Approved by OMB 3060-0678
Estimated Burden: up to 80 hours
April 2016

Federal Communications Commission

312 File Number: **SATMOD2021051200067**

Filing Description

Question	Response
Description	Capella SAR Constellation Block 2 (Mod)

Satellite Information

Question	Response
Select Orbit Type	NGSO
Space Station or Satellite Network Name	Capella SAR Constellation
Estimated Lifetime of Satellite(s) From Date of Launch	3 Years
Will the space station(s) operate on a Common Carrier basis?	No

Operating Frequency Bands (6)

Nature of service	Description	Frequency Band (s)	Mode Type
Earth Exploration-Satellite Service		9300.0 MHz -9900.0 MHz	Transmit
Earth Exploration-Satellite Service		8025.0 MHz -8400.0 MHz	Transmit
Earth Exploration-Satellite Service		8025.0 MHz -8400.0 MHz	Transmit
Other Satellite Service (please specify)	Inter-Satellite Service	1626.5 MHz -1660.0 MHz	Transmit
Earth Exploration-Satellite Service		2035.0 MHz -2037.0 MHz	Receive
Other Satellite Service (please specify)	Inter-Satellite Service	1525.0 MHz -1559.0 MHz	Receive

Orbital Information For Non-Geostationary Satellites

Question	Response
Total Number of Satellites in the active constellation	2
Orbit Epoch Date	05/17/2021
Celestrial Reference Body	Earth

Orbital Plane 1:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	97.5 degrees
Right Ascension of Ascending Node	259.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5708.0 seconds
Apogee	525.0 km
Perigee	525.0 km
Active Service Arc Begin Angle with respect to Ascending Node	0.0 degrees
Active Service Arc End Angle with respect to Ascending Node	0.0 degrees

Mean Anomaly For Each Satellite

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

Orbital Plane 2:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	53.0 degrees
Right Ascension of Ascending Node	106.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5770.0 seconds
Apogee	575.0 km
Perigee	575.0 km
Active Service Arc Begin Angle with respect to Ascending Node	0.0 degrees
Active Service Arc End Angle with respect to Ascending Node	0.0 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	ISL1
Receive Beam Frequency	1525.0 MHz -1559.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	9.0 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	-18.6 dB/K
Min. Saturation Flux Density	-0.1 dBW/m2
Max. Saturation Flux Density	0.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global

Receiving Beams 2:

Question	Response
Beam ID	RX1
Receive Beam Frequency	2035.3 MHz -2036.7 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	4.3 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	-23.4 dB/K
Min. Saturation Flux Density	-0.1 dBW/m2
Max. Saturation Flux Density	0.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global

Receiving Channels (2)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
TTC0	1.4	2036.0	Service Link
ISL0	34.0	1542.0	TT&C

Transmitting Beams 1:

Question	Response
Beam ID	ISL
Transmit Beam Frequency	1626.5 MHz -1660.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	9.5 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	-29.5 dBW/Hz
Max. Transmit EIRP	8.5 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global

Max. Power Flux Density

* BW:	* 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):
4.0 kHz	-146.6	-144.9	-143.4	-142.1	-140.8	-134.7

Transmitting Beams 2:

Question	Response
Beam ID	PDL
Transmit Beam Frequency	8043.75 MHz -8381.25 MHz

Beam Type	Fixed
Polarization	LHCP
Peak Gain	20.6 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	-55.8 dBW/Hz
Max. Transmit EIRP	26.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global

Max. Power Flux Density

* BW:	* 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):
4.0 kHz	-159.1	-157.4	-155.9	-154.6	-153.3	-147.2

Transmitting Beams 3:

Question	Response
Beam ID	SAR
Transmit Beam Frequency	9300.0 MHz -9900.0 MHz
Beam Type	Fixed
Polarization	V
Peak Gain	48.2 dBi
Antenna Pointing Error	0.1 degrees

Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
Max. Transmit EIRP Density	-10.99 dBW/Hz
Max. Transmit EIRP	76.0 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global

Max. Power Flux Density

* BW:	* 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):
4.0 kHz	-113.1	-111.4	-109.9	-108.5	-107.3	-101.2

Transmitting Beams 4:

Question	Response
Beam ID	TTC
Transmit Beam Frequency	8026.3 MHz -8027.7 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	5.6 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	-56.96 dBW/Hz

Max. Transmit EIRP	4.5 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global

Max. Power Flux Density

* BW:	* 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):
4.0 kHz	-159.1	-157.4	-155.9	-154.5	-153.3	-147.1

Transmitting Channels (4)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
TTC	1.4	8027.0	TT&C
SAR	600.0	9600.0	Service Link
ISL	33.5	1643.25	TT&C
PDL	337.5	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
comms_bahrain[1].gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)	
comms_awarua[1].gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)	
comms_australia[1].gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)	
comms_athens[1].gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)	
idrs_svalsat.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)	
ttnc_trollsat.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)	
ttnc_punta_arenas.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)	
comms_capella_boulder[1].gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)	
comms_capella_san_francisco[1].gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)	

idrs_awarua.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)
idrs_bahrain.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)
idrs_capella_boulder.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)
idrs_capella_san_francisco.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)
idrs_hartebeesthoek.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)
idrs_hawaii.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)
idrs_ireland.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)
idrs_ohio.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)
idrs_oregon.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)
idrs_south_africa.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)

ttnc_sweden.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)
ttnc_svalsat.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)
ttnc_south_africa.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)
ttnc_oregon.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)
ttnc_ohio.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)
ttnc_ireland.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)
ttnc_hawaii.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)
ttnc_hartebeesthoek.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)
ttnc_capella_san_francisco.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)
ttnc_bahrain.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)

ttnc_awarua.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)
ttnc_australia.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)
ttnc_athens.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)
sar_trollsat.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)
sar_sweden.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)
sar_svalsat.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)
sar_south_africa.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)
sar_punta_arenas.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)
sar_oregon.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)
sar_ohio.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)

sar_ireland.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)
sar_hawaii.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)
sar_hartebeesthoek.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)
sar_capella_san_francisco.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)
sar_capella_boulder.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)
sar_australia.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)
sar_athens.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)
idrs_sweden.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)
idrs_trollsat.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)
sar_awarua.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)

sar_bahrain.gxt	SAR	NGSO Antenna Gain Data	GXT file (*.gxt)
ttnc_capella_boulder.gxt	TTC	NGSO Antenna Gain Data	GXT file (*.gxt)
idrs_punta_arenas.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)
idrs_australia.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)
idrs_athens.gxt	ISL	NGSO Antenna Gain Data	GXT file (*.gxt)
comms_sweden.gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)
comms_trollsat.gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)
comms_svalsat.gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)
comms_south_africa.gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)
comms_punta_arenas.gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)

comms_oregon.gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)
comms_ohio.gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)
comms_ireland[1].gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)
comms_hawaii[1].gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)
comms_hartebeesthoek[1].gxt	PDL	NGSO Antenna Gain Data	GXT file (*.gxt)