

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

Application of Kuiper Systems LLC for)	File No. SAT-LOA- _____
Authority to Launch and Operate a)	
Non-Geostationary Satellite Orbit System)	Call Sign _____
in V-band and Ku-band Frequencies)	

**APPLICATION FOR AUTHORITY TO LAUNCH AND OPERATE A
NON-GEOSTATIONARY SATELLITE ORBIT SYSTEM
IN V-BAND AND KU-BAND FREQUENCIES**

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EXECUTIVE SUMMARY

Kuiper Systems LLC (“Kuiper”), a wholly owned subsidiary of Amazon.com Services LLC (collectively, “Amazon”) requests Federal Communications Commission (“FCC” or “Commission”) authority to launch and operate a non-geostationary satellite orbit (“NGSO”) fixed-satellite service (“FSS”) system as a part of Kuiper’s second-generation constellation. Utilizing V- and Ku-band frequencies, the “Kuiper-V System” will be comprised of 7,774 satellites in five altitude and inclination combinations between 590 and 650 km, including two polar shells, and will provide high-speed, low-cost, and low-latency broadband services to tens of millions of customers domestically and internationally.

The Kuiper-V System will expand the capacity and range of Amazon’s already approved NGSO FSS system in the Ka-band (the “Kuiper-Ka System”) (collectively, the “Kuiper System”). Amazon’s Kuiper-V System includes (i) additional payloads and satellites that will increase the available capacity of the Kuiper System, thereby allowing Amazon to close the digital divide for even more customers; and (ii) two polar shells that augment the overall geographic reach of the Kuiper System – stretching beyond 56 degrees north and south latitude to provide full pole-to-pole coverage.

Amazon commends and supports the Commission’s consistent focus on accelerating broadband deployment and bridging the digital divide. The Commission’s 2021 Broadband Deployment Report recently indicated that more than 14.5 million Americans are still unable to receive fixed, residential broadband services that satisfy benchmark download and upload speeds of 25 Mbps and 3 Mbps, respectively. Among these, communities of color, low income populations, and Americans living in rural and Tribal areas constitute a disproportionate amount.

The State of Alaska has been described as lacking widely available connectivity despite substantial private and public investments into adapting broadband services for its rugged terrain.

Amazon is committed to ensuring that broadband services are accessible, reliable, and affordable on a global scale. Through the Kuiper System, Amazon will offer broadband communications services to consumers and businesses alike, including in rural and hard-to-reach areas of the United States. Moreover, Amazon's innovative constellation was designed to ensure that its services will be both high-quality and dependable. The Kuiper System will utilize both fixed and mobile customer terminals, equipping them with the flexibility not only to facilitate essential connectivity for schools, hospitals, libraries, and government operations, but also to support disaster relief, humanitarian aid, and other critical services by land, air, or sea.

Amazon's customer obsession and commitment to long-term initiatives make it uniquely well-positioned to help expand broadband access to tens of millions of global customers who do not currently have quality connectivity. Kuiper's leadership, engineers, and industry partners bring deep and diverse expertise to the development of state-of-the-art satellites, terrestrial gateways, and customer terminals. The Kuiper System utilizes advanced and innovative technologies to enable efficient spectrum use and sharing with other authorized operators whose frequencies overlap with the Kuiper System. And Amazon's existing infrastructure and experience in customer operations provide the required foundation for effectively deploying a dependable global satellite system.

Grant of this Application will allow Amazon to expand the capacity of its Kuiper-Ka System and create an even more robust Kuiper System, which will further close the digital divide. Accordingly, Amazon respectfully requests that the Commission grant its application to launch and operate the Kuiper-V System.

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**APPLICATION FOR AUTHORITY TO LAUNCH AND OPERATE A
NON-GEOSTATIONARY SATELLITE ORBIT SYSTEM
IN V-BAND AND KU-BAND FREQUENCIES**

Kuiper Systems LLC (“Kuiper”), a wholly owned subsidiary of Amazon.com Services LLC (collectively, “Amazon”), requests authority to launch and operate a non-geostationary satellite orbit (“NGSO system”) using V-band and Ku-band frequencies allocated for satellite services (the “Kuiper-V System”) as a part of Kuiper’s second-generation constellation.¹ The Kuiper-V System will deliver high-speed, low-latency broadband connectivity to domestic and international customers through 7,774 high-performance satellites operating at altitudes between 590 and 650 km; as well as terrestrial gateways; earth stations for telemetry, tracking, and control (“TT&C”); and a range of customer terminals. Grant of this application will facilitate the provision of affordable, reliable, and quality broadband services to tens of millions of customers, including unserved and underserved consumers and businesses.

Accordingly, Amazon respectfully requests grant of its application.

¹ In accordance with Section 25.157(c) of the Commission’s rules, Amazon’s request for V-band frequencies is an application filed by the cut-off date announced by the Commission for the current V-band processing round, and its request for Ku-band frequencies may be treated as a lead application for the purposes of initiating a processing round. *See* 47 C.F.R. § 25.157(c); *Cut-Off Established for Additional NGSO-Like Satellite Systems in the 37.5-40.0 GHz, 40.0-42.0 GHz, 47.2-50.2 GHz and 50.4-51.4 GHz Bands*, Public Notice, Report No. SPB-288, DA 21-941 (rel. Aug. 4, 2021).

I. COMPANY BACKGROUND

Amazon is guided by four principles: customer obsession rather than competitor focus, passion for invention, commitment to operational excellence, and long-term thinking. Amazon strives to be Earth's most customer-centric company, Earth's best employer, and Earth's safest place to work. Customer reviews, 1-Click shopping, personalized recommendations, Prime, Fulfillment by Amazon, AWS, Kindle Direct Publishing, Kindle, Career Choice, Fire tablets, Fire TV, Amazon Echo, Alexa, Just Walk Out Technology, Amazon Studios and The Climate Pledge are some of the things pioneered by Amazon.

Project Kuiper manifests Amazon's four principles. Amazon recognizes that the provision of broadband services for unserved and underserved communities is an important initiative, and, moreover, one that requires significant effort and resources. As demonstrated by Amazon's investments in state-of-the-art facilities, launch services, and recruiting hundreds of Kuiper scientists and engineers, Amazon is committed to making high-speed, low-latency broadband services not only globally accessible, but also affordable.² Once deployed, Kuiper's satellites will serve households, hospitals, businesses, government agencies, and other organizations around the world, including in geographic areas where reliable broadband remains lacking.

Amazon is well equipped to help bridge the digital divide. To begin with, the Kuiper team is comprised of over 750 dedicated employees—and growing—with expertise in fields such as modern satellite design, propulsion, antennas, orbital analysis, networking, and space safety. Kuiper's rapidly expanding team spans over seven offices coast-to-coast. Amazon is designing and testing the Kuiper System in an all-new, 219,000-square-foot facility in Redmond,

² See *Amazon receives FCC approval for Project Kuiper satellite constellation*, About Amazon (July 30, 2020), <https://www.aboutamazon.com/news/company-news/amazon-receives-fcc-approval-for-project-kuiper-satellite-constellation>.

Washington, which serves as the primary prototype and qualification facility, and it is adding another 22,000-square-foot facility to provide additional capacity.³ In addition, Kuiper draws upon Amazon’s engineering resources, broad in-house expertise in advanced technology development, substantial infrastructure, and global operational capabilities. In particular, Amazon’s experience in and dedication to ensuring consistent, stable, and trustworthy customer experiences is conducive to providing quality satellite broadband services to consumers.

In fact, Amazon has already taken concrete steps towards increasing international broadband access. As a part of its already authorized constellation of Ka-band satellites (the “Kuiper-Ka System”)⁴ (collectively with the Kuiper-V System, the “Kuiper System”), Amazon has designed an innovative phased-array antenna for its customer terminals at a substantially lower cost than traditional antennas,⁵ and will build upon this expertise to develop similar technology for use with V- and Ku-band spectrum as well. Earlier this year, Amazon secured nine United Launch Alliance Atlas V launch vehicles to support deployment of Kuiper System satellites.⁶ And, on November 1, 2021, Amazon requested a license to launch and operate two satellites at 590 km using Ka-band frequencies for testing and demonstration purposes.⁷ These satellites, which

³ See *AWS and Project Kuiper are driving innovation in Redmond, Washington*, About Amazon (June 29, 2021), <https://www.aboutamazon.com/news/job-creation-and-investment/aws-and-project-kuiper-are-driving-innovation-in-redmond-washington>.

⁴ See *Kuiper Systems LLC*, Order and Authorization, 35 FCC Rcd 8324 (2020) (“*Ka-band Kuiper System Authorization*”).

⁵ See *Amazon marks breakthrough in Project Kuiper development*, About Amazon (Dec. 16, 2020), <https://www.aboutamazon.com/news/innovation-at-amazon/amazon-marks-breakthrough-in-project-kuiper-development>.

⁶ See *Amazon Secures United Launch Alliance’s Proven Atlas V Rocket for Nine Project Kuiper Launches*, United Launch Alliance (Apr. 19, 2021), <https://www.ulalaunch.com/about/news/2021/04/19/amazon-secures-united-launch-alliance-s-proven-atlas-v-rocket-for-nine-project-kuiper-launches>.

⁷ See Request of Kuiper Systems LLC for Experimental Authorization, OET File No. 0956-EX-CN-2021 (filed Nov. 1, 2021).

Amazon plans to launch by 4th quarter 2022 on ABL Space Systems’ all-new RS1 rocket,⁸ will allow for the collection of important data used to validate Amazon’s hardware and software engineering, launch operations, and satellite mission management before full deployment of the Kuiper System.

II. DESCRIPTION OF THE KUIPER-V SYSTEM

As described in greater detail in the Technical Appendix, the Kuiper-V System is a supplement to, and augmentation of, the Kuiper-Ka System. The addition of V- and Ku-band payloads to the Kuiper System, as well as the addition of high-inclination orbits, will enable Amazon to increase its total available capacity and service availability throughout the United States, including all of Alaska. Consistent with the Kuiper-Ka System, the Kuiper-V System will utilize small spot beams and advanced interference avoidance techniques in order to support high spectrum efficiency, frequency reuse, and spectrum sharing capabilities as required by applicable Commission rules.

The Kuiper-V System will consist of 7,774 satellites operating at altitudes between 590 and 650 km, as shown in Table 1, below.

Table 1. Constellation Design Showing Altitudes and Inclinations

Altitude (km)	Inclination (deg)	Planes	Number of Satellites per Plane	Number of Satellites	Previously Licensed Payloads	Current Application Payloads
590	33	28	28	784	Ka-band	V-band
610	42	36	36	1,296	Ka-band	V-band
630	51.9	34	34	1,156	Ka-band	V-band
590	33	28	28	784	None	V-band Ku-band

⁸ See *Project Kuiper announces plans and launch provider for prototype satellites*, About Amazon (Nov. 1, 2021), <https://www.aboutamazon.com/news/innovation-at-amazon/project-kuiper-announces-plans-and-launch-provider-for-prototype-satellites>.

610	42	36	36	1,296	None	V-band Ku-band
630	51.9	34	34	1,156	None	V-band Ku-band
640	72	652	1	652	None	V-band Ku-band
650	80	325	2	650	None	V-band Ku-band
Total				7,774		

The first 3,236 satellites of the Kuiper-V System will supplement the Kuiper-Ka System with additional V-band payloads. The remaining satellites proposed will operate gateway and service beams in the V-band, as well as service beams in the Ku-band. In addition, all satellites will include V-band telemetry, tracking, and control (“TT&C”) links. Table 2, below, outlines the various frequencies used by the Kuiper-V System.

Table 2. Frequency Bands Used by the Kuiper-V System

Type of Link and Transmission Direction	Frequency Band	Frequency Ranges
Satellite to Gateway	V-band	37.5 – 42.0 GHz <i>42.0 – 42.5 GHz</i> <i>(non-U.S. only)</i>
Gateway to Satellite	V-band	47.2 – 50.2 GHz 50.4 – 51.4 GHz
Satellite to Customer Terminal	Ku-band and V-Band	10.7 – 12.7 GHz 37.5 – 42.0 GHz ⁹ <i>42.0 – 42.5 GHz</i> <i>(non-U.S. only)</i>
Customer Terminal to Satellite	Ku-band and V-Band	12.75 – 13.25 GHz ¹⁰ 14.0 – 14.5 GHz 47.2 – 50.2 GHz ¹¹

⁹ Per 47 C.F.R. § 25.202(a)(1)(ii), use of the 37.5 – 40 GHz band for Fixed-Satellite Service downlinks is limited to individually licensed earth stations, and earth stations licensed in this band must not be ubiquitously deployed and must not be used to serve individual consumers. The Kuiper-V System will comply with these conditions.

¹⁰ Per 47 C.F.R. § 2.106 NG57, use of the 12.75 – 13.25 GHz band for Fixed-Satellite Service is limited to individually licensed earth stations. The Kuiper-V System will comply with this condition.

¹¹ Per 47 C.F.R. § 25.136(d), use of the 47.2 – 48.2 GHz band is limited to individually licensed earth stations. The Kuiper-V System will comply with this condition.

		50.4 – 51.4 GHz ¹²
TT&C Downlink & Beacon	V-band	40.0 – 40.1 GHz
TT&C Uplink	V-band	47.2 – 47.3 GHz

The Kuiper-V System’s ground segment will consist of V-band and Ku-band customer terminals, V-band gateway earth stations, as well as a software-defined network and satellite control functionality, including satellite operations centers and TT&C earth stations. Customer terminals will be safe, reliable, and easy to install at customer locations. A variety of customer terminal models will be available with varying performance capabilities tailored to different customer segments (e.g., residential and enterprise customers). The Kuiper-V System will support earth station in motion (“ESIM”) terminals for specific mobility applications (e.g., aeronautical, maritime, and land-mobile), in compliance with applicable ESIM rules and other requirements adopted by the Commission. Gateway earth stations will be connected with high-speed fiber links to global Internet exchange points and point-of-presence sites to interchange traffic and reduce network hops and latency. Amazon will separately submit applications to the Commission requesting authority to operate gateway and TT&C earth stations and customer terminals in the United States.¹³

III. GRANT OF THIS APPLICATION WILL SERVE THE PUBLIC INTEREST

The Commission has long recognized that access to high-speed broadband services is a critical component of both the social and economic growth of the United States.¹⁴ And, in recent

¹² Per 47 C.F.R. § 25.136(e), use of the 50.4 – 51.4 GHz band is limited to individually licensed earth stations. The Kuiper-V System will comply with this condition.

¹³ See 47 C.F.R. § 25.115.

¹⁴ See, e.g., *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, 2020 Broadband Deployment Report, 35 FCC Rcd 8986, ¶ 1 (2020) (“For the past three years, the Commission’s top priority has been closing the digital divide, in recognition that high-speed broadband and the digital opportunity it brings can be essential to innovation, economic opportunity, healthcare, and civic engagement in today’s modern society.”); Jessica

years, reliable broadband connectivity has become “increasingly essential to innovation, economic opportunity, healthcare, and civic engagement in today’s modern society.”¹⁵ The COVID-19 pandemic has unfortunately put an even brighter spotlight on the essentiality of broadband access: as the Commission is well aware, broadband connectivity played—and continues to play—an integral part throughout the pandemic, including allowing businesses, schools, families, and entire communities to continue operating, learning, and maintaining contact with friends and families in the midst of unprecedented obstacles. Amazon commends and supports the Commission’s efforts to close the digital divide and, through the Commission’s V-band processing round, seeks to improve broadband connectivity for all Americans by supplementing and building upon its authority for the Kuiper-Ka System with the Kuiper-V System.

A. The Kuiper-V System Will Supplement Capacity of the Kuiper-Ka System

Grant of this Application will enable Amazon to create a robust Kuiper System with improved broadband coverage for unserved and underserved Americans. As described above and in the Technical Appendix, the Kuiper-V System will significantly expand the capacity of the Kuiper-Ka System, thereby providing low-cost and low-latency broadband services to more customers, and in more geographic regions, than it could using only its current authorization. Furthermore, the addition of V-band and Ku-band frequencies will enable more service to customers by increasing the bandwidth and capacity available.

Rosenworcel, Acting Chairwoman, FCC, Remarks to the World Summit on the Information Society Forum: Bridging Digital Divides (Mar. 22, 2021), *available at* <https://bit.ly/3uT9zox> (“No matter who you are or where you live you need access to modern communications to have a fair shot at 21st century success.”); *Acceleration of Broadband Deployment by Improving Wireless Facilities Siting Policies*, Report and Order, 29 FCC Rcd 12865, ¶ 7 (2014) (“[G]rowing demand reflects the importance of broadband to our nation’s economic growth, global competitiveness, and civic life.”).

¹⁵ See *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, Fourteenth Broadband Deployment Report, 36 FCC Rcd 836, ¶ 1 (2021) (“2021 Broadband Deployment Report”).

B. The Kuiper-V System Will Support Government and Emergency Services

Amazon already supports numerous government agencies through its Amazon Web Services (“AWS”) cloud infrastructure and plans to continue this support through operation of the Kuiper-Ka System.¹⁶ The Kuiper-V System will further augment Amazon’s support of government agencies, including for disaster relief efforts in remote locations. By utilizing both fixed customer terminals and mobile customer terminals, the Kuiper-V System will be equipped with flexibility to support public protection and humanitarian aid in a myriad of ways.

C. The Kuiper-V System Will Provide High-Quality Service to Unserved and Underserved Populations in the United States and Globally

As customers everywhere seek higher speeds and greater capacity to support a wide range of existing and emerging applications, demand for broadband connectivity continues to rise. Global peak Internet traffic grew at a compound annual rate of 30% from 2016-2020, with an observed 47% growth rate in peak traffic between 2019 and 2020.¹⁷ Amazon is committed to supporting its existing and future customers, including those who do not yet have reliable broadband access. This unfortunately remains a substantial portion of the world: although connectivity has improved on a global basis, only 51% of the global population, and 44% of the population of developing countries, are online.¹⁸

Despite the unyielding increase in Internet use and demand—and perhaps in part because of it—broadband access remains out of reach for too many Americans. As the Commission

¹⁶ See Kuiper Systems LLC Application for Authority to Launch and Operate a Non-Geostationary Satellite Orbit System in Ka-Band Frequencies, IBFS File No. SAT-LOA-20190704-00057, at 10 (filed July 4, 2019).

¹⁷ See TeleGeography, Global Internet Map 2021 (2021), <https://global-internet-map-2021.telegeography.com/>.

¹⁸ See International Telecommunication Union/UNESCO Broadband Commission for Sustainable Development, The State of Broadband 2021: People-Centred Approaches for Universal Broadband, 43 (2021), https://www.itu.int/dms_pub/itu-s/opb/pol/S-POL-BROADBAND.23-2021-PDF-E.pdf.

identified in its 2021 Broadband Deployment Report, 14.5 million Americans lack access to fixed, residential broadband with benchmark download and upload speeds of 25 Mbps and 3 Mbps, respectively;¹⁹ though some studies have indicated this number may in fact be substantially higher.²⁰ In rural areas, 17.3% of Americans lack access to high-speed services, compared to only 1.2% of Americans in urban areas.²¹ An even greater disparity exists in Tribal lands: 20.9% of those populations remain without access to broadband services.²² Alaska has long struggled with adequate broadband coverage as a result of its rugged and complicated terrain, and much of the state has been characterized by others as a connectivity “dead zone.”²³ Despite substantial and costly investment in submarine cables,²⁴ a 2019 report indicated that no school in Alaska had met the Commission’s broadband deployment benchmark.²⁵ Indeed, one Alaskan college reported paying \$9,500 per month for 10 megabits spread across 2,000 students.²⁶

¹⁹ *2021 Broadband Deployment Report* at ¶ 33, Fig. 1.

²⁰ See, e.g., John Kahan, *It’s Time for a New Approach for Mapping Broadband Data to Better Serve Americans*, Microsoft on the Issues (Apr. 8, 2019), <https://blogs.microsoft.com/on-the-issues/2019/04/08/its-time-for-a-new-approach-for-mapping-broadband-data-to-better-serve-americans/> (alleging that “162.8 million people are not using the internet at broadband speeds”); Linda Poon, *There Are Far More Americans Without Broadband Access than Previously Thought*, Bloomberg (Feb. 19, 2020), <https://www.bloomberg.com/news/articles/2020-02-19/where-the-u-s-underestimates-the-digital-divide> (referencing studies asserting that FCC broadband deployment reports vastly underestimate the number of Americans without broadband access).

²¹ See *2021 Broadband Deployment Report* at Fig. 1.

²² See *id.*

²³ See, e.g., Russell Brandom and William Joel, *This is a Map of America’s Broadband Problem*, The Verge (May 10, 2021), <https://www.theverge.com/22418074/broadband-gap-america-map-county-microsoft-data>.

²⁴ See, e.g., Austin Carr, *The Billion-Dollar High-Speed Internet Scam*, Bloomberg (Oct. 8, 2019), <https://www.bloomberg.com/news/features/2019-10-08/quintillion-ceo-s-promise-to-wire-the-arctic-was-1-billion-scam> (“*High-Speed Internet Scam*”).

²⁵ See The Denali Commission, *A Blueprint for Alaska’s Broadband Future*, 11 (Dec. 11, 2019), available at https://connectednation.org/wp-content/uploads/2020/03/CN_ALASKA_BB_PLAN_12-2019_07_FINAL-1.pdf.

²⁶ See *High-Speed Internet Scam*.

Clearly, the demand for broadband services has outpaced, and will continue to outpace, global and domestic broadband availability. In fact, even with the Commission’s dedicated work on connectivity in recent years, consumer needs for broadband services outstrip the potential capacity available by all NGSO systems proposed to date, including the Kuiper-Ka System. The Kuiper-V System will not only expand the available bandwidth to customers around the world, but it will also offer necessary polar coverage to regions such as Alaska, whose residents have lacked meaningful access to affordable broadband for too long. Authorizing Amazon to launch and operate the Kuiper-V System would be a considerable step towards increasing broadband service capacity and addressing the needs of American consumers who remain largely excluded from the digital economy.

D. The Kuiper-V System Will Help Move the Digital Economy Forward

While the need for high-quality broadband coverage is well-established, it has drastically intensified with the continued advancement of Internet of Things applications, as well as the recent increase of large-scale remote work and education requiring network support. Various diverse industries—including agriculture, medicine, finance, retail, and transportation—are consistently innovating and utilizing new and emerging technologies available over the Internet. Yet this innovation is stymied without sufficient and quality network capacity to support it.

By integrating Amazon’s experience across sectors and its progress with the Kuiper-Ka System, the Kuiper-V System is designed with the recognition that companies and organizations require networks with flexibility, security, and the ability to create high-quality customer experiences. The Kuiper-V System will leverage and expand Amazon’s robust and reliable global networking and cloud infrastructure, which has been carefully developed and continually refined for over a decade, including by providing backhaul services to terrestrial operators to extend the geographic reach of their next-generation wireless networks. In doing so, Amazon will support

consumers, government agencies and emergency services, as well as local, national, and international companies and economies with expanded access to broadband connectivity in even the most rural and hard-to-reach locations.

IV. GRANT OF REQUESTED WAIVERS WILL SERVE THE PUBLIC INTEREST

Amazon respectfully requests waiver of certain Commission rules in connection with the Commission's consideration of the Kuiper-V System application. These waiver requests address inharmonious administrative requirements and evolution of Commission policy. Several of these waiver requests are similar to those granted to other NGSO FSS licensees. In all cases, grant of the requested waivers would serve the public interest.

The Commission may waive any of its rules if there is "good cause" to do so.²⁷ Waiver is 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.²⁸ Generally, the Commission will 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.²⁹ The Commission may also consider potential hardship, equity, or policy implementation factors as part of its review.³⁰ Amazon respectfully submits that good cause exists to waive the following rules to the extent necessary to consider and grant the Kuiper-V System application.

²⁷ 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).

²⁸ *Northeast Cellular*, 897 F.2d at 1166.

²⁹ *WAIT Radio*, 418 F.2d at 1157.

³⁰ *Id.* at 1159.

A. Section 2.106, Table of Frequency Allocations

Amazon requests a waiver, to the extent necessary, of the U.S. Table of Frequency Allocations to use the 42.0-42.5 GHz band for gateway and customer terminal downlinks internationally.³¹ In the United States, this band is allocated to fixed services and mobile services on a primary basis.³² Internationally, this band is authorized for FSS space-to-Earth transmissions in all three ITU regions and is also authorized for fixed, mobile, broadcast, and broadcast satellite transmissions.³³ Amazon intends to operate in this band only with earth stations located outside of the United States, which is consistent with international allocations. Amazon demonstrates in the attached Technical Appendix that its use of the spectrum will not cause interference to authorized services. Amazon's ability to downlink to non-U.S. earth stations in this spectrum will facilitate use of frequency diversity to address potential interference and coordination issues. For these reasons, granting Amazon's request to operate in this band outside of the United States would serve the public interest.

B. Section 25.114(c)(4)(v), Schedule S

Amazon requests, to the extent necessary, limited waiver of Section 25.114(c) of the FCC's rules, which requires submission of certain technical information using Schedule S.³⁴ Because the Kuiper-V System consists of 7,774 satellites, Amazon did not include the mean anomaly for every satellite in every plane of the orbital shells in the Schedule S form. Instead, only the first orbital plane of each of the orbital shells was provided in the form. The information for the complete set

³¹ This requested waiver is included out of an abundance of caution and may not be required because Amazon's proposed operations in this band are consistent with international allocations and only will be used to communicate with non-U.S. based earth stations. *See, e.g., Ka-band Kuiper System Authorization*, ¶ 12 (authorizing Amazon to use the 17.7-17.8 GHz band for NGSO FSS downlinks internationally).

³² *See* 47 C.F.R. § 2.106.

³³ *See id.*

³⁴ *See* 47 C.F.R. § 25.114(c).

of orbital planes, including mean anomaly for each satellite within each plane, is provided in a spreadsheet attached to the Schedule S form, as a more efficient way to provide this information.

Limited waiver of Section 25.114(c) is warranted as it would enable Amazon to submit its advanced and robust Kuiper-V System for approval without undermining the rule's intent that the Commission receive all information necessary to evaluate the application. Amazon provides all relevant information in this Legal Narrative, Technical Appendix, and, to the extent possible, Schedule S. The FCC has granted similar waivers to other NGSO system applicants that were unable to accurately describe their system architectures in Schedule S.³⁵ Accordingly, grant of limited waiver is appropriate, consistent with FCC precedent, and would serve the public interest.

V. COMPLIANCE WITH FCC RULES

A. U.S. Table of Frequency Allocations Footnote Conditions

Amazon will comply with the U.S. Table of Frequency Allocations, codified in Section 2.106 of the Commission's rules, and all corresponding footnotes.³⁶

B. ITU Cost Recovery

Amazon will comply with Section 25.111(d) of the Commission's rules,³⁷ which obligates Commission applicants to be responsible for any and all fees charged by the ITU.³⁸ Amazon accepts responsibility for ITU cost recovery fees associated with ITU filings for the Kuiper-V System.

³⁵ See, e.g., *O3b Limited*, Order and Declaratory Ruling, 33 FCC Rcd 5508, ¶ 35 (2018); *Space Exploration Holdings, LLC*, Memorandum Opinion, Order, and Authorization, 33 FCC Rcd 3391, ¶ 36 (2018).

³⁶ See 47 C.F.R. § 2.106.

³⁷ 47 C.F.R. § 25.111(d).

³⁸ Pursuant to ITU Resolution 88 (Rev. Marrakech, 2002) and ITU Council Decision 482, as modified, the ITU assesses processing fees for satellite network filings.

C. Availability of Ephemeris Data

Amazon will comply with Section 25.146(e) of the Commission’s rules concerning the availability of ephemeris data to operators of authorized, in-orbit, co-frequency satellite systems.³⁹

D. Milestone and Bond Obligations

Amazon will comply with the satellite launch milestones applicable to authorized NGSO satellite systems and corresponding bond requirement codified in Sections 25.164(b) and 25.165 of the Commission’s rules.⁴⁰

VI. REQUEST FOR TREATMENT AS PERMIT-BUT-DISCLOSE

Amazon requests that the Commission treat this application as a “permit-but-disclose” for purposes of the agency’s *ex parte* rules.⁴¹ Allowing Amazon and other interested parties to engage in discussions with the Commission will best ensure that the public interest is served. Permit-but-disclose status in this case would also be consistent with consideration of earlier NGSO system applications.⁴²

³⁹ See 47 C.F.R. § 25.146(e).

⁴⁰ See 47 C.F.R. §§ 25.164(b), 25.165.

⁴¹ See *id.* § 1.1200(a) (“Where the public interest so requires in a particular proceeding, the Commission and its staff retain the discretion to modify the applicable *ex parte* rules by order, letter, or public notice.”).

⁴² See, e.g., *Satellite Policy Branch Information, OneWeb Petition Accepted for Filing, Cut-Off Established for Additional NGSO-Like Satellite Applications or Petitions for Operations in the 10.7-12.7 GHz, 14.0-14.5 GHz, 17.8-18.6 GHz, 18.8-19.3 GHz, 27.5-28.35 GHz, 28.35-29.1 GHz, and 29.5-30.0 GHz Bands*, Public Notice, 31 FCC Rcd 7666, 7667 (2016).

VII. CONCLUSION

Based on the foregoing, Amazon respectfully requests that the Commission grant its request for authority to launch and operate the Kuiper-V System.

Respectfully submitted,

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