Mars Outpost 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.

Mars Outpost: a two hour hosted mission on SpaceX second stage. Downlinks S Band and X Band to 5 stations each, uplinks S band from 3 stations.

Part A: Space to Earth Downlink Data

Satellite Transmitter Data (Required for Each Frequency)

Satellite Transmitter S Band

Transmit Frequency	y: 2209.2 MHz	
Satellite Name: Ma	rs Outpost	
Data Field	Data Answer	Description/Comments
Transmit Power (PWR)	Power = 1.59 W PWR01 W2	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	2 MHz	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	N/A	2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth		
-20 dB bandwidth		
-40 dB bandwidth		
-60 dB bandwidth		
Modulation Type	OQPSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	1 Mbps	INFORMATION DATA RATE
Forward Error	Is FEC used? Yes 🛛 No 🗌	
Correction Coding	FEC Type: _Convolutional Encoding, FEC Rate:R ½ K=7,	
Total Symbol Rate	2 Mbps	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUTE 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 two none it to a hop		
If transmitter has	Yes 🗆	
a beacon mode,	No 🗆	
can the beacon be		
commanded off?		
Transmit Antenna	XAP = R	POLARIZATIONS INCLUDE: H = HORIZONTAL,
Polarization (XAP)		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	XAZ = NB	NB= NARROWBEAM EC = EARTH COVERAGE
Orientation (XAZ)		
Transmit Antenna	ANTENNA GAIN6,	NTIA FORMAT (XAD), EXAMPLE, FOR 16 DBI
Dimension (XAD)	BEAMWIDTH75,	ANTENNA GAIN AND 30 DEGREE BEAMWIDTH XAD01 16G030B
	XAD = 06G075B	
Type of satellite	Type =	CHOOSE EITHER:
(State = SPCE)	NONGEOSTATIONARY	GEOSTATIONARY OR NONGEOSTATIONARY
(City = Geo or		
Nongeo)		
- 07		
For Geostationary	Longitude =	IF ANY SATELLITES ARE GEOSTATIONARY, REPORT
Satellites		ITS LATITUDE AS 000000N (XLA AND/OR RLA) AND
Satemites		REPORT ITS LONGITUDE IN DDDMMSS FORMAT (XLG AND/OR RLG).
For	INCLINATION ANGLE 97.5,	IF ANY SATELLITES ARE NONGEOSTATIONARY,
Nongeostationary	APOGEE IN	REPORT ITS INCLINATION ANGLE, APOGEE
(Orbital Data)	KILOMETERS_538, PERIGEE	IN KILOMETERS, PERIGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF
	IN KILOMETERS 531 , ORBITAL	HOURS IN DECIMAL, THE NUMBER OF SATELLITES
	PERIOD IN HOURS 1 AND	IN THE SYSTEM, THEN T01, EXAMPLE,
	FRACTIONS OF HOURS IN	REM04 *ORB,98.0IN00510AP00510PE001.58H01NRT01,
		AND FOR SPACE-TO-SPACE
	DECIMAL_59,	COMMUNICATIONS WITH ANOTHER
	THE NUMBER OF SATELLITES IN THE	NONGEOSTATIONARY SATELLITE ADD AN
	SYSTEM1,	ADDITIONAL *ORB FOR IT ENDING IN R01, EXAMPLE, REM05
		*ORB,72.9IN03209AP00655PE013.46H01NRR01
	ORB =	
	97.5IN00538AP00531PE001.59H01NRT01	
For	Mean Local Time of Ascending Node	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN
SunSynchronous	(MLTAN) =	EXPRESSED AS UNIT OF TIME (HH:MM)
Nongeostationary		
Orbits		
Earth Station Dat	a (Receiver) at Each Earth Station Locatio	on
	ation, Ross Island, Antarctica	
NEN White Sands		
	obile CubeSat Command and Control (M	(2) Ground Station Alabama
•		Cor Ground Station, Aldudina
	eflight Program MC3, Texas	
	Mexico Ground Station	

State (RSC)	RSC = Ross Island, Antarctica	
City Name (RAL)	RAL =	
Latitude (DDMMSS)	Lat = 775021 S	
Longitude (DDDMMSS)	Lon = 1664001 E	
Receive Antenna Polarization (RAP)	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
Receive Antenna Orientation (RAZ)	RAZ = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00
Receive Antenna Dimensions (RAD)	ANTENNA GAIN45, BEAMWIDTH0.91, AZIMUTHAL RANGE000-360_, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS143 THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS10 RAD =	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	RAD01 45G001B001-360A00143H010 ANTENNA DIAMETER10, ANTENNA EFFICIENCY60,	
Antennas) Number of Satellite Contacts Supported Per Day	1	NUMBER OF TIMES THE SATELLITE WILL COMMUNICATE WITH THE EARTH STATION IN THI SPACE TO EARTH DIRECTION (DOWNLINKS) EACH DAY
Expected Duration of Each Contact	6 Minutes	AVERAGE DURATION OF EACH CONTACT
Supported Operations	Satellite Health and Status Data ⊠ Mission Payload Data ⊠	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA

NEN White Sands, New Mexico S Receive		
State (RSC)	RSC = NM	
City Name (RAL)	RAL = White Sands	
Latitude	Lat = 323227 North	
(DDMMSS)		
Longitude	Lon = 1063644 West	
(DDDMMSS)		
Receive Antenna Polarization (RAP)	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
Receive Antenna Orientation (RAZ)	RAZ = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00
Receive Antenna Dimensions (RAD)	ANTENNA GAIN49, BEAMWIDTH0.56, AZIMUTHAL RANGE000-360_, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS1480m, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS25m, RAD = RAD02 49G001B001-360A01480H025	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 DIAMETER18.3, ANTENNA EFFICIENCY60,	
Number of Satellite Contacts Supported Per Day	1	NUMBER OF TIMES THE SATELLITE WILL COMMUNICATE WITH THE EARTH STATION IN TH SPACE TO EARTH DIRECTION (DOWNLINKS) EACH DAY
Expected Duration of Each Contact	6 Minutes	AVERAGE DURATION OF EACH CONTACT
Supported Operations	Satellite Health and Status Data ⊠ Mission Payload Data ⊠	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA

-	Iobile CubeSat Command and Control (N	MC3) Ground Station, Alabama
S Receive State (RSC)	RSC = AL	
City Name (RAL)	RAL = Huntsville	
Latitude	Lat = 293339 North	
(DDMMSS)		
Longitude	Lon = 0950532 West	
(DDDMMSS)		
Receive Antenna Polarization (RAP)	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
Receive Antenna Orientation (RAZ)	RAZ = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00
Receive Antenna Dimensions (RAD)	ANTENNA GAIN31, BEAMWIDTH3, AZIMUTHAL RANGE000-360_, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS _170m THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS20m, RAD = RAD03 31G003B001-360A00170H020	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 DIAMETER3.7, ANTENNA EFFICIENCY60,	
Number of Satellite Contacts Supported Per Day	1	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	6 Minutes	AVERAGE DURATION OF EACH CONTACT
Supported Operations	Satellite Health and Status Data ⊠ Mission Payload Data ⊠	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA

DoD Human Spac	eflight Program MC3, Texas S Receive	
State (RSC)	RSC = TX	
City Name (RAL)	RAL = HOUSTON	
Latitude	Lat = 293339 North	
(DDMMSS)		
Longitude	Lon = 0950532 West	
(DDDMMSS)		
Receive Antenna	XAP = R	POLARIZATIONS INCLUDE:
Polarization (RAP)		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	RAZ = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF
Orientation (RAZ)		ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01
		V00
Receive Antenna	ANTENNA GAIN45,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
Dimensions (RAD)	BEAMWIDTH0.91,	DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
	AZIMUTHAL RANGE 000-360_,	RANGE FROM 001-360, SITE ELEVATION OF 357 METERS, AND ANTENNA HEIGHT ABOVE TERRAIN
	THE SITE ELEVATION ABOVE MEAN SEA	OF 6 METERS:
	LEVEL IN METERS _20m,	RAD01 16G030B001-360A00357H006
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS,	
	RAD =	
	RAD04 45G001B001-360A00020H020	
Receive Antenna	ANTENNA	
Additional	DIAMETER10,	
Information (For	ANTENNA EFFICIENCY60,	
Parabolic		
Antennas)		
Number of	1	NUMBER OF TIMES THE SATELLITE WILL
Satellite Contacts		COMMUNICATE WITH THE EARTH STATION IN THE SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		
Expected	6 Minutes	AVERAGE DURATION OF EACH CONTACT
Duration of Each		
Contact		
Supported	Satellite Health and Status Data 🛛	SATELLITE HEALTH AND STATUS TELEMETRY
Operations	Mission Payload Data 🛛	AND/OR MISSION PAYLOAD DATA

University of Nev	v Mexico Ground Station S Receive	
State (RSC)	RSC = NM	
City Name (RAL)	RAL = Albuquerque	
Latitude	Lat = 350504 North	
(DDMMSS)		
Longitude	Lon = 1063711 West	
(DDDMMSS)		
Receive Antenna Polarization (RAP)	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
Receive Antenna Orientation (RAZ)	RAZ = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00
Receive Antenna Dimensions (RAD)	ANTENNA GAIN 45 , BEAMWIDTH 0.91 , AZIMUTHAL RANGE 000-360 , THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 1584m , THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 20m , RAD = RAD05 45G001B001-360A01584H020	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 DIAMETER10, ANTENNA EFFICIENCY60,	
Number of Satellite Contacts Supported Per Day	1	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	6 Minutes	AVERAGE DURATION OF EACH CONTACT
Supported Operations	Satellite Health and Status Data $oxtimes$ Mission Payload Data $oxtimes$	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA

Satellite Transmitter X Band

Transmit Frequency: 8045 MHz

Satellite Name: Mars Outpost

Data Field	Data Answer	Description/Comments
Transmit Power (PWR)	Power = 1.59 W PWR01 W2	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	16 MHz	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	N/A	2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth		
-20 dB bandwidth		
-40 dB bandwidth		
-60 dB bandwidth		
Modulation Type	OQPSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	8 Mbps	INFORMATION DATA RATE
Forward Error Correction Coding	Is FEC used? Yes ⊠ No □ FEC Type: _Convolutional Encoding, FEC Rate:R ½ K=7,	
Total Symbol Rate	16 Mbps	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUTE 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	Yes 🗆	
a beacon mode, can the beacon be commanded off?	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 = NB	NB= NARROWBEAM EC = EARTH COVERAGE
Transmit Antenna Dimension (XAD)	ANTENNA GAIN6, BEAMWIDTH75, XAD = 06G075B	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	Longitude =	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 ANGLE97.5, APOGEE IN KILOMETERS538, PERIGEE IN KILOMETERS531, ORBITAL PERIOD IN HOURS _1AND FRACTIONS OF HOURS IN DECIMAL59, THE NUMBER OF SATELLITES IN THE SYSTEM1, ORB = 97.5IN00538AP00531PE001.59H01NRT02	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) =	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 (X Band Receiver) at Each Earth Station Location NEN McMurdo Station, Ross Island, Antarctica US Army SMDC Mobile CubeSat Command and Control (MC3) Ground Station, Alabama DoD Human Spaceflight Program MC3, Texas University of New Mexico Ground Station Atlas Space Operations, New Mexico		

NEN McMurdo Station, Ross Island, Antarctica X Band Receive		
State (RSC)	RSC = Ross Island, Antarctica	
City Name (RAL)	RAL =	
Latitude (DDMMSS)	Lat = 775021 S	
Longitude (DDDMMSS)	Lon = 1664001 E	

Receive Antenna	XAP = R	POLARIZATIONS INCLUDE:
Polarization (RAP)		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	RAZ = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA
Orientation (RAZ)		MINIMUM OPERATING ANGLE OF
		ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00
		100
Receive Antenna	ANTENNA GAIN56,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
Dimensions (RAD)	BEAMWIDTH0.26,	DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
		RANGE FROM 001-360, SITE ELEVATION OF 357
	AZIMUTHAL RANGE000-360_,	METERS, AND ANTENNA HEIGHT ABOVE TERRAIN OF 6 METERS:
	THE SITE ELEVATION ABOVE MEAN SEA	RAD01 16G030B001-360A00357H006
	LEVEL IN METERS _143,	
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS10,	
	RAD =	
	RAD01 56G001B001-360A00143H010	
Receive Antenna	ANTENNA	
Additional	DIAMETER10,	
Information (For	ANTENNA EFFICIENCY60,	
Parabolic		
Antennas)		
Number of	1	NUMBER OF TIMES THE SATELLITE WILL
Satellite Contacts		COMMUNICATE WITH THE EARTH STATION IN THE SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		
Expected	6 Minutes	AVERAGE DURATION OF EACH CONTACT
Duration of Each		
Contact		
Supported	Satellite Health and Status Data 🖂	SATELLITE HEALTH AND STATUS TELEMETRY
••		AND/OR MISSION PAYLOAD DATA
Operations	Mission Payload Data 🛛	
FCC notes:		
3. Use S-Note S945.		
4. REM AGN, Cubesat, Mars Outpost		

US Army SMDC N X Band Receive	Iobile CubeSat Command and Control (N	MC3) Ground Station, Alabama
State (RSC)	RSC = AL	
City Name (RAL)	RAL = Huntsville	
Latitude (DDMMSS)	Lat = 293339 North	
Longitude (DDDMMSS)	Lon = 0950532 West	
Receive Antenna Polarization (RAP)	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
Receive Antenna Orientation (RAZ)	RAZ = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00
Receive Antenna Dimensions (RAD)	ANTENNA GAIN45, BEAMWIDTH0.75, AZIMUTHAL RANGE000-360_, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS170m THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS20m, RAD = RAD02 45G001001-360A00170H020	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 DIAMETER3.7, ANTENNA EFFICIENCY60,	
Number of Satellite Contacts Supported Per Day	1	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	6 Minutes	AVERAGE DURATION OF EACH CONTACT
Supported Operations	Satellite Health and Status Data ⊠ Mission Payload Data ⊠	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA

DoD Human Spac	eflight Program MC3, Texas X Band Reco	eive
State (RSC)	RSC = TX	
City Name (RAL)	RAL = HOUSTON	
Latitude	Lat = 293339 North	
(DDMMSS)		
Longitude	Lon = 0950532 West	
(DDDMMSS)		
Receive Antenna	XAP = R	POLARIZATIONS INCLUDE:
Polarization (RAP)		H = HORIZONTAL, V = VERTICAL,
		S = HORIZONTAL AND VERTICAL,
		L = LEFT HAND CIRCULAR, R = RIGHT HAND CIRCULAR,
		T = RIGHT AND LEFT HAND CIRCULAR,
Receive Antenna	RAZ = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF
Orientation (RAZ)		ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01
		V00
Receive Antenna	ANTENNA GAIN45,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
Dimensions (RAD)	BEAMWIDTH0.75,	DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL RANGE FROM 001-360, SITE ELEVATION OF 357
	AZIMUTHAL RANGE 000-360 ,	METERS, AND ANTENNA HEIGHT ABOVE TERRAIN
	THE SITE ELEVATION ABOVE MEAN SEA	OF 6 METERS:
	LEVEL IN METERS _20m,	RAD01 16G030B001-360A00357H006
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS20m,	
	RAD =	
	RAD03 45G001B001-360A00020H020	
Receive Antenna	ANTENNA	
Additional	DIAMETER3.7,	
Information (For	ANTENNA EFFICIENCY60,	
Parabolic		
Antennas)		
Number of	1	NUMBER OF TIMES THE SATELLITE WILL
Satellite Contacts		COMMUNICATE WITH THE EARTH STATION IN THE SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		
Expected	6 Minutes	AVERAGE DURATION OF EACH CONTACT
Duration of Each		
Contact		
Supported	Satellite Health and Status Data $oxtimes$	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA
Operations	Mission Payload Data 🛛	AND ON MISSION FAILOAD DATA

University of Nev	v Mexico Ground Station X Band Receive	2
State (RSC)	RSC = NM	
City Name (RAL)	RAL = Albuquerque	
Latitude	Lat = 350504 North	
(DDMMSS)		
Longitude	Lon = 1063711 West	
(DDDMMSS)		
Receive Antenna	XAP = R	POLARIZATIONS INCLUDE: H = HORIZONTAL,
Polarization (RAP)		V = VERTICAL,
		S = HORIZONTAL AND VERTICAL, L = LEFT HAND CIRCULAR,
		R = RIGHT HAND CIRCULAR,
		T = RIGHT AND LEFT HAND CIRCULAR,
Receive Antenna	RAZ = RAZ01 V00	J = LINEAR POLARIZATION THE EARTH STATION RECEIVER ANTENNA
Orientation (RAZ)		MINIMUM OPERATING ANGLE OF
		ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00
Receive Antenna	ANTENNA GAIN45,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16 DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Dimensions (RAD)	BEAMWIDTH0.75,	RANGE FROM 001-360, SITE ELEVATION OF 357
	AZIMUTHAL RANGE000-360_,	METERS, AND ANTENNA HEIGHT ABOVE TERRAIN OF 6 METERS:
	THE SITE ELEVATION ABOVE MEAN SEA	RAD01 16G030B001-360A00357H006
	LEVEL IN METERS _1584m	
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS20m,	
	RAD =	
	RAD04 45G001B001-360A01584H020	
Receive Antenna	ANTENNA	
Additional	DIAMETER3.7,	
Information (For	ANTENNA EFFICIENCY60,	
Parabolic		
Antennas)		
Number of	1	NUMBER OF TIMES THE SATELLITE WILL
Satellite Contacts		COMMUNICATE WITH THE EARTH STATION IN THE SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		
Expected	6 Minutes	AVERAGE DURATION OF EACH CONTACT
Duration of Each		
Contact		
Supported	Satellite Health and Status Data 🖂	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA
Operations	Mission Payload Data 🛛	

Atlas Space Operation	ations X Band Receive	
State (RSC)	RSC = NM	
City Name (RAL)	RAL = Albuquerque	
Latitude	Lat = 350223 North	
(DDMMSS)		
Longitude	Lon = 1063414 W	
(DDDMMSS)		
Receive Antenna	XAP = R	POLARIZATIONS INCLUDE: H = HORIZONTAL,
Polarization (RAP)		V = VERTICAL,
		S = HORIZONTAL AND VERTICAL,
		L = LEFT HAND CIRCULAR, R = RIGHT HAND CIRCULAR,
		T = RIGHT AND LEFT HAND CIRCULAR,
Dessition Austanus		J = LINEAR POLARIZATION THE EARTH STATION RECEIVER ANTENNA
Receive Antenna	RAZ = RAZ01 V00	MINIMUM OPERATING ANGLE OF
Orientation (RAZ)		ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01
		V00
Receive Antenna	ANTENNA GAIN52,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
Dimensions (RAD)	BEAMWIDTH0.4,	DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL RANGE FROM 001-360, SITE ELEVATION OF 357
	AZIMUTHAL RANGE000-360_,	METERS, AND ANTENNA HEIGHT ABOVE TERRAIN
	THE SITE ELEVATION ABOVE MEAN SEA	OF 6 METERS: RAD01 16G030B001-360A00357H006
	LEVEL IN METERS _1500m,	
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS20m,	
	RAD =	
Dessition Austanus	RAD05 52G001B001-360A01500H020	
Receive Antenna	ANTENNA	
Additional	DIAMETER6.1, ANTENNA EFFICIENCY 60 ,	
Information (For Parabolic	ANTENNA EFFICIENCI60,	
Antennas)		
Number of	1	NUMBER OF TIMES THE SATELLITE WILL
Satellite Contacts	-	COMMUNICATE WITH THE EARTH STATION IN THE
Supported Per		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Day		
Expected	6 Minutes	AVERAGE DURATION OF EACH CONTACT
Duration of Each		
Contact		
Supported	Satellite Health and Status Data 🖂	SATELLITE HEALTH AND STATUS TELEMETRY
Operations	Mission Payload Data	AND/OR MISSION PAYLOAD DATA

Part B: Ground Stations, Earth to Space link data: 3 S Band Uplink Stations

NEN McMurdo Station, Ross Island, Antarctica

NEN White Sands, New Mexico

US Army SMDC Mobile CubeSat Command and Control (MC3) Ground Station, Alabama

Transmit Frequency	/: 2079.2 MHz	
State (XSC)	XSC = Ross Island, Antarctica	
City Name (XAL)	XAL =	
Latitude (DDMMSS)	Lat = 775021 S	
Longitude (DDDMMSS)	Lon = 1664001 E	
Transmit Power (PWR)	PWR = PWR01 W80	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	256 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	N/A	2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth -20 dB bandwidth		_
-40 dB bandwidth		-
-40 dB bandwidth		-
Modulation Type	PCM/PM/Bip-L (same for all 3 uplinks)	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	256 kbps	INFORMATION DATA RATE
Forward Error Correction Coding	Is FEC used? Yes □ No ⊠ FEC Type:, FEC Rate:,	
Total Symbol Rate	256 ksps	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)	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 = 5° XAZ01 V05	THE EARTH STATION TRANSMITTER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (XAZ), V00 TO V90, EXAMPLE, XAZ01 V00

NEN McMurdo Station, Ross Island, Antarctica

Transmit Antenna Dimensions (XAD)	ANTENNA GAIN 45 , BEAMWIDTH 0.91 , AZIMUTHAL RANGE 000-360 , THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 143 THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 10 .	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
	XAD = XAD01 45G001001-360A00143H010	
Transmit Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER10, ANTENNA EFFICIENCY60,	
Number of Satellite Contacts Supported Per Day	1	NUMBER OF TIMES THE EARTH STATION WILL COMMUNICATE WITH THE STATELLITE IN THE EARTH TO SPACE DIRECTION (UPINKS) EACH DAY
Expected Duration of Each Contact	6	AVERAGE DURATION OF EACH CONTACT
Satellite Receive Sp	pecifications	
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)	RAZ = NB	NB= NARROWBEAM EC = EARTH COVERAGE
Receive Antenna Dimension (RAD)	ANTENNA GAIN6, BEAMWIDTH75, RAD = 06G075B	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 =	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 ANGLE97.5, APOGEE IN KILOMETERS538, PERIGEE IN KILOMETERS531, ORBITAL PERIOD IN HOURS _1AND FRACTIONS OF HOURS IN DECIMAL59, THE NUMBER OF SATELLITES IN THE SYSTEM1, ORB = 97.5IN00538AP00531PE001.59H01NRR01	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) =	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)

NEN White Sands, New Mexico

Transmit Frequency	/: 2079.2 MHz	
State (XSC)	XSC = NM	
City Name (XAL)	XAL = White Sands	
Latitude (DDMMSS)	Lat = 323227 North	
Longitude (DDDMMSS)	Lon = 1063644 West	
Transmit Power (PWR)	PWR = PWR02 W300	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	256 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	N/A	2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth		
-20 dB bandwidth		_
-40 dB bandwidth		
-60 dB bandwidth		
Modulation Type	PCM/PM/Bip-L (same for all 3 uplinks)	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	256 kbps	INFORMATION DATA RATE
Forward Error	Is FEC used? Yes 🗌 No 🖂	
Correction Coding	FEC Type:, FEC Rate:,	
Total Symbol Rate	256 ksps	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)	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 = 5° XAZ02 V05	THE EARTH STATION TRANSMITTER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (XAZ), V00 TO V90, EXAMPLE, XAZ01 V00

Transmit Antenna Dimensions (XAD)	ANTENNA GAIN 31, BEAMWIDTH 3, AZIMUTHAL RANGE 000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 1480m, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 25m, XAD = XAD02 31G003B001-360A01480H025	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 DIAMETER3.7, ANTENNA EFFICIENCY60,	
Number of Satellite Contacts Supported Per Day	1	NUMBER OF TIMES THE EARTH STATION WILL COMMUNICATE WITH THE STATELLITE IN THE EARTH TO SPACE DIRECTION (UPINKS) EACH DAY
Expected Duration of Each Contact	6	AVERAGE DURATION OF EACH CONTACT
Satellite Receive Sp	pecifications	
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)	RAZ = NB	NB= NARROWBEAM EC = EARTH COVERAGE
Receive Antenna Dimension (RAD)	ANTENNA GAIN6, BEAMWIDTH75, RAD = 06G075B	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 =	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 97.5 , APOGEE IN KILOMETERS 538 , PERIGEE IN KILOMETERS 531 , ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL 59, THE NUMBER OF SATELLITES IN THE SYSTEM 1 , ORB = 97.5IN00538AP00531PE001.59H01NRR01	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) =	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)

Transmit Frequency	/: 2079.2 MHz	
State (XSC)	XSC = AL	
City Name (XAL)	XAL = Huntsville	
Latitude (DDMMSS)	Lat = 293339 North	
Longitude (DDDMMSS)	Lon = 0950532 West	
Transmit Power (PWR)	PWR = PWR03 W30	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	256 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	N/A	2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth		
-20 dB bandwidth		
-40 dB bandwidth		
-60 dB bandwidth		
Modulation Type	PCM/PM/Bip-L (same for all 3 uplinks)	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	256 kbps	INFORMATION DATA RATE
Forward Error Correction Coding	Is FEC used? Yes □ No ⊠ FEC Type:, FEC Rate:,	
Total Symbol Rate	256 ksps	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)	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 = 5° XAZ03 V05	THE EARTH STATION TRANSMITTER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (XAZ), V00 TO V90, EXAMPLE, XAZ01 V00

US Army SMDC Mobile CubeSat Command and Control (MC3) Ground Station, Alabama

Transmit Antenna Dimensions (XAD)	ANTENNA GAIN, BEAMWIDTH3,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16 DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Dimensions (AAD)	AZIMUTHAL RANGE_000-360,	RANGE FROM 001-360, SITE ELEVATION OF 357 METERS, AND ANTENNA HEIGHT ABOVE TERRAIN
	THE SITE ELEVATION ABOVE MEAN SEA	OF 6 METERS: XAD01 16G030B001-360A00357H006
	LEVEL IN METERS170m,	XADUI 1000306001-300A00357H000
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS20m,	
	XAD =	
	XAD03 31G003B001-360A00170H020	
Transmit Antenna	ANTENNA	
Additional	DIAMETER 3.7 ,	
Information (For	DIAMETER3.7, ANTENNA EFFICIENCY60,	
Parabolic		
Antennas)		
Number of	1	NUMBER OF TIMES THE EARTH STATION WILL
Satellite Contacts		COMMUNICATE WITH THE STATELLITE IN THE EARTH TO SPACE DIRECTION (UPINKS) EACH DAY
Supported Per		
Day		
Expected	6	AVERAGE DURATION OF EACH CONTACT
Duration of Each		
Contact		
Satellite Receive Sp	pecifications	
Receive Antenna	RAP = R	POLARIZATIONS INCLUDE:
Polarization (RAP)		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	RAZ = NB	NB= NARROWBEAM
Orientation (RAZ)		EC = EARTH COVERAGE
Receive Antenna	ANTENNA GAIN6,	NTIA FORMAT(RAD), EXAMPLE, FOR 16 DBI
Dimension (RAD)	BEAMWIDTH75,	ANTENNA GAIN AND 30 DEGREE BEAMWIDTH RAD01 16G030B
	RAD = 06G075B	
Type of satellite	Type =	CHOOSE EITHER:
(State = SPCE)	NONGEOSTATIONARY	GEOSTATIONARY OR NONGEOSTATIONARY
City = Geo or		
Nongeo		
For Geostationary	Longitude =	IF ANY SATELLITES ARE GEOSTATIONARY, REPORT
Satellites		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 97.5 , APOGEE IN KILOMETERS 538 , PERIGEE IN KILOMETERS 531 , ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL 59, THE NUMBER OF SATELLITES IN THE SYSTEM 1 , ORB = 97.5IN00538AP00531PE001.59H01NRR01	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) =	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)