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: 2240.0 MHz		
Satellite Name: LIME		
Data Field	**Data Answer**	**Description/Comments**
Transmit Power (PWR)	PWR = 0.711 W	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	140 kHz	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	N/A	
-20 dB bandwidth	N/A	
-40 dB bandwidth	N/A	
-60 dB bandwidth	N/A	
Modulation Type	GMSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	Configurable during mission to 48 or 96 kbps	INFORMATION DATA RATE
Forward Error Correction Coding	Is FEC used? Yes ☒ No ☐ FEC Type: Reed-Solomon, FEC Rate: 223/255,	
Total Symbol Rate	48 or 96 ksym/s depending on data rate configuration	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUTE TO THE SYMBOL MAPPER/MODULATOR.
Does transmitter have a beacon mode?	Yes ☐ 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.

If transmitter has a beacon mode, can the beacon be commanded off?	Yes ☐ No ☒	
Transmit Antenna Polarization (XAP)	XAP = J	POLARIZATIONS INCLUDE: H = HORIZONTAL, V = VERTICAL, S = HORIZONTAL AND VERTICAL, L = LEFT HAND CIRCULAR, R = RIGHT HAND CIRCULAR, T = RIGHT AND LEFT HAND CIRCULAR, J = LINEAR POLARIZATION
Transmit Antenna Orientation (XAZ)	XAZ = EC	NB= NARROWBEAM EC = EARTH COVERAGE
Transmit Antenna Dimension (XAD)	ANTENNA GAIN: 2.5 dBi, BEAMWIDTH: 360 deg, XAD = 2.5G360B	NTIA FORMAT (XAD), EXAMPLE, FOR 16 DBI ANTENNA GAIN AND 30 DEGREE BEAMWIDTH XAD01 16G030B
Type of satellite (State = SPCE) (City = Geo or Nongeo)	Type = Nongeostationary	CHOOSE EITHER: GEOSTATIONARY OR NONGEOSTATIONARY
For Geostationary Satellites	N/A	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)	ORB = 97.4IN00520AP00520PE001.5813H01NRT01	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 *ORB,98.0IN00510AP00510PE001.58H01NRT01, AND FOR SPACE-TO-SPACE COMMUNICATIONS WITH ANOTHER NONGEOSTATIONARY SATELLITE ADD AN ADDITIONAL *ORB FOR IT ENDING IN R01, EXAMPLE, REM05 *ORB,72.9IN03209AP00655PE013.46H01NRR01
For SunSynchronous Nongeostationary Orbits	Mean Local Time of Ascending Node (MLTAN) =22:30	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)
Earth Station Data (Receiver) at Each Earth Station Location		

State (RSC)	1. RSC =Southern Australia 2. RSC =Western Australia 3. RSC =Azerbaijan 4. RSC =Iceland 5. RSC =Sri Lanka 6. RSC =New Zealand 7. RSC =Portugal 8. RSC =United Kingdom 9. RSC =Chile 10. RSC =South Africa 11. RSC =Mexico	
City Name (RAL)	1. RAL =Peterborough 2. RAL =Nangetty 3. RAL =Absheron 4. RAL =Blonduos 5. RAL =Kandy 6. RAL =Awarua 7. RAL =Santa Maria, Azores 8. RAL =Unst, Shetland 9. RAL =Punta Arenas 10. RAL =Pretoria 11. RAL =La Paz	
Latitude (DDMMSS)	1. Lat =-32.57.43 2. Lat =-29.00.38 3. Lat =40.27.59 4. Lat =65.38.51 5. Lat =07.16.27 6. Lat =-46.31.41 7. Lat =36.59.51 8. Lat =60.44.54 9. Lat =-53.02.28 10. Lat =-25.51.37 11. Lat =24.06.18	
Longitude (DDDMMSS)	1. Lon =138.50.58 2. Lon =115.20.30 3. Lon =49.29.09 4. Lon =-20.14.46 5. Lon =80.43.30 6. Lon =168.22.45 7. Lon =-25.08.14 8. Lon =-00.51.30 9. Lon =-70.50.50 10. Lon =28.27.14 11. Lon =-110.22.19	

Receive Antenna Polarization (RAP)	RAP = R	POLARIZATIONS INCLUDE: H = HORIZONTAL, V = VERTICAL, S = HORIZONTAL AND VERTICAL, L = LEFT HAND CIRCULAR, R = RIGHT HAND CIRCULAR, T = RIGHT AND LEFT HAND CIRCULAR, J = LINEAR POLARIZATION
Receive Antenna Orientation (RAZ)	RAZ = V05	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00
Receive Antenna Dimensions (RAD)	RAD = RAD01 34.6G2.4B000-360A00540H002.2 RAD02 34.6G2.4B000-360A00270H002.2 RAD03 34.6G2.4B000-360A00210H002.2 RAD04 34.6G2.4B000-360A00053H002.2 RAD05 34.6G2.4B000-360A00462H002.2 RAD06 34.6G2.4B000-360A00016H002.2 RAD07 34.6G2.4B000-360A00194H002.2 RAD08 34.6G2.4B000-360A00019H002.2 RAD09 34.6G2.4B000-360A0038.6H003.2 RAD10 34.6G2.4B000-360A01392H003.2 RAD11 34.6G2.4B000-360A0003.2H003.3	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: RAD01 16G030B001-360A00357H006
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER: 3.7m, ANTENNA EFFICIENCY: 0.383,	
Number of Satellite Contacts Supported Per Day	16 passes per day	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	1-9 minutes	AVERAGE DURATION OF EACH CONTACT
Supported Operations	Satellite Health and Status Data ☒ Mission Payload Data ☒	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA
FCC notes: 1. Use S-Note S945. 2. REM AGN, Cubesat, LIME		

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

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

Transmit Frequency: 2067.0 MHz		
State (XSC)	1. XSC =Southern Australia 2. XSC =Western Australia 3. XSC =Azerbaijan 4. XSC =Iceland 5. XSC =Sri Lanka 6. XSC =New Zealand 7. XSC =Portugal 8. XSC =United Kingdom 9. XSC =Chile 10. XSC =South Africa 11. XSC =Mexico	V
City Name (XAL)	1. XAL =Peterborough 2. XAL =Nangetty 3. XAL =Absheron 4. XAL =Blonduos 5. XAL =Kandy 6. XAL =Awarua 7. XAL =Santa Maria, Azores 8. XAL =Unst, Shetland 9. XAL =Punta Arenas 10. XAL =Pretoria 11. XAL =La Paz	
Latitude (DDMMSS)	1. Lat =-32.57.43 2. Lat =-29.00.38 3. Lat =40.27.59 4. Lat =65.38.51 5. Lat =07.16.27 6. Lat =-46.31.41 7. Lat =36.59.51 8. Lat =60.44.54 9. Lat =-53.02.28 10. Lat =-25.51.37 11. Lat =24.06.18	

Longitude (DDDMMSS)	1. Lon =138.50.58 2. Lon =115.20.30 3. Lon =49.29.09 4. Lon =-20.14.46 5. Lon =80.43.30 6. Lon =168.22.45 7. Lon =-25.08.14 8. Lon =-00.51.30 9. Lon =-70.50.50 10. Lon =28.27.14 11. Lon =-110.22.19	
Transmit Power (PWR)	PWR = 31.62 W	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	140 kHz	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	N/A	
-20 dB bandwidth	N/A	
-40 dB bandwidth	N/A	
-60 dB bandwidth	N/A	
Modulation Type	GMSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	Configurable during mission to 9.6, 19.2, 48, or 96 kbps	INFORMATION DATA RATE
Forward Error Correction Coding	Is FEC used? Yes ☒ No ☐ FEC Type: Reed-Solomon, FEC Rate: 223/255,	
Total Symbol Rate	9.6, 19.2, 48 or 96 ksym/s depending on data rate configuration	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUTE TO THE SYMBOL MAPPER/MODULATOR.
Transmit Antenna Polarization (XAP)	XAP = R	POLARIZATIONS INCLUDE: H = HORIZONTAL, V = VERTICAL, S = HORIZONTAL AND VERTICAL, L = LEFT HAND CIRCULAR, R = RIGHT HAND CIRCULAR, T = RIGHT AND LEFT HAND CIRCULAR, J = LINEAR POLARIZATION
Transmit Antenna Orientation (XAZ)	XAZ = V05	THE EARTH STATION TRANSMITTER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (XAZ), V00 TO V90, EXAMPLE, XAZ01 V00

Transmit Antenna Dimensions (XAD)	XAD = XAD01 35.0G2.76B000-360A00540H002.2 XAD02 35.0G2.76B000-360A00270H002.2 XAD03 35.0G2.76B000-360A00210H002.2 XAD04 35.0G2.76B000-360A00053H002.2 XAD05 35.0G2.76B000-360A00462H002.2 XAD06 35.0G2.76B000-360A00016H002.2 XAD07 35.0G2.76B000-360A00194H002.2 XAD08 35.0G2.76B000-360A00019H002.2 XAD09 35.0G2.76B000-360A0038.6H003.2 XAD10 35.0G2.76B000-360A01392H003.2 XAD11 35.0G2.76B000-360A0003.2H003.3	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: XAD01 16G030B001-360A00357H006
Transmit Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER: 3.7m, ANTENNA EFFICIENCY: 0.493,	
Number of Satellite Contacts Supported Per Day	16 passes per day	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	1-9 minutes	AVERAGE DURATION OF EACH CONTACT
Satellite Receive Specifications		
Receive Antenna Polarization (RAP)	RAP = J	POLARIZATIONS INCLUDE: H = HORIZONTAL, V = VERTICAL, S = HORIZONTAL AND VERTICAL, L = LEFT HAND CIRCULAR, R = RIGHT HAND CIRCULAR, T = RIGHT AND LEFT HAND CIRCULAR, J = LINEAR POLARIZATION
Receive Antenna Orientation (RAZ)	RAZ = EC	NB= NARROWBEAM EC = EARTH COVERAGE
Receive Antenna Dimension (RAD)	ANTENNA GAIN: 2.5 dBi, BEAMWIDTH: 360, RAD = 2.5G360B	NTIA FORMAT(RAD), EXAMPLE, FOR 16 DBI ANTENNA GAIN AND 30 DEGREE BEAMWIDTH RAD01 16G030B
Type of satellite (State = SPCE) City = Geo or Nongeo	Type = Nongeostationary	CHOOSE EITHER: GEOSTATIONARY OR NONGEOSTATIONARY
For Geostationary Satellites	N/A	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)	ORB = 97.4IN00520AP00520PE001.5813H01NRT01	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 *ORB,98.0IN00510AP00510PE001.58H01NRT01, AND FOR SPACE-TO-SPACE COMMUNICATIONS WITH ANOTHER NONGEOSTATIONARY SATELLITE ADD AN ADDITIONAL *ORB FOR IT ENDING IN R01, EXAMPLE, REM05 *ORB,72.9IN03209AP00655PE013.46H01NRR01
For SunSynchronous Nongeostationary Orbits	Mean Local Time of Ascending Node (MLTAN) =22:30	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)