

**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.

**The following space record data is provided for SeaHawk-1 and for SeaHawk-2**

**Part A: Space to Earth Downlink Data - SeaHawk-1****Satellite Transmitter Data - SeaHawk-1**

|                                                       |                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TransmitFrequency: <b>UHF 400-420 MHz</b>             |                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Satellite Name: <b>SeaHawk-1</b>                      |                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Data Field</b>                                     | <b>Data Answer</b>                                                                                                                                                                                                                                                                                            | <b>Description/Comments</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Polarization (XAP)                                    | XAP = 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)                                     | XAZ = EC                                                                                                                                                                                                                                                                                                      | NB= NARROWBEAM EC<br>= EARTH COVERAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Antenna Dimension (XAD)                               | ANTENNA GAIN <u>0 dB</u><br>BEAMWIDTH <u>360 degrees</u><br><br>XAD =00G360B                                                                                                                                                                                                                                  | (NTIA format (XAD), EXAMPLE, XAD01 16G030B)                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Type of satellite (State = SP)<br>(City = geo or non) | Type = NON                                                                                                                                                                                                                                                                                                    | 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 <u>97.7</u> ,<br>APOGEE IN KILOMETERS <u>575</u> ,<br>PERIGEE IN KILOMETERS <u>575</u> ,<br>ORBITAL PERIOD IN HOURS <u>1</u> AND<br>FRACTIONS OF HOURS IN<br>DECIMAL <u>0.605</u> ,<br>THE NUMBER OF SATELLITES IN THE<br>SYSTEM <u>2</u> ,<br><br>ORB = 97.7IN00575AP00575PE001.61H02NRT01 | 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) Clyde Space -UHF --- 400 - 420 MHz        |                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (RSC)                                                             | RSC = G                                                                                                                                                                                                                                              |                                                                                                                                                                                                                    |
| City Name (RAL)                                                         | RAL = Glasgow                                                                                                                                                                                                                                        |                                                                                                                                                                                                                    |
| Latitude (DDMMSS)                                                       | Lat = 555744                                                                                                                                                                                                                                         |                                                                                                                                                                                                                    |
| Longitude (DDDMMSS)                                                     | Lon = 0041649                                                                                                                                                                                                                                        |                                                                                                                                                                                                                    |
| 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 <u>16.2</u> ,<br>BEAMWIDTH <u>30</u> ,<br>AZIMUTHAL RANGE <u>0 - 360</u> ,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS <u>0020</u><br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS <u>0042</u><br>RAD = 10G052B000-360A00020H042 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>RAD01 16G030B000-360A00357H006                                                                                                                                               |
| FCC notes:<br>1. Use S-Note S945.<br>2. REM AGN, Cubesat, (insert name) |                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                    |

**Satellite Transmitter Data - SeaHawk-1**

|                                                       |                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transmit Frequency: <b>8100 MHz</b>                   |                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Satellite Name: SeaHawk-1                             |                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <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 <u>7.8 dB</u><br>BEAMWIDTH <u>82 degrees</u><br><br>XAD =08G082                                                                                                                                                                                                                                  | (NTIA format (XAD), EXAMPLE, XAD01 16G030B)                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Type of satellite (State = SP)<br>(City = geo or non) | Type = NON                                                                                                                                                                                                                                                                                                    | 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 <u>97.7</u> ,<br>APOGEE IN KILOMETERS <u>575</u> ,<br>PERIGEE IN KILOMETERS <u>575</u> ,<br>ORBITAL PERIOD IN HOURS <u>1</u> AND<br>FRACTIONS OF HOURS IN<br>DECIMAL <u>0.605</u> ,<br>THE NUMBER OF SATELLITES IN THE<br>SYSTEM <u>2</u> ,<br><br>ORB = 97.7IN00575AP00575PE001.61H02NRT01 | 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 |

### NASA/NEN Wallops Flight Facility Ground Station -WG1 (Primary)

| Earth Station Data (Receiver) Wallops Flight Facility Ground Station -WG1 - 8100 MHz |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (RSC)                                                                          | RSC = Virginia                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |
| City Name (RAL)                                                                      | RAL = Wallops                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                                                                    | Lat = 375528                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                   |
| Longitude (DDDMMSS)                                                                  | Lon = 0752835                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                   |
| 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 = 00                                                                                                                                                                                                                                                             | THE EARTH STATION RECEIVER ANTENNA AZIMUTH (RAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                  |
| Antenna Dimensions (RAD)                                                             | ANTENNA GAIN <u>56.8 dBi</u> ,<br>BEAMWIDTH <u>0.23 degrees</u> ,<br>AZIMUTHAL RANGE <u>0-360</u> THE SITE<br>ELEVATION ABOVE MEAN SEA LEVEL IN<br>METERS <u>00011</u><br>THE ANTENNA HEIGHT ABOVE TERRAIN<br>IN METERS <u>011</u><br>RAD = 56G0.2G000-360A00011H011 | EXAMPLE ASSUMING NONGEOSTATIONARY, RAD01 16G030B000-360A00357H006                                                                                                                                                 |
| FCC notes:<br>1. Use S-Note S945.<br>2. REM AGN, Cubesat, (insert name)              |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |

**NASA/NEN ALASKA AS1 (Secondary)**

| <b>Earth Station Data (Receiver) NASA/NEN ALASKA AS1 - 8100 MHz</b>     |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (RSC)                                                             | RSC = AK                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                    |
| City Name (RAL)                                                         | RAL = Fairbanks                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                    |
| Latitude (DDMMSS)                                                       | Lat = 645131                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                    |
| Longitude (DDMMSS)                                                      | Lon = 1475127                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                    |
| 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 = 00                                                                                                                                                                                                                                                              | THE EARTH STATION RECEIVER ANTENNA AZIMUTH (RAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                   |
| Antenna Dimensions (RAD)                                                | ANTENNA GAIN <u>56.8 dBi</u> ,<br>BEAMWIDTH <u>0.23 degrees</u> ,<br>AZIMUTHAL RANGE <u>0-360</u> THE SITE<br>ELEVATION ABOVE MEAN SEA LEVEL IN<br>METERS <u>00217</u><br>THE ANTENNA HEIGHT ABOVE TERRAIN<br>IN METERS <u>024</u><br>RAD = 56G0.23B000-360A00217H024 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>RAD01 16G030B000-360A00357H006                                                                                                                                               |
| FCC notes:<br>1. Use S-Note S945.<br>2. REM AGN, Cubesat, (insert name) |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                    |

**NASA/NEN ALASKA AS2 (Secondary)**

| <b>Earth Station Data (Receiver) NASA/NEN ALASKA AS2 - 8100 MHz</b>     |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (RSC)                                                             | RSC = AK                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                   |
| City Name (RAL)                                                         | RAL = Fairbanks                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                                                       | Lat = 645135                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                   |
| Longitude (DDMMSS)                                                      | Lon = 1475050                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                   |
| 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 = 00                                                                                                                                                                                                                                                              | THE EARTH STATION RECEIVER ANTENNA AZIMUTH (RAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                  |
| Antenna Dimensions (RAD)                                                | ANTENNA GAIN <u>56.8 dBi</u> ,<br>BEAMWIDTH <u>0.23 degrees</u> ,<br>AZIMUTHAL RANGE <u>0-360</u> THE SITE<br>ELEVATION ABOVE MEAN SEA LEVEL IN<br>METERS <u>00238</u> THE<br>ANTENNA HEIGHT ABOVE TERRAIN IN<br>METERS <u>040</u><br>RAD = 56G0.23B000-360A00238H040 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>RAD01 16G030B000-360A00357H006                                                                                                                                              |
| FCC notes:<br>1. Use S-Note S945.<br>2. REM AGN, Cubesat, (insert name) |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |

**Part A: Space to Earth Downlink Data - Sea Hawk-1****Satellite Transmitter Data – SeaHawk-2**

| Transmit Frequency: 400-420 MHz                       |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Satellite Name: SeaHawk-2                             |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Data Field                                            | Data Answer                                                                                                                                                                                                                                                                                                  | Description/Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Polarization (XAP)                                    | XAP = 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)                                     | XAZ = EC                                                                                                                                                                                                                                                                                                     | NB= NARROWBEAM EC<br>= EARTH COVERAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Antenna Dimension (XAD)                               | ANTENNA GAIN <u>0 dB</u><br>BEAMWIDTH <u>360 degrees</u><br><br>XAD = 00G360B                                                                                                                                                                                                                                | (NTIA format (XAD), EXAMPLE, XAD01 16G030B)                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Type of satellite (State = SP)<br>(City = geo or non) | Type = NON                                                                                                                                                                                                                                                                                                   | 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 <u>97.5</u> ,<br>APOGEE IN KILOMETERS <u>525</u> ,<br>PERIGEE IN KILOMETERS <u>525</u> ,<br>ORBITAL PERIOD IN HOURS <u>1</u> AND<br>FRACTIONS OF HOURS IN<br>DECIMAL <u>0.59</u> ,<br>THE NUMBER OF SATELLITES IN THE<br>SYSTEM <u>2</u> ,<br><br>ORB = 97.5IN00525AP00525PE001.59H02NRT01 | 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)     Clyde Space UHF --- 400 - 420 MHz           |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (RSC)                                                                   | RSC =    G                                                                                                                                                                                                                                               |                                                                                                                                                                                                                    |
| City Name (RAL)                                                               | RAL =   Glasgow                                                                                                                                                                                                                                          |                                                                                                                                                                                                                    |
| Latitude (DDMMSS)                                                             | Lat =    555744                                                                                                                                                                                                                                          |                                                                                                                                                                                                                    |
| Longitude (DDDMMSS)                                                           | Lon =    0041649                                                                                                                                                                                                                                         |                                                                                                                                                                                                                    |
| 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 <u>16.2</u> ,<br>BEAMWIDTH <u>30</u> ,<br>AZIMUTHAL RANGE <u>0 - 360</u> ,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS <u>0020</u><br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS <u>0042</u><br><br>RAD = 10G052B000-360A00020H042 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>RAD01 16G030B000-360A00357H006                                                                                                                                               |
| FCC notes:<br>1.    Use S-Note S945.<br>2.    REM AGN, Cubesat, (insert name) |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                    |

**Part A: Space to Earth Downlink Data– SeaHawk-2****Satellite Transmitter Data**

| Transmit Frequency: 8100 MHz                                |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Satellite Name: SeaHawk-2                                   |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Data Field                                                  | Data Answer                                                                                                                                                                                                                                                                                                  | Description/Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 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<br>Dimension (XAD)                                  | ANTENNA GAIN <u>7.8 dB</u><br>BEAMWIDTH <u>82 degrees</u><br>XAD = 08G082B                                                                                                                                                                                                                                   | (NTIA format (XAD), EXAMPLE, XAD01 16G030B)                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Type of satellite<br>(State = SP)<br>(City = geo or<br>non) | Type = NON                                                                                                                                                                                                                                                                                                   | Choose either:<br>Geostationary or<br>Nongeostationary                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| For Geostationary                                           | Longitude =                                                                                                                                                                                                                                                                                                  | IF ANY SATELLITES ARE GEOSTATIONARY, REPORT<br>ITS LATITUDE AS 000000N (XLA AND/OR RLA) AND<br>REPORT ITS LONGITUDE (XLG AND/OR RLG).                                                                                                                                                                                                                                                                                                                                                                         |
| For<br>Nongeostationary<br>(Orbital Data)                   | INCLINATION ANGLE <u>97.5</u> ,<br>APOGEE IN KILOMETERS <u>525</u> ,<br>PERIGEE IN KILOMETERS <u>525</u> ,<br>ORBITAL PERIOD IN HOURS <u>1</u> AND<br>FRACTIONS OF HOURS IN<br>DECIMAL <u>0.59</u> ,<br>THE NUMBER OF SATELLITES IN THE<br>SYSTEM <u>2</u> ,<br><br>ORB = 97.5IN00525AP00525PE001.59H02NRT01 | IF ANY SATELLITES ARE NONGEOSTATIONARY,<br>REPORT ITS INCLINATION ANGLE, APOGEE IN<br>KILOMETERS, PERIGEE IN KILOMETERS,<br>ORBITAL PERIOD IN HOURS AND FRACTIONS OF<br>HOURS IN DECIMAL, THE NUMBER OF SATELLITES<br>IN THE SYSTEM, THEN T01, EXAMPLE,<br>REM04<br>*ORB,98.0IN00510AP00510PE001.58H01NRT01,<br>AND FOR SPACE-TO-SPACE COMMUNICATIONS<br>WITH ANOTHER NONGEOSTATIONARY<br>SATELLITE ADD AN ADDITIONAL<br>*ORB FOR IT ENDING IN R01, EXAMPLE, REM05<br>*ORB,72.9IN03209AP00655PE013.46H01NRR01 |

**NASA/NEN Wallops Flight Facility Ground Station -WG1 (Primary)**

| <b>Earth Station Data (Receiver) Wallops Flight Facility Ground Station -WG1</b> |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (RSC)                                                                      | RSC = Virginia                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |
| City Name (RAL)                                                                  | RAL = Wallops                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                                                                | Lat = 375528                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                   |
| Longitude (DDDMMSS)                                                              | Lon = 0752835                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                   |
| 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 = 00                                                                                                                                                                                                                                                             | THE EARTH STATION RECEIVER ANTENNA AZIMUTH (RAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                  |
| Antenna Dimensions (RAD)                                                         | ANTENNA GAIN <u>56.8 dBi</u> ,<br>BEAMWIDTH <u>0.23 degrees</u> ,<br>AZIMUTHAL RANGE <u>0-360</u> THE SITE<br>ELEVATION ABOVE MEAN SEA LEVEL IN<br>METERS <u>00011</u><br>THE ANTENNA HEIGHT ABOVE TERRAIN<br>IN METERS <u>011</u><br>RAD = 56G0.2G000-360A00011H011 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>RAD01 16G030B000-360A00357H006                                                                                                                                              |
| FCC notes:<br>1. Use S-Note S945.<br>2. REM AGN, Cubesat, (insert name)          |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |

**NASA/NEN ALASKA AS2 (Secondary)**

| <b>Earth Station Data (Receiver) NASA/NEN ALASKA AS2</b>                |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (RSC)                                                             | RSC = AK                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                   |
| City Name (RAL)                                                         | RAL = Fairbanks                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                                                       | Lat = 645135                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                   |
| Longitude (DDDMMSS)                                                     | Lon = 1475050                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                   |
| 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 = 00                                                                                                                                                                                                                                                              | THE EARTH STATION RECEIVER ANTENNA AZIMUTH (RAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                  |
| Antenna Dimensions (RAD)                                                | ANTENNA GAIN <u>56.8 dBi</u> ,<br>BEAMWIDTH <u>0.23 degrees</u> ,<br>AZIMUTHAL RANGE <u>0-360</u> THE SITE<br>ELEVATION ABOVE MEAN SEA LEVEL IN<br>METERS <u>00238</u> THE<br>ANTENNA HEIGHT ABOVE TERRAIN IN<br>METERS <u>040</u><br>RAD = 56G0.23B000-360A00238H040 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>RAD01 16G030B000-360A00357H006                                                                                                                                              |
| FCC notes:<br>1. Use S-Note S945.<br>2. REM AGN, Cubesat, (insert name) |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |

**NASA/NEN ALASKA AS1 (Secondary)**

| <b>Earth Station Data (Receiver) NASA/NEN ALASKA AS1</b>                |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State (RSC)                                                             | RSC = AK                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                    |
| City Name (RAL)                                                         | RAL = Fairbanks                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                    |
| Latitude (DDMMSS)                                                       | Lat = 645131                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                    |
| Longitude (DDDMMSS)                                                     | Lon = 1475127                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                    |
| 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 = 00                                                                                                                                                                                                                                                              | THE EARTH STATION RECEIVER ANTENNA AZIMUTH (RAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                   |
| Antenna Dimensions (RAD)                                                | ANTENNA GAIN <u>56.8 dBi</u> ,<br>BEAMWIDTH <u>0.23 degrees</u> ,<br>AZIMUTHAL RANGE <u>0-360</u> THE SITE<br>ELEVATION ABOVE MEAN SEA LEVEL IN<br>METERS <u>00217</u><br>THE ANTENNA HEIGHT ABOVE TERRAIN<br>IN METERS <u>024</u><br>RAD = 56G0.23B000-360A00217H024 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>RAD01 16G030B000-360A00357H006                                                                                                                                               |
| FCC notes:<br>1. Use S-Note S945.<br>2. REM AGN, Cubesat, (insert name) |                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                    |

**Part B: Ground Stations, Earth to Space link data:****Clyde Space, Glasgow, Scotland, UK: Uplink to SeaHawk-1 and SeaHawk-2**

## Earth Station Transmitter Data

|                                                  |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transmit Frequency: <b>VHF --- 140 – 150 MHz</b> |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                   |
| State (XSC)                                      | XSC = G                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                   |
| City Name (XAL)                                  | XAL = Glasgow                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |
| Latitude (DDMMSS)                                | Lat = 555744                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                   |
| Longitude (DDDMMSS)                              | Lon = 0041649                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                   |
| 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 <u>10.2 dB</u> ,<br>BEAMWIDTH <u>52 degrees</u> ,<br>AZIMUTHAL RANGE <u>0 – 360</u> ,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS <u>00020</u><br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS <u>042</u><br><br>XAD = 10G052B000-360A00020H042 | EXAMPLE ASSUMING NONGEOSTATIONARY,<br>XAD01 16G030B000-360A00357H006                                                                                                                                              |

Satellite Receive Specifications **UHF --- 140 - 150 MHz**

|                                               |                                                                            |                                                                                                                                                                                                                   |
|-----------------------------------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00                                                                                                            |
| Dimension (RAD)                               | ANTENNA GAIN <u>0.0 dB</u><br>BEAMWIDTH <u>30 degrees</u><br>RAD = 00G030B | (NTIA format (RAD), EXAMPLE, RAD01 16G030B)                                                                                                                                                                       |
| Type of satellite (State = SP)<br>City = G/No | Type = NO                                                                  | Choose either:<br>Geostationary or<br>Nongeostationary                                                                                                                                                            |