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 (Required for Each Frequency)

| Transmit Frequency:<br>437.080 | | |
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| Satellite Name:<br>D3 | | |
| **Data Field** | **Data Answer** | **Description/Comments** |
| Transmit Power (PWR) | PWR = PWR02 W2 | TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2<br>TRANSMIT POWER UNITS INCLUDE:<br>W = WATT,<br>K = KILOWATT,<br>M = MEGAWATT |
| Necessary Bandwidth | 9K50 | THE WIDTH OF FREQUENCY BAND WHICH IS JUST SUFFICIENT TO SUCCESSFULLY TRANSFER DATA. FORMULAS CAN BE FOUND IN ANNEX J OF THE NTIA MANUAL. |
| RF Emissions Data | | 2-SIDED EMISSION BANDWIDTH VALUES |
| -3 dB bandwidth | 4.91 kHz | |
| -20 dB bandwidth | 10.11 kHz | |
| -40 dB bandwidth | 17.8 kHz | |
| -60 dB bandwidth | 28.4 kHz | |
| Modulation Type | GMSK | THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK. |
| Data Rate | 9600 bps | INFORMATION DATA RATE |
| Forward Error Correction Coding | Is FEC used? Yes ☒ No ☐<br>FEC Type: _____,<br>FEC Rate: _____, | |
| Total Symbol Rate | 9600 bps | DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUTE TO THE SYMBOL MAPPER/MODULATOR.<br><br>Data rate provided by the manufacturer includes the frame overhead. |
| Does transmitter have a beacon mode? | Yes ☒<br>No ☐ | BEACON MODE IS NORMALLY CONSIDERED A REGULAR AND PERIODIC SHORT DURATION TRANSMISSION THAT IS OFTEN USED TO ASSIST WITH TRACKING, DOPPLER COMPENSATION, OR SMALL SATELLITE IDENTIFICATION WHOSE TRANSMISSIONS ARE NOT LIMITED TO DURATIONS WHEN SUPPORTING GROUND STATIONS ARE VISIBLE. |

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| If transmitter has a beacon mode, can the beacon be commanded off? | Yes ☒<br>No ☐ | |
| Transmit Antenna 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 |
| Transmit Antenna Orientation (XAZ) | XAZ = EC | NB= NARROWBEAM<br>EC = EARTH COVERAGE |
| Transmit Antenna Dimension (XAD) | ANTENNA GAIN__0.0_____,<br>BEAMWIDTH ___360_____,<br>XAD = XAD = XAD02 0G360B | NTIA FORMAT (XAD), EXAMPLE, FOR 16 DBI ANTENNA GAIN AND 30 DEGREE BEAMWIDTH<br>XAD01 16G030B |
| Type of satellite (State = SPCE) (City = Geo or Nongeo) | Type = NONGEOSTATIONARY | CHOOSE EITHER:<br>GEOSTATIONARY OR NONGEOSTATIONARY |
| For Geostationary Satellites | Longitude = | IF ANY SATELLITES ARE GEOSTATIONARY, REPORT ITS LATITUDE AS 000000N (XLA AND/OR RLA) AND REPORT ITS LONGITUDE IN DDDMMSS FORMAT (XLG AND/OR RLG). |
| For Nongeostationary (Orbital Data) | INCLINATION ANGLE_____52_____,<br>APOGEE IN KILOMETERS____415_____,<br>PERIGEE IN KILOMETERS____415_____,<br>ORBITAL PERIOD IN HOURS ___1 ___AND FRACTIONS OF HOURS IN DECIMAL___0.55__,<br>THE NUMBER OF SATELLITES IN THE SYSTEM_____1____,<br><br>ORB = 52IN00415AP00415PE001.55H01NR | 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,<br>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 |
| For SunSynchronous Nongeostationary Orbits | Mean Local Time of Ascending Node (MLTAN) =_____ | MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM) |
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| **Earth Station Data (Receiver) at Each Earth Station Location** | | |
| State (RSC) | RSC = FL | |
| City Name (RAL) | RAL = Gainesville | |
| Latitude (DDMMSS) | Lat = 293737N | |
| Longitude (DDDMMSS) | Lon = 0822139W | |

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| Receive 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 |
| Receive Antenna Orientation (RAZ) | RAZ = RAZ01 V00 | THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00 |
| Receive Antenna Dimensions (RAD) | ANTENNA GAIN_____16_____,<br>BEAMWIDTH_____30°____,<br>AZIMUTHAL RANGE____0-360___,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS ___25_____<br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS _____8_____<br><br>RAD =<br>RAD01 16G030B000-360A00025H008 | EXAMPLE ASSUMING NONGEOSTATIONARY, 16 DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL RANGE FROM 001-360, SITE ELEVATION OF 357 METERS, AND ANTENNA HEIGHT ABOVE TERRAIN OF 6 METERS:<br>RAD01 16G030B001-360A00357H006 |
| Receive Antenna Additional Information (For Parabolic Antennas) | ANTENNA DIAMETER_____,<br>ANTENNA EFFICIENCY_____, | The antenna is not parabolic. |
| Number of Satellite Contacts Supported Per Day | Average: Once a day<br>Anticipated Upper Limit: 10 | NUMBER OF TIMES THE SATELLITE WILL COMMUNICATE WITH THE EARTH STATION IN THE SPACE TO EARTH DIRECTION (DOWNLINKS) EACH DAY |
| Expected Duration of Each Contact | Average: 1 second | AVERAGE DURATION OF EACH CONTACT |
| Supported Operations | Satellite Health and Status Data ☒<br>Mission Payload Data ☒ | SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA |
| FCC notes:<br>1. Use S-Note S945.<br>2. REM AGN, Cubesat, (insert name) | | |

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

Earth Station Transmitter Data (Required for Each Frequency at Each Earth Station Location)

| Transmit Frequency: 437.080 MHz | | |
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| State (XSC) | XSC = FL | |
| City Name (XAL) | XAL = Gainesville | |
| Latitude (DDMMSS) | Lat = 293737N | |
| Longitude (DDDMMSS) | Lon = 0822139W | |
| Transmit Power (PWR) | PWR = PWR01 W100 | TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2<br>TRANSMIT POWER UNITS INCLUDE:<br>W = WATT,<br>K = KILOWATT,<br>M = MEGAWATT |
| Necessary Bandwidth | 16K0 | THE WIDTH OF FREQUENCY BAND WHICH IS JUST SUFFICIENT TO SUCCESSFULLY TRANSFER DATA. FORMULAS CAN BE FOUND IN ANNEX J OF THE NTIA MANUAL. |
| RF Emissions Data | | 2-SIDED EMISSION BANDWIDTH VALUES |
| -3 dB bandwidth | 3.067 kHz | |
| -20 dB bandwidth | 7.867 kHz | |
| -40 dB bandwidth | 11.067 kHz | |
| -60 dB bandwidth | 13.733 kHz | |
| Modulation Type | GMSK | THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK. |
| Data Rate | 9600 bps | INFORMATION DATA RATE |
| Forward Error Correction Coding | Is FEC used? Yes ☐ No ☒<br>FEC Type: _____,<br>FEC Rate: _____, | |
| Total Symbol Rate | 9600 bps | DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUTE TO THE SYMBOL MAPPER/MODULATOR.<br><br>Data rate provided by the manufacturer includes the frame overhead. |
| Transmit Antenna 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 |
| Transmit Antenna Orientation (XAZ) | XAZ = XAZ01 V00 | THE EARTH STATION TRANSMITTER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (XAZ), V00 TO V90, EXAMPLE, XAZ01 V00 |

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| Transmit Antenna Dimensions (XAD) | ANTENNA GAIN_____16_____,<br>BEAMWIDTH_____30°____,<br>AZIMUTHAL RANGE____0-360___,<br>THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS ___25_____<br>THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS _____8_____<br><br>XAD =<br>XAD01 16G030B000-360A00025H008 | EXAMPLE ASSUMING NONGEOSTATIONARY, 16 DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL RANGE FROM 001-360, SITE ELEVATION OF 357 METERS, AND ANTENNA HEIGHT ABOVE TERRAIN OF 6 METERS:<br>XAD01 16G030B001-360A00357H006 |
| Transmit Antenna Additional Information (For Parabolic Antennas) | ANTENNA DIAMETER_____,<br>ANTENNA EFFICIENCY_____, | The antenna is not parabolic. |
| Number of Satellite Contacts Supported Per Day | Average: Once a day<br>Anticipated Upper Limit: 10 | NUMBER OF TIMES THE EARTH STATION WILL COMMUNICATE WITH THE STATELLITE IN THE EARTH TO SPACE DIRECTION (UPINKS) EACH DAY |
| Expected Duration of Each Contact | Average: 1 second<br>Anticipated Upper Limit: 45 seconds | AVERAGE DURATION OF EACH CONTACT<br>Updating the guidance requires transmitting a 50kB file. This operation sets the 45 second upper limit. |
| **Satellite Receive Specifications** | | |
| Receive 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 |
| Receive Antenna Orientation (RAZ) | RAZ = EC | NB= NARROWBEAM<br>EC = EARTH COVERAGE |
| Receive Antenna Dimension (RAD) | ANTENNA GAIN____0.0_____<br>BEAMWIDTH _____360_____<br>RAD = RAD02 00G360B | NTIA FORMAT(RAD), EXAMPLE, FOR 16 DBI ANTENNA GAIN AND 30 DEGREE BEAMWIDTH<br>RAD01 16G030B |
| Type of satellite (State = SPCE) City = Geo or Nongeo | Type = NONGEOSTATIONARY | CHOOSE EITHER:<br>GEOSTATIONARY OR NONGEOSTATIONARY |
| For Geostationary Satellites | Longitude = | IF ANY SATELLITES ARE GEOSTATIONARY, REPORT ITS LATITUDE AS 000000N (XLA AND/OR RLA) AND REPORT ITS LONGITUDE IN DDDMMSS FORMAT (XLG AND/OR RLG). |

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| For Nongeostationary (Orbital Data) | INCLINATION ANGLE_____52_____,<br>APOGEE IN KILOMETERS____415_____,<br>PERIGEE IN KILOMETERS____415_____,<br>ORBITAL PERIOD IN HOURS ___1___AND FRACTIONS OF HOURS IN DECIMAL___0.55__,<br>THE NUMBER OF SATELLITES IN THE SYSTEM_____1____,<br><br>ORB = 52.0IN00415AP00415PE001.55H01NR | 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, 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 |
| For SunSynchronous Nongeostationary Orbits | Mean Local Time of Ascending Node (MLTAN) =_____ | MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM) |