



312 File Number: **SATLOA2022092000112**

Filing Description

Question	Response
----------	----------

Description	Applicant requests authorization for 10 new EESS satellites operating in a single orbital plane at an altitude of 406 km (plus or minus 2 km) communicating in the S-band, X-band, and Ka-band, with C-band inter-satellite links.
-------------	--

Satellite
Information

Question	Response
Select Orbit Type	NGSO
Space Station or Satellite Network Name	Tanager satellite network
Estimated Lifetime of Satellite(s) From Date of Launch	5 Years
Will the space station(s) operate on a Common Carrier basis?	No

**Operating
Frequency
Bands (5)**

Nature of service	Description	Frequency Band (s)	Mode Type
Earth Exploration-Satellite Service		2025.0 MHz -2110.0 MHz	Receive
Earth Exploration-Satellite Service		8025.0 MHz -8400.0 MHz	Transmit
Earth Exploration-Satellite Service		25500.0 MHz -27000.0 MHz	Transmit
Other Satellite Service (please specify)	Inter-Satellite Service	4000.0 MHz -4200.0 MHz	Receive
Other Satellite Service (please specify)	Inter-Satellite Service	6225.0 MHz -6425.0 MHz	Transmit

**Orbital
Information For
Non-
Geostationary
Satellites**

Question	Response
Total Number of Satellites in the active constellation	10
Orbit Epoch Date	05/29/2025
Celestial Reference Body	Earth

Orbital Plane 1:

Question	Response
Number of Satellites in Plane	10
Inclination Angle	97.05 degrees
Right Ascension of Ascending Node	67.166 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5561.0 seconds
Apogee	406.0 km
Perigee	406.0 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	195.1495
2	14.4774
3	232.7961
4	159.5206
5	50.8274
6	338.137
7	302.5897
8	119.0896
9	86.0966
10	267.9307

Receiving Beams 1:

Question	Response
Beam ID	SLSU
Receive Beam Frequency	2025.0 MHz -2110.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	5.0 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
G/T at Max. Gain Point	-22.5 dB/K
Min. Saturation Flux Density	-999.9 dBW/m2
Max. Saturation Flux Density	0.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	XVE

Receiving Beams 2:

Question	Response
Beam ID	SHSU
Receive Beam Frequency	2025.0 MHz -2110.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	5.0 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
G/T at Max. Gain Point	-22.5 dB/K
Min. Saturation Flux Density	-999.9 dBW/m2
Max. Saturation Flux Density	0.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	XVE

Receiving
Beams 3:

Question	Response
Beam ID	CBR2
Receive Beam Frequency	4000.0 MHz -4200.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	12.0 dBi
Antenna Pointing Error	0.0 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-11.0 dB/K
Min. Saturation Flux Density	-999.9 dBW/m2
Max. Saturation Flux Density	0.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	XVE

Receiving

Beams 4:

Question	Response
Beam ID	CBR1
Receive Beam Frequency	4000.0 MHz -4200.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	3.0 dBi
Antenna Pointing Error	0.0 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-24.0 dB/K
Min. Saturation Flux Density	-999.9 dBW/m2
Max. Saturation Flux Density	0.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	XVE

Receiving
Channels (6)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
SLS2	0.2	2066.6	TT&C
SLS1	0.2	2056.6	TT&C
CBC2	2.0	4100.0	Service Link
SHS2	1.1	2096.1	TT&C
SHS1	1.1	2086.1	TT&C
CBC1	2.0	4100.0	Service Link

Transmitting
Beams 1:

Question	Response
Beam ID	KAT2
Transmit Beam Frequency	25500.0 MHz -27000.0 MHz
Beam Type	Fixed
Polarization	LHCP
Peak Gain	32.0 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	-59.5 dBW/Hz
Max. Transmit EIRP	32.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	XVE

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):
1.0 MHz	-135.7	-133.7	-132.0	-130.5	-129.1	-122.7

Transmitting
Beams 2:

Question	Response
Beam ID	KAT1
Transmit Beam Frequency	25500.0 MHz -27000.0 MHz

Beam Type	Fixed
Polarization	RHCP
Peak Gain	32.0 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	-59.5 dBW/Hz
Max. Transmit EIRP	32.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	XVE

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):
1.0 MHz	-135.7	-133.7	-132.0	-130.5	-129.1	-122.7

Transmitting Beams 3:

Question	Response
Beam ID	CBTB
Transmit Beam Frequency	6225.0 MHz -6425.0 MHz
Beam Type	Fixed
Polarization	LHCP
Peak Gain	3.0 dBi
Antenna Pointing Error	0.0 degrees

Antenna Rotational Error	0.0 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-60.0 dBW/Hz
Max. Transmit EIRP	3.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	XVE

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	-160.2	-158.2	-156.5	-155.0	-153.6	-147.2

Transmitting Beams 4:

Question	Response
Beam ID	XTB
Transmit Beam Frequency	8025.0 MHz -8400.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	5.0 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	-55.0 dBW/Hz

Max. Transmit EIRP	0.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	XVE

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	-155.2	-153.2	-151.5	-149.9	-148.6	-142.1

**Transmitting
Channels (35)**

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
KA31	86.4	26761.6	Service Link
KA23	86.4	26070.4	Service Link
KA24	86.4	26156.8	Service Link
KA25	86.4	26243.2	Service Link
KA26	86.4	26329.6	Service Link
KA22	86.4	25984.0	Service Link
KA32	86.4	26848.0	Service Link
KA30	86.4	26675.2	Service Link
KA29	86.4	26588.8	Service Link
KA28	86.4	26502.4	Service Link
KA27	86.4	26416.0	Service Link
KA21	86.4	25897.6	Service Link
KA20	86.4	25811.2	Service Link
KA19	86.4	25724.8	Service Link
KA18	86.4	25638.4	Service Link
KA17	86.4	25552.0	Service Link
CTB1	2.0	6325.0	Service Link
KA1	86.4	25552.0	Service Link
KA10	86.4	26329.6	Service Link
KA11	86.4	26416.0	Service Link
KA12	86.4	26502.4	Service Link
KA13	86.4	26588.8	Service Link
KA14	86.4	26675.2	Service Link
KA15	86.4	26761.6	Service Link

KA16	86.4	26848.0	Service Link
KA2	86.4	25638.4	Service Link
KA3	86.4	25724.8	Service Link
KA4	86.4	25811.2	Service Link
KA5	86.4	25897.6	Service Link
KA6	86.4	25984.0	Service Link
KA7	86.4	26070.4	Service Link
KA8	86.4	26156.8	Service Link
KA9	86.4	26243.2	Service Link
XTB2	0.2	8040.0	TT&C
XTB1	0.2	8030.0	TT&C

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?	Yes
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>Tanager_S-band_(2025-2110_MHz)_antenna_pattern.pdf</u>	SLSU	NGSO Antenna Gain Data	PDF file (*.pdf)	
<u>Tanager_X-band_(8025-8400_MHz)_antenna_pattern.pdf</u>	XTB	NGSO Antenna Gain Data	PDF file (*.pdf)	X-band Antenna Pattern
<u>Tanager_C-band_(4000-4200_MHz) _low_gain_antenna_pattern.pdf</u>	CBR1	NGSO Antenna Gain Data	PDF file (*.pdf)	C-band Low Gain Antenna Pattern
<u>Tanager_C-band_(4000-4200_MHz) _high_gain_antenna_pattern.pdf</u>	CBR2	NGSO Antenna Gain Data	PDF file (*.pdf)	C-band High Gain Antenna Pattern
<u>Tanager_C-band_(6225-6425_MHz)_antenna_pattern.pdf</u>	CBTB	NGSO Antenna Gain Data	PDF file (*.pdf)	C-band Antenna Pattern
<u>Tanager_Ka-band_(25.5-27_GHz) _RHCP_antenna_patterns.pdf</u>	KAT1	NGSO Antenna Gain Data	PDF file (*.pdf)	Ka-band RHCP Antenna Pattern
<u>Tanager_Ka-band_(25.5-27_GHz) _LHCP_antenna_patterns.pdf</u>	KAT2	NGSO Antenna Gain Data	PDF file (*.pdf)	Ka-band LHCP Antenna Pattern
<u>Tanager_S-band_(2025-2110_MHz)_antenna_pattern.pdf</u>	SHSU	NGSO Antenna Gain Data	PDF file (*.pdf)	