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: 401.50 MHz		
Satellite Name: CTC-0		
Data Field	**Data Answer**	**Description/Comments**
Transmit Power (PWR)	PWR = 0.9W	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	25 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	Telemetry and telecommand	2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth	< 25 kHz	
-20 dB bandwidth	< 25 kHz	
-40 dB bandwidth	< 50 kHz	
-60 dB bandwidth	< 50 kHz	
Modulation Type	2GFSK	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 V FEC Type: n/a	
Total Symbol Rate	9600 sps	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUT 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 = T	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 0 dBi, BEAMWIDTH 360°, XAD = 00G360B	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)	INCLINATION ANGLE 45 deg, APOGEE IN KILOMETERS 550 km, PERIGEE IN KILOMETERS 550 km, ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL .594, THE NUMBER OF SATELLITES IN THE SYSTEM, 1 ORB = ORB,45.0IN00550AP00550PE001H.594NRT01	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) = N/A	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 = Scotland 2) RSC = Bulgaria	
City Name (RAL)	1) RAL = Dundee (RBC Signals) 2) RAL = Plana (EnduroSat)	
Latitude (DDMMSS)	1) Lat = 562416.25 (56° 24' 16.25'' N) 2) Lat = 422858.6 (42° 28' 58.6'' N)	
Longitude (DDDMMSS)	1) Lon = 0031032.94 (3° 10' 32.94'' W) 2) Lon = 0232643.0 (23° 26' 43.0'' E)	

Receive Antenna Polarization (RAP)	RAP = T	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)	RAZ1 = V05 RAZ2 = V05	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00
Receive Antenna Dimensions (RAD)	1) RAD1 = 14G035B001-360A00005H008 2) RAD2 = 14G035B001-360A00194H007	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 1.8 meters ANTENNA EFFICIENCY 65% (for all stations)	NOTE: ~1.8m long Yagi antenna, not a dish
Number of Satellite Contacts Supported Per Day	Up to 2 contacts per Earth station location 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	10 minutes	AVERAGE DURATION OF EACH CONTACT
Supported Operations	SATELLITE HEALTH AND STATUS TELEMETRY AND MISSION PAYLOAD DATA	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA
FCC notes: 1.		

Transmit Frequency: 2240.5 MHz		
Satellite Name: CTC-0		
Data Field	**Data Answer**	**Description/Comments**
Transmit Power (PWR)	PWR = 0.2W	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	62.5 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	Telemetry and telecommand	2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth	<62.5 kHz	
-20 dB bandwidth	<125 kHz	
-40 dB bandwidth	<250 kHz	
-60 dB bandwidth	<250 kHz	
Modulation Type	4FSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	<62.5 kbps	INFORMATION DATA RATE
Forward Error Correction Coding	Is FEC used? Yes V No ☐ FEC Type: Convolutional encoding with Viterbi decoding FEC Rate: ½ rate	
Total Symbol Rate	<62.5 ksps	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUT TO THE SYMBOL MAPPER/MODULATOR.
Does transmitter have a beacon mode?	Yes ☐ No V	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 = 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 = EC	NB= NARROWBEAM EC = EARTH COVERAGE
Transmit Antenna Dimension (XAD)	ANTENNA GAIN = 3.5 dBi BEAMWIDTH = 180° XAD = 03.5G180B	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		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 45 deg, APOGEE IN KILOMETERS 550 km, PERIGEE IN KILOMETERS 550 km, ORBITAL PERIOD IN HOURS __1___AND FRACTIONS OF HOURS IN DECIMAL __.583__, THE NUMBER OF SATELLITES IN THE SYSTEM1, ORB = ORB,45.0IN00550AP00550PE001H.583NRT01	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) = N/A	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)	3) RSC = Scotland 4) RSC = Bulgaria 5) RSC = Portugal	
City Name (RAL)	3) RAL = Dundee (RBC Signals) 4) RAL = Plana (EnduroSat) 5) RAL = Santa Maria, Azores (Leaf Space)	
Latitude (DDMMSS)	3) Lat = 562416.25 (56° 24' 16.25'' N) 4) Lat = 422858.6 (42° 28' 58.6'' N) 5) Lat = 365951.2 (36° 59' 51.2'' N)	
Longitude (DDDMMSS)	3) Lon = 0031032.94 (3° 10' 32.94'' W) 4) Lon = 0232643.0 (23° 26' 43.0'' E) 5) Lon = 0250814.3 (25° 8' 14.3'' W)	
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)	RAZ1 = V05 RAZ2 = V05 RAZ3 = V05	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00
Receive Antenna Dimensions (RAD)	3) RAD1 = 35G002B001-360A00005H008 4) RAD2 = 34.6G002.4B001-360A00194H007 5) RAD3 = 35.8G002.2B001-360A01250H005	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 3.7 meters ANTENNA EFFICIENCY 65% (for all stations)	
Number of Satellite Contacts Supported Per Day	Up to 2 contacts per Earth station location 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	10 minutes	AVERAGE DURATION OF EACH CONTACT
Supported Operations	SATELLITE HEALTH AND STATUS TELEMETRY AND MISSION PAYLOAD DATA	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA
FCC notes: 2.		

Transmit Frequency: 2185.0 MHz (center freq)		
Satellite Name: CTC-0		
Data Field	**Data Answer**	**Description/Comments**
Transmit Power (PWR)	PWR = 6W	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	200KHz, 100KHz	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	5G-NTN NR, 3GPP standard	2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth	<200 kHz	
-20 dB bandwidth	<400 kHz	
-40 dB bandwidth	<800 kHz	
-60 dB bandwidth	<800 kHz	
Modulation Type	QPSK, 16QAM, 64QAM, 256QAM (OFDM for multiplexing)	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	Estimated 200kbps at 200KHz bandwidth	INFORMATION DATA RATE
Forward Error Correction Coding	Is FEC used? Yes V No ☐ FEC Type: LDPC and Polar Codes FEC Rate: Variable (ACM)	
Total Symbol Rate	Estimated 200ksps, 100ksps	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUT TO THE SYMBOL MAPPER/MODULATOR.
Does transmitter have a beacon mode?	Yes ☐ No V	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 = 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 = EC	NB= NARROWBEAM EC = EARTH COVERAGE
Transmit Antenna Dimension (XAD)	ANTENNA GAIN = 8 dBi BEAMWIDTH = 70° XAD = 08G070B	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)	INCLINATION ANGLE 45 deg, APOGEE IN KILOMETERS 550 km, PERIGEE IN KILOMETERS 550 km, ORBITAL PERIOD IN HOURS __1___AND FRACTIONS OF HOURS IN DECIMAL __.583__, THE NUMBER OF SATELLITES IN THE SYSTEM1, ORB = ORB,45.0IN00550AP00550PE001H.583NRT01	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) = N/A	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)	6) RSC = Nigeria 7) RSC = Nigeria	
City Name (RAL)	6) RAL = Lagos 7) RAL = Mobile	
Latitude (DDMMSS)	6) Lat = 062542.05 (6° 25' 42.05'' N) 7) Lat = N/A	
Longitude (DDDMMSS)	6) Lon = 032535.79 (3° 25' 35.79'' E) 7) Lon = N/A	
Receive Antenna Polarization (RAP)	RAP06 = T RAP07 = 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)	RAZ06 = V05 RAZ07 = V45	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00
Receive Antenna Dimensions (RAD)	6) RAD6 = 35G002B001-360A00005H008 7) RAD7 = N/A MSS	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 3.7 meters (Lagos) ANTENNA EFFICIENCY 65% N/A MSS	
Number of Satellite Contacts Supported Per Day	Up to 2 contacts per Earth station location 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	2 Minutes	AVERAGE DURATION OF EACH CONTACT
Supported Operations	Mission Payload Data, 5G-NTN NR	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA

FCC notes: 3.

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

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

Transmit Frequency: 402.50 MHz		
State (XSC)	1) XSC1 = Scotland 2) XSC2 = Bulgaria	
City Name (XAL)	1) XAL1 = Dundee 2) XAL2 = Plana	
Latitude (DDMMSS)	1) Lat1 = 562416.25 (56° 24' 16.25'' N) 2) Lat2 = 422858.6 (42° 28' 58.6'' N)	
Longitude (DDDMMSS)	1) Lon1 = 031032.94 (3° 10' 32.94'' W) 2) Lon2 = 0232643.0 (23° 26' 43.0'' E)	
Transmit Power (PWR)	1) PWR1 = 0.2W 2) PWR2 = 0.2W	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	1) 25 KHz 2) 25 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	1) <25 KHz 2) <25 KHz	
-20 dB bandwidth	1) <25 KHz 2) <25 KHz	
-40 dB bandwidth	1) <50 KHz 2) <50 KHz	
-60 dB bandwidth	1) <50 KHz 2) <50 KHz	
Modulation Type	1) 2GFSK 2) 2GFSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	1) 9600bps 2) 9600bps	INFORMATION DATA RATE

Forward Error Correction Coding	Is FEC used? V No ☐ Yes FEC Type: n/a	
Total Symbol Rate	1) 9600sps 2) 9600sps	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)	1) XAP = T 2) XAP = T	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)	1) XAZ1 = V05 2) XAZ2 = V05	THE EARTH STATION TRANSMITTER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (XAZ), V00 TO V90, EXAMPLE, XAZ01 V00
Transmit Antenna Dimensions (XAD)	ANTENNA GAIN_____, BEAMWIDTH_____deg_, AZIMUTHAL RANGE___deg__, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS ____ m__, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS _____ m_____, 1) XAD1 = 14G035B001-360A00005H008 2) XAD2 = 14G035B001-360A00194H007	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 1.8M ANTENNA EFFICIENCY 65% (all)	NOTE: ~1.8m long Yagi antenna, not a dish
Number of Satellite Contacts Supported Per Day	Up to 2 contacts per Earth station location per day	NUMBER OF TIMES THE EARTH STATION WILL COMMUNICATE WITH THE SATELLITE IN THE EARTH TO SPACE DIRECTION (UPINKS) EACH DAY
Expected Duration of Each Contact	10 minutes	AVERAGE DURATION OF EACH CONTACT
Satellite Receive Specifications		

Receive Antenna Polarization (RAP)	1) RAP = T 2) RAP = T	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 0 dBi BEAMWIDTH 360 deg 1) RAD1 = 0G360B 2) RAD2 = 0G360B	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	Longitude = 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)	INCLINATION ANGLE 45 deg, APOGEE IN KILOMETERS 550 km, PERIGEE IN KILOMETERS 550 km, ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL .594, THE NUMBER OF SATELLITES IN THE SYSTEM, 1 ORB = ORB,45.0IN00550AP00550PE001H.594NRT01	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) = N/A	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)

Transmit Frequency: 2067.5 MHz		
State (XSC)	3) XSC3 = Scotland 4) XSC4 = Bulgaria 5) XSC5 = Portugal	
City Name (XAL)	3) XAL3 = Dundee 4) XAL4 = Plana 5) XAL5 = Santa Maria, Azores	
Latitude (DDMMSS)	3) Lat3 = 562416.25 (56° 24' 16.25'' N) 4) Lat4 = 422858.6 (42° 28' 58.6'' N) 5) Lat5 = 365951.2 (36° 59' 51.2'' N)	
Longitude (DDDMMSS)	3) Lon3 = 031032.94 (3° 10' 32.94'' W) 4) Lon4 = 0232643.0 (23° 26' 43.0'' E) 5) Lon5 = 250814.3 (25° 8' 14.3'' W)	
Transmit Power (PWR)	3) PWR3 = 20W 4) PWR4 = 20W 5) PWR5 = 20W	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	3) 62.5 KHz 4) 62.5 KHz 5) 62.5 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	3) 62.5 KHz 4) 62.5 KHz 5) 62.5 KHz	
-20 dB bandwidth	3) 125 KHz 4) 125 KHz 5) 125 KHz	
-40 dB bandwidth	3) 250 KHz 4) 250 KHz 5) 250 KHz	
-60 dB bandwidth	3) 250 KHz 4) 250 KHz 5) 250 KHz	

Modulation Type	3) 4FSK 4) 4FSK 5) 4FSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	3) <125kbps 4) <125kbps 5) <125kbps	INFORMATION DATA RATE
Forward Error Correction Coding	Is FEC used? Yes V No ☐ FEC Type: Convolutional encoding with Viterbi decoding FEC Rate: ½ rate	
Total Symbol Rate	3) 62.5ksps 4) 62.5ksps 5) 62.5ksps	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)	3) XAP = R 4) XAP = R 5) 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)	3) XAZ3 = V05 4) XAZ4 = V05 5) XAZ5 = V05	THE EARTH STATION TRANSMITTER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (XAZ), V00 TO V90, EXAMPLE, XAZ01 V00
Transmit Antenna Dimensions (XAD)	ANTENNA GAIN_____, BEAMWIDTH_____deg_, AZIMUTHAL RANGE___deg__, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS ____ m__, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS _____ m_____, 3) XAD3 = 35G002.2B001-360A00005H008 4) XAD4 = 34.6G002.76B001-360A00194H007 5) XAD5 = 35.8G002.2B001-360A01250H005	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 65% (all)	

Number of Satellite Contacts Supported Per Day	Up to 2 contacts per Earth station location per day	NUMBER OF TIMES THE EARTH STATION WILL COMMUNICATE WITH THE SATELLITE IN THE EARTH TO SPACE DIRECTION (UPINKS) EACH DAY
Expected Duration of Each Contact	10 minutes	AVERAGE DURATION OF EACH CONTACT
Satellite Receive Specifications		
Receive Antenna Polarization (RAP)	3) RAP = R 4) RAP = R 5) 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 = EC	NB= NARROWBEAM EC = EARTH COVERAGE
Receive Antenna Dimension (RAD)	ANTENNA GAIN 4 dBi BEAMWIDTH 180 deg, 3) RAD3 = 4G180B 4) RAD4 = 4G180B 5) RAD5 = 4G180B	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	Longitude = 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)	INCLINATION ANGLE 45 deg, APOGEE IN KILOMETERS 550 km, PERIGEE IN KILOMETERS 550 km, ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL .594, THE NUMBER OF SATELLITES IN THE SYSTEM, 1 ORB = ORB,45.0IN00550AP00550PE001H.594NRT01	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) = N/A	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)

Transmit Frequency: 1995.0 MHz		
State (XSC)	6) XSC6 = Nigeria 7) XSC7 = Nigeria	
City Name (XAL)	6) XAL6 = Lagos 7) XAL7 = Mobile	
Latitude (DDMMSS)	6) Lat6 = 062542.05 (6° 25' 42.05'' N) 7) La7 – N/A	
Longitude (DDDMMSS)	6) Lon6 = 032535.79 (3° 25' 35.79'' E) 7) Lon7 = N/A	
Transmit Power (PWR)	6) PWR6 = 20W 7) PWR7 = up to 2W (MSS)	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT

Necessary Bandwidth	6) 100 KHz and 200 KHz 7) 100 kHz and 200 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	5G-NTN NR, 3GPP standard	2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth	6) 200 KHz 7) 200 KHz	
-20 dB bandwidth	6) 400 KHz 7) 400 KHz	
-40 dB bandwidth	6) 800 KHz 7) 800 KHz	
-60 dB bandwidth	6) 800 KHz 7) 800 KHz	
Modulation Type	QPSK, 16QAM, 64QAM, 256QAM (OFDM for multiplexing)	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	6) 200kbps 7) 200kbps	INFORMATION DATA RATE
Forward Error Correction Coding	Is FEC used? Yes V No ☐ FEC Type: LDPC and Polar Codes FEC Rate: Variable (ACM)	
Total Symbol Rate	6) 200ksps 7) 200ksps	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)	6) XAP6 = R 7) XAP7 = 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)	6) XAZ6 = V45 7) XAZ7 = V45	THE EARTH STATION TRANSMITTER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (XAZ), V00 TO V90, EXAMPLE, XAZ01 V00

Transmit Antenna Dimensions (XAD)	ANTENNA GAIN_____, BEAMWIDTH_____deg_, AZIMUTHAL RANGE___deg__, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS ____ m__, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS _____ m_____, 6) XAD6 = 35G002.2B001-360A01250H005 7) XAD7 = N/A MSS	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 65% N/A for MSS terminal	
Number of Satellite Contacts Supported Per Day	Up to 2 contacts per Earth station location per day	NUMBER OF TIMES THE EARTH STATION WILL COMMUNICATE WITH THE SATELLITE IN THE EARTH TO SPACE DIRECTION (UPINKS) EACH DAY
Expected Duration of Each Contact	2 minutes	AVERAGE DURATION OF EACH CONTACT
Satellite Receive Specifications		
Receive Antenna Polarization (RAP)	6) RAP = R 7) 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 = EC	NB= NARROWBEAM EC = EARTH COVERAGE
Receive Antenna Dimension (RAD)	ANTENNA GAIN 8 dBi BEAMWIDTH 100 deg 6) RAD6 = 8G100B 7) RAD7 = 8G100B	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	Longitude = 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)	INCLINATION ANGLE 45 deg, APOGEE IN KILOMETERS 550 km, PERIGEE IN KILOMETERS 550 km, ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL .594, THE NUMBER OF SATELLITES IN THE SYSTEM, 1 ORB = ORB,45.0IN00550AP00550PE001H.594NRT01	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) = N/A	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)