV. SPECTRUM USE AND SHARING CAPABILITIES

The GHOSt constellation will operate in a manner that will not materially constrain co-frequency operators and will allow for spectrum sharing across all requested frequency bands because: (1) OSK has initiated coordination discussions with Federal operators in the requested spectrum bands and will operate in accordance with any applicable coordination conditions; (2) the GHOSt satellites only transmit/receive while visible to the relevant earth stations, reducing the likelihood of interference to other systems and allowing for interference mitigation through coordination; (3) the GHOSt constellation uses earth stations located at very high latitudes (*e.g.*, Svalbard, Norway at 78°N), thus limiting the number of potential victim earth stations; (4) GHOSt transmissions have a small and directed beamwidth of only 7.4° for payload downlink transmissions; and (5) the power flux-density of all transmissions comply with the limits set by both the Commission and the International Telecommunication Union ("ITU"), further reducing the possibility of interference.[32] Accordingly, GHOSt operations will avoid harmful interference and not materially constrain current and future co-frequency spectrum users.

A. Ka-Band Payload Downlink

OSK seeks authorization to utilize the 25.5-27.0 GHz band for payload downlink operations under the co-primary EESS (space-to-Earth) allocation.[33] Like other EESS systems

[31] OSK's certification is not applicable to the requested L-band frequencies, which are used pursuant to commercial arrangements with Globalstar.

[32] *Streamlined Licensing Order*, ¶ 81; *See also* Schedule S.

[33] *See* 47 C.F.R. § 2.106 n.US258.

licensed pursuant to the Commission's streamlined rules,[34] the hyperspectral sensor carried by each GHOSt satellite will observe and record data relating to the characteristics of the Earth and its natural phenomena, and downlink such data to earth stations that are part of the satellite network.[35] All data transmitted in the requested band will be limited to payload sensor data or metadata directly pertaining to the operation of the payload.

As detailed more fully in the Technical Annex, the high gain Ka-band antennas employed by the GHOSt satellites will use six band channels, allowing for six wideband emissions to share three frequency channels using polarization diversity, thereby enabling the GHOSt satellites to utilize the requested spectrum at its highest efficiency.[36]

OSK will be able to facilitate sharing with existing and future operations in the 25.5-27.0 GHz band for the reasons identified above. Moreover, as few satellite operators utilize the band for EESS, the opportunity for harmful interference is limited and can be adequately mitigated, as needed, through the coordination process.

B. S-Band Adaptive Coding and Modulation and TT&C Uplink

OSK seeks authorization to utilize the 2025-2110 MHz band for telemetry, tracking, and command ("TT&C"), as well as modulation and coding of the high speed data ("HSD") link for payload transmissions. Specifically, OSK plans to use the 2045.0-2050.0 MHz band for the HSD

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[34] *See, e.g.*, *Application of Capella Space Corp. for Authority to Launch and Operate a Non-Geostationary Orbit Satellite System in the Earth Exploration Satellite Service*, Stamp Grant, File No. SAT-LOA-20210119-00012 (Granted May 4, 2021).

[35] *See* 47 C.F.R. § 2.1 ("Earth Exploration-Satellite Service. A radiocommunication service between earth stations and one or more space stations, which may include links between space stations, in which: (1) Information relating to the characteristics of the Earth and its natural phenomena, including data relating to the state of the environment, is obtained from active sensors or passive sensors on Earth satellites…").

[36] In all cases, the power flux-density of these transmissions comply with the limits set by both the Commission and the ITU. *See* Technical Annex, § A.2.b; *see also* 47 C.F.R. § 25.208(p).

control uplink. This technique adjusts the satellite's modulation and coding to optimize payload downlink conditions, ensure proper link performance and efficiency, and advise the spacecraft to retransmit any lost data frames. A second link, operating within the 2054.85-2055.15 MHz band, will provide the traditional TT&C uplink operations for the GHOSt satellites.[37]

Non-Federal Earth-to-space transmissions in the 2025-2110 MHz band may be authorized in the EESS services subject to such conditions as may be applied on a case-by-case basis. Uplink transmissions shall not cause harmful interference to authorized Federal and non-Federal operations operating in accordance with the Table of Frequency Allocations.[38] OSK has already initiated coordination with Federal operators in this band to ensure that OSK uplinks do not interfere with critical systems of these agencies,[39] and will coordinate with additional co-frequency operators, as necessary, to ensure spectrum sharing consistent with the Commission's rules.[40]

C. UHF TT&C Downlink

The GHOSt constellation will use the 400.15-401.0 MHz band for TT&C downlink telemetry operations consistent with the secondary allocation for the Space Operation service

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[37] Out of an abundance of caution, and to the extent necessary, OSK requests a waiver of 47 C.F.R. § 25.202(g)(1) to permit TT&C operations not at band edge. Good cause for waiver exists here as OSK's uplink operations are purely limited to TT&C and control operations. No service bands are requested for uplink operations from which a band edge may be derived.

[38] 47 C.F.R. § 2.106 n. US 347. The Commission has recently granted multiple streamlined applications proposing TT&C uplink operations within this band. *See, e.g*, *Application of Capella Space Corp. for Authority to Launch and Operate a Non-Geostationary Satellite Orbit System in the Earth-Exploration Satellite Service*, Stamp Grant, File No. SAT-LOA-20200914-00108 (Dec. 17, 2020); *see also Amendment Application of Loft Orbital for Authority to Launch and Operate a Non-Geostationary Satellite Orbit System in the Earth-Exploration Satellite Service*, Stamp Grant, File No. SAT-AMD-20200527-00063 (Granted Oct. 8, 2020) ("Loft Orbital Grant").

[39] For example, OSK has already initiated coordination discussions with representatives from NASA regarding the planned operations of the GHOSt constellation within this spectrum band. *See* n.12 *supra*.

[40] *See* Technical Annex, § A.7.

(space-to-Earth) and other smallsat operators authorized to operate in this band.[41] OSK will comply with all technical requirements and complete any necessary coordination with Federal operators to ensure spectrum sharing is successful.

D. L-Band Intersatellite Links

OSK plans to use a space-to-space link between its GHOSt satellites and the existing commercial Globalstar NGSO constellation. The GHOSt satellites will transmit to Globalstar satellites, pursuant to an agreement with Globalstar, but will not have the capability to receive communications from the Globalstar satellites. These transmissions are approved and supported by Globalstar and fall within Globalstar's currently licensed spectrum. Globalstar will be responsible for obtaining its own authorizations, as necessary.

V. WAIVER REQUESTS

The Commission may waive any of its rules if there is "good cause" to do so.[42] In general, waiver is appropriate if (1) special circumstances warrant a deviation from the general rule; and (2) such deviation would better serve the public interest than would strict adherence to the rule.[43] Generally, the Commission will grant a waiver of its rules in a particular case if the relief requested would not undermine the policy objective of the rule in question and would otherwise serve the

[41] The Commission recently granted Astro Digital U.S., Inc.'s TT&C operations in the space-to-Earth direction within this same band. *See Amendment Application of Astro Digital US, Inc. for Authority to Launch and Operate a Non-Geostationary Satellite Orbit System in the Earth-Exploration Satellite Service*, Stamp Grant, File No. SAT-AMD-20200528-00064 (Granted In Part, Oct. 9, 2020).

[42] *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).

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

public interest.[44] OSK respectfully submits that good cause exists to waive the following Commission rules when granting the instant application.

A. U.S. Table of Frequency Allocations

1. 1615-1617.5 MHz (space-to-space) Inter-Satellite Service Links (Globalstar Frequencies)

OSK requests a waiver of the U.S. Table of Frequency Allocations to use specific Globalstar frequencies for space-to-space inter-satellite data relay service ("IDRS").[45] The GHOSt satellites will use a conventional (but, space-hardened) NSL Eyestar-S3 Simplex radio (FCC type-approved) as the IDRS modem. The IDRS modem will operate on Globalstar-authorized and assigned channels centered at 1616.25 MHz.[46] The 1615-1617. 5 MHz sub-band is allocated to Mobile Satellite Service (Earth-to-space) on a primary basis, and the Commission has previously authorized Globalstar to communicate with U.S.-licensed earth stations in this band.[47]

As discussed in more detail in the Technical Annex, use of these frequencies for IDRS will allow for spectrum sharing and will not cause harmful interference to other authorized operations. Given a top end emission of 1617.5 MHz, OSK's IDRS operations will not overlap with the lower portion of the shared Iridium-Globalstar spectrum band.[48] Moreover, the IDRS modem will only be used in limited, time-sensitive scenarios as part of OSK's service offerings to its customers.

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

[45] *See* 47 C.F.R. §§ 2.102(a), 2.106. The band is also authorized for Mobile Satellite Service (space-to-Earth) transmissions on a secondary basis.

[46] The Commission has recently granted waiver requests to operate an IDRS in similar spectrum bands using the Globalstar system. *See, e.g.*, Loft Orbital Grant at Condition 9.

[47] *See*, *e.g.*, *Policy Branch Information, Actions Taken*, Report No. SAT-01042, File No. SAT-MOD-20130314-00030 (Sept. 19, 2014) (Public Notice).

[48] OSK notes that Iridium's service links are in the 1617.775-1626.5 MHz part of the Big LEO band. OSK confirms that it will not operate in this part of the L-band.

OSK anticipates primarily using the IDRS modem to send alerts based on analytics from one or more of the GHOSt satellites. This capability serves the public interest by greatly increasing the responsiveness of the GHOSt system, improving safety, and potentially saving lives in emergency situations. For these reasons, OSK respectfully requests that the Commission grant a waiver of the U.S. Table of Frequency Allocations to permit the GHOSt constellation to communicate with Globalstar satellites.

VI. GRANT OF THE APPLICATION IS IN THE PUBLIC INTEREST

The grant of the instant application will serve the public interest by facilitating the near-term deployment of enhanced hyperspectral monitoring capabilities for commercial, scientific, and government applications. Upon deployment, the GHOSt constellation satellites will produce the highest resolution commercial hyperspectral imagery launched to-date. The market-leading sensing capabilities provided by OSK enable customers in the energy, extraction, infrastructure, agriculture, and forestry industries to make vital decisions with better information, thereby improving safety and potentially saving lives. The following are just some of the key industry sectors that will benefit from capabilities unlocked by the GHOSt constellation:

***National Defense*:** GHOSt's hyperspectral sensors can capture critical environmental and situational awareness information for use in national defense and crisis response efforts, including plume, camouflage, chemical weapon signatures, and target detection. In October 2020, the United States Department of the Air Force's commercial investment group, in conjunction with the Space and Missile Systems Center, and the Air Force Research Laboratory, contracted with OSK to accelerate the deployment of these services.[49] Upon deployment, OSK plans to integrate

[49] *See*, *e.g.*, Press Release, *Orbital Sidekick Awarded $16M U.S. Air Force STRATFI Contract*, ORBITAL SIDEKICK, INC. (Oct. 15, 2020), https://orbitalsidekick.com/orbital-sidekick-awarded-16m-u-s-air-force-stratfi-contract/.

GHOSt's monitoring services with the United States Air Force Advanced Battle Management System.

Infrastructure Monitoring. GHOSt's hyperspectral imaging can detect minute changes in physical infrastructure and report such changes in real-time, allowing operators to monitor the integrity of their mission-critical infrastructure more closely and maintain infrastructure more cost-effectively. GHOSt is particularly well suited for monitoring energy infrastructure, such as oil and gas pipelines, and for ensuring regulatory compliance, such as leak prevention and early leak detection.

***Environmental and Agricultural Monitoring*:** GHOSt will enable customers to collect and access vital data on environmental erosion and degradation, including the evapotranspiration levels for crops. These data sets provide OSK customers with early-warning detection of water, air, and land pollution, as well crop viability and yield.

Taken together, the GHOSt constellation will provide valuable new services for customers in the United States and around the world. Critically, the GHOSt constellation will provide these services while becoming neither a potential new source of orbital debris nor a source of harmful interference to co-frequency operators. For these reasons, OSK submits that grant of this application is in the public interest.

VII. OTHER MATTERS

A. NOAA Authorization

OSK was issued a license to operate a private remote sensing space system by NOAA's National Environmental Satellite, Data, and Information Service on September 3, 2021. The NOAA license permits OSK to operate the private remote sensing constellation of up to 6 hyperspectral imaging satellites, subject to the conditions and terms of the license. The NOAA license includes findings that OSK satisfies the requirements for compliance and monitoring, will

comply with the national security concerns of the United States, and will comply with all applicable international obligations and foreign policies.

B. ITU Compliance

OSK acknowledges that pursuant to Section 25.111 of the Commission's rules, the Commission will submit filings to the ITU on OSK's behalf and that OSK is responsible for any and all fees charged by the ITU for such filings.[50] OSK will provide the Commission with the appropriate electronic files for submission to the ITU under separate cover. OSK's ITU Cost Recovery Letter is attached to this application.[51]

[50] 47 C.F.R. § 25.111.

[51] Attachment D, ITU Cost Recovery Letter.

VIII. CONCLUSION

For the foregoing reasons, and for the reasons set forth in the accompanying materials, OSK respectfully requests the Commission determine that granting OSK operating authority for the GHOSt constellation proposed herein would serve the public interest, and issue such grant expeditiously.

Respectfully submitted,

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