SMALL SATELLITE LICENSE

TECHNICAL NARRATIVE STATEMENT

LYNK GLOBAL, INC.

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TECHNICAL NARRATIVE STATEMENT

Lynk Global, Inc. ("Lynk"), provides this attachment to detail information required under Part 25 of the Commission's rules that cannot be fully captured by the required Schedule S.

I. Lynk Smallsat System

The proposed Lynk Smallsat System will contain both a space and ground component. The space component will have ten (10) small satellites operating in the non-geostationary ("NGSO") mobile satellite service ("MSS"). The ground component will be made up of fixed earth stations at specific locations in-and-outside the United States to operate feeder links and Telemetry, Tracking, and Command ("TT&C"). Also comprising the ground component are the service links connecting off-the-shelf cellular devices with Lynk's satellites using UHF frequencies. The Lynk Smallsat System is a cellular-based satellite communications network that will provide global GSM and LTE cellular services by operating on most cellular frequencies used globally in the 617-960 MHz band. Lynk's system is designed to extend use of the terrestrial Mobile Network Operator ("MNO") spectrum to remote areas where MNOs cannot profitably provide coverage using typical cell tower technologies. Lynk's patented technology enables it to deploy 3GPP mobile communications fronthaul technologies that considers both geospatial and spectral orthogonality with respect to the MNO terrestrial networks in and around the frequency bands of interest. Lynk is not requesting authority to operate service links in any UHF frequencies in this application in the United States. Operations in the UHF frequencies will be limited to operations outside the United States and will be subject to agreements with administrations where Lynk seeks to operate service links.

A. The Orbital Launch Plan

The satellites making up the Lynk Smallsat System will be deployed in multiple orbital planes in low-Earth orbit ("LEO") via ridesharing opportunities offered by SpaceX. The current launch opportunities are sun-synchronous orbit ("SSO") and mid-inclination at a rate of one to two launches per month in one or more orbits. Thus, the current ridesharing opportunities offer a flexible launch manifest schedule, which enables Lynk to launch satellites as they are manufactured and become ready.

Considering the available launches are a mix of SSO and mid-inclination, the satellites making up the Lynk Smallsat System will all operate in one of two orbital segments, which are defined by unique orbital inclinations and altitudes. As a result, the launch manifest schedule for the Lynk Smallsat System will become more evident as satellites become ready for launch. However, the Schedule S does not provide flexibility for taking advantage of such ridesharing opportunities. For instance, a particular launch opportunity that Lynk may take advantage of may provide Lynk the ability to populate only a mid-inclination orbit, while another launch only SSO, or even another allowing the population of both SSO and mid-inclination. Hence, depending upon availability of satellite readiness and ridesharing availability, the Lynk Smallsat System may populate only mid-inclination, only SSO, or both. Nevertheless, Lynk provides a baseline launch schedule that maps scheduled launches to specific orbits as illustrated in the following table:[1]

[1] To the extent that the number of satellites launched to a particular orbit changes from what is provided in the Schedule S, Lynk will notify the Commission prior to launch and update its technical demonstrations if necessary.

Planned Launch Schedule			
Launch Date	Number of Satellites	Inclination	Altitude
2021 December	1	97.6° (+/- 0.3°)	550 km (+/- 25 km)
2022 July	3	97.6° (+/- 0.3°)	550 km (+/- 25 km)
2022 December	6	53.0° (+/- 0.1°)	500 km (+/- 25 km)

Given this schedule, four satellites will operate in SSO, and six satellites will operate in a 53-degree mid-inclination orbit, which is a baseline configuration that offers a good mix of SSO and mid-inclination orbits. Both orbits are evaluated in the separately attached Orbital Debris Assessment Report ("ODAR"). As explained above, however, the launch manifest schedule is flexible and subject to change based on when Lynk's satellites are available and ready for launch. Hence, the Commission should be aware that the final orbital configuration of the Lynk Smallsat System may vary from what is provided in the Schedule S.

The following table contains the orbital parameters for both the SSO satellites and the mid-inclination satellites:

Orbital Parameters		
Parameter	SSO satellites	Mid-inclination satellites
Number of Satellites	4	6
Inertial Planes	2	1
Inclination	97.6° +/- 0.3°	53.0° +/- 0.1°
Orbital Period	5,738.6 +/- 31 seconds	5,676.6 +/- 31 seconds
Apogee	~ 550 km +/- 25 km	~ 500 km +/- 25 km
Perigee	~ 550 km +/- 25 km	~ 500 km +/- 25 km
Argument of Perigee	0.0°	0.0°
Active Service Arc	-82° to 82°	-53° to 53°

The four Lynk Smallsat System satellites in the SSO inclination orbit will operate at a circular altitude at approximately 550 km (+/- 25 km) above the Earth's surface. Thus, the inclination to the equator will be approximately 97.6 degrees (+/- 0.3 degrees). The SSO satellites will operate in multiple planes: one satellite will be deployed in one plane, and three satellites will be deployed in another plane. Under the planned launch schedule in the table above, the SSO satellites will be deployed to orbit via two separate launches—i.e., first a single satellite and then a batch of three. The remaining six satellites in the 53-degree (+/- 0.1 degrees) mid-inclination orbits will operate in a common orbital shell defined by a circular altitude of approximately 500 kilometers (+/- 25 km).

B. Spectrum Utilization, Channel Plan, and Coexistence

To operate the Lynk Smallsat System, which is designed in a manner that will not cause any harmful interference with other services, Lynk respectfully requests authorization for the following frequency bands in a full duplex fashion:

Lynk Smallsat System		Frequency Bands	Channel Bandwidths
Ka-Band Feeder and TT&C Links	Uplink	29.9 - 30.0 GHz	≤ 50 MHz
	Downlink	20.1 - 20.2 GHz	≤ 50 MHz
S-Band TT&C Link*	Uplink	2025 - 2110 MHz	≤ 1 MHz
	Downlink	2200 - 2290 MHz	≤ 1 MHz
Globalstar Space to Space Link (Simplex)	Uplink	N/A	N/A
	Downlink	1613.75 - 1616.25 MHz	2.5 MHz
Globalstar Space to Space Link (Duplex)	Uplink	2483.5 - 2500 MHz	1.23 MHz
	Downlink	1615.65 - 1616.88 MHz	1.23 MHz
Service Link**	Uplink	663 - 915 MHz	MNO dependent
	Downlink	617 - 960 MHz	MNO dependent

* Transmissions to and from international earth station sites only.
** The Lynk Smallsat System will only utilize ***service links outside of the United States*** and use of these service links will be limited solely to the frequencies, bandwidths, and technologies assigned and requested by present and future terrestrial MNO service partners.

The Lynk Smallsat System is designed to operate in a manner that will not cause any harmful interference with other protected services.

1. Ka-band Feeder and TT&C Links

Satellites in the Lynk Smallsat System will host a Ka-band modem with a directive antenna to create links with specific fixed earth stations around the world. These links are in the 20.1-20.2 GHz and 29.9-30.0 GHz bands and will serve as both feeder links and primary TT&C for the constellation. Importantly, the requested spectrum can easily be shared, and so Lynk will not materially constrain other operations in the requested bands.

Firstly, only a modest amount of the requested Ka-band spectrum is required for the Lynk Smallsat System. During any given communications session, up to fifty (50) MHz of channel bandwidth out of the requested one hundred (100) MHz may be used for uplink and downlink operations. The center frequency, bandwidth, and transmit power from the Ka-band transmitter on the satellite may vary depending on earth station location and current operations in the bands. Consequently, Lynk will have ample room to move operations and dynamically reconfigure its operations around the world in the requested Ka-bands to accommodate current and future operators in the bands.

Secondly, Lynk's operations in the 20.1-20.2 GHz and 29.9-30.0 GHz will be intermittent in nature. The small number of satellites making up the Lynk Smallsat System communicating with remotely located earth stations will result in periodic communication sessions. The Ka-band earth stations will be located, predominately, at high latitude locations. Each of these high latitude ground station sites may support no more than three (3) overpasses per satellite in the network per twenty-four (24) hours. The overpass duration should not exceed nine (9) minutes each. As a result, communications between Lynk's satellites and each of these ground station sites will be 270 minutes per day or 18.75% of the time. Hence, Lynk's use of these frequencies will not materially constrain current and future operators due to the limited time and remote locations of its operations.

Lastly, Lynk can coordinate its Ka-band operations in advance as well as dynamically in near real-time depending on the preference of the operators with whom Lynk is coordinating. For instance, the bandwidths, transmit powers, and center frequencies can be pre-decided during coordination with other operators at a given earth station location. Additionally, Lynk can make available a database that indicates the ephemeris of Lynk's constellation, the locations for ground stations in the network, as well as the future overpass schedule for each ground station site in the network.[2] Under existing experimental authorizations, Lynk is already in the practice of sharing this type of information with NASA to coordinate its use of S-band around the International Space Station. Based on location of the International Space Station relative to the ground station, the Commission set a threshold determined by NASA to indicate when Lynk could not utilize an overpass opportunity to avoid radiating radio frequencies up toward the ISS that might cause harmful interference. Therefore, because Lynk's operations enable a friendly sharing environment and Lynk maintains coordination flexibility with other operators, no current and future operators will be materially constrained in the requested Ka-band frequencies.

2. S-band TT&C Links

The satellites in the Lynk Smallsat System will host a S-band modem with a wide beam antenna to create links with remotely located fixed earth stations outside of the United States.[3]

[2] Overpass times can be computed from ephemeris data, and operations for each overpass opportunity can be enabled, disabled, or modified based on coordination—e.g., change start and end times, transmit power, transmit frequency, and transmit bandwidth.

[3] Lynk is also aware of the significant use of this band by U.S. government stakeholders in and around the CONUS and Pacific regions of the world. Lynk will limit its use of the S-band

These links will serve as the secondary TT&C links for the Lynk Smallsat System, in which use will be limited to when the satellite is not under sufficient control for utilization of the primary Ka-band TT&C system—e.g., a situation where a narrower Ka-band beam cannot be steered towards an earth station. Consequently, Lynk's S-band operations will be limited to during LEOPs, commissioning, and on-orbit anomaly resolution scenarios. Hence, the requested spectrum for these links can easily be shared not only for all the reasons outlined in the discussion of the Ka-band links above, but also because S-band utilization is reserved only for secondary TT&C.

The request herein seeks access to the entire 2025-2110 MHz and 2200-2290 MHz bands to provide flexibility in operations that will ensure no material constraint on current and future operators. The Lynk Smallsat System will utilize no more than an individual channel of one megahertz in bandwidth centered on a frequency within these S-band frequencies for its secondary TT&C links. Like its proposed operations in the Ka-band, Lynk can configure the S-band transceiver to accommodate various center frequencies, transmit powers, and bandwidths (but not to exceed those specified in this application). Given the congestion in the S-band, Lynk's request provides flexibility to coordinate limited use of a narrow S-band channel depending on earth station location—i.e., certain channels may be more ideal than others in specific locations around the world. Moreover, this request enables Lynk to move operations to any unused portions of the band to avoid an unlikely interference event. Furthermore, Lynk's S-band operations will be even more intermittent than in the Ka-band, which allows for

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channels to only international ground station locations, offering complete geospatial orthogonality to those government stakeholders.

even more sharing capability in the requested spectrum. The number of ground stations communicating in the S-band with the Lynk Smallsat System will be less than that in the Ka-band, equally remote, and more limited in time utilization. As an estimate, each of these ground station sites may support no more than one overpass per satellite in the network per seventy-two (72) hours. The overpass duration should not exceed nine (9) minutes each. As a result, communications between Lynk's satellites and each of these ground station sites will be at most nine (9) minutes every three (3) day or 0.21% of the time. Thus, Lynk's use of these frequencies will not materially constrain current and future operators.

3. TT&C Intersatellite Links with Globalstar Constellation

Outside reach of the remotely located earth stations operating in the S-band and Ka-band, Lynk's small satellites will have a transmit and receive capability for TT&C communications via space-to-space intersatellite service links ("ISL") with Globalstar's constellation and ground network pursuant to agreement with Globalstar. These ISLs will provide rapid and near real-time satellite TT&C.

The satellites of the Lynk Smallsat System will host two Globalstar transmitters: one for a simplex modem and the other for a duplex modem. The simplex modem will transmit on a 2.5 MHz wide channel between 1613.75-1616.25 MHz with no receive capability, and the duplex modem will transmit on a 1.23 MHz wide channel between 1615.65-1616.88 MHz and will receive on one of thirteen 1.23 MHz wide channels in the 2483.5-2500 MHz band. The following table outlines these operations.

ISLs	Direction	Frequency Band	Channel Bandwidth	Number of Channels
Simplex Modem	Uplink	N/A		
	Downlink	1613.75 - 1616.25 MHz	2.50 MHz	1
Duplex Modem	Uplink	2483.50 - 2500.00 MHz	1.23 MHz	13
	Downlink	1615.65 - 1616.88 MHz	1.23 MHz	1

The Globalstar modules are standard terrestrial terminals that are repurposed for use in orbit and can provide timely TT&C functionality to monitor and command the satellite while on orbit. The simplex modem is used to send near real time SMS based telemetry downlink to Lynk command and control. The duplex module allows for both telemetry file downlink and SMS based commanding of Lynk's satellites on the uplink. Globalstar will communicate with the Lynk's satellites using Globalstar's already approved ground station network and satellite constellation. The only change from Globalstar's currently licensed operations is that the Globalstar constellation will communicate with what would otherwise be terrestrial terminals hosted on Lynk's satellites—i.e., the Globalstar terminals on Lynk's satellites will operate in the same manner as if the terminals were located on the ground. Globalstar is already licensed for use of the frequencies requested herein.[4]

Lynk's operations in these bands will not materially constrain current and future operators. In fact, the planned operations are congruent with current and future operations with the only difference being, instead of Globalstar communicating with already approved antennas on the ground, Globalstar's constellation will be communicating with the same antennas located on Lynk's satellites. Moreover, Lynk's operations will not create interference

[4] Lynk understands that its ISL operations will be on a non-interference, non-protected basis. However, this is not an operational concern for Lynk or its customers since these links are intended for non-primary TT&C and will not move customer data.

concerns with the adjacent frequency band shared with Iridium. The top end of each modem's emissions bandwidth is sufficiently separated by 895 kHz of frequency from the bottom end of the shared Iridium-Globalstar spectrum band 1617.775-1618.725 MHz. In addition to the frequency separation, use of the Globalstar modems further ensures no harmful interference to Iridium because: (A) Globalstar uses closed-loop power control to manage PFD levels at its satellite receiver; (B) operations are limited to frequencies authorized to Globalstar; and (C) the modems safely meet the international standards governing out-of-band emissions. Indeed, the Commission has previously approved similar usage of Globalstar modems on NGSO satellites.[5]

4. UHF Service Links Outside the United States

The Lynk Smallsat System will operate service links outside of the United States in UHF cellular bands between 617-960 MHz in partnership with MNOs and under required regulatory approvals. This frequency range includes ten unique LTE and GSM duplex bands with uplink and downlink portions, on which channel blocks of variable bandwidths can be deployed.

UHF Bands	Lynk Smallsat System	UHFs / Lynk Channels	UHF Bandwidths	Lynk Channel Bandwidths
Band 71	Uplink	663 – 698 MHz	35.0 MHz	≤ 20 MHz
	Downlink	617 – 652 MHz		
Band 85	Uplink	698 – 716 MHz	18.0 MHz	≤ 15 MHz
	Downlink	728 – 746 MHz		
Band 68	Uplink	698 – 728 MHz	30.0 MHz	≤ 20 MHz
	Downlink	753 – 783 MHz		
Band 28	Uplink	703 – 748 MHz	45.0 MHz	≤ 20 MHz
	Downlink	758 – 803 MHz		
Band 13	Uplink	777 – 787 MHz	10.0 MHz	≤ 10 MHz
	Downlink	746 – 756 MHz		
Band 14	Uplink	788 – 798 MHz	10.0 MHz	≤ 10 MHz
	Downlink	758 – 768 MHz		

[5] Astro Digital U.S., Inc., IBFS File No. SAT-LOA-2017-0508-00071, n.3 (Grant Stamp Dec. 14, 2017); Loft Orbital Solutions, Inc., IBFS File No. SAT-LOA-20190807-00072, n.5, Condition 9 (Grant Stamp Oct. 8, 2020).

Band 27	Uplink	807 – 824 MHz	17.0 MHz	≤ 15 MHz
	Downlink	852 – 869 MHz		
Band 20	Uplink	832 – 862 MHz	30.0 MHz	≤ 20 MHz
	Downlink	791 – 821 MHz		
Band 26	Uplink	814 – 849 MHz	35.0 MHz	≤ 20 MHz
	Downlink	859 – 894 MHz		
Band 08	Uplink	880 – 915 MHz	35.0 MHz	≤ 20 MHz
	Downlink	925 – 960 MHz		
NOTE: The Lynk Smallsat System will only utilize ***service links outside of the United States*** and use of these service links will be limited solely to the frequencies, bandwidths, and technologies assigned and requested by present and future terrestrial MNO service partners.				

As illustrated in the table above, Lynk's channel bandwidths are dependent on the protocol and MNOs' spectrum they wish to deploy over the Lynk Smallsat System. The GSM protocol allows for channel bandwidths of 200 kHz, and the LTE protocol provides a range of channel bandwidths of 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, or 20 MHz. Hence, the spectrum that an MNO wants to deploy over the Lynk Smallsat System will determine the Lynk's channel bandwidths.

Lynk's service link operations will not materially constrain current and future operators. The Lynk Smallsat System service links will only operate in areas where Lynk has negotiated agreements with MNOs licensed in those areas and will only operate on frequencies agreed to by those MNOs. Because Lynk's operations in these frequencies require the permission of potentially impacted MNOs and because Lynk will operate in accordance with the terms of any agreements reached with such MNOs, Lynk's operations will not cause issues for terrestrial operators. In other words, Lynk's system will only deploy service links as directed by MNO partners, consistent with their existing licenses, and under required regulatory approvals. Included separately in this application is a UHF Interference Mitigation Analysis demonstrating that Lynk's operations will not cause harmful interference to allocated terrestrial services. Lynk is not currently seeking to access any UHF bands to operate the Lynk Smallsat System service links in the United States.

II. Space Station Antennas

The satellites in the Lynk Smallsat System will host several antennas to accommodate feeder, service, and TT&C links. However, the Schedule S does not provide the necessary flexibility to cover the parameters of operation for these links. Accordingly, Lynk provides herein the planned parameters of operation.

A. Ka-band Antenna Operations

The Ka-band transmitter located on Lynk's satellites utilizes a phased array Ka-band antenna mounted on the nadir deck of the satellite bus. Lynk will utilize the Ka-band modem for TT&C and feeder link operations during periods when the satellite is at least five (5) degrees above the horizon relative to a ground station during a coordinated overpass depending on the location of the ground station. The Ka-band beams will be steered to point toward the ground site during the utilized overpasses. This can be done using a mechanically, or electrically, steered beam from the Ka-band antenna. As described later in this document, there are two possible sizes of satellites that are proposed under this application. Depending on the size of the satellite, it may host a different size Ka-band antenna; the larger of the satellites hosting a larger Ka-band antenna (with more gain and narrower beamwidth).

1. Ka-band Schedule S Parameters

The Lynk Smallsat System's Ka-band operations will fall within the following parameters:

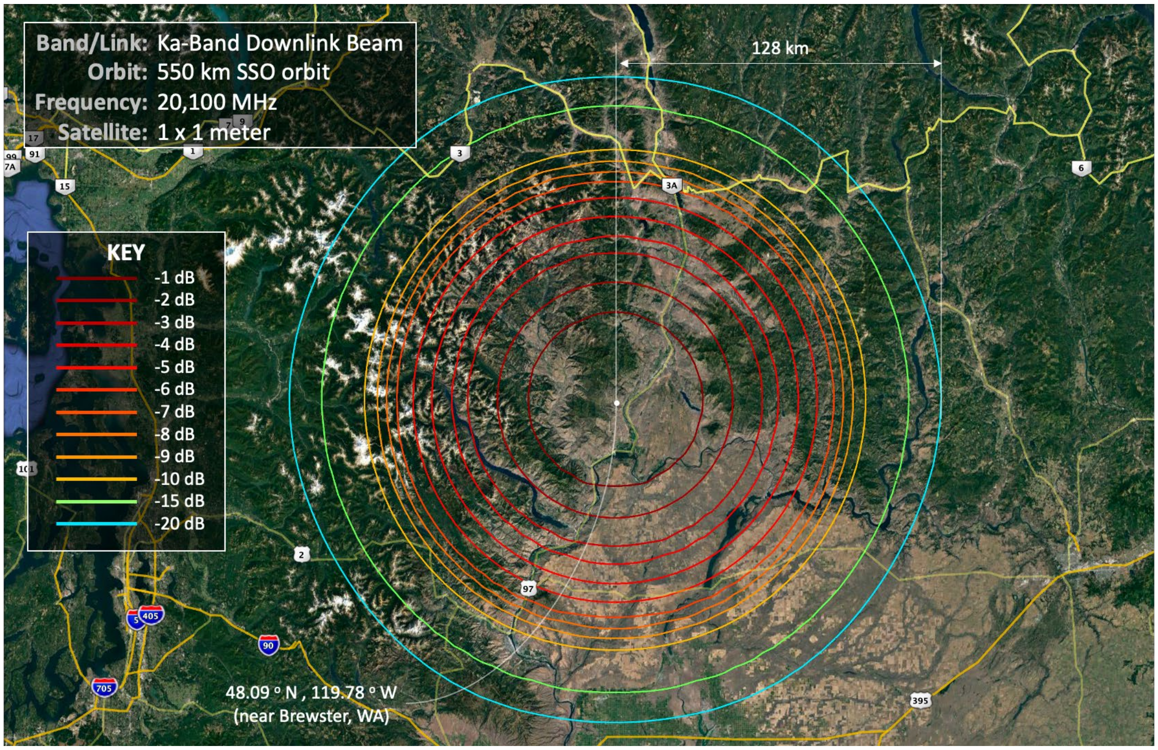
Ka-band Operational Parameters – 1 x 1 m satellite				
Parameters	Uplink		Downlink	
Frequency	29.0-30.0	GHz	20.1-20.2	GHz
Center Frequency	Variable		Variable	
Channel Bandwidth	≤ 50	MHz	≤ 50	MHz
Beam Type	steerable		steerable	
Polarization	RHCP & LHCP		RHCP & LHCP	
Peak Gain	19.07	dBiC	19.10	dBiC
Antenna Pointing Error	2	Degrees	2	Degrees
Antenna Rotational Error	N/A (circ)	Degrees	N/A (circ)	Degrees
Minimum Cross-polar Isolation	25	dB	25	dB
Polarization Alignment Relative to the Equatorial Plane	N/A (circ)	Degrees	N/A (circ)	Degrees
Switchable Polarization	Yes		Yes	
Co- or Cross- Polar Mode	Cross		Cross	
G/T at Maximum Gain Point	-9.88	dB/K	N/A	
Minimum Saturation Flux Density	-98.01	dBW/m²/MHz		
Maximum Saturation Flux Density	-80.48	dBW/m²/MHz		
Maximum Transmit EIRP Density	N/A		-53.87	dBW/Hz
Maximum Transmit EIRP			23.12	dBW

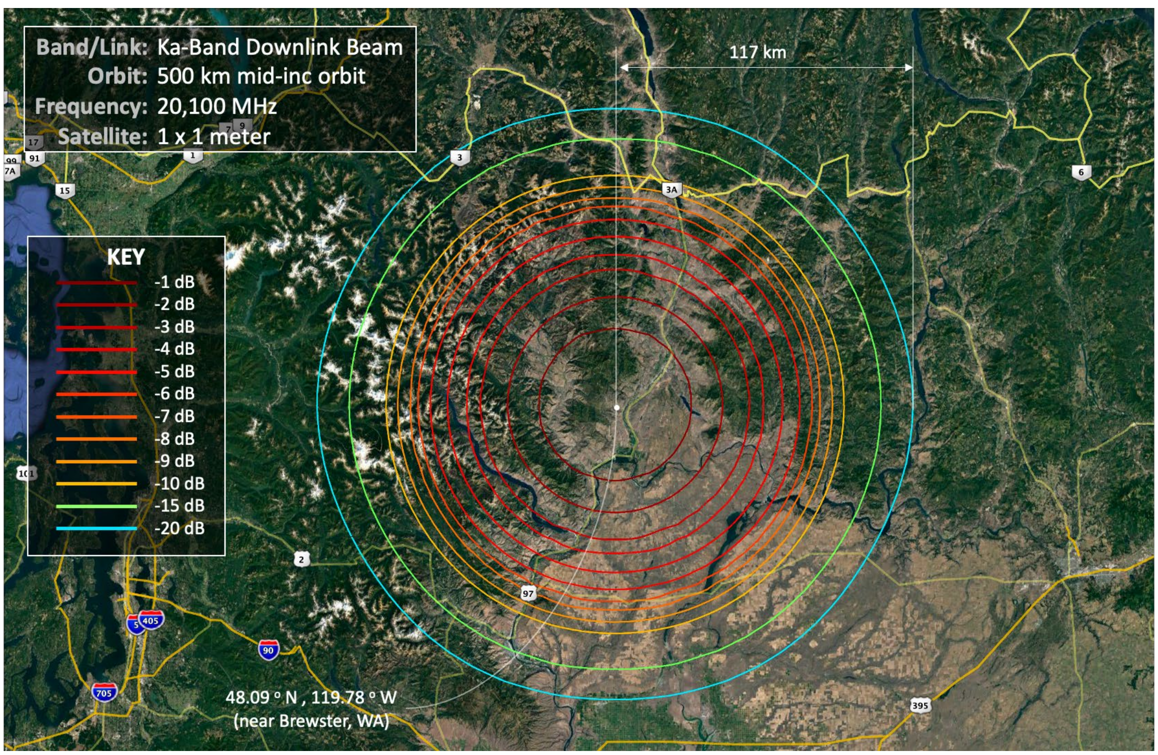
Ka-band Operational Parameters – 1.5 x 1.5 m satellite				
Parameters	Uplink		Downlink	
Frequency	29.0-30.0	GHz	20.1-20.2	GHz
Center Frequency	Variable		Variable	
Channel Bandwidth	≤ 50	MHz	≤ 50	MHz
Beam Type	steerable		steerable	
Polarization	RHCP & LHCP		RHCP & LHCP	
Peak Gain	23.14	dBiC	23.17	dBiC
Antenna Pointing Error	2	Degrees	2	Degrees
Antenna Rotational Error	N/A (circ)	Degrees	N/A (circ)	Degrees
Minimum Cross-polar Isolation	25	dB	25	dB
Polarization Alignment Relative to the Equatorial Plane	N/A (circ)	Degrees	N/A (circ)	Degrees
Switchable Polarization	Yes		Yes	
Co- or Cross- Polar Mode	Cross		Cross	
G/T at Maximum Gain Point	-5.81	dB/K	N/A	
Minimum Saturation Flux Density	-107.09	dBW/m²/MHz		
Maximum Saturation Flux Density	-80.48	dBW/m²/MHz		
Maximum Transmit EIRP Density	N/A		-49.80	dBW/Hz
Maximum Transmit EIRP			27.19	dBW

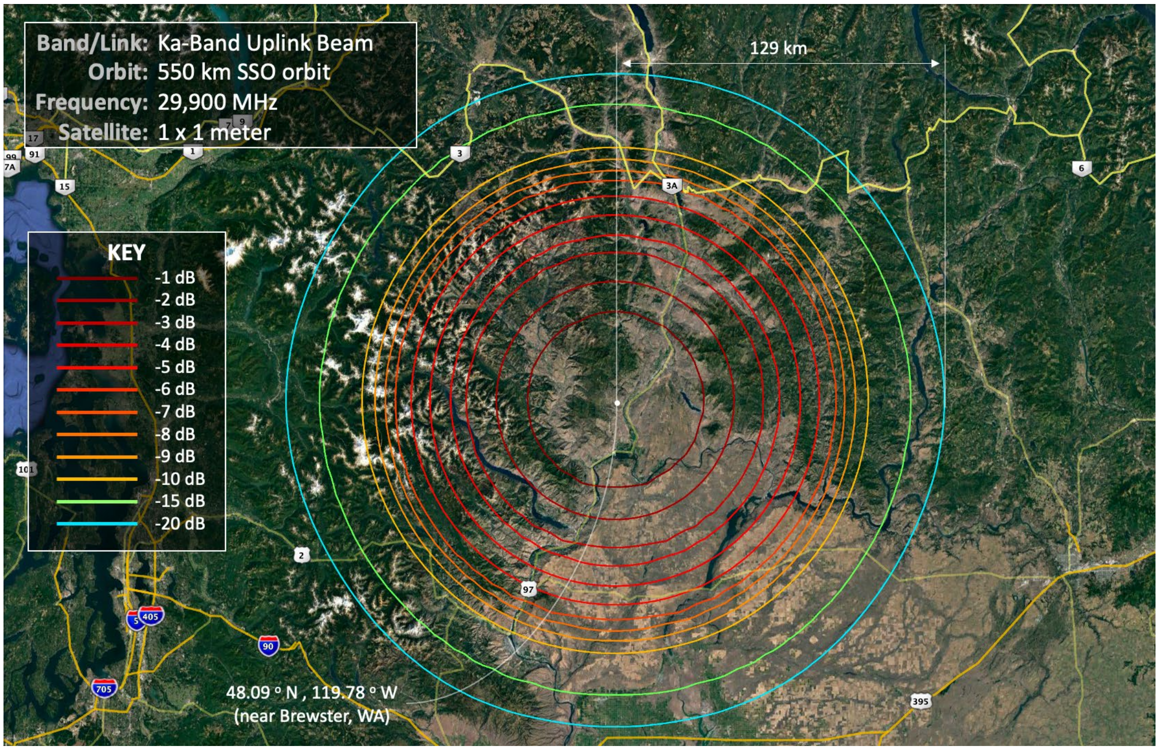
In the Schedule S for the transmit and receive beams, Lynk provided "0.0" degrees for the requested parameter Antenna Rotational Error, but this parameter is not applicable because the beams are circularly polarized. Likewise, although the Schedule S automatically fills in "45.0" degrees for the requested parameter Polarization Alignment Relative to the Equatorial Plane, this parameter is also not applicable because of the circularly polarized beams. To accommodate the Schedule S limiting the transmit and receive beams to one polarization and for not allowing Lynk to answer "Yes" to Switchable Polarization, Lynk provided duplicate beams in order to provide both polarizations "RHCP" and "LHCP." Regarding the transmitting and receiving channels, Lynk provided in the Schedule S the entire channel bandwidth and the absolute center frequency. As explained above, however, Lynk can configure the center frequency to fall anywhere in the requested frequency range that accommodates the required bandwidth of the operation at the time, which will be less than or equal to fifty (50) MHz because the bandwidth may vary but will not operationally exceed this value during any instantaneous use of the up and down links.

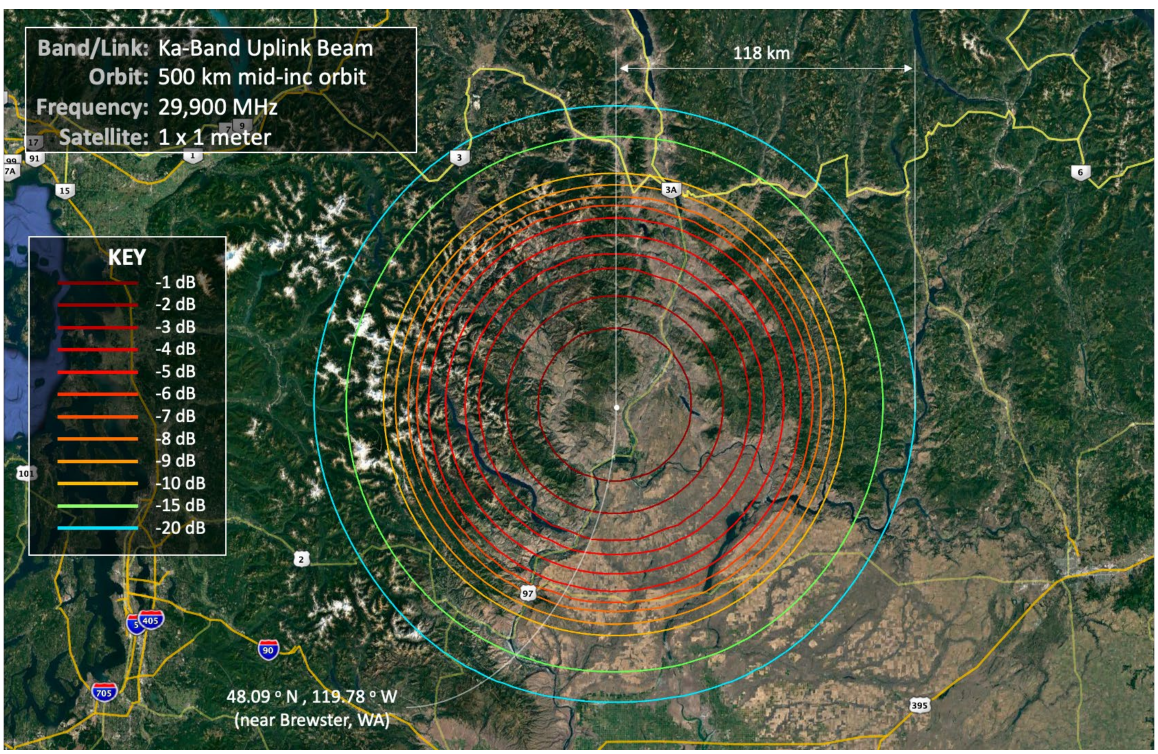
2. Ka-band Uplink and Downlink Beams

The Ka-band uplink and downlink beam contours are provided for all combinations of satellite form factor and orbit, resulting in four (4) for downlink and four (4) for uplink. The following four (4) beam contours for the Ka-band downlink and uplink beams are relevant to the 1 by 1 meter satellite design:

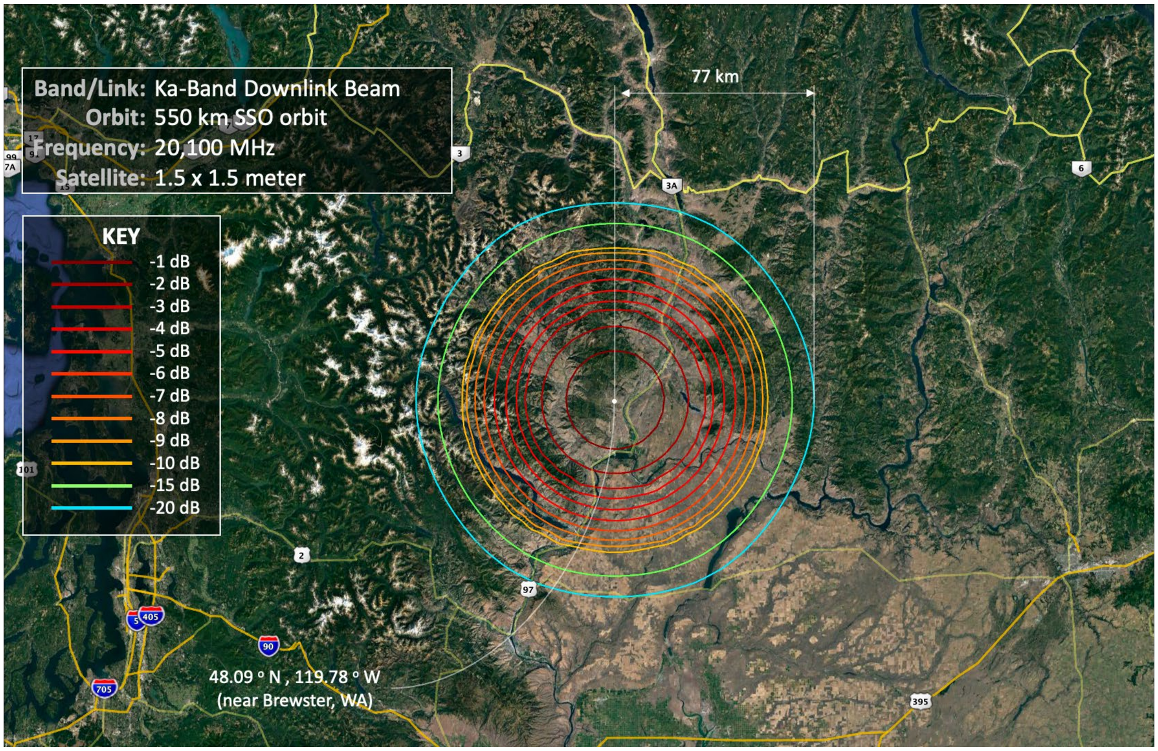

Band/Link: Ka-Band Downlink Beam
Orbit: 550 km SSO orbit
Frequency: 20,100 MHz
Satellite: 1 x 1 meter
128 km
KEY
-1 dB
-2 dB
-3 dB
-4 dB
-5 dB
-6 dB
-7 dB
-8 dB
-9 dB
-10 dB
-15 dB
-20 dB
48.09 ° N , 119.78 ° W
(near Brewster, WA)

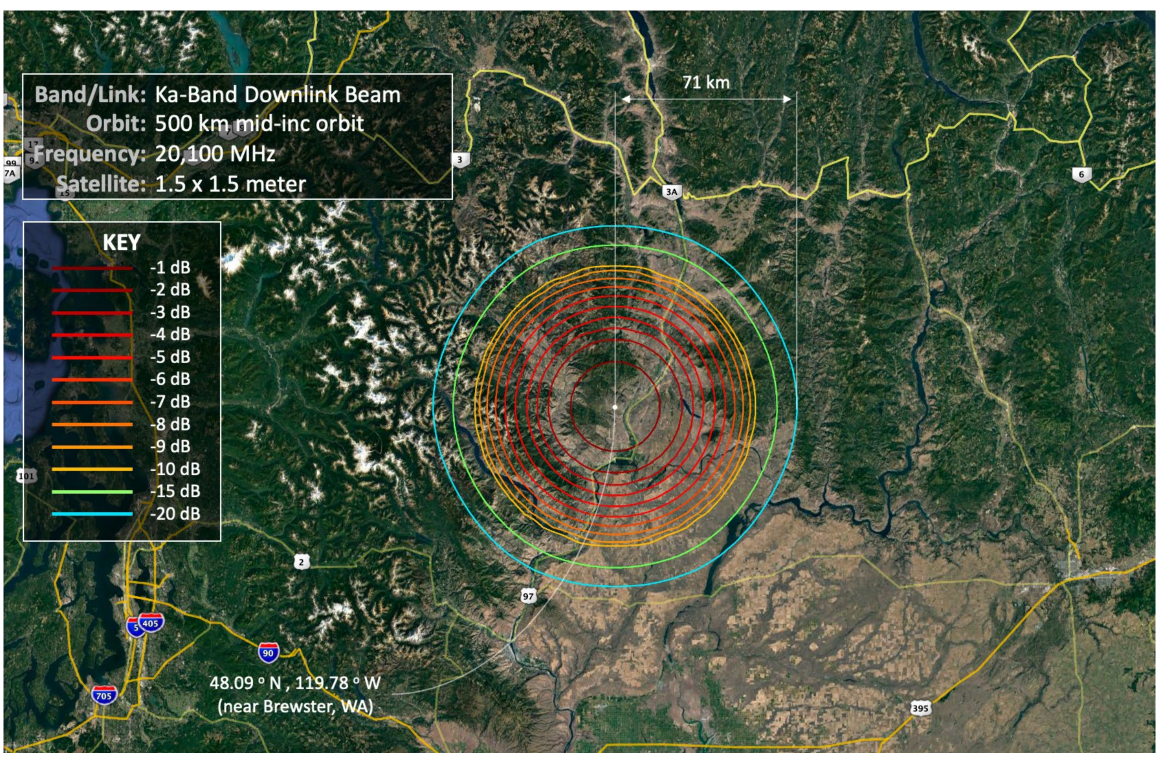

Band/Link: Ka-Band Downlink Beam
Orbit: 500 km mid-inc orbit
Frequency: 20,100 MHz
Satellite: 1 x 1 meter
117 km
KEY
-1 dB
-2 dB
-3 dB
-4 dB
-5 dB
-6 dB
-7 dB
-8 dB
-9 dB
-10 dB
-15 dB
-20 dB
48.09 ° N , 119.78 ° W
(near Brewster, WA)

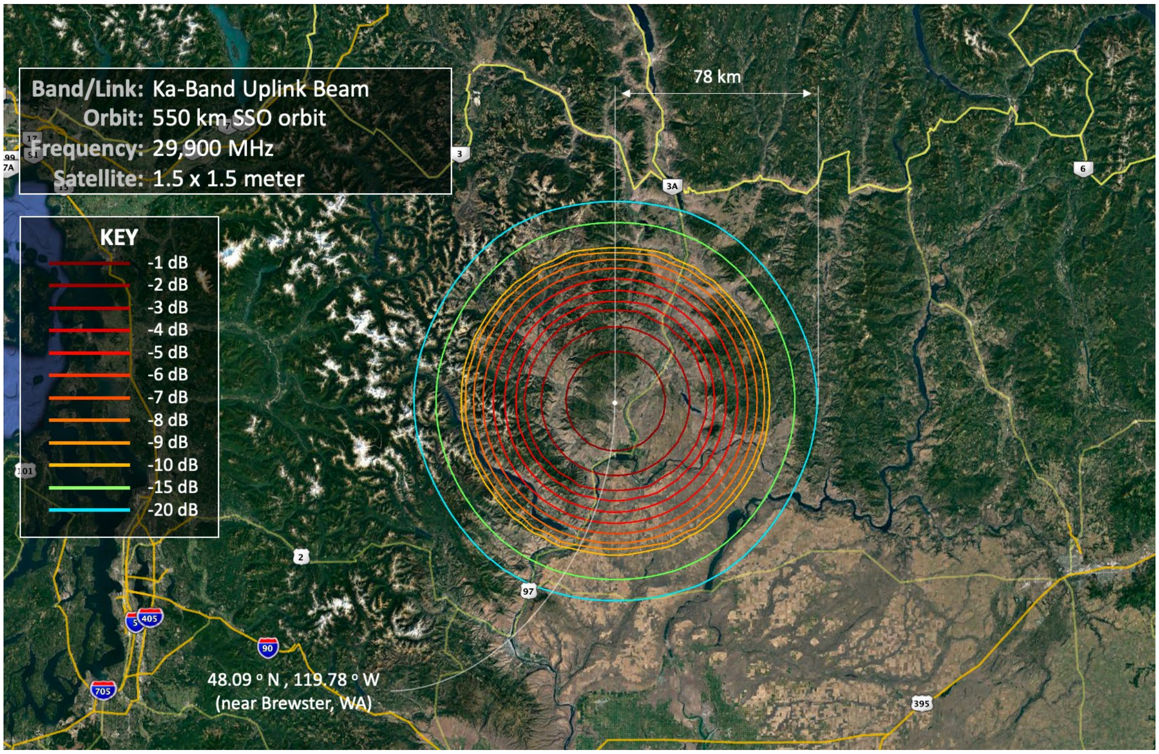

Band/Link: Ka-Band Uplink Beam
Orbit: 550 km SSO orbit
Frequency: 29,900 MHz
Satellite: 1 x 1 meter
129 km
KEY
-1 dB
-2 dB
-3 dB
-4 dB
-5 dB
-6 dB
-7 dB
-8 dB
-9 dB
-10 dB
-15 dB
-20 dB
48.09 ° N , 119.78 ° W
(near Brewster, WA)


Band/Link: Ka-Band Uplink Beam
Orbit: 500 km mid-inc orbit
Frequency: 29,900 MHz
Satellite: 1 x 1 meter
118 km
KEY
-1 dB
-2 dB
-3 dB
-4 dB
-5 dB
-6 dB
-7 dB
-8 dB
-9 dB
-10 dB
-15 dB
-20 dB
48.09 ° N , 119.78 ° W
(near Brewster, WA)

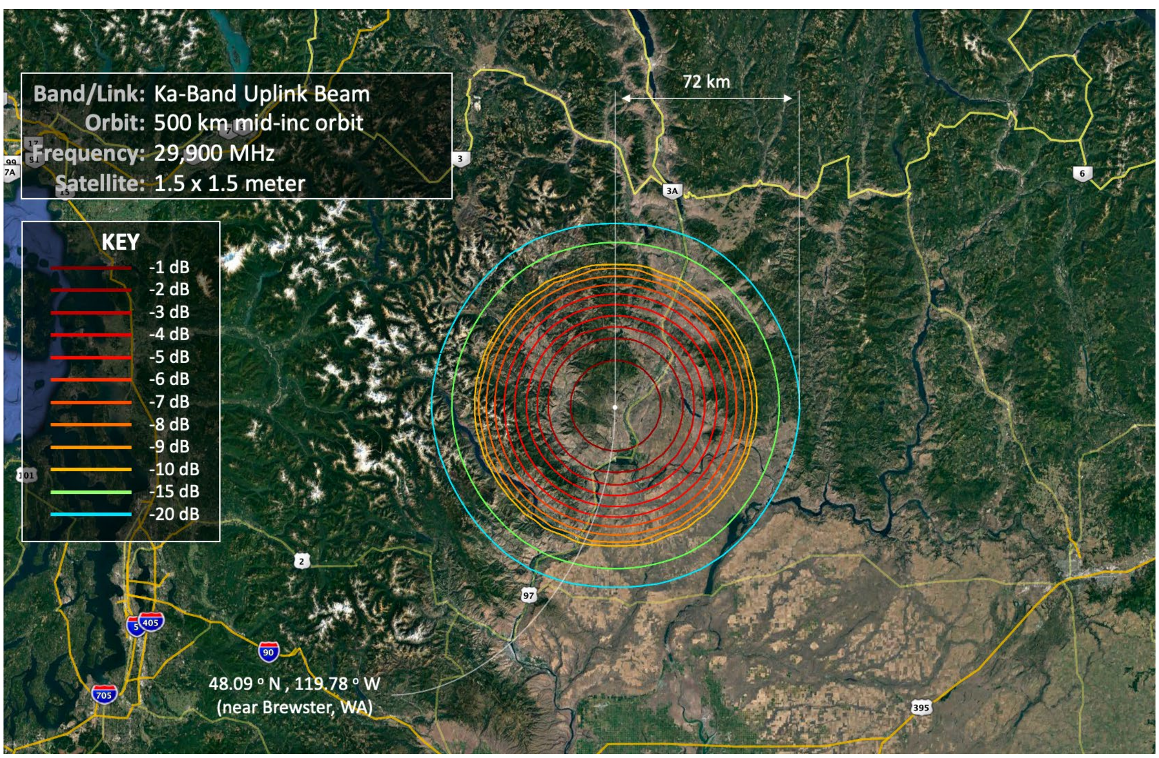
The following four (4) beam contours for the Ka-band downlink and uplink beams are relevant to the 1.5 by 1.5 meter satellite design:







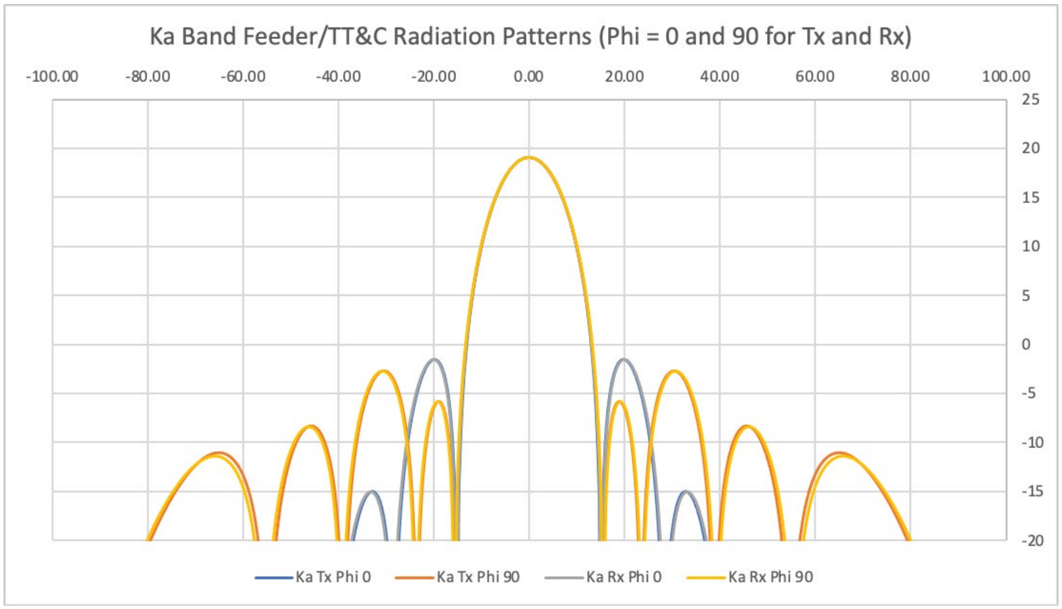
Band/Link: Ka-Band Uplink Beam
Orbit: 550 km SSO orbit
Frequency: 29,900 MHz
Satellite: 1.5 x 1.5 meter
KEY
-1 dB
-2 dB
-3 dB
-4 dB
-5 dB
-6 dB
-7 dB
-8 dB
-9 dB
-10 dB
-15 dB
-20 dB
78 km
48.09 ° N , 119.78 ° W
(near Brewster, WA)



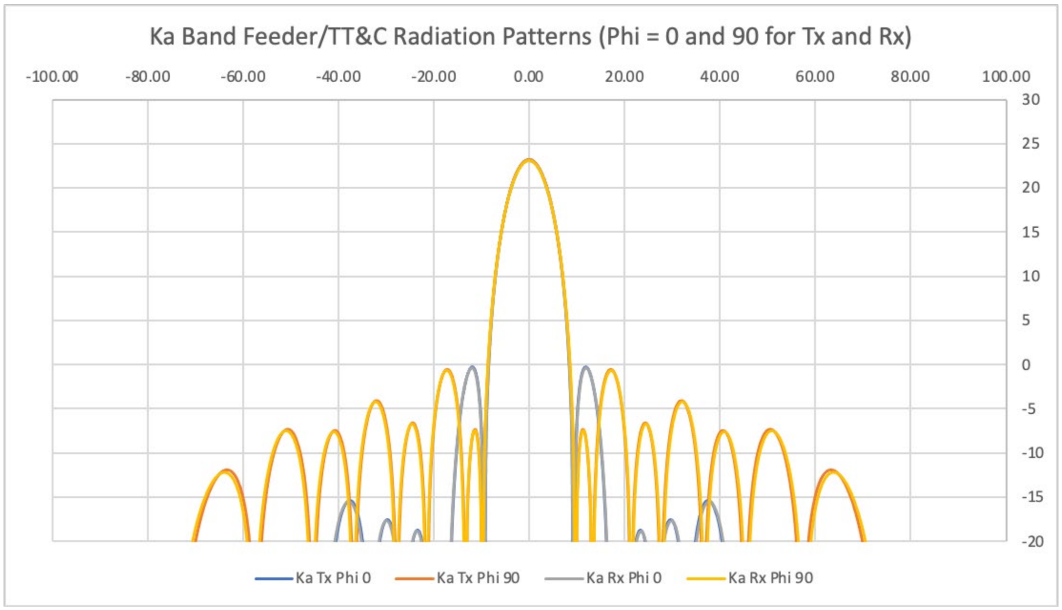
Band/Link: Ka-Band Uplink Beam
Orbit: 500 km mid-inc orbit
Frequency: 29,900 MHz
Satellite: 1.5 x 1.5 meter
KEY
-1 dB
-2 dB
-3 dB
-4 dB
-5 dB
-6 dB
-7 dB
-8 dB
-9 dB
-10 dB
-15 dB
-20 dB
72 km
48.09 ° N , 119.78 ° W
(near Brewster, WA)

3. Ka-band Antenna Radiation Patterns

The following radiation pattern is plotted for the 19 dBiC gain antenna for azimuth angles (phi) of zero (0) and ninety (90) degrees relative to boresight, and the pattern demonstrates a 20 dB Chebyshev amplitude taper for peak side lobes just below zero.



The following radiation pattern is plotted for the 23 dBiC gain antenna for azimuth angles (phi) of zero (0) and ninety (90) degrees relative to boresight, and the pattern demonstrates a 23 dB Chebyshev amplitude taper for peak side lobes just below zero.



B. S-band Antenna Operations

The S-band transmitter located on Lynk's satellites utilizes a low gain, wide beamwidth, patch antenna mounted on the nadir deck of the satellite bus. Lynk will utilize the S-band modem for TT&C operations during periods when the satellite is at least five (5) degrees above the horizon relative to a ground station during a coordinated overpass depending on the ground station location. S-Band TT&C operations are secondary TT&C links, and will only be used if they are operationally required—e.g., commissioning, emergency scenarios, etc. The S-band beams will not be steered, but instead will be pointed toward nadir using the spacecraft three-axis attitude control system. The S-band antenna is identical among the 1 by 1 meter and 1.5 by 1.5 meter satellite counterparts addressed later in this document.

1. S-band Schedule S Parameters

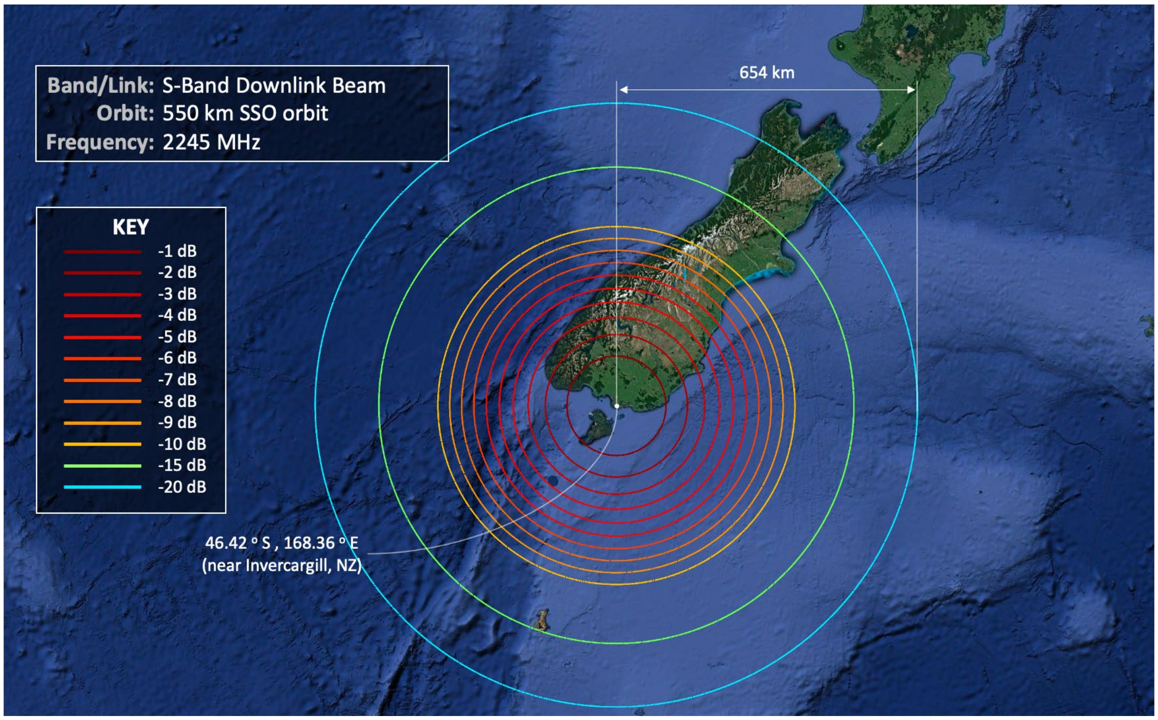
The Lynk Smallsat System's S-band operations will fall within the following parameters:

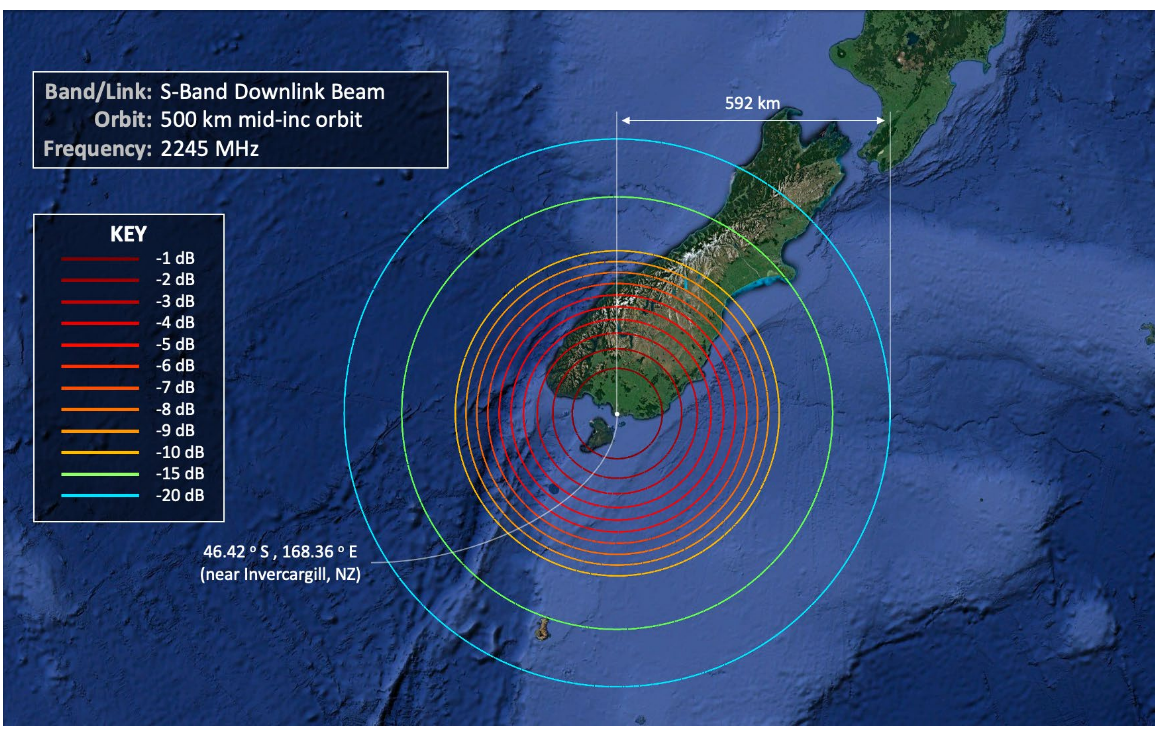
S-band Operational Parameters				
Parameters	Uplink		Downlink	
Frequency	2025-2110	MHz	2200-2290	MHz
Center Frequency	Variable		Variable	
Channel Bandwidth	≤ 1	MHz	≤ 1	MHz
Beam Type	fixed		fixed	
Polarization	RHCP		RHCP	
Peak Gain	5.87	dBiC	5.64	dBiC
Antenna Pointing Error	1	Degree	1	Degrees
Antenna Rotational Error	N/A (circ)	Degrees	N/A (circ)	Degrees
Minimum Cross-polar Isolation	20	dB	20	dB
Polarization Alignment Relative to the Equatorial Plane	N/A (circ)	Degrees	N/A (circ)	Degrees
Switchable Polarization	No		No	
Co- or Cross- Polar Mode	Co		Co	
G/T at Maximum Gain Point	-23.08	dB/K	N/A	
Minimum Saturation Flux Density	-95.46	dBW/m^2/MHz		
Maximum Saturation Flux Density	-81.19	dBW/m^2/MHz		
Maximum Transmit EIRP Density	N/A		-55.36	dBW/Hz
Maximum Transmit EIRP			4.64	dBW

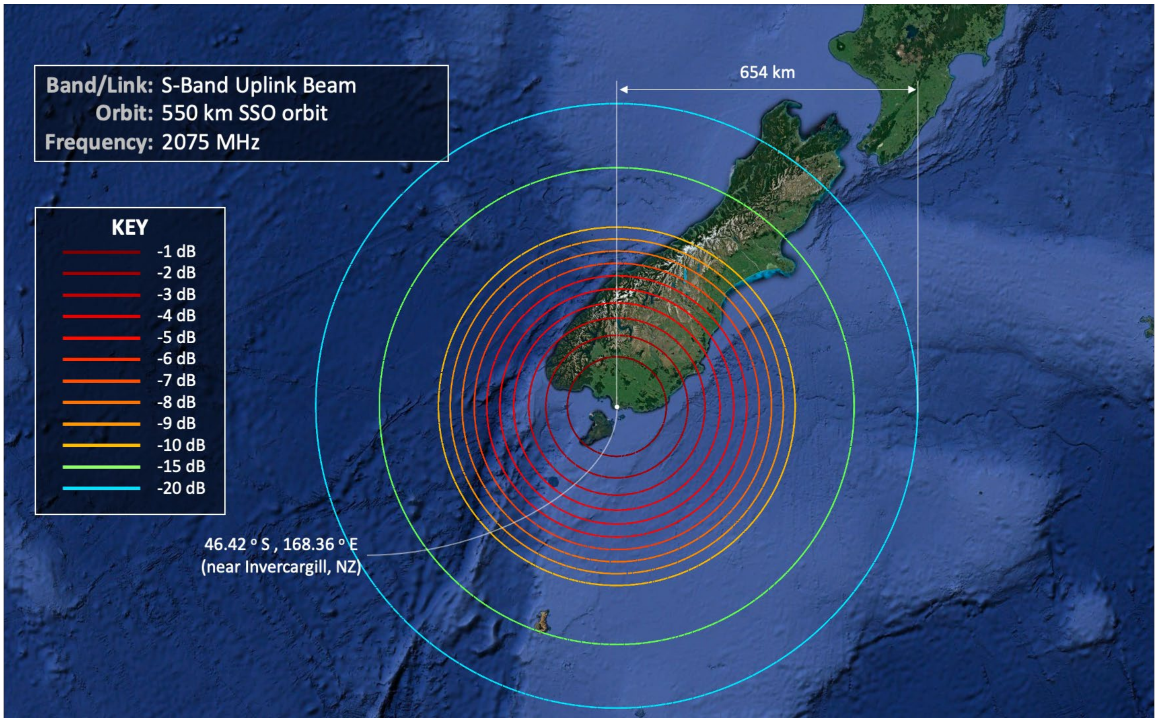
In the Schedule S for the transmit and receive beams, Lynk provided "0.0" degrees for the requested parameter Antenna Rotational Error, but this parameter is not applicable because the beams are circularly polarized. Likewise, although the Schedule S automatically fills in "45.0" degrees for the requested parameter Polarization Alignment Relative to the Equatorial Plane, this parameter is also not applicable because of the circularly polarized beams. Regarding the transmitting and receiving channels, Lynk provided in the Schedule S the entire channel bandwidth and the absolute center frequency. As explained earlier, however, Lynk can configure the center frequency to fall anywhere in the requested frequency range that accommodates the required bandwidth of the operation at the time, which will be less than or equal to one (1) MHz because the bandwidth may vary but will not operationally exceed this value during any instantaneous use of the up and down links.

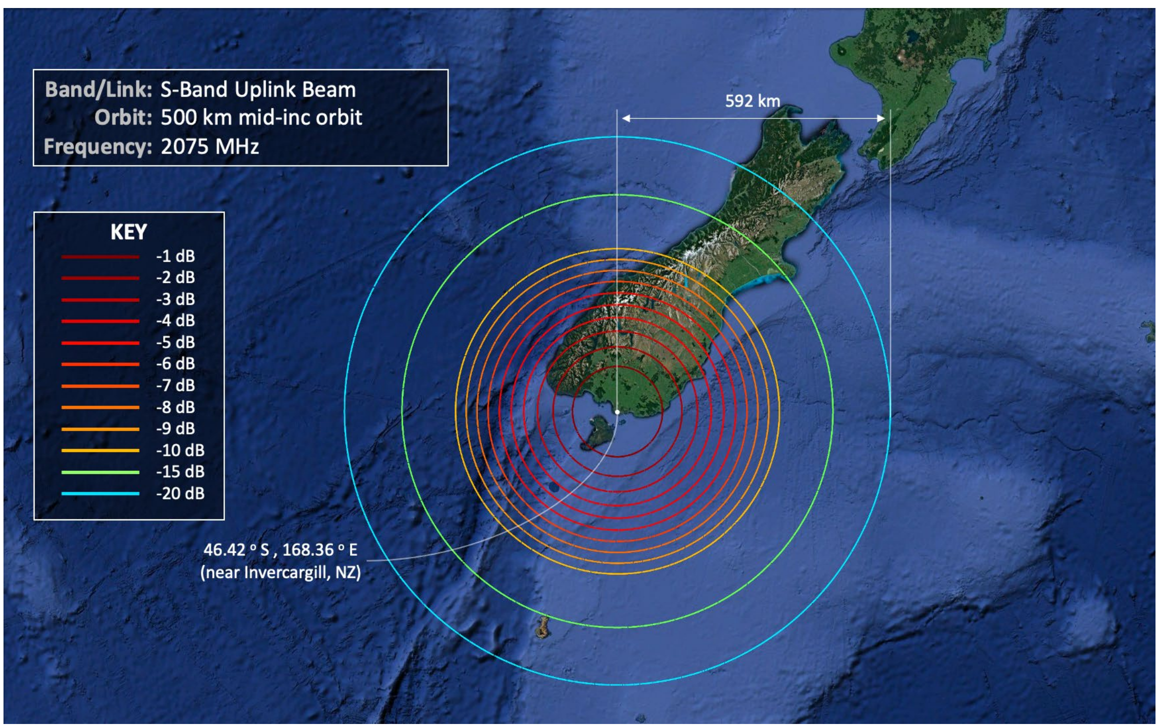
2. S-band Uplink and Downlink Beams

The S-band uplink and downlink beam contours are provided for both orbits and are illustrated below.



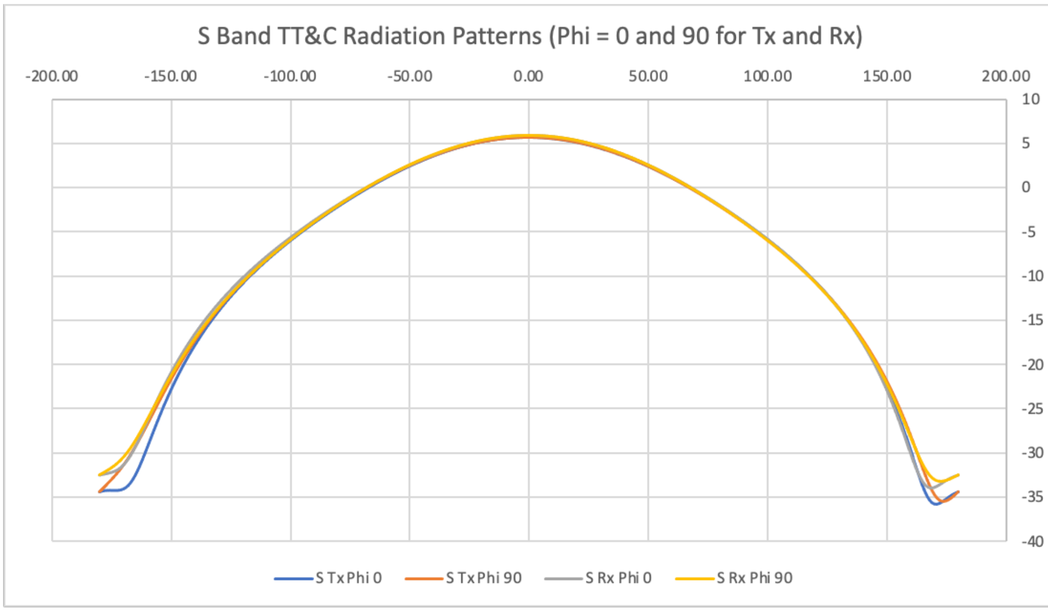



Band/Link: S-Band Uplink Beam
Orbit: 550 km SSO orbit
Frequency: 2075 MHz
KEY
-1 dB
-2 dB
-3 dB
-4 dB
-5 dB
-6 dB
-7 dB
-8 dB
-9 dB
-10 dB
-15 dB
-20 dB
654 km
46.42 ° S , 168.36 ° E
(near Invercargill, NZ)


Band/Link: S-Band Uplink Beam
Orbit: 500 km mid-inc orbit
Frequency: 2075 MHz
KEY
-1 dB
-2 dB
-3 dB
-4 dB
-5 dB
-6 dB
-7 dB
-8 dB
-9 dB
-10 dB
-15 dB
-20 dB
592 km
46.42 ° S , 168.36 ° E
(near Invercargill, NZ)

3. S-band Antenna Radiation Patterns

The radiation patterns for the transmit and receive beams of the S-band antennas on the space stations are illustrated below, where each radiation pattern is plotted for azimuth angles (phi) of zero (0) and ninety (90) degrees relative to boresight.



C. Intersatellite Links Antenna Operations

The Globalstar simplex and duplex transmitters located on Lynk's satellites are small, patch antennas mounted to the zenith deck of the satellites. Lynk will utilize the simplex and duplex modems for TT&C during periods when the satellite deck—i.e., the side opposite to the earth pointing antenna—is directed away from the earth, which is the normal operating mode of the satellites in the Lynk Smallsat System. Lynk commands its satellites with a three-axis attitude control system to always point the ISL antennas in the zenith direction. Moreover, the Globalstar simplex and duplex modems will leverage a horizon sensor to identify anomalous attitudes—i.e., not near zenith pointing—and cease emissions when the antennas are not pointed near the zenith direction. The intersatellite link antenna is identical among the 1 by 1 meter and 1.5 by 1.5 meter satellite counterparts covered later in this document.

1. ISL Schedule S Parameters

The Lynk Smallsat System's ISL operations will fall within the following parameters:

ISL Operational Parameters						
Parameters	Uplink		Downlink			
	Duplex		Duplex		Simplex	
Frequency	2483.5-2500	MHz	1615.65-1616.88	MHz	1613.75-1616.25	MHz
Center Frequency	See Below Channel Plan		1616.265	MHz	1615	MHz
Channel Bandwidth	1.23	MHz	1.23	MHz	2.5	MHz
Beam Type	fixed		fixed		fixed	
Polarization	LHCP		LHCP		LHCP	
Peak Gain	4	dBiC	4.5	dBiC	4.5	dBiC
Antenna Pointing Error	1	Degree	1	Degree	1	Degree
Antenna Rotational Error	N/A (cir)	Degrees	N/A (cir)	Degrees	N/A (cir)	Degrees
Minimum Cross-polar Isolation	20	dB	20	dB	20	dB
Polarization Alignment Relative to the Equatorial Plane	N/A (cir)	Degrees	N/A (cir)	Degrees	N/A (cir)	Degrees
Switchable Polarization	No		No		No	
Co- or Cross-Polar Mode	Co		Co		Co	
G/T at Maximum Gain Point	-23.99	dB/K	N/A			
Minimum Saturation Flux Density	N/A					
Maximum Saturation Flux Density						

Maximum Transmit EIRP Density	N/A	-55.55	dBW/Hz	-69.04	dBW/Hz
Maximum Transmit EIRP		5.35	dBW	-5.06	dBW

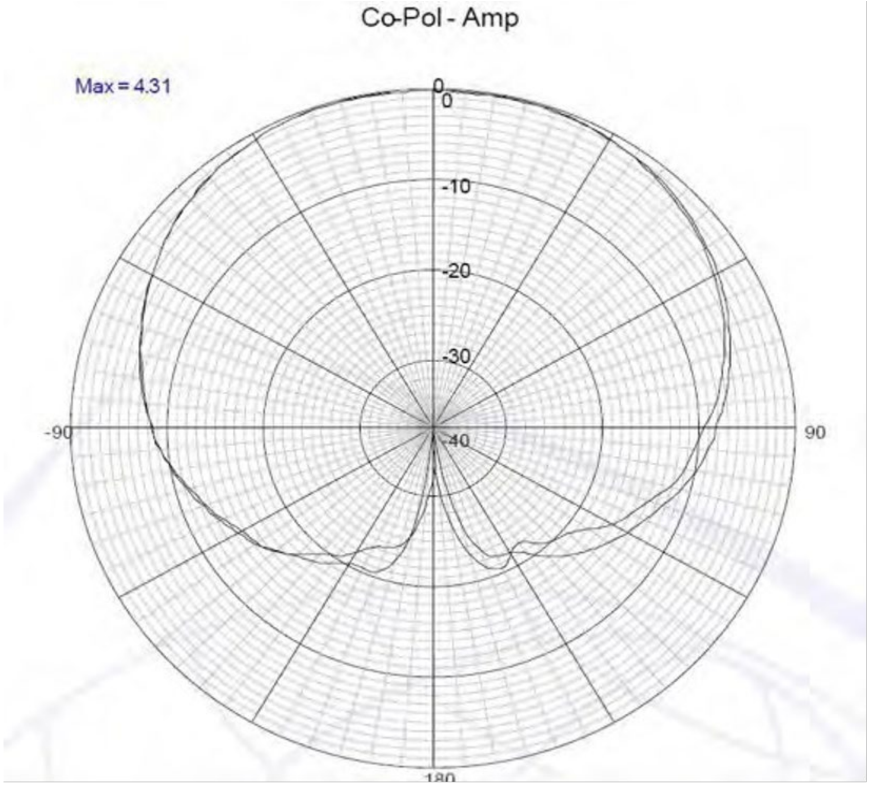
In the Schedule S for the transmit and receive beams, Lynk provided "0.0" degrees for the requested parameter Antenna Rotational Error, but this parameter is not applicable because the beams are circularly polarized. Likewise, although the Schedule S automatically fills in "45.0" degrees for the requested parameter Polarization Alignment Relative to the Equatorial Plane, this parameter is also not applicable because of the circularly polarized beams. As for the parameter Maximum Transmit EIRP, the Schedule S limited Lynk to a positive value, so Lynk provided "0.0" dBW despite the actual value being -5.06 dBW. Regarding the requested Minimum and Maximum Saturation Flux Density for the receive beams and the Max Power Flux Density for the transmit beams, the Schedule S limited Lynk to negative values despite the parameter not being applicable due to being ISLs.

ISL Duplex Uplink Channel Plan: Channel ID with Corresponding Center Frequency (MHz)						
GD01	GD02	GD03	GD04	GD05	GD06	GD07
2484.39	2485.62	2486.85	2488.08	2489.31	2490.54	2491.77
GD08	GD09	GD10	GD11	GD12	GD13	
2493.00	2494.23	2495.46	2496.69	2497.92	2499.15	

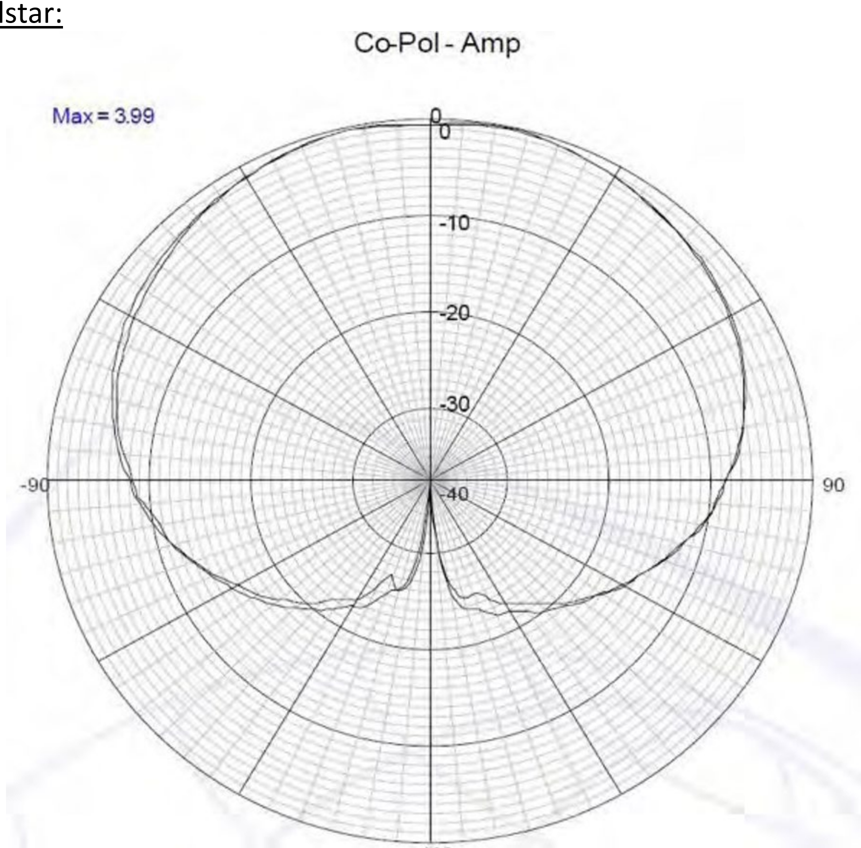
2. ISL Antenna Radiation Patterns

The radiation patterns for the transmit and receive beams of the Globalstar antennas on the space stations are illustrated below, where each radiation pattern is plotted for azimuth angles (phi) of zero (0) and ninety (90) degrees relative to boresight.

Globalstar-to-Lynk:



Lynk-to-Globalstar:



D. UHF Antenna Operations

The UHF transmitter located on Lynk satellite utilizes a high gain phased array antenna mounted on the nadir deck of the satellite bus. Lynk will utilize the UHF modem for service links during periods when the satellite is at least thirty-five (35) degrees above the horizon relative to a service location during an overpass. As previously noted, the service links are only enabled in locations and on frequencies, bandwidths, and protocols strictly enforced by MNO partners who use the Lynk network to augment their terrestrial networks. Lynk can steer the UHF beams both mechanically and digitally to focus service link energy on specific service geographies selected by the MNO partners deploying the service for their subscribers. Notably, there can be up to nineteen (19) identical beams per satellite. Similar to the Ka-band antennas, larger Lynk satellites will host larger UHF phased array antennas (with more gain and narrower beamwidth). The UHF antenna operational parameters are bounded by the two apertures described and analyzed later in this document. The separately attached UHF Interference Mitigation Analysis provides additional information on the UHF service links and their operational details.

1. <u>UHF Schedule S Parameters</u>

The Lynk Smallsat System's UHF operations will fall within the following parameters:

UHF-band Operational Parameters 1 x 1 m satellite				
Parameters	Uplink		Downlink	
Frequency	663-915	MHz	617-960	MHz
Center Frequency	See Below Channel Plan			
Channel Bandwidth	≤ 20	MHz	≤ 20	MHz
Beam Type	steerable		steerable	
Polarization	RHCP & LHCP		RHCP & LHCP	
Peak Gain	21.21	dBiC	21.44	dBiC
Antenna Pointing Error	1	Degree	1	Degree

Antenna Rotational Error	N/A (circ)	Degrees	N/A (circ)	Degrees
Minimum Cross-polar Isolation	25	dB	25	dB
Polarization Alignment Relative to the Equatorial Plane	N/A (circ)	Degrees	N/A (circ)	Degrees
Switchable Polarization	Yes		Yes	
Co- or Cross- Polar Mode	Cross		Cross	
G/T at Maximum Gain Point	-8.37	dB/K	N/A	
Minimum Saturation Flux Density	-142.00	dBW/m²/MHz		
Maximum Saturation Flux Density	-127.73	dBW/m²/MHz		
Maximum Transmit EIRP Density	N/A		-35.12	dBW/Hz
Maximum Transmit EIRP			37.43	dBW

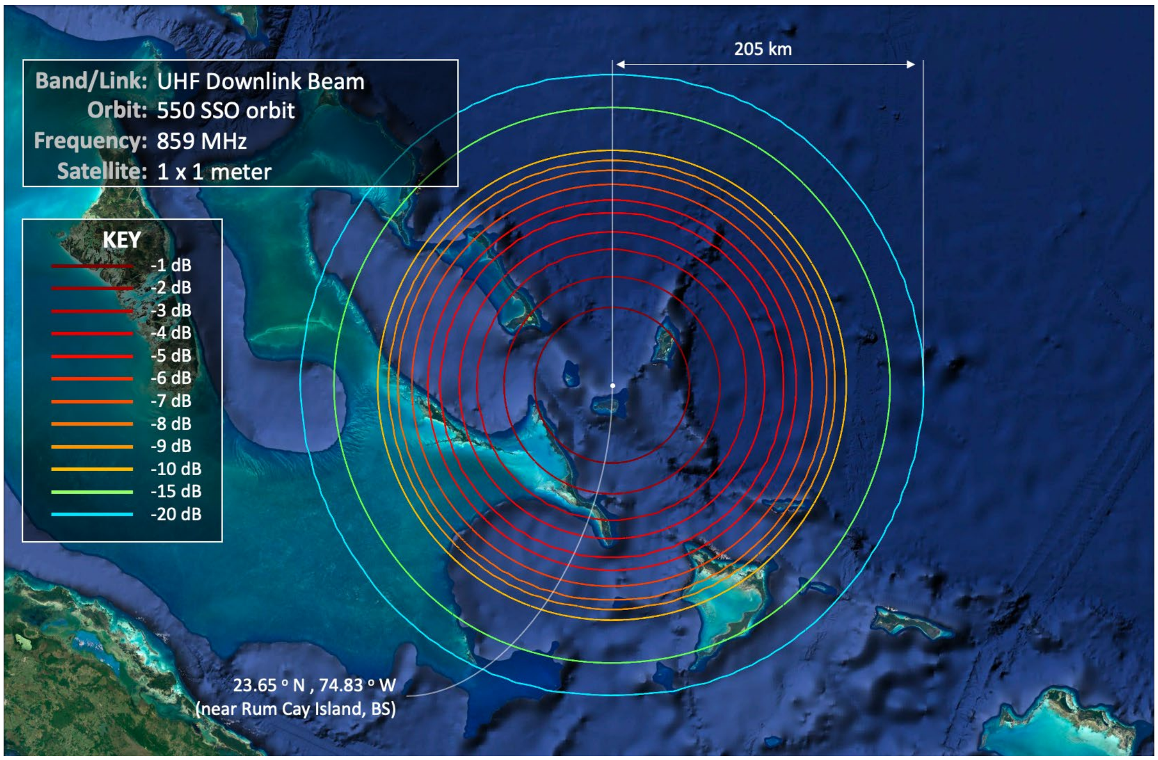
UHF-band Operational Parameters 1.5 x 1.5 m satellite				
Parameters	Uplink		Downlink	
Frequency	663-915	MHz	617-960	MHz
Center Frequency	See Below Channel Plan			
Channel Bandwidth	≤ 20	MHz	≤ 20	MHz
Beam Type	steerable		steerable	
Polarization	RHCP & LHCP		RHCP & LHCP	
Peak Gain	24.09	dBiC	24.32	dBiC
Antenna Pointing Error	1	Degree	1	Degree
Antenna Rotational Error	N/A (circ)	Degrees	N/A (circ)	Degrees
Minimum Cross-polar Isolation	25	dB	25	dB
Polarization Alignment Relative to the Equatorial Plane	N/A (circ)	Degrees	N/A (circ)	Degrees
Switchable Polarization	Yes		Yes	
Co- or Cross- Polar Mode	Cross		Cross	
G/T at Maximum Gain Point	-5.49	dB/K	N/A	
Minimum Saturation Flux Density	-142.00	dBW/m²/MHz		
Maximum Saturation Flux Density	-127.73	dBW/m²/MHz		
Maximum Transmit EIRP Density	N/A		-32.24	dBW/Hz
Maximum Transmit EIRP			40.31	dBW

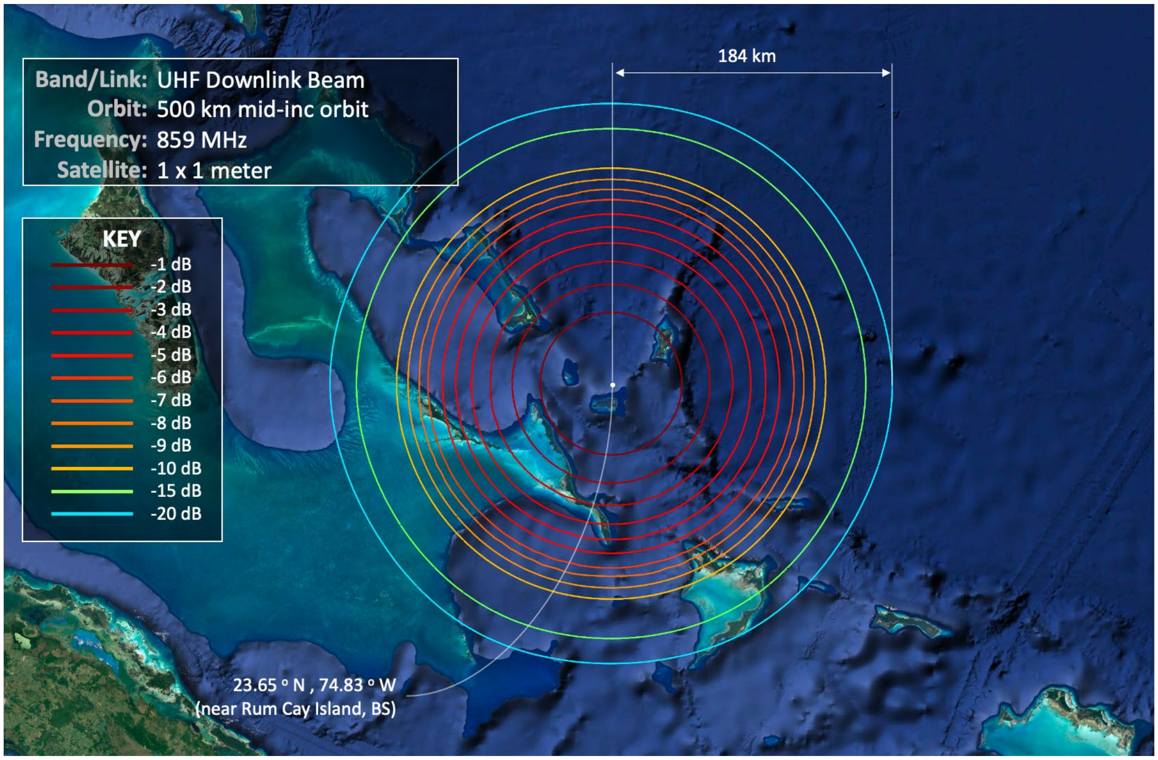
In the Schedule S for the transmit and receive beams, Lynk provided “0.0” degrees for the requested parameter Antenna Rotational Error, but this parameter is not applicable because the beams are circularly polarized. Likewise, although the Schedule S automatically fills in “45.0” degrees for the requested parameter Polarization Alignment Relative to the Equatorial Plane, this parameter is also not applicable because of the circularly polarized beams. To accommodate the Schedule S limiting the transmit and receive beams to one polarization and for not allowing Lynk to answer “Yes” to Switchable Polarization, Lynk provided duplicate beams in order to provide both polarizations “RHCP” and “LHCP.” Regarding the transmitting and receiving channels, Lynk provided in the Schedule S the entire channel bandwidth and the absolute center frequency. As explained earlier, however, Lynk can configure the center frequency to conform to whichever EARFCN is selected by an MNO partner in a given service area. Lynk’s planned use of this spectrum in its service links is in conformance with the channel plan set forth below. Correspondingly, the Lynk channel bandwidths are notated as “≤ ## MHz” because the bandwidths may vary but will not operationally exceed the values during any instantaneous use of the up and down links.

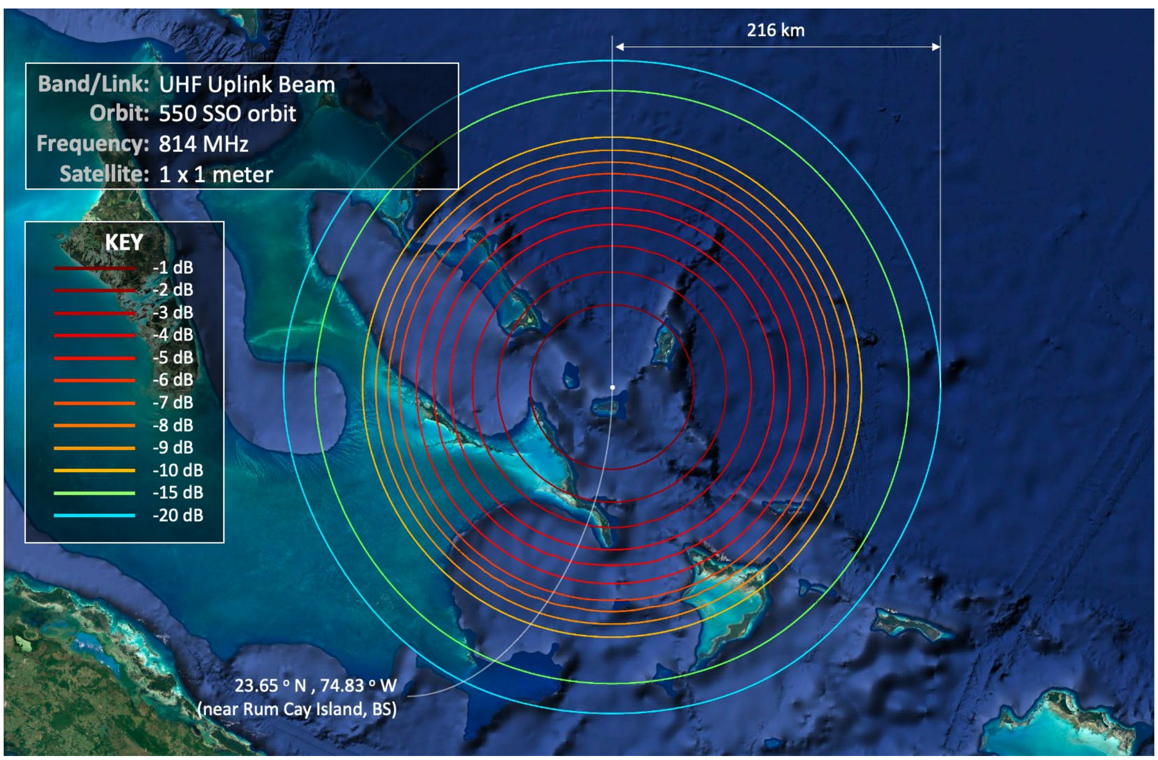
UHF-band Channel Plan				
Schedule S Channel ID	Lynk Smallsat System	UHFs / Lynk Channels	Entire Channel Bandwidths	Lynk Channel Bandwidths
BD71	Uplink	663 – 698 MHz	35.0 MHz	≤ 20 MHz
	Downlink	617 – 652 MHz		
BD85	Uplink	698 – 716 MHz	18.0 MHz	≤ 15 MHz
	Downlink	728 – 746 MHz		
BD68	Uplink	698 – 728 MHz	30.0 MHz	≤ 20 MHz
	Downlink	753 – 783 MHz		
BD28	Uplink	703 – 748 MHz	45.0 MHz	≤ 20 MHz
	Downlink	758 – 803 MHz		
BD13	Uplink	777 – 787 MHz	10.0 MHz	≤ 10 MHz
	Downlink	746 – 756 MHz		
BD14	Uplink	788 – 798 MHz	10.0 MHz	≤ 10 MHz
	Downlink	758 – 768 MHz		
BD27	Uplink	807 – 824 MHz	17.0 MHz	≤ 15 MHz
	Downlink	852 – 869 MHz		
BD20	Uplink	832 – 862 MHz	30.0 MHz	≤ 20 MHz
	Downlink	791 – 821 MHz		
BD26	Uplink	814 – 849 MHz	35.0 MHz	≤ 20 MHz
	Downlink	859 – 894 MHz		
BD08	Uplink	880 – 915 MHz	35.0 MHz	≤ 20 MHz
	Downlink	925 – 960 MHz		

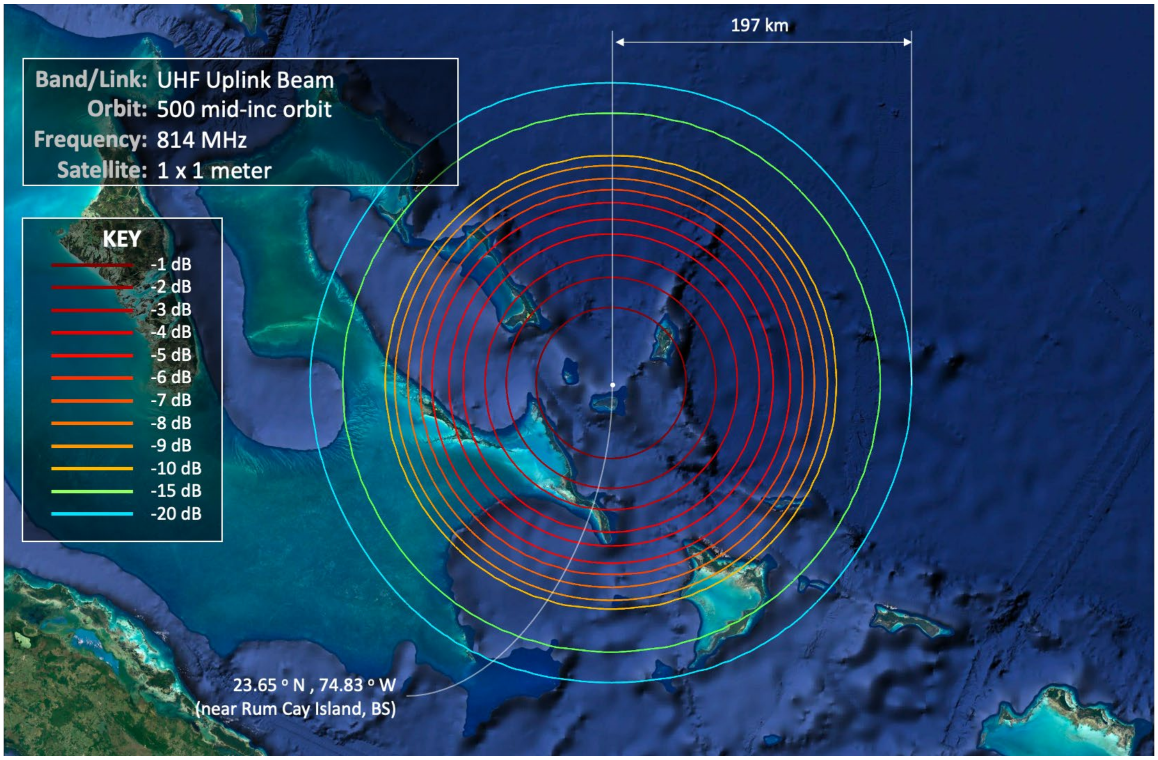
2. UHF Uplink and Downlink Beams

The UHF-band uplink and downlink beam contours are provided for all combinations of satellite form factor and orbit, resulting in four (4) for downlink and four (4) for uplink. The following four (4) beam contours for the UHF-band downlink and uplink beams are relevant to the 1x1 meter satellite design:

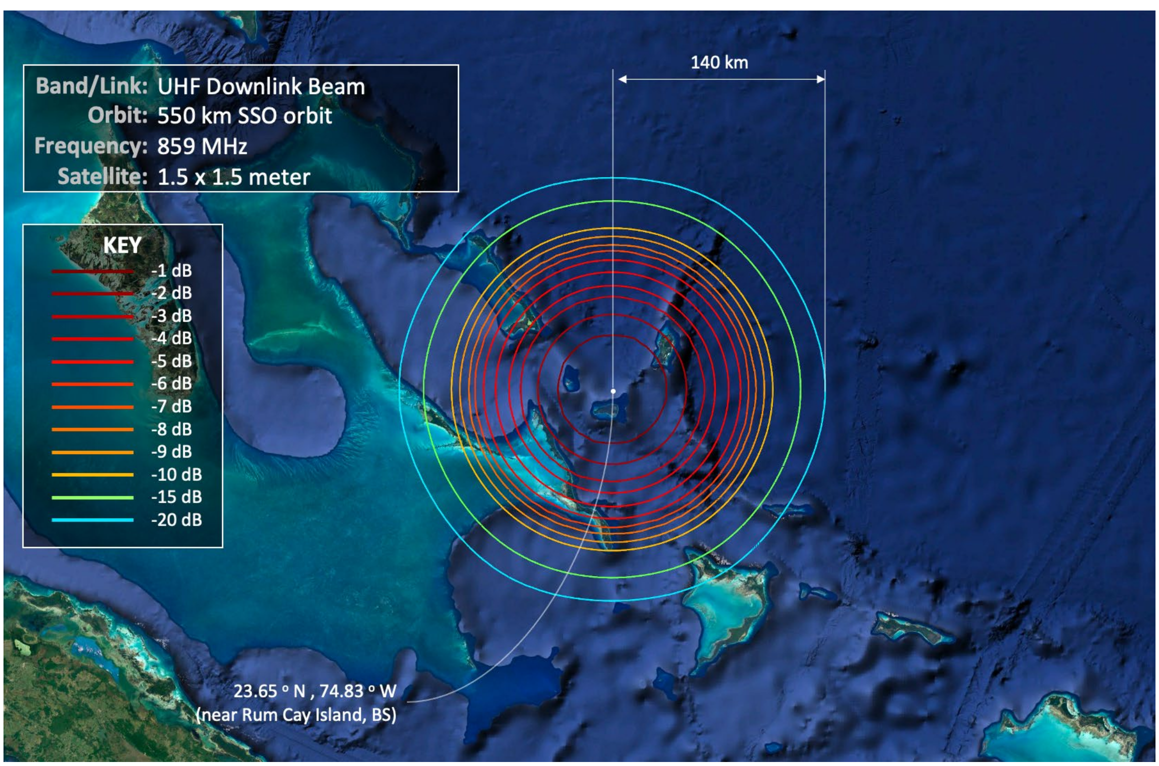


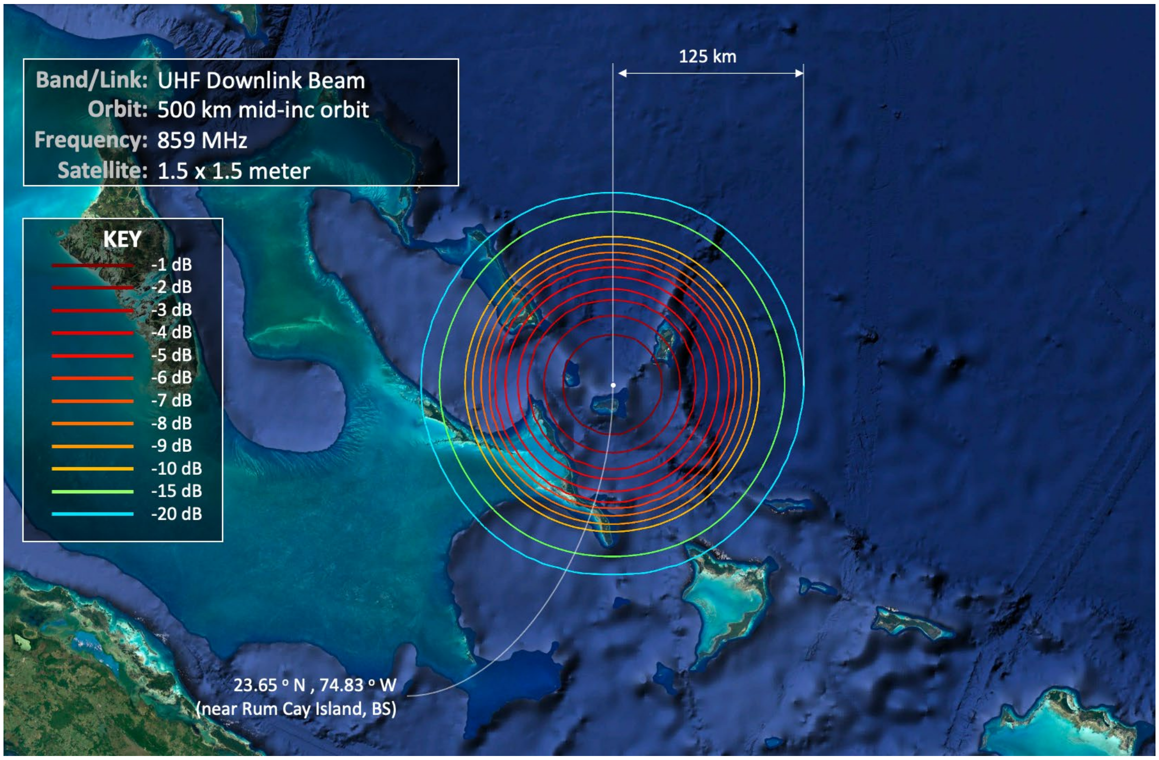

184 km
Band/Link: UHF Downlink Beam
Orbit: 500 km mid-inc orbit
Frequency: 859 MHz
Satellite: 1 x 1 meter
KEY
-1 dB
-2 dB
-3 dB
-4 dB
-5 dB
-6 dB
-7 dB
-8 dB
-9 dB
-10 dB
-15 dB
-20 dB
23.65 ° N , 74.83 ° W
(near Rum Cay Island, BS)

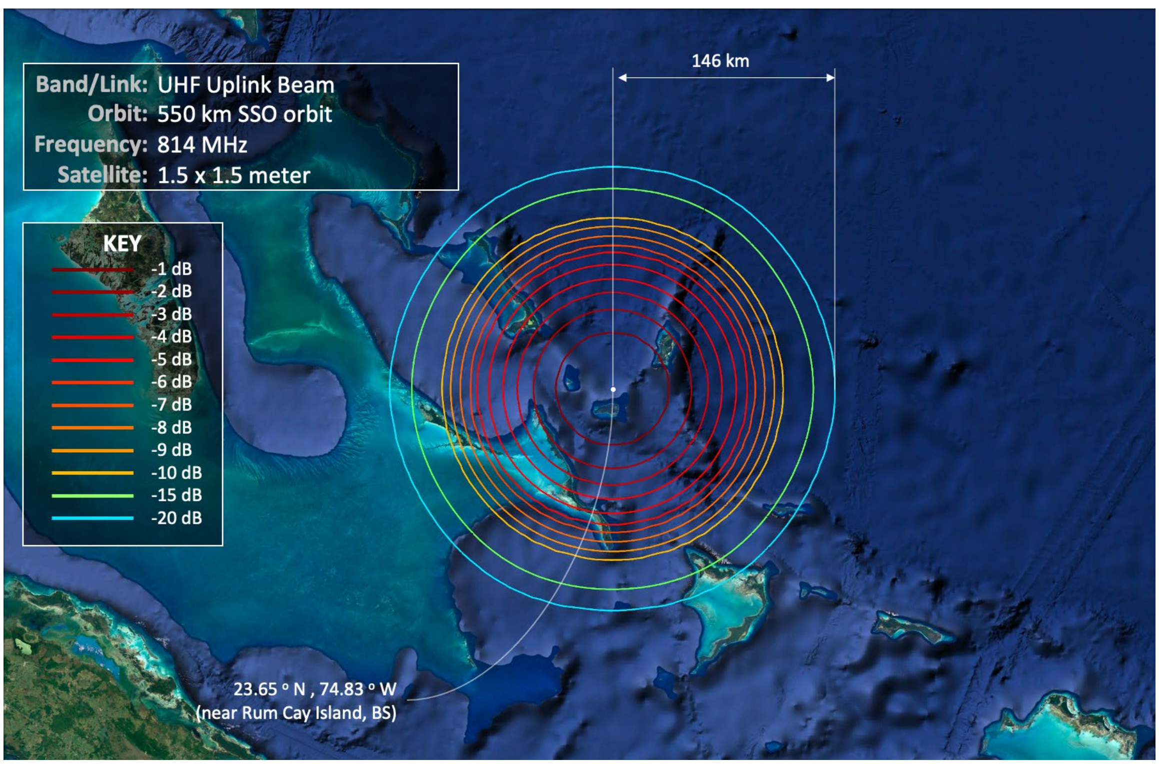

216 km
Band/Link: UHF Uplink Beam
Orbit: 550 SSO orbit
Frequency: 814 MHz
Satellite: 1 x 1 meter
KEY
-1 dB
-2 dB
-3 dB
-4 dB
-5 dB
-6 dB
-7 dB
-8 dB
-9 dB
-10 dB
-15 dB
-20 dB
23.65 ° N , 74.83 ° W
(near Rum Cay Island, BS)

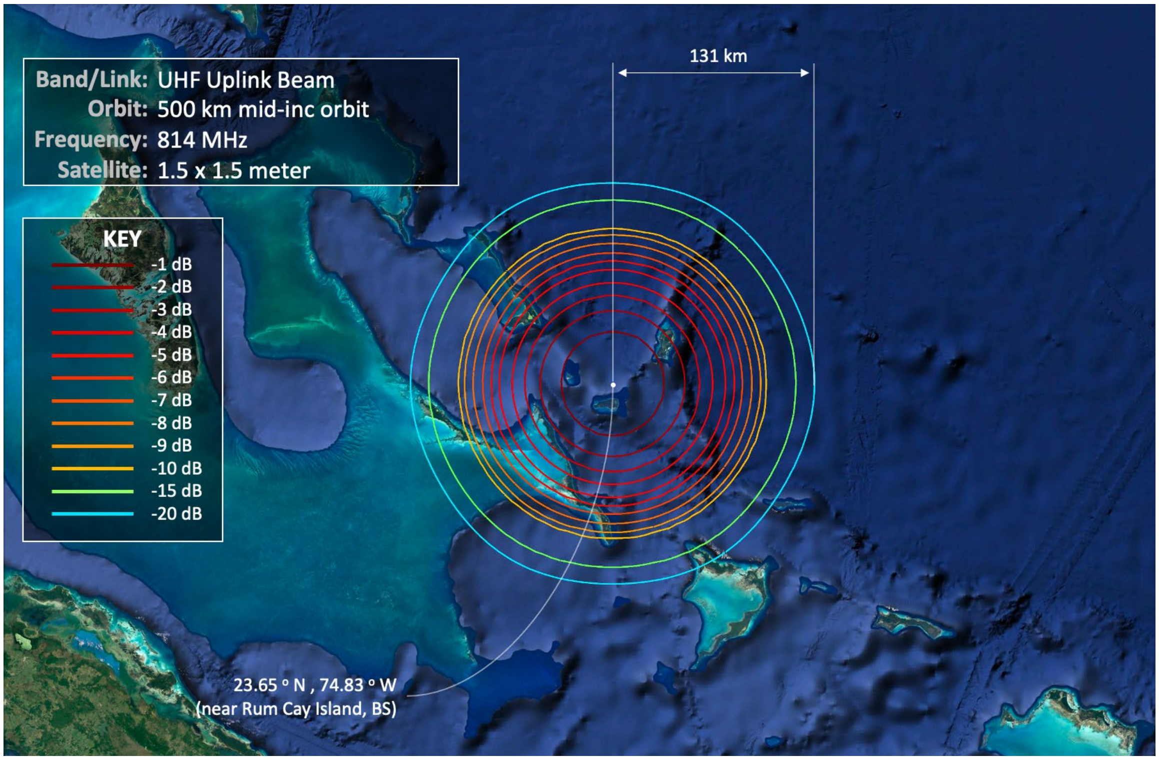


The following four (4) beam contours for the UHF-band downlink and uplink beams are relevant to the 1.5 by 1.5 meter satellite design:



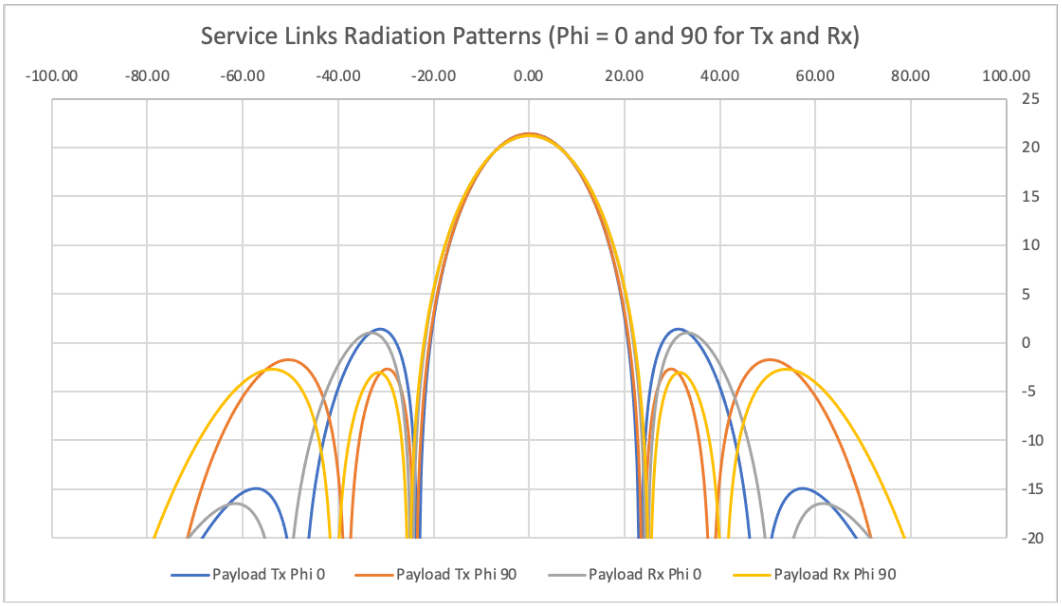

Band/Link: UHF Downlink Beam
Orbit: 500 km mid-inc orbit
Frequency: 859 MHz
Satellite: 1.5 x 1.5 meter
KEY
-1 dB
-2 dB
-3 dB
-4 dB
-5 dB
-6 dB
-7 dB
-8 dB
-9 dB
-10 dB
-15 dB
-20 dB
125 km
23.65 ° N , 74.83 ° W
(near Rum Cay Island, BS)


Band/Link: UHF Uplink Beam
Orbit: 550 km SSO orbit
Frequency: 814 MHz
Satellite: 1.5 x 1.5 meter
KEY
-1 dB
-2 dB
-3 dB
-4 dB
-5 dB
-6 dB
-7 dB
-8 dB
-9 dB
-10 dB
-15 dB
-20 dB
146 km
23.65 ° N , 74.83 ° W
(near Rum Cay Island, BS)

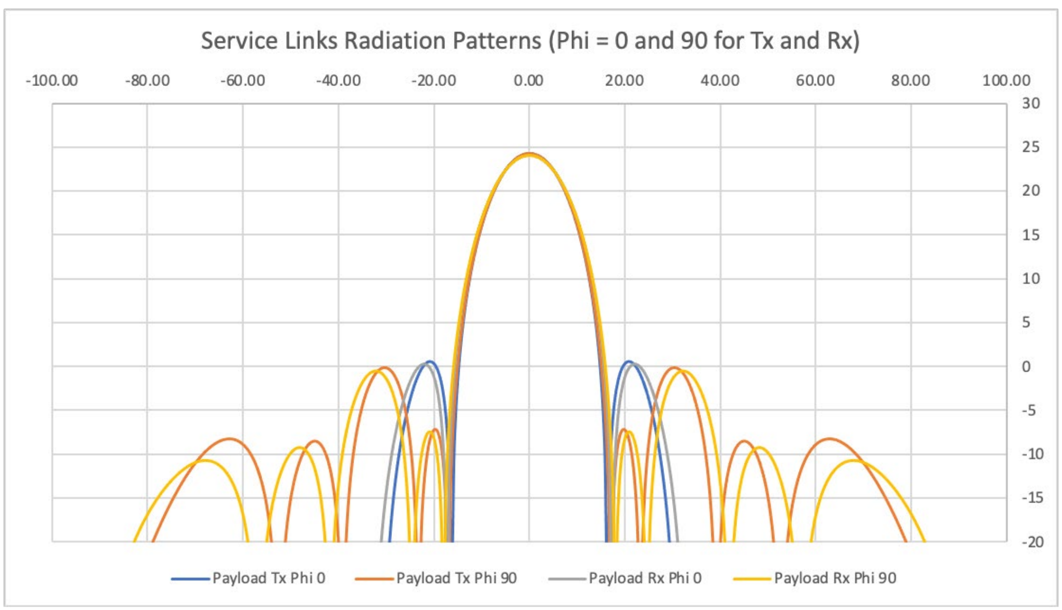


3. UHF Antenna Radiation Patterns

The following radiation pattern is plotted for the 21 dBiC gain antenna for azimuth angles (phi) of zero (0) and ninety (90) degrees relative to boresight, and the pattern demonstrates a 20 dB Chebyshev amplitude taper for peak side lobes just below zero. The amplitude taper on the array may be reconfigured and is dynamic.



The following radiation pattern is plotted for the 24 dBiC gain antenna for azimuth angles (phi) of zero (0) and ninety (90) degrees relative to boresight, and the pattern demonstrates a 25 dB Chebyshev amplitude taper for peak side lobes just below zero. The amplitude taper on the array may be reconfigured and is dynamic.



III. Space Station Design

The satellites in the Lynk Smallsat System are intentionally designed to mitigate any risk of orbital debris so that Lynk's operations contribute to a safe and thriving space environment. In addition to the information provided herein, a detailed Orbital Debris Assessment Report ("ODAR") is included with this application.

A. Satellite Dimensions

The satellites in the Lynk Smallsat System will come in two sizes: the smaller form factor will be 0.15 m by 1 m by 1 m, and the larger form factor will be 0.15 m by 1.5 m by 1.5 m. Consequently, the satellites will maintain the same shape and thickness, while only varying in surface area and volume. The increased surface area provides improved power capabilities and directivity of the antennas. The satellites in the Lynk Smallsat System are technically identical except as otherwise noted in this application.[6] Lynk's accompanying ODAR assumes the largest dimension (0.15 x 1.5 x 1.5 m) for all satellites in the Lynk Smallsat System to provide the most conservative orbital debris evaluation.

B. Orbital Debris Mitigation

To meet and exceed the orbital debris mitigation expectations of both NASA and the FCC, Lynk ongoingly reviews and verifies its satellite design, constellation architecture, and

[6] All satellite components are the same between the smaller and larger form factors, just some of the components will be smaller/larger due to available surface area—e.g., consistent with what was stated above, the size of the Ka-band and UHF-band antennas depend on the size of the satellite.

operations to ensure that none of Lynk's satellites becomes a source of orbital debris risk in the LEO environment.

1. Safe Satellite Design

The satellites in the Lynk Smallsat System are designed with safe space in mind. The satellites will not be comprised of or use deployment or separation systems that require the release or generation of projectiles or debris on orbit. Furthermore, Lynk evaluated the satellite hardware design parameters using the latest version of the NASA Debris Assessment Software (DAS v.3.1.0), and all satellites in the Lynk Smallsat System demonstrate compliance with all NASA standards.

Lynk considered the unlikely possibility that its satellites may become a source of debris in the event of a collision with small debris or meteoroids at which time could result in loss of control of the satellite and timely disposal of the satellite. To mitigate such an event, Lynk designed the satellites with highly capable three-axis attitude determination and control systems ("ADCS") with some satellites possibly hosting a water resistojet propulsion system.[7] The ADCS serve as the actuators for changing the satellite's trajectory and orientation as it traverses orbit, enabling orbital maintenance, collision avoidance, and deorbit maneuvers. The thin and square satellite design and articulated orientation relative to the satellite's velocity vector provide easy support for differential drag maneuvers. If a satellite contains a water resistojet propulsion system on board, it can change the velocity vector by expelling water on

[7] Further explained in the ODAR, some of the satellites in the Lynk Smallsat System may host a water-based resistojet propulsion system to provide increased flexibility for maneuvers.

orbit, resulting in minimal impact because the satellite will not expel any debris during propulsive maneuvers.

The satellites of the Lynk Smallsat System meet the Commission's requirements for end-of-life disposal.

Deorbiting Situation	550 km SSO	500 km Mid-inclination Orbit
Uncontrolled Satellite (very unlikely event)	Demise ≤ 5.17 years	Demise ≤ 2.96 years
Controlled Satellite ADCS only	Demise ≤ 3.60 years	Demise ≤ 2.19 years
Controlled Satellite ADCS and Propulsion	Demise = days to weeks	Demise = days to weeks

Upon re-entering the atmosphere, the satellites of the Lynk Smallsat System will burn up completely before surface impact.

2. Minimizing Accidental Explosions

The satellites in the Lynk Smallsat System have only two points of failure in which stored energy could get released and cause an accidental explosion, and those are the onboard batteries and the water resistojet propulsion system.

Each satellite contains four Lithium-Ion battery packs of ninety-two (92) watt hours each made up of Lithium-Ion cells wired in a series surrounded in an aluminum housing to create a robust twenty-eight (28) volt supply. The over-current protection is set to ten (10) amps, and the battery overcharge protection limits both charging and voltage. The four batteries in each satellite are designed to be mechanically integrated with greater than four (4) inches of physical separation where each battery pack is thermally heat sunk to a separate heat sink on opposite sides of the satellite. Moreover, the cells are designed to vent out the top in the event of over-heating/over-pressure through the positive terminal (button cap). In the unlikely case where cell rupture in the sidewall occurs, the pack-level design includes physical aluminum barriers between cells and a twenty (20) millimeter compliant gap filling material between each cell and the aluminum housing. There are also vent holes in the capture plates at the bottom/top of the battery packs to allow for venting in the case of over-pressure.

Lynk considered and addressed the main failure modes associated with the batteries, which result from: (A) overcharging, (B) over-discharging, (C) under-discharging (D) internal shorts, and (E) external shorts. Solar-battery charger protection circuitry on each battery pack prevents overcharging, under-discharging, and external shorts. A low-voltage-disconnect and a ten (10) amp-current-limiter prevent over-discharging. In the unlikely event of an internal short, the thermal isolation and separation of batteries prevent the possibility of thermal runaway in one battery from causing thermal runaway in another battery. Overall, the physical aluminum separators will prevent a failure from propagating between cells, and the compliant material creates room for venting in the case of over-pressure. Accordingly, for a cell experiencing a catastrophic failure event—e.g., overcharge to the point of venting, or internal/external short resulting in overheating and/or gas venting—the battery-level and cell-level safety protections further mitigate the probability of failure propagation. Therefore, Lynk's design mitigates the various modes of failure that may result in the accidental explosion of the batteries.

With regards to the water resistojet propulsion system, it will store the working fluid at a very low pressure. Specifically, the water in the tank will be stored at less than or equal one-hundred (100) psi. However, the tank that hold the working fluid will be designed to withstand this pressure to a safety factor of thirty (30). Therefore, the propulsion system does not represent a credible point of failure that could result in an explosion.

3. Orbital Characteristics

The supplemental ODAR analysis provides the characteristics of the space station orbits, satellite collision risk, operational procedures/considerations, satellite trackability, etc. in detail.

IV. Engineering Certification

I, Tyghe Speidel, hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in this application, that I am familiar with Part 25 of the Commission's rules, that I have either prepared or reviewed the engineering information submitted in this application, and that it is complete and accurate to the best of my knowledge and belief.

/s/ Tyghe Speidel

Tyghe Speidel
CTO
Lynk Global, Inc.