



312 File Number: **SATLOA2022011100007**

Filing Description

Question	Response
Description	Sherpa-AC1 Filing

**Satellite
Information**

Question	Response
Select Orbit Type	NGSO
Space Station or Satellite Network Name	SHERPA-AC1
Estimated Lifetime of Satellite(s) From Date of Launch	1 Years
Will the space station(s) operate on a Common Carrier basis?	No

**Operating
Frequency
Bands (9)**

Nature of service	Description	Frequency Band (s)	Mode Type
Space Operation Service		8025.0 MHz -8400.0 MHz	Transmit
Radionavigation-Satellite Service		1255.0 MHz -1265.0 MHz	Transmit
Radionavigation-Satellite Service		5010.0 MHz -5030.0 MHz	Transmit
Other Satellite Service (please specify)	Intersatellite Space Service	1615.0 MHz -1617.5 MHz	Transmit
Space Operation Service		2200.0 MHz -2290.0 MHz	Transmit
Space Operation Service		402.0 MHz -403.0 MHz	Receive
Space Operation Service		400.15 MHz -401.0 MHz	Transmit
Space Operation Service		2025.0 MHz -2110.0 MHz	Receive
Space Operation Service		2456.0 MHz -2478.0 MHz	Receive

**Orbital
Information For
Non-
Geostationary
Satellites**

Question	Response
Total Number of Satellites in the active constellation	1
Orbit Epoch Date	01/01/2022
Celestial Reference Body	Earth

Orbital Plane 1:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	97.5 degrees
Right Ascension of Ascending Node	0.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5760.0 seconds
Apogee	525.0 km
Perigee	525.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-90.0 degrees
Active Service Arc End Angle with respect to Ascending Node	90.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0

Receiving Beams 1:

Question	Response
Beam ID	SRX
Receive Beam Frequency	2025.0 MHz -2110.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	4.0 dBi
Antenna Pointing Error	0.01 degrees
Antenna Rotational Error	0.05 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-21.2 dB/K
Min. Saturation Flux Density	-102.8 dBW/m2
Max. Saturation Flux Density	-72.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Visible Earth

Receiving Beams 2:

Question	Response
Beam ID	SRX2
Receive Beam Frequency	2456.0 MHz -2478.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	4.0 dBi
Antenna Pointing Error	0.01 degrees
Antenna Rotational Error	0.05 degrees

Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-21.2 dB/K
Min. Saturation Flux Density	-91.3 dBW/m2
Max. Saturation Flux Density	-78.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Visible Earth

Receiving
Beams 3:

Question	Response
Beam ID	SRX3
Receive Beam Frequency	2025.0 MHz -2110.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	5.5 dBi
Antenna Pointing Error	0.01 degrees
Antenna Rotational Error	0.05 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-19.5 dB/K
Min. Saturation Flux Density	-95.3 dBW/m2
Max. Saturation Flux Density	-72.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Visible Earth

Receiving

Beams 4:

Question	Response
Beam ID	URX
Receive Beam Frequency	402.86 MHz -402.94 MHz
Beam Type	Fixed
Polarization	H
Peak Gain	1.8 dBi
Antenna Pointing Error	0.01 degrees
Antenna Rotational Error	0.05 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
G/T at Max. Gain Point	-23.4 dB/K
Min. Saturation Flux Density	-111.4 dBW/m2
Max. Saturation Flux Density	-88.1 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Visible Earth

Receiving
Channels (11)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
SU14	0.3	2053.0	TT&C
SU15	0.3	2056.0	TT&C
SU31	5.0	2047.5	TT&C
SU32	5.0	2054.0	TT&C
SU11	0.3	2046.0	TT&C
SU13	0.3	2050.0	TT&C
SU12	0.3	2048.0	TT&C
UU1	0.04	402.9	TT&C
SU21	22.0	2467.0	TT&C
SU16	0.3	2075.0	TT&C
SU33	5.0	2075.0	TT&C

**Transmitting
Beams 1:**

Question	Response
Beam ID	LTX
Transmit Beam Frequency	1615.0 MHz -1617.5 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	5.0 dBi
Antenna Pointing Error	1.0 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-69.0 dBW/Hz
Max. Transmit EIRP	0.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	Visible Earth

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
* (dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):	(dBW/m ² /BW):
4.0 kHz	-170.5	-168.8	-167.2	-165.8	-164.6	-158.3

**Transmitting
Beams 2:**

Question	Response
Beam ID	STX
Transmit Beam Frequency	2200.0 MHz -2290.0 MHz

Beam Type	Fixed
Polarization	RHCP
Peak Gain	5.5 dBi
Antenna Pointing Error	0.01 degrees
Antenna Rotational Error	0.05 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-55.3 dBW/Hz
Max. Transmit EIRP	4.7 dBW
Co- or Cross Polar Mode	C
Service Area Description	Visible Earth

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²
	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
4.0 kHz	-156.6	-154.8	-153.2	-151.8	-150.5	-144.2

Transmitting Beams 3:

Question	Response
Beam ID	UTX
Transmit Beam Frequency	400.46 MHz -400.54 MHz
Beam Type	Fixed
Polarization	H
Peak Gain	2.1 dBi
Antenna Pointing Error	0.0 degrees

Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
Max. Transmit EIRP Density	-38.9 dBW/Hz
Max. Transmit EIRP	7.1 dBW
Co- or Cross Polar Mode	C
Service Area Description	Visible Earth

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²	(dBW/m ²
* BW:	/BW):	/BW):	/BW):	/BW):	/BW):	/BW):
4.0 kHz	-156.9	-155.2	-153.6	-152.2	-151.0	-144.7

Transmitting Beams 4:

Question	Response
Beam ID	XTX
Transmit Beam Frequency	8025.0 MHz -8400.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	13.1 dBi
Antenna Pointing Error	0.01 degrees
Antenna Rotational Error	0.05 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-58.9 dBW/Hz

Max. Transmit EIRP	18.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	Visible Earth

Max. Power Flux Density

	* 0° - 5° (dBW/m ² /BW):	* 5° - 10° (dBW/m ² /BW):	* 10° - 15° (dBW/m ² /BW):	* 15° - 20° (dBW/m ² /BW):	* 20° - 25° (dBW/m ² /BW):	* 25° - 90° (dBW/m ² /BW):
* BW:						
4.0 kHz	-160.5	-158.8	-157.2	-155.8	-154.6	-148.3

Transmitting Beams 5:

Question	Response
Beam ID	LTX2
Transmit Beam Frequency	1255.0 MHz -1265.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	5.6 dBi
Antenna Pointing Error	0.0 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-50.5 dBW/Hz
Max. Transmit EIRP	19.5 dBW
Co- or Cross Polar Mode	C
Service Area Description	Visible Earth

Max. Power Flux Density

Transmitting
Beams 6:

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
* BW:	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):
4.0 kHz	-151.8	-150.0	-148.4	-147.0	-145.7	-139.4

Question	Response
Beam ID	CTX
Transmit Beam Frequency	5010.0 MHz -5030.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	5.2 dBi
Antenna Pointing Error	0.0 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-53.8 dBW/Hz
Max. Transmit EIRP	19.2 dBW
Co- or Cross Polar Mode	C
Service Area Description	Visible Earth

Max. Power Flux Density

	* 0° - 5°	* 5° - 10°	* 10° - 15°	* 15° - 20°	* 20° - 25°	* 25° - 90°
* BW:	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):	(dbW/m ² /BW):
4.0 kHz	-155.1	-153.3	-151.7	-150.3	-149.0	-142.7

**Transmitting
Channels (23)**

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
UD1	0.04	400.5	TT&C
SD14	0.3	2245.0	TT&C
ISL1	2.5	1616.25	TT&C
XD1	50.0	8062.5	Service Link
XD2	50.0	8112.5	Service Link
XD3	50.0	8162.5	Service Link
XD5	50.0	8262.5	Service Link
SD27	1.0	2287.5	TT&C
SD26	1.0	2272.5	TT&C
SD25	1.0	2250.0	TT&C
SD24	1.0	2245.0	TT&C
SD23	1.0	2217.5	TT&C
SD17	0.3	2287.5	TT&C
SD16	0.3	2272.5	TT&C
SD15	0.3	2250.0	TT&C
SD13	0.3	2217.5	TT&C
SD12	0.3	2212.5	TT&C
SD11	0.3	2207.5	TT&C
SD21	1.0	2207.5	TT&C
SD22	1.0	2212.5	TT&C
CD1	20.0	5020.0	Service Link
LD1	10.0	1260.0	Service Link
XD4	50.0	8212.5	Service Link

Certification Questions

Question	Response
Are the applicable service area coverage requirements of 25.143(b)(2) (ii) and (iii), or 25.144(a)(3)(i), or 25.145 (c)(1) and (2), or 25.146(i)(1) and (2), or 25.148(c), or 25.225 met?	N/A
Are the applicable frequency tolerances of 25.202(e) and out-of-band emission limits of 25.202(f)(1),(2), and (3) met?	Yes
Are the cessation of emissions requirements of 25.207 met?	Yes
Are the applicable power-flux-density limits of 25.208 met, and is the appropriate technical showing provided within the application?	Yes
For NGSO applications, are the applicable equivalent-power-flux-density limits of 25.208 met, and is the appropriate technical showing provided within the application?	N/A
Are the applicable full-frequency-reuse requirements of 25.210 met?	
If the application is for a 17/24 GHz BSS space station, will it be operated at an offset location with full power and interference protection in accordance with 25.262(b)?	

Attachments

File Name	Beam	Field	Attachment Type	Description
<u>SHERPA-AC1_FCC_GIMS.mdb</u>		NGSO Antenna Gain Data	GIMS file (*.mdb)	GIMS Database with beam projections for all beams in Schedule S. Beams were created as GSO beam projections in order to provide actual contours but contours reflect beam projection from NGSO orbit.