Kuiper Systems LLC
Application for Experimental Radio Service
Special Temporary Authority
Narrative Statement

Pursuant to Sections 5.51, 5.54(a)(2), and 5.61 of the rules[1] of the Federal Communications Commission ("Commission"), Kuiper Systems LLC, a wholly owned subsidiary of Amazon.com Services LLC ("Amazon.com" or "Amazon"), hereby respectfully requests special temporary authority for an experimental license to operate in the 27.5-30.0 GHz and 18.8-20.2 GHz band for a period of 6 months to conduct airlink and antenna measurements. In support of its request, Amazon provides the following additional information required by Section 5.61:

(1) Name, address, phone number (also email address and facsimile number, if available) of the applicant.

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(2) Explanation of why an STA is needed.

Amazon seeks special temporary authority to operate five experimental transmitters to transmit test signals to an earth station for the purpose of measuring earth station antennas and their receiver system performance. Amazon also seeks special temporary authority to radiate carrier signals from five different antennas to measure their characteristics to: a) verify compliance with 47 C.F.R. Part 25 and b) qualify their link performance specifications. These measurements form part of Amazon's program to develop high-speed, innovative, satellite-delivered services to unserved and underserved customers worldwide. Accordingly, grant of the requested experimental authority would serve the public interest, convenience, and necessity.

Amazon seeks to commence testing as soon as possible, by October 15, 2023.

(3) Description of the operation to be conducted and its purpose.

Amazon proposes to transmit from two different locations, one at a time, from indoor stations T1 or T2, corresponding respectively to one transmitter system with three fixed antennas and another transmitter system with two fixed antennas. The experiment with station T1 occurs at one of two indoor locations in the direction of indoor receiving station R1. The experiment with station T2 occurs at one of the same two indoor locations in the direction of indoor receiving station R2. T1

[1] 47 C.F.R. §§ 5.51, 5.54(a)(2), 5.61.

and T2 will transmit one at a time in the frequency ranges 27.5-30.0 GHz and 18.8-20.2 GHz. Only one antenna of the active transmitting system, T1 or T2, will transmit at a time. The experiment will take place in Redmond, Washington at the coordinates shown in Table 1.

Indoor transmitters T1 and T2 have highly directional antennas located 3.5 m above ground level and 20 m away from the indoor receivers R1 and R2, which are both less than 6 m above ground level. Both transmitters and their associated antennas will transmit identical test signals, but at different power levels as described in Table 3. Each transmitter will be operated most of the time at its lowest EIRP, except for a few test cases, where for brief moments a higher EIRP test is required.

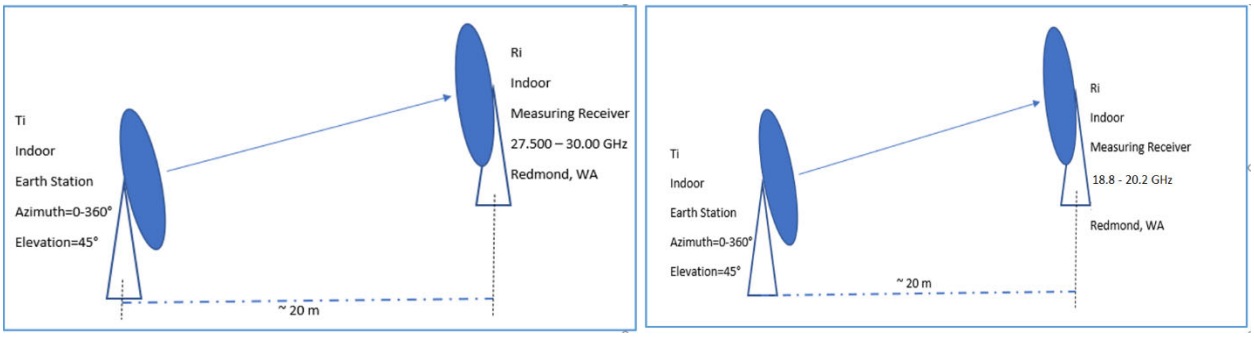

Figure 1. Experiment layout in 27.5-30.0 GHz and 18.8-20.2 GHz (i=1 or i=2)

Table 1. Experimental transmitter and receiver locations

Station	Station Class	County and State	Location	Height above ground and sea levels	Indoor
T1	Fixed	King, Washington	47° 40' 23.1636" North 122° 05' 43.7428" West	AGL: 3.5 m AMSL: 28 m	Yes
			47° 40' 21.9064" North 122° 05' 40.3726" West	AGL: 3.5 m AMSL: 17 m	
T2	Fixed	King, Washington	47° 40' 23.1636" North 122° 05' 43.7428" West	AGL: 3.5 m AMSL: 28 m	Yes
			47° 40' 21.9064" North 122° 05' 40.3726" West	AGL: 3.5 m AMSL: 17 m	
R1	Fixed	King, Washington	20 m from T1 at any azimuth	AGL: 6 m AMSL: 28 m	Yes
				AGL: 6 m AMSL: 17 m	
R2	Fixed	King, Washington	20 m from T2 at any azimuth	AGL: 6 m AMSL: 28 m	Yes
				AGL: 6 m AMSL: 17 m	

Amazon recognizes that experimental operations must not cause harmful interference to authorized facilities, and, prior to commencing operations, Amazon will search for licensed radio stations for which coordination may be needed. Amazon will ensure that its operations do not interfere with authorized operations throughout the period of operations.

(4) Time and dates of proposed operation.

Amazon requests special temporary authority for a 180-day period and seeks to commence testing on October 15, 2023. During that period, the transmitters will be active for measurement periods during normal working hours but will not be continuously transmitting.

(5) Equipment to be used, manufacturer, model number and pointing directions.

Table 2. Experimental equipment and antenna characteristics

Station	Manufacturer	Model number	Gain and 3dB Beamwidth V/H	Pointing direction	# units
T1	Amazon	SGT TX ANT	G= 34.8 dBi 45°/45°	In 20 m radius, any azimuth, elevation: 0 - 90° ± 1°	3
T2	Amazon	TTC TX ANT	G= 10 dBi 45°/45°	In 20 m radius, any azimuth, elevation: 0 - 90° ± 1°	2
R1	Amazon	SGT RX ANT	G= 34.8 dBi 45°/45°	In 20 m radius, any azimuth, elevation: -90 - 0° ± 1°	3
R2	Amazon	TTC RX ANT	G= 10 dBi 45°/45°	In 20 m radius, any azimuth, elevation: -90 - 0° ± 1°	2

(6) Frequency band, emission designator and EIRP.

The modulation for transmissions other than the continuous wave (CW) is OFDM.

Table 3. Experimental frequencies, emissions and EIRP characteristics

Frequency Band (GHz)	Frequency tolerance	Transmitter	Emission Designators	EIRP	
				Min/max (W)	Min/max (dBW)
27.5-30.0	± 2 ppm	T1	900MD7D	0.001/7943.3	-30/39
			N0N		
		T2	5M00D7D	0.001/501187.2	-30/57
			N0N		
18.8-20.2	± 2 ppm	T1	900MD7D	0.001/7943.3	-30/39
			N0N		
		T2	5M00D7D	0.001/501187.2	-30/57
			N0N		

(7) Radiofrequency ("RF") exposure compliance

The Commission's rules for RF exposure "reflect the best available information concerning safe levels of RF exposure for workers and members of the general public" and "specify methods that RF equipment operators can use to mitigate the risk of excess exposure."[2] Amazon will comply with these RF exposure guidelines with respect to all antennas operated during testing. Both sites are operated by a teleport operator that restricts access to the public, however Amazon will comply with the uncontrolled (general population) environments, as specified by Section 1.1310 of the Commission's rules. All personnel operating and maintaining the equipment will be trained on proper handling of the equipment to mitigate radiofrequency exposure. Furthermore, during testing, all transmissions will be actively controlled by Amazon personnel, who will be able to cease transmissions at any time.

[2] *Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields*, 34 FCC Rcd 11687, paras. 2-3 (2019).