



312 File Number: **SATLOA2023030700048**

---

## Filing Description

| Question    | Response                                   |
|-------------|--------------------------------------------|
| Description | Capella SAR Constellation (Acadia 1 and 2) |

---

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 |
|------------------------------------------|-------------------------|-------------------------|-----------|
| Other Satellite Service (please specify) | Inter-Satellite Service | 1525.0 MHz -1559.0 MHz  | Receive   |
| Earth Exploration-Satellite Service      |                         | 2035.0 MHz -2037.0 MHz  | Receive   |
| Other Satellite Service (please specify) | Inter-Satellite Service | 1626.5 MHz -1660.0 MHz  | Transmit  |
| Earth Exploration-Satellite Service      |                         | 8025.0 MHz -8400.0 MHz  | Transmit  |
| Earth Exploration-Satellite Service      |                         | 8025.0 MHz -8400.0 MHz  | Transmit  |
| Earth Exploration-Satellite Service      |                         | 9300.0 MHz -10000.0 MHz | Transmit  |

**Orbital  
Information For  
Non-  
Geostationary  
Satellites**

| Question                                               | Response   |
|--------------------------------------------------------|------------|
| Total Number of Satellites in the active constellation | 2          |
| Orbit Epoch Date                                       | 06/30/2023 |
| Celestial Reference Body                               | Earth      |

**Orbital Plane 1:**

| Question                                                      | Response       |
|---------------------------------------------------------------|----------------|
| Number of Satellites in Plane                                 | 2              |
| Inclination Angle                                             | 49.0 degrees   |
| Right Ascension of Ascending Node                             | 293.0 degrees  |
| Argument of Perigee                                           | 0.0 degrees    |
| Orbital Period                                                | 5801.0 seconds |
| Apogee                                                        | 600.0 km       |
| Perigee                                                       | 600.0 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                | 180.0                                          |
| 2                | 0.0                                            |

## Receiving Beams 1:

| 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 Beams 2:

| 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  
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                                                 | PDLL                     |
| 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                              | -57.98 dBW/Hz            |
| Max. Transmit EIRP                                      | 26.0 dBW                 |
| Co- or Cross Polar Mode                                 | C                        |
| Service Area Description                                | Global                   |

Max. Power Flux Density

|                             | * 0° - 5°                 | * 5° - 10°                | * 10° - 15°               | * 15° - 20°               | * 20° - 25°               | * 25° - 90°               |
|-----------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| * (dBW/m <sup>2</sup> /BW): | (dBW/m <sup>2</sup> /BW): | (dBW/m <sup>2</sup> /BW): | (dBW/m <sup>2</sup> /BW): | (dBW/m <sup>2</sup> /BW): | (dBW/m <sup>2</sup> /BW): | (dBW/m <sup>2</sup> /BW): |
| 4.0 kHz                     | -158.1                    | -156.1                    | -154.4                    | -152.8                    | -151.5                    | -145.0                    |

Transmitting  
Beams 2:

| 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

|                             | * 0° - 5°                 | * 5° - 10°                | * 10° - 15°               | * 15° - 20°               | * 20° - 25°               | * 25° - 90°               |
|-----------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| * (dBW/m <sup>2</sup> /BW): | (dBW/m <sup>2</sup> /BW): | (dBW/m <sup>2</sup> /BW): | (dBW/m <sup>2</sup> /BW): | (dBW/m <sup>2</sup> /BW): | (dBW/m <sup>2</sup> /BW): | (dBW/m <sup>2</sup> /BW): |
| 4.0 kHz                     | -158.1                    | -156.1                    | -154.4                    | -152.8                    | -151.5                    | -145.0                    |

Transmitting Beams 3:

| Question                | Response                |
|-------------------------|-------------------------|
| Beam ID                 | SAR                     |
| Transmit Beam Frequency | 9300.0 MHz -10000.0 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                              | 0.0 dBW/Hz  |
| Max. Transmit EIRP                                      | 78.0 dBW    |
| Co- or Cross Polar Mode                                 | C           |
| Service Area Description                                | Global      |

Max. Power Flux Density

|         | * 0° - 5°           | * 5° - 10°          | * 10° - 15°         | * 15° - 20°         | * 20° - 25°         | * 25° - 90°         |
|---------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|         | (dBW/m <sup>2</sup> | (dBW/m <sup>2</sup> | (dBW/m <sup>2</sup> | (dBW/m <sup>2</sup> | (dBW/m <sup>2</sup> | (dBW/m <sup>2</sup> |
| * BW:   | /BW):               | /BW):               | /BW):               | /BW):               | /BW):               | /BW):               |
| 4.0 kHz | -92.1               | -90.1               | -88.4               | -86.8               | -85.5               | -79.1               |

Transmitting Beams 4:

| 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**

|         | * 0° - 5°           | * 5° - 10°          | * 10° - 15°         | * 15° - 20°         | * 20° - 25°         | * 25° - 90°         |
|---------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|         | (dBW/m <sup>2</sup> | (dBW/m <sup>2</sup> | (dBW/m <sup>2</sup> | (dBW/m <sup>2</sup> | (dBW/m <sup>2</sup> | (dBW/m <sup>2</sup> |
| * BW:   | /BW):               | /BW):               | /BW):               | /BW):               | /BW):               | /BW):               |
| 4.0 kHz | -144.6              | -142.7              | -140.9              | -139.4              | -138.0              | -131.5              |

**Transmitting Beams 5:**

| Question                                                | Response                 |
|---------------------------------------------------------|--------------------------|
| Beam ID                                                 | PDLR                     |
| Transmit Beam Frequency                                 | 8043.75 MHz -8381.25 MHz |
| Beam Type                                               | Fixed                    |
| Polarization                                            | RHCP                     |
| 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                              | -57.98 dBW/Hz            |
| Max. Transmit EIRP                                      | 26.0 dBW                 |
| Co- or Cross Polar Mode                                 | C                        |
| Service Area Description                                | Global                   |

**Max. Power Flux Density**

|            | * 0° - 5°           | * 5° - 10°          | * 10° - 15°         | * 15° - 20°         | * 20° - 25°         | * 25° - 90°         |
|------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|            | (dbW/m <sup>2</sup> | (dbW/m <sup>2</sup> | (dbW/m <sup>2</sup> | (dbW/m <sup>2</sup> | (dbW/m <sup>2</sup> | (dbW/m <sup>2</sup> |
| *<br>BW:   | /BW):               | /BW):               | /BW):               | /BW):               | /BW):               | /BW):               |
| 4.0<br>kHz | -158.1              | -156.1              | -154.4              | -152.8              | -151.5              | -145.0              |

---

Transmitting  
Channels (5)

| Channel ID | Channel Bandwidth (MHz) | Center Frequency s (MHz) | Feeder Link, Service Link or TT&C |
|------------|-------------------------|--------------------------|-----------------------------------|
| SAR2       | 700.0                   | 9650.0                   | Service Link                      |
| ISL        | 33.5                    | 1643.25                  | TT&C                              |
| TTC        | 1.4                     | 8027.0                   | TT&C                              |
| SAR1       | 10.0                    | 9650.0                   | Service Link                      |
| 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 |
|--------------------------------------------------------|------|---------------------------------|------------------|-------------|
| <a href="#"><u>ids_capella_san_francisco.gxt</u></a>   | ISL  | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |             |
| <a href="#"><u>ids_capella_san_francisco.gxt</u></a>   | ISL1 | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |             |
| <a href="#"><u>comms_capella_san_francisco.gxt</u></a> | PDLL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |             |
| <a href="#"><u>comms_capella_san_francisco.gxt</u></a> | PDLR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |             |
| <a href="#"><u>comms_capella_san_francisco.gxt</u></a> | RX1  | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |             |
| <a href="#"><u>sar_capella_san_francisco.gxt</u></a>   | SAR  | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |             |