Part A: Space to Earth Downlink Data

Satellite Transmitter #1 Data		
Transmit Frequency: 400.500 MHz		
Satellite Name: Lumen-1		
Data Field	**Data Answer**	**Description/Comments**
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
Orientation (XAZ)	XAZ = EC	N = Narrowbeam, EC = Earth Coverage
Antenna Dimension (XAD)	Antenna Gain = 1.8 dBi, Beamwidth = 360 XAD = XAD01 02G360B	NTIA format (XAD), Example: XAD01 16G030B
Type of Satellite (State = SP, City = geo or non)	Type = Nongeostationary	Choose either: Geostationary or Nongeostationary
For Geostationary	Longitude = (Blank)	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 = 45 Apogee = 325 km Perigee = 325 km Orbital Period = 1 hour AND Fractions of Hours = 0.51, Number of Satellites = 1 ORB=ORB, 45.0IN00325AP00325PE001.51H01N RTR01	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,72.9IN03209AP00655PE013.46H01NRR0 1
Satellite Transmitter #2 Data		
Transmit Frequency: 1622 MHz		
Satellite Name: Lumen-1		
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 Hand Circular, T = Right and Left Hand Circular, J = Linear Polarization
Orientation (XAZ)	XAZ = EC	N = Narrowbeam, EC = Earth Coverage
Antenna Dimension (XAD)	Antenna Gain = 2 dBi, Beamwidth = 190 XAD = XAD02 02G190B	NTIA format (XAD), Example: XAD01 16G030B
Type of Satellite (State = SP, City = geo or non)	Type = Nongeostationary	Choose either: Geostationary or Nongeostationary
For Geostationary	Longitude = (Blank)	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 = 45 Apogee = 325 km Perigee = 325 km Orbital Period = 1 hour AND Fractions of Hours = 0.51, Number of Satellites = 1	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,

	ORB=ORB, 45.0IN00325AP00325PE001.51H01N RTR02	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,72.9IN03209AP00655PE013.46H01NRR0 1
Satellite Transmitter #3 Data		
Transmit Frequency: 1622 MHz		
Satellite Name: Lumen-1		
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 Hand Circular, T = Right and Left Hand Circular, J = Linear Polarization
Orientation (XAZ)	XAZ = EC	N = Narrowbeam, EC = Earth Coverage
Antenna Dimension (XAD)	Antenna Gain = 5 dBi, Beamwidth = 90 XAD = XAD03 05G090B	NTIA format (XAD), Example: XAD01 16G030B
Type of Satellite (State = SP, City = geo or non)	Type = Nongeostationary	Choose either: Geostationary or Nongeostationary
For Geostationary	Longitude = (Blank)	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 = 45 Apogee = 325 km Perigee = 325 km Orbital Period = 1 hour AND Fractions of Hours = 0.51, Number of Satellites = 1 ORB=ORB, 45.0IN00325AP00325PE001.51H01N RTR03	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,72.9IN03209AP00655PE013.46H01NRR0 1
Earth Station Data (Receiver) #1		
State (RSC)	RSC = Italy	
City Name (RAL)	RAL = Lomazzo	
Latitude (DDMMSS)	Lat = 45 41 50N	
Longitude (DDMMSS)	Lon = 09 02 05E	
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
Antenna Azimuth (RAZ)	RAZ = V00 to V90	The Earth Station Receiver Antenna Azimuth (RAZ), the minimum angle of elevation, V00 to V90
Antenna Dimensions (RAD)	Antenna Gain = 14.8 Beamwidth = 40 degree Azimuthal Range = 360 Elevation = 296 meters above sea level Antenna Height = <6 meters above terrain RAD = RAD01 15G040B000-360A0296H006	Example assuming nongeostationary, RAD01 16G0308000-360A00357H006
Earth Station Data (Receiver) #2		

State (RSC)	RSC = Italy	
City Name (RAL)	RAL = Vimercate	
Latitude (DDMMSS)	Lat = 453536N	
Longitude (DDMMSS)	Lon = 092144E	
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
Antenna Azimuth (RAZ)	RAZ = V00 to V90	The Earth Station Receiver Antenna Azimuth (RAZ), the minimum angle of elevation, V00 to V90
Antenna Dimensions (RAD)	Antenna Gain = 14.8 dB Beamwidth = 40 degree Azimuthal Range = 360 Elevation = 199 meters above sea level Antenna Height = <6 meters above terrain RAD = RAD02 15G040B000-360A0199H006	Example assuming nongeostationary, RAD01 16G0308000-360A00357H006
Earth Station Data (Receiver) #3		
State (RSC)	RSC = South Africa	
City Name (RAL)	RAL = Pretoria	
Latitude (DDMMSS)	Lat = 25 51 39 S	
Longitude (DDMMSS)	Lon = 28 27 12 E	
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
Antenna Azimuth (RAZ)	RAZ = V00 to V90	The Earth Station Receiver Antenna Azimuth (RAZ), the minimum angle of elevation, V00 to V90
Antenna Dimensions (RAD)	Antenna Gain = 16.2 Beamwidth = 40 degree Azimuthal Range = 360 Elevation = 1339 meters above sea level Antenna Height = <6 meters above terrain RAD = RAD03 16G040B000-360A1339H006	Example assuming nongeostationary, RAD01 16G0308000-360A00357H006
Earth Station Data (Receiver) #4		
State (RSC)	RSC = Bulgaria	
City Name (RAL)	RAL = Kaspichan	
Latitude (DDMMSS)	Lat = 43 18 49 N	
Longitude (DDMMSS)	Lon = 27 09 27 E	
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
Antenna Azimuth (RAZ)	RAZ = V00 to V90	The Earth Station Receiver Antenna Azimuth (RAZ), the minimum angle of elevation, V00 to V90
Antenna Dimensions (RAD)	Antenna Gain = 14.8 Beamwidth = 40 degree Azimuthal Range = 360 Elevation = 1280 meters above sea level Antenna Height = >6 meters above terrain RAD = RAD04 15G040B000-360A1280H006	Example assuming nongeostationary, RAD01 16G0308000-360A00357H006
Earth Station Data (Receiver) #5		
State (RSC)	RSC = Spain	
City Name (RAL)	RAL = Santa Maria	
Latitude (DDMMSS)	Lat = 36 59 51 N	
Longitude (DDMMSS)	Lon = 25 08 10 W	

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
Antenna Azimuth (RAZ)	RAZ = V00 to V90	The Earth Station Receiver Antenna Azimuth (RAZ), the minimum angle of elevation, V00 to V90
Antenna Dimensions (RAD)	Antenna Gain = 16.2 Beamwidth = 40 degree Azimuthal Range = 360 Elevation = 708 meters above sea level Antenna Height = <6 meters above terrain RAD = RAD05 16G040B000-360A0708H006	Example assuming nongeostationary, RAD01 16G0308000-360A00357H006

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

Earth Station Transmitter Data #1		
Transmit Frequency: 2067.500 MHz		
State (XSC)	XSC = Italy	
City Name (XAL)	XAL = Vimercate	
Latitude (DDMMSS)	Lat = 45 41 50N	
Longitude (DDMMSS)	Lon = 09 02 05E	
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
Antenna Azimuth (XAZ)	XAZ = V00 to V90	The Earth Station Transmitter Antenna Azimuth (XAZ), the minimum angle of elevation, V00 to V90
Antenna Dimensions (XAD)	Antenna Gain = 34.3 dB Beamwidth = 3.2 degree Azimuthal Range = 360 Elevation = 199 meters above sea level Antenna Height = <6 meters above terrain RAD = RAD01 34G003B000-360A0199H006	Example assuming nongeostationary, XAD01 16G0308000-360800357H006
Earth Station Transmitter Data #2		
Transmit Frequency: 2067.500 MHz		
State (XSC)	XSC = Spain	
City Name (XAL)	XAL = Santa Maria	
Latitude (DDMMSS)	Lat = 36 59 51 N	
Longitude (DDMMSS)	Lon = 25 08 10 W	
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
Antenna Azimuth (XAZ)	XAZ = V00 to V90	The Earth Station Transmitter Antenna Azimuth (XAZ), the minimum angle of elevation, V00 to V90
Antenna Dimensions (XAD)	Antenna Gain = 18.6 Beamwidth = 20 degree Azimuthal Range = 360 Elevation = 708 meters above sea level Antenna Height = >6 meters above terrain RAD = RAD02 19G020B000-360A0708H006	Example assuming nongeostationary, XAD01 16G0308000-360800357H006
Earth Station Transmitter Data #3		
Transmit Frequency: 2067.500 MHz		
State (XSC)	XSC = South Africa	
City Name (XAL)	XAL = Pretoria	
Latitude (DDMMSS)	Lat = 25 51 39 S	
Longitude (DDMMSS)	Lon = 28 27 12 E	
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
Antenna Azimuth (XAZ)	XAZ = V00 to V90	The Earth Station Transmitter Antenna Azimuth (XAZ), the minimum angle of elevation, V00 to V90
Antenna Dimensions (XAD)	Antenna Gain = 39 Beamwidth = 1.2 degree Azimuthal Range = 360 Elevation = 1339 meters above sea level Antenna Height = <6 meters above terrain RAD = RAD03 39G001B000-360A1339H006	Example assuming nongeostationary, XAD01 16G0308000-360800357H006
Earth Station Transmitter Data #4		
Transmit Frequency: 2067.500 MHz		
State (XSC)	XSC = Bulgaria	
City Name (XAL)	XAL = Kaspichan	
Latitude (DDMMSS)	Lat = 43 18 49 N	
Longitude (DDMMSS)	Lon = 27 09 27 E	
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
Antenna Azimuth (XAZ)	XAZ = V00 to V90	The Earth Station Transmitter Antenna Azimuth (XAZ), the minimum angle of elevation, V00 to V90
Antenna Dimensions (XAD)	Antenna Gain = 34.4 dB Beamwidth = 3.2 degree Azimuthal Range = 360 Elevation = 1280 meters above sea level Antenna Height = <6 meters above terrain RAD = RAD04 34G003B000-360A0199H006	Example assuming nongeostationary, XAD01 16G0308000-360800357H006
Satellite Receive Specifications		
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 Hand Circular, T = Right and Left Hand Circular, J = Linear Polarization
Orientation (XAZ)	XAZ = N	N = Narrowbeam, EC = Earth Coverage
Antenna Dimension (XAD)	Antenna Gain = 4 dBi, Beamwidth = 80 XAD = XAD01 04G080B	NTIA format (XAD), Example: XAD01 16G030B
Type of Satellite (State = SP, City = geo or non)	Type = Nongeostationary	Choose either: Geostationary or Nongeostationary
For Geostationary	Longitude = (Blank)	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 = 45 Apogee = 325 km Perigee = 325 km Orbital Period = 1 hour AND Fractions of Hours = 0.51, Number of Satellites = 1 ORB=ORB,	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,98.0IN00510AP00510PE001.58H01NR

	45.0IN00325AP00325PE001.51H01N RTR01	T01, AND FOR SPACE-TO-SPACE COMMUNICATIONS WITH ANOTHER NONGEOSTATIONARY SATELLITE ADD AN ADDITIONAL *ORB FOR IT ENDING IN R01, EXAMPLE, REM05 *ORB,72.9IN03209AP00655PE013.46H01NR R01