Part A: Space to Earth Downlink Data

Satellite Transmitter #1 Data		
Transmit Frequency: 400.500 M	Hz	
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 Gain = 1.8 dBi, Beamwidth = 360	
Antenna Dimension (XAD)	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	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,98.0IN00510AP00510PE001.58H01NRT01 , 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
Data)	45.0IN00325AP00325PE001.51H01N RTR01	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 ongitude (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,

		EXAMPLE, REM04
		*ORB,98.0IN00510AP00510PE001.58H01NRT01
	45.0IN00325AP00325PE001.51H01N RTR02	, 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	2	
Satellite Name: Lumen-1	1	
Data Field	Data Answer	Description/Comments
		Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular,
		R = Right Hand Circular, T = Right and Left Hand
Polarization (XAP)	XAP = R	Circular, J = Linear Polarization
Orientation (XAZ)	XAZ = EC	N = Narrowbeam, EC = Earth Coverage
	Antenna Gain = 5 dBi,	
	Beamwidth = 90	
Antenna Dimension (XAD)	XAD = XAD03 05G090B	NTIA format (VAD) Example: VAD01.160020D
Type of Satellite (State = SP,		NTIA format (XAD), Example: XAD01 16G030B
City = geo or non)	Type = Nongeostationary	Choose either: Geostationary or Nongeostationary
		If any satellites are geostationary, report its latitude
		as 000000N (XLA and/or RLA) and report its
For Geostationary	Longitude = (Blank)	longitude (XLG and/or RLG).
		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
	Inclination Angle = 45	SATELLITES IN THE SYSTEM, THEN TO1,
	Apogee = 325 km	EXAMPLE, REM04
	Perigee = 325 km	*ORB,98.0IN00510AP00510PE001.58H01NRT01
	•	, AND FOR SPACE-TO-SPACE
	Orbital Period = 1 hour AND Fractions of	COMMUNICATIONS WITH ANOTHER
	Hours = 0.51,	NONGEOSTATIONARY SATELLITE ADD AN
	Number of Satellites = 1	ADDITIONAL *ORB FOR IT ENDING IN R01, EXAMPLE, REM05
For Nongeostationary (Orbital	ORB=ORB,	*ORB,72.9IN03209AP00655PE013.46H01NRR0
Data)	45.0IN00325AP00325PE001.51H01N RTR03	
Earth Station Data (Receiver)		
State (RSC)	RSC = Italy	
City Name (RAL)	RAL = Lomazzo	
Latitude (DDMMSS)	Lat = 45 41 50N	
Longitude (DDMMSS)	Lon = 09 02 05E	
		Polarizations include: H = Horizontal, V = Vertical, S = Horizontal and Vertical, L = Left Hand Circular,
		R = Right Hand Circular, T = Right and Left Hand
Antenna Polarization (RAP)	RAP = J	Circular, J = Linear Polarization
Antenna Azimuth (RAZ)	RAZ = V00 to V90	The Earth Station Receiver Antenna Azimuth
	Antenna Gain = 14.8	(RAZ), the minimum angle of elevation, V00 to V90
	Beamwidth = 40 degree	
	•	
	Azimuthal Range = 360	
	Elevation = 296 meters above sea level	
	Antenna Height = <6 meters above terrain	Example assuming nongeostationary, RAD01
Antenna Dimensions (RAD)	RAD = RAD01 15G040B000-360A0296H006	16G0308000-360A00357H006
Earth Station Data (Receiver)	#0	

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 Gain = 14.8 dB	· · · · · · · · · · · · · · · · · · ·
	Beamwidth = 40 degree Azimuthal Range = 360 Elevation = 199 meters above sea level Antenna Height = <6 meters above terrain	Example assuming nongeostationary, RAD01
Antenna Dimensions (RAD)	RAD = RAD02 15G040B000-360A0199H006	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)	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		1000308000-300A0033711000
State (RSC)	RSC = Bulgaria	
City Name (RAL)	RAL = Kaspichan	
Latitude (DDMMSS)	Lat = 43 18 49 N	
, , ,		
Longitude (DDMMSS) Antenna Polarization (RAP)	Lon = 27 09 27 E 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 Gain = 14.8 Beamwidth = 40 degree Azimuthal Range = 360 Elevation = 1280 meters above sea level Antenna Height = >6 meters above terrain	Example assuming nongeostationary, RAD01
Antenna Dimensions (RAD)	RAD = RAD04 15G040B000-360A1280H006	16G0308000-360A00357H006
Earth Station Data (Receiver	·	1
State (RSC)	RSC = Spain	
City Name (RAL)	RAL = Santa Maria	
Latitude (DDMMSS)	Lat = 36 59 51 N	
Longitude (DDMMSS)	Lon = 25 08 10 W	

		Polarizations include: H = Horizontal, V = Vertical,
		S = Horizontal and Vertical, L = Left Hand Circular,
		R = Right Hand Circular, T = Right and Left Hand
Antenna Polarization (RAP)	RAP = J	Circular, J = Linear Polarization
		The Earth Station Receiver Antenna Azimuth
Antenna Azimuth (RAZ)	RAZ = V00 to V90	(RAZ), the minimum angle of elevation, V00 to V90
	Antenna Gain = 16.2	
	Beamwidth = 40 degree	
	Azimuthal Range = 360	
	Elevation = 708 meters above sea level	
	Antenna Height = <6 meters above terrain	Example assuming nongeostationary, RAD01
Antenna Dimensions (RAD)		16G0308000-360A00357H006

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

Earth Station Transmitter Da	ta #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
		The Earth Station Transmitter Antenna Azimuth (XAZ), the minimum angle of elevation, V00 to
Antenna Azimuth (XAZ)	XAZ = V00 to V90	V90
Antonna Dimonsiona (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	Example assuming nongeostationary, XAD01
Antenna Dimensions (XAD) Earth Station Transmitter Da	RAD = RAD01 34G003B000-360A0199H006	16G0308000-360800357H006
Transmit Frequency: 2067.500		
State (XSC)	XSC = Spain	
City Name (XAL) Latitude (DDMMSS)	XAL = Santa Maria 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 Azimut (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 Da	ta #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

XAZ = V00 to V90 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	Right and Left Hand Circular, J = Linear Polarization The Earth Station Transmitter Antenna Azimuth (XAZ), the minimum angle of elevation, V00 to V90 Example assuming nongeostationary, XAD01 16G0308000-360800357H006
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	(XAZ), the minimum angle of elevation, V00 to V90 Example assuming nongeostationary, XAD01
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
Beamwidth = 1.2 degree Azimuthal Range = 360 Elevation = 1339 meters above sea level Antenna Height = <6 meters above terrain RAD = RAD03 39G001B000-360A1339H006	
Azimuthal Range = 360 Elevation = 1339 meters above sea level Antenna Height = <6 meters above terrain RAD = RAD03 39G001B000-360A1339H006	
Elevation = 1339 meters above sea level Antenna Height = <6 meters above terrain RAD = RAD03 39G001B000-360A1339H006	
Antenna Height = <6 meters above terrain RAD = RAD03 39G001B000-360A1339H006	
RAD = RAD03 39G001B000-360A1339H006	
#4	
Hz	
XSC = Bulgaria	
XAL = Kaspichan	
_at = 43 18 49 N	
_on = 27 09 27 E	
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
XAZ - 1/00 to 1/00	The Earth Station Transmitter Antenna Azimuth (XAZ), the minimum angle of elevation, V00 to
	V90
Antenna Height = <6 meters above terrain	
RAD = RAD04 34G003B000-360A0199H006	Example assuming nongeostationary, XAD01 16G0308000-360800357H006
	Description/Comments
	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
	N = Narrowbeam, EC = Earth Coverage
	NTIA format (XAD), Example: XAD01
XAD = XAD01.04G080B	16G030B
Type = Nongeostationary	Choose either: Geostationary or Nongeostationary
	If any satellites are geostationary, report its latitude as 000000N (XLA and/or RLA) and
	report its longitude (XLG and/or RLG). IF ANY SATELLITES ARE
	NONGEOSTATIONARY, REPORT ITS
	INCLINATION ANGLE, APOGEE IN
•	KILOMETERS, PERIGEE IN KILOMETERS,
100000 PODOO = 10000 ANULLERSONOR OF	
Drbital Period = 1 hour AND Fractions of f_{0}	ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE
Orbital Period = 1 hour AND Fractions of Hours = 0.51, Number of Satellites = 1	
	at = 43 18 49 N $an = 27 09 27 E$ $(AP = R)$ $(AZ = V00 to V90)$ $Antenna Gain = 34.4 dB$ $Beamwidth = 3.2 degree$ $Azimuthal Range = 360$ Elevation = 1280 meters above sea level Antenna Height = <6 meters above terrain RAD = RAD04 34G003B000-360A0199H006 $Data Answer$ $(AP = R)$ $(AZ = N)$ $Antenna Gain = 4 dBi,$ $Beamwidth = 80$ $(AD = XAD01 04G080B)$ $Type = Nongeostationary$

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