



312 File Number: **SATSTA2023041200082**

Filing Description

Question	Response
Description	Modification of TTC frequencies and addition of TTC channel for the Arcturus satellite

Satellite
Information

Question	Response
Select Orbit Type	GSO
Space Station or Satellite Network Name	ARCTURUS
Estimated Lifetime of Satellite(s) From Date of Launch	10 Years
Will the space station(s) operate on a Common Carrier basis?	No

Operating
Frequency
Bands (2)

Nature of service	Description	Frequency Band(s)	Mode Type
Fixed-Satellite Service		28000.0 MHz -30000.0 MHz	Receive
Fixed-Satellite Service		18200.0 MHz -20200.0 MHz	Transmit

**Orbital
Information For
Geostationary
Satellites**

Section	Question	Response
Orbital Longitude Information	Orbital Longitude	163.0 degrees
	Hemisphere of Orbital Longitude	W
Longitudinal Tolerance or East /West Station-Keeping	Toward West	0.05 degrees
	Toward East	0.05 degrees
Inclination Excursion or North /South Station-Keeping Tolerance	Inclination Excursion or North /South Station-Keeping Tolerance	0.1 degrees
Antenna Axis Attitude Accuracy	Roll	0.1 degrees
	Pitch	0.1 degrees
	Yaw	0.1 degrees

Receiving Beams 1:

Question	Response
Beam ID	CRK
Receive Beam Frequency	28351.0 MHz -28353.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	8.0 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-25.4 dB/K
Min. Saturation Flux Density	-82.0 dBW/m2
Max. Saturation Flux Density	-74.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Eagle Mountain, Utah

Receiving Beams 2:

Question	Response
Beam ID	FRG1
Receive Beam Frequency	28000.0 MHz -30000.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	46.7 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees

Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	17.0 dB/K
Min. Saturation Flux Density	-93.0 dBW/m2
Max. Saturation Flux Density	-73.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Eagle Mountain, Utah

Receiving Beams 3:

Question	Response
Beam ID	FRG2
Receive Beam Frequency	28000.0 MHz -30000.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	46.6 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	17.2 dB/K
Min. Saturation Flux Density	-93.0 dBW/m2
Max. Saturation Flux Density	-73.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Eagle Mountain, Utah

Receiving

Beams 4:

Question	Response
Beam ID	CRA
Receive Beam Frequency	28354.0 MHz -28356.0 MHz
Beam Type	Fixed
Polarization	LHCP
Peak Gain	8.0 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-25.4 dB/K
Min. Saturation Flux Density	-82.0 dBW/m2
Max. Saturation Flux Density	-74.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Eagle Mountain, Utah

Receiving Beams 5:

Question	Response
Beam ID	CRRB
Receive Beam Frequency	28000.0 MHz -30000.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	48.3 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	19.0 dB/K
Min. Saturation Flux Density	-93.0 dBW/m2
Max. Saturation Flux Density	-73.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Alaska and coastal cruise routes down to Seattle

Receiving Beams 6:

Question	Response
Beam ID	CRRC
Receive Beam Frequency	28000.0 MHz -30000.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	48.8 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	20.1 dB/K
Min. Saturation Flux Density	-93.0 dBW/m2
Max. Saturation Flux Density	-73.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Alaska and coastal cruise routes down to Seattle

Receiving Beams 7:

Question	Response
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Beam ID	CRRD
Receive Beam Frequency	28000.0 MHz -30000.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	48.7 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	19.9 dB/K
Min. Saturation Flux Density	-93.0 dBW/m2
Max. Saturation Flux Density	-73.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Alaska and coastal cruise routes down to Seattle

Receiving Beams 8:

Question	Response
Beam ID	CRRE
Receive Beam Frequency	28000.0 MHz -30000.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	48.6 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees

Receiving Beams 9:

G/T at Max. Gain Point	19.8 dB/K
Min. Saturation Flux Density	-93.0 dBW/m2
Max. Saturation Flux Density	-73.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Alaska and coastal cruise routes down to Seattle

Question	Response
Beam ID	CRRF
Receive Beam Frequency	28000.0 MHz -30000.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	48.3 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	18.8 dB/K
Min. Saturation Flux Density	-93.0 dBW/m2
Max. Saturation Flux Density	-73.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Alaska and coastal cruise routes down to Seattle

Receiving
Channels (6)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
CRK	2.0	28352.0	TT&C
CRA	2.0	28355.0	TT&C
FRG0	1100.0	28550.0	Feeder Link
FRG1	750.0	29625.0	Feeder Link
RRD0	1100.0	28550.0	Service Link
RRD1	700.0	29650.0	Service Link

Transmitting
Beams 1:

Question	Response
Beam ID	CFTB
Transmit Beam Frequency	18200.0 MHz -20200.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	44.2 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-17.4 dBW/Hz
Max. Transmit EIRP	62.6 dBW
Co- or Cross Polar Mode	C
Service Area Description	Alaska and coastal cruise routes down to Seattle

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	-143.6	-143.6	-136.6	-128.6	-126.6	-126.6

Transmitting
Beams 2:

Question	Response
Beam ID	CFTE
Transmit Beam Frequency	18200.0 MHz -20200.0 MHz

Beam Type	Spot
Polarization	LHCP
Peak Gain	44.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-17.4 dBW/Hz
Max. Transmit EIRP	62.6 dBW
Co- or Cross Polar Mode	C
Service Area Description	Alaska and coastal cruise routes down to Seattle

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):
1.0 MHz	-124.5	-122.9	-121.5	-120.2	-121.0	-121.0

Transmitting Beams 3:

Question	Response
Beam ID	CFTF
Transmit Beam Frequency	18200.0 MHz -20200.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	44.2 dBi
Antenna Pointing Error	0.1 degrees

Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-17.4 dBW/Hz
Max. Transmit EIRP	62.6 dBW
Co- or Cross Polar Mode	C
Service Area Description	Alaska and coastal cruise routes down to Seattle

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):
1.0 MHz	-128.1	-126.8	-124.8	-123.1	-123.1	-123.1

Transmitting Beams 4:

Question	Response
Beam ID	CRTG
Transmit Beam Frequency	18200.0 MHz -20200.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	43.6 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees

Max. Transmit EIRP Density	-19.1 dBW/Hz
Max. Transmit EIRP	60.9 dBW
Co- or Cross Polar Mode	C
Service Area Description	Eagle Mountain, Utah

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):
1.0 MHz	-133.5	-132.0	-130.9	-129.2	-129.1	-129.1

Transmitting Beams 5:

Question	Response
Beam ID	CTA
Transmit Beam Frequency	19701.0 MHz -19703.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	8.0 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-26.1 dBW/Hz
Max. Transmit EIRP	10.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	Eagle Mountain, Utah

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):
1.0 MHz	-155.2	-155.1	-155.0	-155.0	-154.9	-154.2

Transmitting Beams 6:

Question	Response
Beam ID	CFTC
Transmit Beam Frequency	18200.0 MHz -20200.0 MHz
Beam Type	Spot
Polarization	LHCP
Peak Gain	44.4 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-17.4 dBW/Hz
Max. Transmit EIRP	62.6 dBW
Co- or Cross Polar Mode	C
Service Area Description	Alaska and coastal cruise routes down to Seattle

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):

1.0 MHz	-126.4	-124.4	-122.4	-120.9	-120.4	-120.4
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**Transmitting
Beams 7:**

Question	Response
Beam ID	CFTD
Transmit Beam Frequency	18200.0 MHz -20200.0 MHz
Beam Type	Spot
Polarization	RHCP
Peak Gain	44.7 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-17.4 dBW/Hz
Max. Transmit EIRP	62.6 dBW
Co- or Cross Polar Mode	C
Service Area Description	Alaska and coastal cruise routes down to Seattle

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):
1.0 MHz	-122.6	-121.9	-120.6	-119.9	-121.1	-121.1

**Transmitting
Beams 8:**

Question	Response
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Beam ID	CTK
Transmit Beam Frequency	19704.0 MHz -19706.0 MHz
Beam Type	Fixed
Polarization	LHCP
Peak Gain	8.0 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-26.1 dBW/Hz
Max. Transmit EIRP	10.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	Eagle Mountain, Utah

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):
1.0 MHz	-156.4	-156.3	-156.2	-156.2	-156.1	-155.4

Transmitting
Channels (6)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
CTK	2.0	19705.0	TT&C
CTA	2.0	19702.0	TT&C
FTC0	1100.0	18750.0	Service Link
FTC1	500.0	19950.0	Service Link
RTG0	1200.0	18800.0	Feeder Link
RTG1	600.0	19900.0	Feeder 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?	Yes
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>Arcturus</u> <u>GXT.</u> <u>mdb</u>		GSO Antenna Gain Contour Data	GIMS file (*.mdb)	GXT files for Arcturus transmit and receive beams except for beams where the contour at 8 dB below peak falls entirely beyond the edge of the visible Earth.