



312 File Number: **SATLOA2020091400108**

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## Filing Description

| Question    | Response                  |
|-------------|---------------------------|
| Description | Capella SAR Constellation |

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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 -9900.0 MHz | Transmit  |

**Orbital  
Information For  
Non-  
Geostationary  
Satellites**

| Question                                               | Response   |
|--------------------------------------------------------|------------|
| Total Number of Satellites in the active constellation | 3          |
| Orbit Epoch Date                                       | 08/30/2020 |
| Celestial Reference Body                               | Earth      |

**Orbital Plane 1:**

| Question                                                      | Response       |
|---------------------------------------------------------------|----------------|
| Number of Satellites in Plane                                 | 1              |
| Inclination Angle                                             | 45.0 degrees   |
| Right Ascension of Ascending Node                             | 280.0 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                                 | 2              |
| Inclination Angle                                             | 97.5 degrees   |
| Right Ascension of Ascending Node                             | 293.0 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                | 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 |
|------------|-------------------------|--------------------------|-----------------------------------|
| ISL0       | 34.0                    | 1542.0                   | TT&C                              |
| TTC0       | 1.4                     | 2036.0                   | Service Link                      |

Transmitting  
Beams 1:

| 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

|                             | * 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                     | -112.6                    | -110.9                    | -109.3                    | -107.9                    | -106.6                    | -100.4                    |

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                     | -158.6                    | -156.8                    | -155.3                    | -153.8                    | -152.6                    | -146.3                    |

Transmitting Beams 3:

| 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

|         | * 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 | -157.4              | -155.4              | -154.1              | -152.6              | -151.4              | -145.1              |

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> |
| *<br>BW:           | /BW):               | /BW):               | /BW):               | /BW):               | /BW):               | /BW):               |
| <b>4.0<br/>kHz</b> | -146.1              | -144.4              | -142.8              | -141.4              | -140.1              | -133.9              |

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                      |
| PDL        | 337.5                   | 8212.5                   | Service Link                      |
| ISL        | 33.5                    | 1643.25                  | 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?                   | 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>comms_athens.gxt</u></a>       | PDL  | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |             |
| <a href="#"><u>comms_australia.gxt</u></a>    | PDL  | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |             |
| <a href="#"><u>comms_auarua.gxt</u></a>       | PDL  | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |             |
| <a href="#"><u>comms_svalsat.gxt</u></a>      | PDL  | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |             |
| <a href="#"><u>comms_trollsat.gxt</u></a>     | PDL  | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |             |
| <a href="#"><u>comms_sweden.gxt</u></a>       | PDL  | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |             |
| <a href="#"><u>comms_south_africa.gxt</u></a> | PDL  | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |             |
| <a href="#"><u>comms_punta_arenas.gxt</u></a> | PDL  | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |             |
| <a href="#"><u>comms_oregon.gxt</u></a>       | PDL  | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |             |

|                                        |     |                                 |                  |
|----------------------------------------|-----|---------------------------------|------------------|
| <u>comms_ohio.gxt</u>                  | PDL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>comms_ireland.gxt</u>               | PDL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>comms_hawaii.gxt</u>                | PDL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>comms_hartebeesthoek.gxt</u>        | PDL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>comms_capella_san_francisco.gxt</u> | PDL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>comms_capella_boulder.gxt</u>       | PDL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>comms_bahrain.gxt</u>               | PDL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>sar_trollsat.gxt</u>                | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>sar_sweden.gxt</u>                  | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>sar_svalsat.gxt</u>                 | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |

|                               |     |                                 |                  |
|-------------------------------|-----|---------------------------------|------------------|
| <u>sar_south_africa.gxt</u>   | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>sar_punta_arenas.gxt</u>   | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>sar_oregon.gxt</u>         | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>sar_ohio.gxt</u>           | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>sar_ireland.gxt</u>        | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>sar_hawaii.gxt</u>         | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>sar_hartebeesthoek.gxt</u> | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>ids_trollsat.gxt</u>       | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>ids_sweden.gxt</u>         | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>ids_svalsat.gxt</u>        | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |

|                                                       |     |                                 |                  |
|-------------------------------------------------------|-----|---------------------------------|------------------|
| <a href="#"><u>idrs_south_africa.gxt</u></a>          | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <a href="#"><u>idrs_punta_arenas.gxt</u></a>          | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <a href="#"><u>idrs_oregon.gxt</u></a>                | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <a href="#"><u>idrs_ohio.gxt</u></a>                  | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <a href="#"><u>idrs_ireland.gxt</u></a>               | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <a href="#"><u>idrs_hawaii.gxt</u></a>                | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <a href="#"><u>idrs_hartebeesthoek.gxt</u></a>        | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <a href="#"><u>idrs_capella_san_francisco.gxt</u></a> | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <a href="#"><u>idrs_capella_boulder.gxt</u></a>       | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <a href="#"><u>idrs_bahrain.gxt</u></a>               | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |

|                                              |     |                                 |                      |
|----------------------------------------------|-----|---------------------------------|----------------------|
| <a href="#"><u>idrs_awarua.gxt</u></a>       | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.<br>gxt) |
| <a href="#"><u>idrs_australia.gxt</u></a>    | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.<br>gxt) |
| <a href="#"><u>idrs_athens.gxt</u></a>       | ISL | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.<br>gxt) |
| <a href="#"><u>ttnc_trollsat.gxt</u></a>     | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.<br>gxt) |
| <a href="#"><u>ttnc_sweden.gxt</u></a>       | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.<br>gxt) |
| <a href="#"><u>ttnc_svalsat.gxt</u></a>      | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.<br>gxt) |
| <a href="#"><u>ttnc_south_africa.gxt</u></a> | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.<br>gxt) |
| <a href="#"><u>ttnc_punta_arenas.gxt</u></a> | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.<br>gxt) |
| <a href="#"><u>ttnc_oregon.gxt</u></a>       | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.<br>gxt) |
| <a href="#"><u>ttnc_ohio.gxt</u></a>         | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.<br>gxt) |

|                                      |     |                                 |                  |
|--------------------------------------|-----|---------------------------------|------------------|
| <u>tnc_ireland.gxt</u>               | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>tnc_hawaii.gxt</u>                | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>tnc_hartebeesthoek.gxt</u>        | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>tnc_capella_san_francisco.gxt</u> | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>tnc_capella_boulder.gxt</u>       | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>tnc_bahrain.gxt</u>               | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>tnc_auarua.gxt</u>                | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>tnc_australia.gxt</u>             | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>tnc_athens.gxt</u>                | TTC | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |
| <u>sar_capella_san_francisco.gxt</u> | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.gxt) |

|                                |     |                                 |                      |
|--------------------------------|-----|---------------------------------|----------------------|
| <u>sar_capella_boulder.gxt</u> | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.<br>gxt) |
| <u>sar_bahrain.gxt</u>         | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.<br>gxt) |
| <u>sar_auarua.gxt</u>          | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.<br>gxt) |
| <u>sar_australia.gxt</u>       | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.<br>gxt) |
| <u>sar_athens.gxt</u>          | SAR | NGSO<br>Antenna<br>Gain<br>Data | GXT file (*.<br>gxt) |