

### NTIA Space Record Data Form

NTIA requires the following data for space related experiments using government shared spectrum. For each transmit frequency, please provide the data for both ends of the transmit-receive link. Use Part A to describe the satellite to ground information. Part B is for all ground to space transmit links.

#### Part A: Space to Earth Downlink Data

##### Satellite Transmitter Data

|                                                       |                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Transmit Frequency: 400.6 MHz</b>                  |                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Satellite Name: <b>THEA</b>                           |                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Data Field</b>                                     | <b>Data Answer</b>                                                                                                                                                                                                                                           | <b>Description/Comments</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Polarization (XAP)                                    | XAP01 = J<br>XAP02 = J                                                                                                                                                                                                                                       | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT HAND CIRCULAR,<br>J = LINEAR POLARIZATION                                                                                                                                                                                                                                                                     |
| Orientation (XAZ)                                     | XAZ01 = EC<br>XAZ02 = EC                                                                                                                                                                                                                                     | NB= NARROWBEAM EC<br>= EARTH COVERAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Antenna Dimension (XAD)                               | ANTENNA GAIN 0.0 dBi<br>BEAMWIDTH 60 degrees<br>XAD = 00G060B                                                                                                                                                                                                | (NTIA format (XAD), EXAMPLE, XAD01 16G030B)                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Type of satellite (State = SP)<br>(City = geo or non) | Type = Nongeostationary                                                                                                                                                                                                                                      | Choose either:<br>Geostationary or<br>Nongeostationary                                                                                                                                                                                                                                                                                                                                                                                                                                |
| For Geostationary                                     | Longitude =                                                                                                                                                                                                                                                  | IF ANY SATELLITES ARE GEOSTATIONARY, REPORT ITS LATITUDE AS 000000N (XLA AND/OR RLA) AND REPORT ITS LONGITUDE (XLG AND/OR RLG).                                                                                                                                                                                                                                                                                                                                                       |
| For Nongeostationary (Orbital Data)                   | INCLINATION ANGLE 97.52,<br>APOGEE IN KILOMETERS 575 km,<br>PERIGEE IN KILOMETERS 575 km,<br>ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL .60,<br>THE NUMBER OF SATELLITES IN THE SYSTEM 1,<br><br>ORB=<br>97.5IN00575AP00575PE001.60H01NRT01 | IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, PERIGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN T01, EXAMPLE, REM04<br>*ORB,98.0IN00510AP00510PE001.58H01NRT01,<br>AND FOR SPACE-TO-SPACE COMMUNICATIONS WITH ANOTHER NONGEOSTATIONARY SATELLITE ADD AN ADDITIONAL<br>*ORB FOR IT ENDING IN R01, EXAMPLE, REM05<br>*ORB,72.9IN03209AP00655PE013.46H01NRR01 |

| Earth Station Data (Receiver)                                  |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (RSC)                                                    | RSC = Virginia                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
| City Name (RAL)                                                | RAL = Fairfax                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                                              | Lat = 385136N                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |
| Longitude (DDMMSS)                                             | Lon = 0771830W                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
| Antenna Polarization (RAP)                                     | RAP = T                                                                                                                                                                                                                             | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT HAND CIRCULAR,<br>J = LINEAR POLARIZATION |
| Antenna Azimuth (RAZ)                                          | RAZ = V00                                                                                                                                                                                                                           | THE EARTH STATION RECEIVER ANTENNA AZIMUTH (RAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                  |
| Antenna Dimensions (RAD)                                       | ANTENNA GAIN 13.5 dB,<br>BEAMWIDTH 30 degrees,<br>AZIMUTHAL RANGE 0 - 360 degrees,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 111,<br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 20<br><br>RAD = 14G030B000-360A00111H020 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>RAD01 16G030B000-360A00357H006                                                                                                                                              |
| FCC notes:<br>1. Use S-Note S945.<br>2. REM AGN, Cubesat, THEA |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |

| Earth Station Data (Receiver)                                  |                                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |
|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (RSC)                                                    | RSC = Hawaii                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |
| City Name (RAL)                                                | RAL = Naalehu                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                                              | Lat = 190326N                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
| Longitude (DDDMMSS)                                            | Lon = 1553459W                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
| Antenna Polarization (RAP)                                     | RAP = T                                                                                                                                                                                                                            | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT HAND CIRCULAR,<br>J = LINEAR POLARIZATION |
| Antenna Azimuth (RAZ)                                          | RAZ = V00                                                                                                                                                                                                                          | THE EARTH STATION RECEIVER ANTENNA AZIMUTH (RAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                  |
| Antenna Dimensions (RAD)                                       | ANTENNA GAIN 13.5 dB,<br>BEAMWIDTH 30 degrees,<br>AZIMUTHAL RANGE 0 - 360 degrees,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 256,<br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 6<br><br>RAD = 14G030B000-360A00256H006 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>RAD01 16G030B000-360A00357H006                                                                                                                                              |
| FCC notes:<br>1. Use S-Note S945.<br>2. REM AGN, Cubesat, THEA |                                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |

| Earth Station Data (Receiver)                                  |                                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |
|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (RSC)                                                    | RSC = Alaska                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |
| City Name (RAL)                                                | RAL = North Pole                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                                              | Lat = 644609N                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
| Longitude (DDDMMSS)                                            | Lon = 1472620W                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
| Antenna Polarization (RAP)                                     | RAP = T                                                                                                                                                                                                                            | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT HAND CIRCULAR,<br>J = LINEAR POLARIZATION |
| Antenna Azimuth (RAZ)                                          | RAZ = V00                                                                                                                                                                                                                          | THE EARTH STATION RECEIVER ANTENNA AZIMUTH (RAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                  |
| Antenna Dimensions (RAD)                                       | ANTENNA GAIN 13.5 dB,<br>BEAMWIDTH 30 degrees,<br>AZIMUTHAL RANGE 0 - 360 degrees,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 147,<br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 6<br><br>RAD = 14G030B000-360A00147H006 | EXAMPLE ASSUMING NONGEOSTATIONARY, RAD01 16G030B000-360A00357H006                                                                                                                                                 |
| FCC notes:<br>1. Use S-Note S945.<br>2. REM AGN, Cubesat, THEA |                                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |

| Earth Station Data (Receiver)                                  |                                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |
|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (RSC)                                                    | RSC = Maine                                                                                                                                                                                                                        |                                                                                                                                                                                                                   |
| City Name (RAL)                                                | RAL = Limestone                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                                              | Lat = 465719N                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
| Longitude (DDDMMSS)                                            | Lon = 0675419W                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
| Antenna Polarization (RAP)                                     | RAP = T                                                                                                                                                                                                                            | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT HAND CIRCULAR,<br>J = LINEAR POLARIZATION |
| Antenna Azimuth (RAZ)                                          | RAZ = V00                                                                                                                                                                                                                          | THE EARTH STATION RECEIVER ANTENNA AZIMUTH (RAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                  |
| Antenna Dimensions (RAD)                                       | ANTENNA GAIN 13.5 dB,<br>BEAMWIDTH 30 degrees,<br>AZIMUTHAL RANGE 0 - 360 degrees,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 156,<br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 6<br><br>RAD = 14G030B000-360A00156H006 | EXAMPLE ASSUMING NONGEOSTATIONARY, RAD01 16G030B000-360A00357H006                                                                                                                                                 |
| FCC notes:<br>1. Use S-Note S945.<br>2. REM AGN, Cubesat, THEA |                                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |

**Part B: Ground Stations, Earth to Space link data:****Earth Station Transmitter Data:**

| <b>Transmit Frequency: 399.950 MHz</b> |                                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (XSC)                            | XSC = Virginia                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
| City Name (XAL)                        | XAL = Fairfax                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                      | Lat = 385136N                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
| Longitude (DDDMMSS)                    | Lon = 771830W                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
| Antenna Polarization (XAP)             | XAP = T                                                                                                                                                                                                                            | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT HAND CIRCULAR,<br>J = LINEAR POLARIZATION |
| Antenna Azimuth (XAZ)                  | XAZ =V00                                                                                                                                                                                                                           | THE EARTH STATION Transmitter ANTENNA AZIMUTH (XAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, XAZ01 V00                                                                                               |
| Antenna Dimensions (XAD)               | ANTENNA GAIN 13.5 dB,<br>BEAMWIDTH 30degrees,<br>AZIMUTHAL RANGE 0 - 360 degrees,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 111,<br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 20<br><br>XAD = 14G030B000-360A00111H020 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>XAD01 16G030B000-360A00357H006                                                                                                                                              |

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| <b>Transmit Frequency: 399.950MHz</b> |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |
| State (XSC)                           | XSC = Hawaii                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
| City Name (XAL)                       | XAL = Naalehu                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                     | Lat = 190326N                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
| Longitude (DDDMMSS)                   | Lon = 1553459W                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |
| Antenna Polarization (XAP)            | XAP = T                                                                                                                                                                                                                           | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT HAND CIRCULAR,<br>J = LINEAR POLARIZATION |
| Antenna Azimuth (XAZ)                 | XAZ =V00                                                                                                                                                                                                                          | THE EARTH STATION Transmitter ANTENNA AZIMUTH (XAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, XAZ01 V00                                                                                               |
| Antenna Dimensions (XAD)              | ANTENNA GAIN 13.5 dB,<br>BEAMWIDTH 30degrees,<br>AZIMUTHAL RANGE 0 - 360 degrees,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 256,<br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 6<br><br>XAD = 14G030B000-360A00256H006 | EXAMPLE ASSUMING NONGEOSTATIONARY, XAD01 16G030B000-360A00357H006                                                                                                                                                 |

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|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Transmit Frequency: 399.950 MHz</b> |                                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |
| State (XSC)                            | XSC = Alaska                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |
| City Name (XAL)                        | XAL = North Pole                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                      | Lat = 644609N                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
| Longitude (DDDMMSS)                    | Lon = 1472620W                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
| Antenna Polarization (XAP)             | XAP = T                                                                                                                                                                                                                            | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT HAND CIRCULAR,<br>J = LINEAR POLARIZATION |
| Antenna Azimuth (XAZ)                  | XAZ = V00                                                                                                                                                                                                                          | THE EARTH STATION Transmitter ANTENNA AZIMUTH (XAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, XAZ01 V00                                                                                               |
| Antenna Dimensions (XAD)               | ANTENNA GAIN 13.5 dB,<br>BEAMWIDTH 30 degrees,<br>AZIMUTHAL RANGE 0 - 360 degrees,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 147,<br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 6<br><br>XAD = 14G030B000-360A00147H006 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>XAD01 16G030B000-360A00357H006                                                                                                                                              |

|                                        |                                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Transmit Frequency: 399.950 MHz</b> |                                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |
| State (XSC)                            | XSC = Maine                                                                                                                                                                                                                        |                                                                                                                                                                                                                   |
| City Name (XAL)                        | XAL = Limestone                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                      | Lat = 465719N                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
| Longitude (DDDMMSS)                    | Lon = 0675419W                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
| Antenna Polarization (XAP)             | XAP = T                                                                                                                                                                                                                            | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT HAND CIRCULAR,<br>J = LINEAR POLARIZATION |
| Antenna Azimuth (XAZ)                  | XAZ = V00                                                                                                                                                                                                                          | THE EARTH STATION Transmitter ANTENNA AZIMUTH (XAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, XAZ01 V00                                                                                               |
| Antenna Dimensions (XAD)               | ANTENNA GAIN 13.5 dB,<br>BEAMWIDTH 30 degrees,<br>AZIMUTHAL RANGE 0 - 360 degrees,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 156,<br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 6<br><br>XAD = 14G030B000-360A00156H006 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>XAD01 16G030B000-360A00357H006                                                                                                                                              |

| Satellite Receive Specification - 399.950 MHz    |                                                               |                                                                                                                                                                                                                   |
|--------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Polarization (RAP)                               | RAP = J                                                       | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT HAND CIRCULAR,<br>J = LINEAR POLARIZATION |
| Azimuth (RAZ)                                    | RAZ = V00                                                     | STATION RECEIVER ANTENNA AZIMUTH (XAZ),<br>THE MINIMUM ANGLE OF<br>ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                      |
| Dimension (RAD)                                  | ANTENNA GAIN 0.0 dBi<br>BEAMWIDTH 60 degrees<br>RAD = 00G060B | (NTIA format (RAD), EXAMPLE, RAD01 16G030B)                                                                                                                                                                       |
| Type of satellite<br>(State = SP)<br>City = G/No | Type = Nongeostationary                                       | Choose either:<br>Geostationary or<br>Nongeostationary                                                                                                                                                            |

**Part A: Space to Earth Downlink Data****Satellite Transmitter Data**

|                                                       |                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Transmit Frequency: 2201 MHz (2200-2202 MHz)</b>   |                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Satellite Name: <b>THEA</b>                           |                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Data Field</b>                                     | <b>Data Answer</b>                                                                                                                                                                                                                                           | <b>Description/Comments</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Polarization (XAP)                                    | XAP = R                                                                                                                                                                                                                                                      | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT HAND CIRCULAR,<br>J = LINEAR POLARIZATION                                                                                                                                                                                                                                                                     |
| Orientation (XAZ)                                     | XAZ = NB                                                                                                                                                                                                                                                     | NB= NARROWBEAM EC<br>= EARTH COVERAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Antenna Dimension (XAD)                               | ANTENNA GAIN 7.0 dBi<br>BEAMWIDTH 30 degrees<br><br>XAD01 = 07G030B                                                                                                                                                                                          | (NTIA format (XAD), EXAMPLE, XAD01 16G030B)                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Type of satellite (State = SP)<br>(City = geo or non) | Type = Nongeostationary                                                                                                                                                                                                                                      | Choose either:<br>Geostationary or<br>Nongeostationary                                                                                                                                                                                                                                                                                                                                                                                                                                |
| For Geostationary                                     | Longitude =                                                                                                                                                                                                                                                  | IF ANY SATELLITES ARE GEOSTATIONARY, REPORT ITS LATITUDE AS 000000N (XLA AND/OR RLA) AND REPORT ITS LONGITUDE (XLG AND/OR RLG).                                                                                                                                                                                                                                                                                                                                                       |
| For Nongeostationary (Orbital Data)                   | INCLINATION ANGLE 97.52,<br>APOGEE IN KILOMETERS 575 km,<br>PERIGEE IN KILOMETERS 575 km,<br>ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL .60,<br>THE NUMBER OF SATELLITES IN THE SYSTEM 1,<br><br>ORB=<br>97.5IN00575AP00575PE001.60H01NRT01 | IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, PERIGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN T01, EXAMPLE, REM04<br>*ORB,98.0IN00510AP00510PE001.58H01NRT01,<br>AND FOR SPACE-TO-SPACE COMMUNICATIONS WITH ANOTHER NONGEOSTATIONARY SATELLITE ADD AN ADDITIONAL<br>*ORB FOR IT ENDING IN R01, EXAMPLE, REM05<br>*ORB,72.9IN03209AP00655PE013.46H01NRR01 |

| Earth Station Data (Receiver)                                  |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (RSC)                                                    | RSC = Sweden                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
| City Name (RAL)                                                | RAL = Esrange                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                                              | Lat = 675322N                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
| Longitude (DDDMMSS)                                            | Lon = 0210615E                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |
| Antenna Polarization (RAP)                                     | RAP = T                                                                                                                                                                                                                           | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT-HAND CIRCULAR,<br>J = LINEAR POLARIZATION |
| Antenna Azimuth (RAZ)                                          | RAZ = V00                                                                                                                                                                                                                         | THE EARTH STATION RECEIVER ANTENNA AZIMUTH (RAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                  |
| Antenna Dimensions (RAD)                                       | ANTENNA GAIN 40 dB,<br>BEAMWIDTH 1.5 degrees,<br>AZIMUTHAL RANGE 0 - 360 degrees,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 372,<br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 5<br><br>RAD = 40G002B000-360A00372H005 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>RAD01 16G030B000-360A00357H006                                                                                                                                              |
| FCC notes:<br>1. Use S-Note S945.<br>2. REM AGN, CubeSat, THEA |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |

| Earth Station Data (Receiver)                                  |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (RSC)                                                    | RSC = Maine                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |
| City Name (RAL)                                                | RAL = Limestone                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                                              | Lat = 465719N                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
| Longitude (DDMMSS)                                             | Lon = 0675419W                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |
| Antenna Polarization (RAP)                                     | RAP = T                                                                                                                                                                                                                           | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT HAND CIRCULAR,<br>J = LINEAR POLARIZATION |
| Antenna Azimuth (RAZ)                                          | RAZ = V00                                                                                                                                                                                                                         | THE EARTH STATION RECEIVER ANTENNA AZIMUTH (RAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                  |
| Antenna Dimensions (RAD)                                       | ANTENNA GAIN 40 dB,<br>BEAMWIDTH 1.5 degrees,<br>AZIMUTHAL RANGE 0 - 360 degrees,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 156,<br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 3<br><br>RAD = 40G002B000-360A00156H003 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>RAD01 16G030B000-360A00357H006                                                                                                                                              |
| FCC notes:<br>1. Use S-Note S945.<br>2. REM AGN, Cubesat, THEA |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |

**Part B: Ground Stations, Earth to Space link data:****Earth Station Transmitter Data:**

| <b>Transmit Frequency: 2045.50 MHz (2045-2046 MHz)</b> |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (RSC)                                            | XSC = Sweden                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
| City Name (RAL)                                        | XAL = Esrange                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                                      | Lat = 675322N                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
| Longitude (DDDMMSS)                                    | Lon = 0210615E                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |
| Antenna Polarization (RAP)                             | XAP = T                                                                                                                                                                                                                           | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT-HAND CIRCULAR,<br>J = LINEAR POLARIZATION |
| Antenna Azimuth (RAZ)                                  | XAZ = V00                                                                                                                                                                                                                         | THE EARTH STATION RECEIVER ANTENNA AZIMUTH (RAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                  |
| Antenna Dimensions (RAD)                               | ANTENNA GAIN 40 dB,<br>BEAMWIDTH 1.5 degrees,<br>AZIMUTHAL RANGE 0 - 360 degrees,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 372,<br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 5<br><br>RAD = 40G002B000-360A00372H005 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>RAD01 16G030B000-360A00357H006                                                                                                                                              |

|                                                         |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Transmit Frequency: 2045.50 MHz. (2045-2046 MHz)</b> |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |
| State (XSC)                                             | XSC = Maine                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |
| City Name (XAL)                                         | XAL = LimeStone                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                                       | Lat = 465719N                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
| Longitude (DDMMSS)                                      | Lon = 0675419W                                                                                                                                                                                                                    |                                                                                                                                                                                                                   |
| Antenna Polarization (XAP)                              | XAP = T                                                                                                                                                                                                                           | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT HAND CIRCULAR,<br>J = LINEAR POLARIZATION |
| Antenna Azimuth (XAZ)                                   | XAZ =V00                                                                                                                                                                                                                          | THE EARTH STATION Transmitter ANTENNA AZIMUTH (XAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, XAZ01 V00                                                                                               |
| Antenna Dimensions (XAD)                                | ANTENNA GAIN 40 dB,<br>BEAMWIDTH 1.5 degrees,<br>AZIMUTHAL RANGE 0 - 360 degrees,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 156,<br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 3<br><br>XAD = 40G002B000-360A00156H002 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>XAD01 16G030B000-360A00357H006                                                                                                                                              |

**Satellite Receive Specifications:**

|                                                       |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Receive Frequency: 2045.50 MHz (2045-2046 MHz)</b> |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |
| Polarization (RAP)                                    | RAP = R                                                                                                                                                                                                                                                           | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT HAND CIRCULAR,<br>J = LINEAR POLARIZATION |
| Azimuth (RAZ)                                         | RAZ = V00                                                                                                                                                                                                                                                         | STATION RECEIVER ANTENNA AZIMUTH (XAZ),<br>THE MINIMUM ANGLE OF<br>ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                      |
| Dimension (RAD)                                       | ANTENNA GAIN 7.0 dBi<br>BEAMWIDTH 30 degrees<br>RAD = 07G030B                                                                                                                                                                                                     | (NTIA format (RAD)), EXAMPLE, RAD01 16G030B)                                                                                                                                                                      |
| Type of satellite<br>(State = SP)<br>City = G/No      | Type = Nongeostationary                                                                                                                                                                                                                                           | Choose either: Geostationary or<br>Nongeostationary                                                                                                                                                               |
| For Geostationary                                     | Longitude =                                                                                                                                                                                                                                                       | IF ANY SATELLITES ARE GEOSTATIONARY, REPORT<br>ITS LATITUDE AS 000000N (XLA AND/OR RLA)<br>AND REPORT ITS LONGITUDE (XLG AND/OR RLG).                                                                             |
| For<br>Nongeostationary<br>(Orbital Data)             | INCLINATION ANGLE 97.52,<br>APOGEE IN KILOMETERS 575 km,<br>PERIGEE IN KILOMETERS 575 km,<br>ORBITAL PERIOD IN HOURS 1 AND<br>FRACTIONS OF HOURS IN DECIMAL .60,<br>THE NUMBER OF SATELLITES IN THE<br>SYSTEM 1,<br><br>ORB=<br>97.5IN00575AP00575PE001.60H01NRT0 | V AND FOR SPACE-TO-SPACE COMMUNICATIONS<br>WITH ANOTHER NONGEOSTATIONARY SATELLITE<br>ADD AN ADDITIONAL<br>*ORB FOR IT ENDING IN R01, EXAMPLE, REM05<br>*ORB,72.9IN03209AP00655PE013.46H01NRR01                   |

| Receive Frequency: 1350 to 7075 MHz (Experimental Wideband Antenna) |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                   |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Polarization (RAP)                                                  | RAP = R                                                                                                                                                                                                                                                           | POLARIZATIONS INCLUDE:<br>H = HORIZONTAL,<br>V = VERTICAL,<br>S = HORIZONTAL AND VERTICAL,<br>L = LEFT HAND CIRCULAR,<br>R = RIGHT HAND CIRCULAR,<br>T = RIGHT AND LEFT HAND CIRCULAR,<br>J = LINEAR POLARIZATION |
| Azimuth (RAZ)                                                       | RAZ = V00                                                                                                                                                                                                                                                         | STATION RECEIVER ANTENNA AZIMUTH (XAZ),<br>THE MINIMUM ANGLE OF<br>ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                      |
| Dimension (RAD)                                                     | ANTENNA GAIN 3.0 dBi<br>BEAMWIDTH 60 degrees<br>RAD = 03G060B                                                                                                                                                                                                     | (NTIA format (RAD), EXAMPLE, RAD01 16G030B)                                                                                                                                                                       |
| Type of satellite<br>(State = SP)<br>City = G/No                    | Type = Nongeostationary                                                                                                                                                                                                                                           | Choose either: Geostationary or<br>Nongeostationary                                                                                                                                                               |
| For Geostationary                                                   | Longitude =                                                                                                                                                                                                                                                       | IF ANY SATELLITES ARE GEOSTATIONARY, REPORT<br>ITS LATITUDE AS 000000N (XLA AND/OR RLA)<br>AND REPORT ITS LONGITUDE (XLG AND/OR RLG).                                                                             |
| For<br>Nongeostationary<br>(Orbital Data)                           | INCLINATION ANGLE 97.52,<br>APOGEE IN KILOMETERS 575 km,<br>PERIGEE IN KILOMETERS 575 km,<br>ORBITAL PERIOD IN HOURS 1 AND<br>FRACTIONS OF HOURS IN DECIMAL .60,<br>THE NUMBER OF SATELLITES IN THE<br>SYSTEM 1,<br><br>ORB=<br>97.5IN00575AP00575PE001.60H01NRT0 | ✓ AND FOR SPACE-TO-SPACE COMMUNICATIONS<br>WITH ANOTHER NONGEOSTATIONARY SATELLITE<br>ADD AN ADDITIONAL<br>*ORB FOR IT ENDING IN R01, EXAMPLE, REM05<br>*ORB,72.9IN03209AP00655PE013.46H01NRR01                   |