FOR REFERENCE ONLY
BRIO Satellite Modification
File #: 0273-EX-CM-2019

This modification of FCC File # 0020-EX-CM-2019, adds a ground station in Bahrain to the BRIO satellite S-Band downlink transmissions. The ground station is owned and operated by Amazon Web Services ("AWS"). The BRIO satellite's previously authorized space-to-Earth frequency band of 2201 MHz will be used to downlink its S-Band data in order to provide more comprehensive information for the testing and evaluation of its experimental program.

As required by the Commission, the following technical parameters are provided For Reference Only when using Earth Stations located outside the United States, its territories and possessions. This information is included in the attached NTIA Space Record data form which gives the full picture of both ends of the transmit/receive link.

NTIA Space Record Data Form for the BRIO Satellite

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

Transmit Frequency: 2201 MHz (2200-2202 MHz)		
Satellite Name: **BRIO**		
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 = NB	NB= NARROWBEAM EC = EARTH COVERAGE
Antenna Dimension (XAD)	ANTENNA GAIN 7.0 dBi BEAMWIDTH 30 degrees XAD01 = 07G030B	(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 =	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 97.52, APOGEE IN KILOMETERS 575 km, PERIGEE IN KILOMETERS 575 km, ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL .60, THE NUMBER OF SATELLITES IN THE SYSTEM 1, ORB= 97.5IN00575AP00575PE001.60H01NRT01	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

Earth Station Data (Receiver)		
State (RSC)	RSC = Bahrain	
City Name (RAL)	RAL = Zallaq	
Latitude (DDMMSS)	Lat = 26.0518°N	
Longitude (DDDMMSS)	Lon = 50.5034°E	
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
Antenna Azimuth (RAZ)	RAZ = VOO	THE EARTH STATION RECEIVER ANTENNA AZIMUTH (RAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00
Antenna Dimensions (RAD)	ANTENNA GAIN 39 dBi BEAMWIDTH 1.38 degrees, AZIMUTHAL RANGE 0 - 360 degrees, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 5 THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 7 RAD = 39G002B000-360A00005H007	EXAMPLE ASSUMING NONGEOSTATIONARY, RAD01 16G030B000-360A00357H006
FCC notes: 1. Use S-Note S945. 2. REM AGN, CubeSat, BRIO		

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

Earth Station Transmitter Data:

Transmit Frequency: 2045.50 MHz (2045-2046 MHz)		
State(XSC)	XSC = Bahrain	
City Name (XAL)	XAL = Zallaq	
Latitude (DDMMSS)	Lat = 26.0518°N	
Longitude (DDDMMSS)	Lon = 50.5034°E	
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
Antenna Azimuth (RAZ)	RAZ = VOO	THE EARTH STATION RECEIVER ANTENNA AZIMUTH (RAZ), THE MINIMUM ANGLE OF ELEVATION, V00 TO V90, EXAMPLE, RAZ01 V00
Antenna Dimensions (RAD)	ANTENNA GAIN 39 dB, BEAMWIDTH 1.38 degrees, AZIMUTHAL RANGE 0 - 360 degrees, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 5 THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 7 RAD = 39G002B000-360A00005H007	EXAMPLE ASSUMING NONGEOSTATIONARY, RAD01 16G030B000-360A00357H006
FCC notes: 1. Use S-Note S945. 2. REM AGN, CubeSat, BRIO		