Lynk Towers 3 & 4

NARRATIVE STATEMENT

Lynk Global, INC.
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EXPERIMENTAL LICENSE APPLICATION
NARRATIVE STATEMENT

(1) Applicant Information.

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[redacted]

(2) Description of why experimental authorization is needed.

Lynk Global, Inc. ("Lynk") seeks experimental authority to access and test the performance of ground equipment with Lynk's satellites *Lynk Tower 3* and *Lynk Tower 4* to be launched in July 2022. Lynk is developing a cellular-based smallsat communications network that will provide global GSM and LTE cellular services using Low Earth Orbit ("LEO") satellites. There is the need to perform testing on satellite equipment to gather important information regarding the performance of links and capabilities of the network/system control.

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

This application seeks authorization to perform a series of very short tests via a free-flying payload in various locations throughout the United States and around the world. A typical pass over a test site will only last about 2 minutes and approximately twice per day. All operations will be conducted on a non-interference basis and will be identical to those authorized under File Number 0656-EX-CN-2021 (*Lynk Tower 1*) and currently pending authorization under File Number 1117-EX-CN-2021 (*Lynk Tower 2*).[1]

[1] *Lynk Tower 3* and *Lynk Tower 4* are identical to the authorized *Lynk Tower 1* satellite under File Number 0656-EX-CN-2021 and the currently pending authorization *Lynk Tower 2* satellite under File Number 1117-EX-CN-2021, including the additional Ka-band transmitting and receiving equipment on board the satellites. However, Lynk is not

(4) Timing of proposed operation.
Lynk requests authorization for 24 months starting July 1, 2022.

(5) Class(es) of station (fixed, mobile, fixed & mobile) and call sign of station (if applicable).
The earth stations will operate in a fixed and mobile mode, and the space station will operate in non-geostationary orbit at 550 km.

(6) Description of the location(s) and, if applicable, geographical coordinates of the proposed operation.

Location	Latitude	Longitude	Proposed Operation
United States and its Territories	N/A	N/A	824.2-848.8 MHz 869.2-893.8 MHz
[redacted] Ireland	[redacted]	[redacted]	2260 MHz / 2080 MHz
[redacted] Italy	[redacted]	[redacted]	
[redacted] New Zealand	[redacted]	[redacted]	
[redacted] UK	[redacted]	[redacted]	
[redacted] Sri Lanka	[redacted]	[redacted]	
[redacted] Iceland	[redacted]	[redacted]	

currently seeking authorization to utilize the Ka-band equipment. Lynk will not operate the Ka-band equipment until it is ready to test Ka-band capabilities with ground stations, and Lynk will seek the necessary authorizations from the Commission at that time. This is consistent with Commission precedent to authorize a satellite operator to launch a satellite with a payload that it will not be operating. *See* Application for Authority to Launch and Operate Galaxy 14R, IBFS File Nos. SAT-LOA-20170524-00079 and SAT-AMD-20180410-00026, n. 4 (stamp grant Nov. 14, 2018); *Iridium Constellation LLC, Application for Modification of License to Authorize a Second-Generation NGSO MSS Constellation*, Order and Authorization, 31 FCC Rcd 8675, ¶ 5 (Aug. 1, 2016) ("Like Iridium's first-generation satellites, the new satellites will be capable of operating in the entire 1616-1626.5 MHz band; however, Iridium here requests no change from the operating frequencies specified for its first-generation satellites."); Application for Authority to Launch and Operate Intelsat 32e, a Replacement Satellite, at 43.1° W.L., File Nos. SAT-RPL-20140221-00026 and SAT-AMD 20150806-00054, Legal Narrative at 1 n.2 (filed Feb. 21, 2014) (explaining that the Intelsat 32e satellite contained a Ka-band payload for which Intelsat was not seeking authorization); Application for Authority to Launch and Operate Intelsat 32e, a Replacement Satellite, at 43.1° W.L., File Nos. SAT-RPL-20140221-00026 and SAT-AMD-20150806-00054 (stamp grant May 11, 2016).

Lynk Tower 3 and *Lynk Tower 4* will not contain the duplex modem to communicate with the Globalstar constellation as found on *Lynk Tower 1* and *Lynk Tower 2*. Accordingly, this application only seeks authorization to operate the simplex modem with the Globalstar constellation.

Lynk incorporates by reference the supporting documents filed in conjunction with Lynk's previously granted experimental application under File Number 0088-EX-CN-2021—i.e., the Interference Mitigation and Detailed Description of Testing & Operations. These supporting documents provide additional technical information for review of the immediate application for *Lynk Tower 3* and *Lynk Tower 4*, which were also incorporated by reference in the *Lynk Tower 1* application under File Number 0656-EX-CN-2021 and the *Lynk Tower 2* application under File Number 1117-EX-CN-2021.

(7) Transmit equipment to be used.

# of Units	Equipment	Manufacturer	Model
2+	Off-the-shelf Cellular Devices (ground)	Various	Various
1	Cellular Power Amp (space station)	Lynk	Custom
1	Cellular Antenna (space station)	Lynk	Custom
1	Simplex Modem (space station)	Globalstar	EyeStar-S3
1	SRS Transceiver (space station)	SatLab	SRS-3
1	S-band Patch Antenna (space station)	Lynk	Custom
1	S-band TT&C Transceiver (space station)	Lynk	Custom

(8) Frequencies.

Operations		Uplink	Downlink
Cellular Testing		824.2 - 848.8 MHz	869.2 - 893.8 MHz
TT&C	S-band	2079.6625 - 2080.3375 MHz	2259.6625 - 2260.3375 MHz
	Globalstar (simplex)	1615.00 - 1617.50 MHz	N/A

(9) Maximum effective radiated power (ERP) or equivalent isotropically radiated power (EIRP).
See below, Question (13).

(10) Emission designator.
See below, Question (13).

(11) Overall height of antenna structure above the ground.
Ground stations are less than six meters above ground; not applicable to space station.

(12) Orbital Debris Mitigation.
The *Lynk Tower 3* and *Lynk Tower 4* satellites are designed to eliminate the potential, to the extent possible, of creating orbital debris, and they contain no deployables.[2]

[2] Lynk incorporates by reference the supporting ODAR filed in conjunction with Lynk's previously granted experimental application under File Number 0656-EX-CN-2021. The referenced ODAR includes the Ka-band equipment addressed in the previous footnote.

(13) Supplemental Technical Information.

Cellular Testing			
Parameters		**GSM protocol**	**LTE protocol**
Lynk Uplink (Earth-to-space) Transmitter			
Frequencies		824.2 - 848.8 MHz	
Transmit/Receive Bandwidth		200 kHz	180 kHz
Emission Designator		200KG7W	180KG7W
Antenna Height		~1.5 m	~1.5 m
[redacted]			
Output Power		2 W	0.2 W
Module with antenna	[redacted]		
	ERP	39.85 dBm 9.66 W	29.85 dBm 0.97 W
Standard mobile phone or module	[redacted]		
	ERP	29.85 dBm 0.97 W	19.85 dBm 0.1 W
Frequency Tolerance		0.00001%	
Modulating Signal		Digital on/off quantized	
Lynk Downlink (space-to-Earth) Transmitter			
Frequencies		869.2 - 893.8 MHz	
Altitude		525 km	
Eccentricity		Circular	
Inclination		97°	
Antenna Type		Phased array antenna	
[redacted]			
Output Power		30 W	
[redacted]			
ERP [redacted]		62.62 dBm / 1828.1 W	
[redacted]			
Emission Designator		200KG7W	1M08G7W / 2M70G7W / 4M50G7W / 9M00G7W
Frequency Tolerance		0.00001%	
Modulating Signal		Digital on/off quantized	
[redacted]			

TT&C Operations				
Parameters	Space Station		Earth Station	
	Tx	Rx	Tx	Rx
S-band TT&C				
Frequencies*	2259.6625 - 2260.3375 MHz	2079.6625 - 2080.3375 MHz	2079.6625 - 2080.3375 MHz	2259.6625 - 2260.3375 MHz
[redacted]				
Output Power	0.904 W	-	10.7 W	-
[redacted]				
ERP at 2260 MHz	3.22 dBW 2.1 W	-	40.85 dBW 12171.7 W	-
Fixed / Mobile	Mobile		Fixed	
[redacted]				
Frequency Tolerance	0.00001%			
Emission Designator	563KG1D (SatLab) 675KG1D (Lynk)**			
Modulating Signal	Digital on/off quantized			
Globalstar TT&C (simplex)				
Frequencies	1615.00 - 1617.50 MHz	N/A ***		
ERP	0.19 W			
Output Power	0.0794 W			
Emission Designator	2M50G1D			
Modulating Signal	BPSK			
Frequency Tolerance	0.001%			

* A factory default is programmed into the SatLab SRS-3 that can result in a reset of frequencies, but Lynk has taken the precaution of reprogramming the reset to the operating, requested frequencies.

** The modulated signal occupies slightly more bandwidth with the Lynk QPSK signal by an additional 56 KHz on each side of the carrier center frequency.

*** Globalstar will seek experimental authorization for these operations.