NTIA Space Record Data Form

For submission for FCC Licence application through OET

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Part A: Space to Earth Downlink Data

Satellite Transmitter Data

Transmit Frequency:

2254 MHz

Satellite Name:

Umbra-2001

Data Field	Data Answer	Description / Comments
Polarization (XAP)	XAP = R	Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular, R = Right and Left Hand Circular, J = Linear Polarization
Orientation (XAZ)	XAZ = EC	NB = Narrowbeam EC = Earth Coverage
Antenna Dimension (XAD)	Antenna Gain = 5.6 Beamwidth = 102° XAD = XAD01 06G102B	(NTIA format (XAD), Example, XAD01 16G030B)
Type of satellite (State = SP) (City = geo or non)	Type = non	Choose either: Geostationary or Nongeostationary
For Geostationary	Longitude =	If any are in Geo, report its Latitude as 000000N (XLA and/or RLA) and report it's longitude (XLG and/or RLG)
For NonGeostationary (Orbital Data)	Inclination Angle = 97.4 Apogee in Kilometers = 583 Perigee in Kilometers = 583 Orbital Period in hour = 1 and fractions of hours in decimal = 0.6 The number of sats. In the system = 1 ORB = *ORB,97.5IN00583AP00583PE001.61H01NRT01	If any satellites are nongeostationary, report its inclination angle, apogee (km), perigee (km), orbital period (0.0000), number of satellites in the system, then T01, example, REM04 *ORB,98.0IN00510AP00510PE001.58H01NRT01, and for Space-to-Space Communications with another Satellite add an additional *ORB for it ending in R01, example REM05 *ORB,72.9IN03209AP00655PE013.46H01NRR01

Transmit Frequency:

8150 MHz

Satellite Name:

Umbra-2001

Data Field	Data Answer	Description / Comments
Polarization (XAP)	XAP = R	Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular, R = Right and Left Hand Circular, J = Linear Polarization
Orientation (XAZ)	XAZ = NB	NB = Narrowbeam EC = Earth Coverage
Antenna Dimension (XAD)	Antenna Gain = 12 dBi Beamwidth = 40° XAD = XAD01 34G001B	(NTIA format (XAD), Example, XAD01 16G030B)
Type of satellite (State = SP) (City = geo or non)	Type = non	Choose either: Geostationary or Nongeostationary
For Geostationary	Longitude =	If any are in Geo, report its Latitude as 000000N (XLA and/or RLA) and report it's longitude (XLG and/or RLG)
For NonGeostationary (Orbital Data)	Inclination Angle = 97.4 Apogee in Kilometers = 583 Perigee in Kilometers = 583 Orbital Period in hour = 1 and fractions of hours in decimal = 0.6 The number of sats. In the system = 1 ORB = *ORB,97.5IN00583AP00583PE001.61H01NRT01	If any satellites are nongeostationary, report its inclination angle, apogee (km), perigee (km), orbital period (0.0000), number of satellites in the system, then T01, example, REM04 *ORB,98.0IN00510AP00510PE001.58H01NRT01, and for Space-to-Space Communications with another Satellite add an additional *ORB for it ending in R01, example REM05 *ORB,72.9IN03209AP00655PE013.46H01NRR01

Earth Station Data (Receiver)	**Svalbard**	
State (RSC)	RSC = Svalbard	CA
City Name (RAL)	RAL = Spitsbergen, Svalbard	i.e. San Luis Obispo, CA
Latitude (DDMMSS)	Lat = 781347N	i.e. 351808N
Longitude (DDDMMSS)	Lon = 152428E	i.e. 1203955W
Antenna Polarization (RAP)	RAP = R	Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular, R = Right and Left Hand Circular, J = Linear Polarization
Antenna Azimuth (RAZ)	RAZ = RAZ01 V05	The earth station receiver antenna azimuth (RAZ), the minimum angle of elevation, V00 to V90, Example: RAZ01 V00
Antenna Dimensions (RAD)	Antenna Gain = 35.4 (S-band) Beamwidth = 1.3 Azimuthal Range = 360 The site elevation above mean Sea Level (m) = 484 The antenna height above terrain (m) = 5 RAD = RAD01 35G1.3B000-360A00484H005	Example assuming nongeostationary: RAD01 16G030B000-360A00357H006
Earth Station Data (Receiver)	**Svalbard**	
State (RSC)	RSC = Svalbard	CA
City Name (RAL)	RAL = Spitsbergen, Svalbard	i.e. San Luis Obispo, CA
Latitude (DDMMSS)	Lat = 781347N	i.e. 351808N
Longitude (DDDMMSS)	Lon = 152428E	i.e. 1203955W
Antenna Polarization (RAP)	RAP = R	Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular, R = Right and Left Hand Circular, J = Linear Polarization
Antenna Azimuth (RAZ)	RAZ = RAZ01 V05	The earth station receiver antenna azimuth (RAZ), the minimum angle of elevation, V00 to V90, Example: RAZ01 V00
Antenna Dimensions (RAD)	Antenna Gain = 47 (X-Band) Beamwidth = 1.3 Azimuthal Range = 360 The site elevation above mean Sea Level (m) = 484 The antenna height above terrain (m) = 5 RAD = RAD01 47G1.3B000-360A00484H005	Example assuming nongeostationary: RAD01 16G030B000-360A00357H006
Earth Station Data (Receiver)	**Inuvik**	
State (RSC)	RSC = Inuvik	CA
City Name (RAL)	RAL = Inuvik, Canada	i.e. San Luis Obispo, CA
Latitude (DDMMSS)	Lat = 681200N	i.e. 351808N
Longitude (DDDMMSS)	Lon = 133180W	i.e. 1203955W
Antenna Polarization (RAP)	RAP = R	Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular, R = Right and Left Hand Circular, J = Linear Polarization

Antenna Azimuth (RAZ)	RAZ = RAZ01 V05	The earth station receiver antenna azimuth (RAZ), the minimum angle of elevation, V00 to V90, Example: RAZ01 V00
Antenna Dimensions (RAD)	Antenna Gain = 35.4 Beamwidth = 1.3 Azimuthal Range = 360 The site elevation above mean Sea Level (m) = 127 The antenna height above terrain (m) = 5 RAD = RAD01 35G1.3B000-360A00127H005	Example assuming nongeostationary: RAD01 16G030B000-360A00357H006
Earth Station Data (Receiver)	**Inuvik**	
State (RSC)	RSC = Inuvik	CA
City Name (RAL)	RAL = Inuvik, Canada	i.e. San Luis Obispo, CA
Latitude (DDMMSS)	Lat = 681200N	i.e. 351808N
Longitude (DDDMMSS)	Lon = 133180W	i.e. 1203955W
Antenna Polarization (RAP)	RAP = R	Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular, R = Right and Left Hand Circular, J = Linear Polarization
Antenna Azimuth (RAZ)	RAZ = RAZ01 V05	The earth station receiver antenna azimuth (RAZ), the minimum angle of elevation, V00 to V90, Example: RAZ01 V00
Antenna Dimensions (RAD)	Antenna Gain = 47 Beamwidth = 1.3 Azimuthal Range = 360 The site elevation above mean Sea Level (m) = 127 The antenna height above terrain (m) = 5 RAD = RAD01 47G1.3B000-360A00127H005	Example assuming nongeostationary: RAD01 16G030B000-360A00357H006
Earth Station Data (Receiver)	**Punta Arenas**	
State (RSC)	RSC = Punta Arenas	CA
City Name (RAL)	RAL = Magallanes y la Antártica Chilena, Chile	i.e. San Luis Obispo, CA
Latitude (DDMMSS)	Lat = 530900S	i.e. 351808N
Longitude (DDDMMSS)	Lon = 705512W	i.e. 1203955W
Antenna Polarization (RAP)	RAP = R	Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular, T = Right and Left Hand Circular, J = Linear Polarization
Antenna Azimuth (RAZ)	RAZ = RAZ01 V05	The earth station receiver antenna azimuth (RAZ), the minimum angle of elevation, V00 to V90, Example: RAZ01 V00
Antenna Dimensions (RAD)	Antenna Gain = 35 Beamwidth = 1.3 Azimuthal Range = 360 The site elevation above mean Sea Level (m) = 186 The antenna height above terrain (m) = 5 RAD = RAD01 35G1.3B000-360A00186H005	Example assuming nongeostationary: RAD01 16G030B000-360A00357H006
Earth Station Data (Receiver)	**Punta Arenas**	
State (RSC)	RSC = Punta Arenas	CA
City Name (RAL)	RAL = Magallanes y la Antártica Chilena, Chile	i.e. San Luis Obispo, CA
Latitude (DDMMSS)	Lat = 530900S	i.e. 351808N

Longitude (DDDMMSS)	Lon = 705512W	i.e. 1203955W
Antenna Polarization (RAP)	RAP = R	Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular, T = Right and Left Hand Circular, J = Linear Polarization
Antenna Azimuth (RAZ)	RAZ = RAZ01 V05	The earth station receiver antenna azimuth (RAZ), the minimum angle of elevation, V00 to V90, Example: RAZ01 V00
Antenna Dimensions (RAD)	Antenna Gain = 47 Beamwidth = 1.3 Azimuthal Range = 360 The site elevation above mean Sea Level (m) = 186 The antenna height above terrain (m) = 5 RAD = RAD01 47G1.3B000-360A00186H005	Example assuming nongeostationary: RAD01 16G030B000-360A00357H006
Earth Station Data (Receiver)	**Awarua**	
State (RSC)	RSC = Awarua	CA
City Name (RAL)	RAL = Awarua, New Zealand	i.e. San Luis Obispo, CA
Latitude (DDMMSS)	Lat = 463047S	i.e. 351808N
Longitude (DDDMMSS)	Lon = 1682233E	i.e. 1203955W
Antenna Polarization (RAP)	RAP = R	Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular, T = Right and Left Hand Circular, J = Linear Polarization
Antenna Azimuth (RAZ)	RAZ = RAZ01 V05	The earth station receiver antenna azimuth (RAZ), the minimum angle of elevation, V00 to V90, Example: RAZ01 V00
Antenna Dimensions (RAD)	Antenna Gain = 35 Beamwidth = 1.3 Azimuthal Range = 360 The site elevation above mean Sea Level (m) = 186 The antenna height above terrain (m) = 5 RAD = RAD01 35G1.3B000-360A00186H005	Example assuming nongeostationary: RAD01 16G030B000-360A00357H006
Earth Station Data (Receiver)	**Awarua**	
State (RSC)	RSC = Awarua	CA
City Name (RAL)	RAL = Awarua, New Zealand	i.e. San Luis Obispo, CA
Latitude (DDMMSS)	Lat = 463047S	i.e. 351808N
Longitude (DDDMMSS)	Lon = 1682233E	i.e. 1203955W
Antenna Polarization (RAP)	RAP = R	Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular, T = Right and Left Hand Circular, J = Linear Polarization
Antenna Azimuth (RAZ)	RAZ = RAZ01 V05	The earth station receiver antenna azimuth (RAZ), the minimum angle of elevation, V00 to V90, Example: RAZ01 V00

Antenna Dimensions (RAD)	Antenna Gain = 47 Beamwidth = 1.3 Azimuthal Range = 360 The site elevation above mean Sea Level (m) = 186 The antenna height above terrain (m) = 5 RAD = RAD01 47G1.3B000-360A00186H005	Example assuming nongeostationary: RAD01 16G030B000-360A00357H006
FCC notes: 1. Use S-Note S945. 2. REM AGN, Cubesat, (insert name)		

Part B: Ground Stations, Earth to Space link data:		
Data Field	**Data Answer**	**Description / Comments**
Earth Transmitter Data		
Transmit Frequency: 2080		
Earth Station Data (Transmitter)	**Svalbard**	
State (XSC)	XSC = Svalbard	i.e. CA
City Name (XAL)	XAL = Spitsbergen, Svalbard	i.e. San Luis Obispo, CA
Latitude (DDMMSS)	Lat = 781347N	i.e. 351808N
Longitude (DDDMMSS)	Lon = 152428E	i.e. 1203955W
Antenna Polarization (XAP)	XAP = R	Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular, R = Right and Left Hand Circular, J = Linear Polarization
Antenna Azimuth (XAZ)	XAZ = XAZ01 V05	The earth station transmitter antenna azimuth (XAZ), the minimum angle of elevation, V00 to V90, Example: XAZ01 V00
Antenna Dimensions (XAD)	Antenna Gain = 35.4 Beamwidth = 1.3 Azimuthal Range = 360 The site elevation above mean Sea Level (m) = 484 The antenna height above terrain (m) = 5 XAD = XAD01 35G1.3B000-360A00484H005	Example assuming nongeostationary: XAD01 16G030B000-360A00357H006
Earth Station Data (Receiver)	**Inuvik**	
State (XSC)	XSC = Inuvik	i.e. CA
City Name (XAL)	XAL = Inuvik, Canada	i.e. San Luis Obispo, CA
Latitude (DDMMSS)	Lat = 681200N	i.e. 351808N
Longitude (DDDMMSS)	Lon = 133180W	i.e. 1203955W
Antenna Polarization (XAP)	XAP = R	Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular, R = Right and Left Hand Circular,
Antenna Azimuth (XAZ)	XAZ = XAZ01 V05	The earth station transmitter antenna azimuth (XAZ), the minimum angle of elevation, V00 to V90, Example: XAZ01 V00
Antenna Dimensions (XAD)	Antenna Gain = 35.4 Beamwidth = 1.3 Azimuthal Range = 360 The site elevation above mean Sea Level (m) = 127 The antenna height above terrain (m) = 5	Example assuming nongeostationary: XAD01 16G030B000-360A00357H006
Earth Station Data (Transmitter)	**Punta Arenas**	
State (XSC)	XSC = Punta Arenas	i.e. CA
City Name (XAL)	XAL = Magallanes y la Antártica Chilena, Chile	i.e. San Luis Obispo, CA
Latitude (DDMMSS)	Lat = 530900S	i.e. 351808N
Longitude (DDDMMSS)	Lon = 705512W	i.e. 1203955W

Antenna Polarization (XAP)	XAP = R	Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular, R = Right and Left Hand Circular,
Antenna Azimuth (XAZ)	XAZ = XAZ01 V05	The earth station transmitter antenna azimuth (XAZ), the minimum angle of elevation, V00 to V90, Example: XAZ01 V00
Antenna Dimensions (XAD)	Antenna Gain = 35 Beamwidth = 1.3 Azimuthal Range = 360 The site elevation above mean Sea Level (m) = 186 The antenna height above terrain (m) = 5	Example assuming nongeostationary: XAD01 16G030B000-360A00357H006
Earth Station Data (Transmitter)	**Awarua**	
State (XSC)	XSC = Awarua	i.e. CA
City Name (XAL)	XAL = Awarua, New Zealand	i.e. San Luis Obispo, CA
Latitude (DDMMSS)	Lat = 463047S	i.e. 351808N
Longitude (DDDMMSS)	Lon = 1682233E	i.e. 1203955W
Antenna Polarization (XAP)	XAP = R	Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular, R = Right and Left Hand Circular,
Antenna Azimuth (XAZ)	XAZ = XAZ01 V05	The earth station transmitter antenna azimuth (XAZ), the minimum angle of elevation, V00 to V90, Example: XAZ01 V00
Antenna Dimensions (XAD)	Antenna Gain = 35 Beamwidth = 1.3 Azimuthal Range = 360 The site elevation above mean Sea Level (m) = 186 The antenna height above terrain (m) = 5	Example assuming nongeostationary: XAD01 16G030B000-360A00357H006

Satellite Receive Specifications

Data Field	Data Answer	Description / Comments
Polarization (XAP)	XAP = R	H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular, R = Right and Left Hand Circular, J = Linear Polarization
Azimuth (XAZ)	XAZ = XAZ01 V05	Station receiver antenna azimuth (XAZ), The minimum angle of elevation, V00 to v90, ex: XAZ01 V00
Antenna Dimension (XAD)	Antenna Gain = 5.6 Beamwidth = 102 XAD = XAD01 06G102B	(NTIA format (XAD), ERample, XAD01 16G030B)
Type of satellite (Type = G/No)	Type = No	Choose either: Geostationary or Nongeostationary, G / No

FCC notes: