NTIA Space Record Data Form

(Note: Apex recognizes its frequency plan's complexity and, therefore, has summarized all inputs in its application's <u>technical annex</u> (table 1 and table 2) for convenience. Apex also notes no U.S.-based earth stations will communicate with the Apex Aries 1 satellite. In other words, no space-to-Earth or Earth-to-space transmissions will occur inside the United States and Apex submits no NTIA space record data form Part B information consistent with its other application materials.)

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

Transmit Frequency: 400.5 MHz	2
2.64 kHz bandwidth	2
Transmit Frequency: 401.5 MHz	10
2.64 kHz bandwidth	10
Transmit Frequency:400.5 MHz	18
65.28 kHz bandwidth	18
Transmit Frequency: 401.5 MHz	26
65.28 kHz bandwidth	26
Transmit Frequency: 2287.5 MHz	34
168.8 kHz bandwidth	34
Transmit Frequency: 2287.5 MHz	51
1 MHz bandwidth	51
Transmit Frequency: 8212.5 MHz	68
13.5 MHz bandwidth	68
Transmit Frequency: 8212.5 MHz	72
100 MHz bandwidth	72
Transmit Frequency: 8212.5 MHz	76
13.5 MHz bandwidth	76
Transmit Frequency: 8212.5 MHz	90
100 MHz handwidth	90

Transmit Frequency: 400.5 MHz		
Satellite Name: Ape	x Aries 1	
Data Field	Data Answer	Description/Comments
Transmit Power	PWR = 1.2 W	TRANSMIT POWER SUPPLIED TO THE ANTENNA
(PWR)	PWR01 W1.2	INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE:
		W = WATT,
		K = KILOWATT, M = MEGAWATT
Necessary	2.64 kHz	THE WIDTH OF FREQUENCY BAND WHICH IS JUST SUFFICIENT TO SUCCESSFULLY TRANSFER DATA.
Bandwidth		FORMULAS CAN BE FOUND IN ANNEX J OF THE
DE Estate de Data		NTIA MANUAL. 2-SIDED EMISSION BANDWIDTH VALUES
RF Emissions Data	2 1.11-	Z-SIDED EIVIISSION BANDWIDTH VALUES
-3 dB bandwidth	3 kHz	
-20 dB bandwidth -40 dB bandwidth	17.5 kHz 25 kHz	
-60 dB bandwidth	40 kHz	
Modulation Type	2GFSK	THE METHOD USED TO SUPERIMPOSE DATA ON
		THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	1.2 kbits/sec	INFORMATION DATA RATE
Forward Error	Is FEC used? Yes □ No ☒	
Correction Coding	FEC Type:	_
	FEC Rate:	-
Total Symbol Rate	1.2 ksymbols/sec	DATA RATE COMBINED WITH FEC AND FRAME
•	,	OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUTE TO THE SYMBOL
		MAPPER/MODULATOR.
Does transmitter	Yes ⊠	BEACON MODE IS NORMALLY CONSIDERED A REGULAR AND PERIODIC SHORT DURATION
have a beacon	No □	TRANSMISSION THAT IS OFTEN USED TO ASSIST
mode?		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 ⊠	011110101111111111111111111111111111111
a beacon mode,	No □	
can the beacon be		
commanded off?		
Transmit Antenna	XAP = J	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 = EC	NB= NARROWBEAM
Orientation (XAZ)		EC = EARTH COVERAGE
Transmit Antenna	ANTENNA GAIN <u>0 dBi</u> ,	NTIA FORMAT (XAD), EXAMPLE, FOR 16 DBI
Dimension (XAD)	BEAMWIDTH <u>360</u>	ANTENNA GAIN AND 30 DEGREE BEAMWIDTH XAD01 16G030B
	XAD = XAD01 00G360B	

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 97.4 , APOGEE IN KILOMETERS 525 , PERIGEE IN KILOMETERS 525 , ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL 0.58 , THE NUMBER OF SATELLITES IN THE SYSTEM 1 , ORB = *ORB,97.4IN00525AP00525PE001.58H01NRT01	IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN TO1, EXAMPLE, REMO4 *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 MLTDN = 13:00 + 60 mins or 13:00-14:00 (Note: SpaceX notified use of LTDN, not	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)
Orbits	LTAN.)	
Earth Station Data	 a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = South Africa	
City Name (RAL)	RAL = Pretoria	
Latitude (DDMMSS)	Lat = 255136 S	
Longitude (DDDMMSS)	Lon = 0282700 E	
Receive 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
Receive Antenna Orientation (RAZ)	RAZ = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), VOO TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN16.2, BEAMWIDTH22,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16 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 METERS1339,	
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS6,	
	RAD =	
	RADD 16.2G022B000-360A01339H006	
Dossius Antonna		
Receive Antenna Additional	ANTENNA DIAMETERN/A, ANTENNA EFFICIENCYN/A,	
	ANTENNA EFFICIENCYN	
Information (For Parabolic		
Antennas)	A southerte man devi	NUMBER OF TIMES THE SATELLITE WILL
Number of	4 contacts per day	COMMUNICATE WITH THE EARTH STATION IN THE
Satellite Contacts		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		AVERAGE DURATION OF EACH CONTACT
Expected	8 minutes	AVERAGE DURATION OF EACH CONTACT
Duration of Each		
Contact		CATELLITE LIE ALTIL AND CTATLIC TELEMETRY
Supported	Satellite Health and Status Data ⊠	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA
Operations	Mission Payload Data	,
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Sweden	
City Name (RAL)	RAL = Boden	
Latitude	Lat = 654800 N	
(DDMMSS)		
Longitude	Lon = 0214048 E	
(DDDMMSS)		
Receive Antenna	RAP = J	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

Receive Antenna Dimensions (RAD)	ANTENNA GAIN16.2, BEAMWIDTH22, AZIMUTHAL RANGE360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS46, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS6, RAD = RADO2 16.2G022B000-360A00046H006	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 DIAMETERN/A, ANTENNA EFFICIENCYN/A,	
Number of Satellite Contacts Supported Per Day	11 contacts per day	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	8 minutes	AVERAGE DURATION OF EACH CONTACT
Fouth Station Date	(Doseiver) at Fook Forth Station Location	
State (RSC)	a (Receiver) at Each Earth Station Location RSC = Spain	
City Name (RAL)	RAL = Puertollano	
Latitude (DDMMSS)	Lat = 384026 N	
Longitude (DDDMMSS)	Lon = 0040943 W	
Receive 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
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) Receive Antenna Additional	ANTENNA GAIN14.8, BEAMWIDTH40, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS690, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS14, RAD = RAD03 14.8G040B000-360A00690H014 ANTENNA DIAMETERN/A, ANTENNA EFFICIENCYN/A,	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
Information (For Parabolic Antennas)		
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Italy	
City Name (RAL)	RAL = Vimercate	
Latitude (DDMMSS)	Lat = 453536 N	
Longitude (DDDMMSS)	Lon = 0092144 E	
Receive 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
Receive Antenna Orientation (RAZ)	RAZ = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Dagaine Automo	ANITENINA CAINI 440	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
Receive Antenna	ANTENNA GAIN14.8,	DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Dimensions (RAD)	BEAMWIDTH40,	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 METERS177,	
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS13,	
	RAD =	
	RAD04 14.8G040B000-360A00177H013	
Receive Antenna	ANTENNA DIAMETERN/A,	
Additional	ANTENNA EFFICIENCYN/A,	
Information (For		
Parabolic		
Antennas)		
Number of	<1 contact per day	NUMBER OF TIMES THE SATELLITE WILL
Satellite Contacts	12 contact per day	COMMUNICATE WITH THE EARTH STATION IN THE
Supported Per		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH DAY
		DAT
Day	8 minutes	AVERAGE DURATION OF EACH CONTACT
Expected	8 minutes	AVENAGE BONATION OF EACH CONTACT
Duration of Each		
Contact		CATELLITE LIEALTH AND STATUS TELENASTRY
Supported	Satellite Health and Status Data ⊠	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA
Operations	Mission Payload Data	
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Italy	
City Name (RAL)	RAL = Lomazzo	
Latitude	Lat = 454150 N	
(DDMMSS)		
Longitude	Lon = 0090205 E	
(DDDMMSS)		
Receive Antenna	RAP = J	POLARIZATIONS INCLUDE:
Polarization (RAP)	10.11 – 3	H = HORIZONTAL,
Totalization (NAT)		V = VERTICAL,
		S = HORIZONTAL AND VERTICAL, L = LEFT HAND CIRCULAR,
		R = RIGHT HAND CIRCULAR,
		T = RIGHT AND LEFT HAND CIRCULAR,
Posoivo Antonno	RAZ = RAZ01 V00	J = LINEAR POLARIZATION THE EARTH STATION RECEIVER ANTENNA
Receive Antenna	RAZ - KAZUI VUU	MINIMUM OPERATING ANGLE OF
Orientation (RAZ)		ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01
		V00
		V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN14.8, BEAMWIDTH40, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS296, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS25, RAD = RAD05 14.8G040B000-360A00296H025	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	ANTENNA DIAMETERN/A, ANTENNA EFFICIENCYN/A,	
Information (For		
Parabolic		
Antennas)		
Number of	<1 contact per day	NUMBER OF TIMES THE SATELLITE WILL COMMUNICATE WITH THE EARTH STATION IN THE
Satellite Contacts		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day	O minutes	AVERAGE DURATION OF EACH CONTACT
Expected Duration of Each	8 minutes	AVEIVAGE DONATION OF EACH CONTACT
Contact		
Supported	Satellite Health and Status Data ⊠	SATELLITE HEALTH AND STATUS TELEMETRY
Operations	Mission Payload Data	AND/OR MISSION PAYLOAD DATA
Орегинопа	Wilssion Fayload Data	
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = United Kingdom	
City Name (RAL)	RAL = Unst, Shetland	
Latitude	Lat = 604452 N	
(DDMMSS)		
Longitude	Lon = 0005128 W	
(DDDMMSS)		
Receive Antenna	RAP = J	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, 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

Receive Antenna	ANTENNA GAIN14.8,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16 DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Dimensions (RAD)	BEAMWIDTH40,	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 METERS19,	KAD01 100030B001-300A0033711000
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS4,	
	RAD =	
	RAD06 14.8G040B000-360A00019H004	
Receive Antenna	ANTENNA DIAMETERN/A,	
Additional	ANTENNA EFFICIENCYN/A,	
Information (For		
Parabolic		
Antennas)		
Number of	<1 contact per day	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	8 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
FCC notes:		•
1. Use S-Note	S945.	
2 REMINGNI	Cubasat (Anay Arias 1)	

2. REM AGN, Cubesat, (Apex Aries 1)

Transmit Frequency	v: 401.5 MHz	
Satellite Name: Ape	ex Aries 1	
Data Field	Data Answer	Description/Comments
Transmit Power	PWR = 1.2 W	TRANSMIT POWER SUPPLIED TO THE ANTENNA
(PWR)	PWR01 W1.2	INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	2.64 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		2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth	3 kHz	
-20 dB bandwidth	17.5 kHz	
-40 dB bandwidth	25 kHz	
-60 dB bandwidth	40 kHz	
Modulation Type	2GFSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	1.2 kbits/sec	INFORMATION DATA RATE
Forward Error	Is FEC used? Yes \square No \boxtimes	
Correction Coding	FEC Type:,	
	FEC Rate:,	
Total Symbol Rate	1.2 ksymbols/sec	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUTE TO THE SYMBOL MAPPER/MODULATOR.
Does transmitter	Yes ⊠	BEACON MODE IS NORMALLY CONSIDERED A
have a beacon	No □	REGULAR AND PERIODIC SHORT DURATION TRANSMISSION THAT IS OFTEN USED TO ASSIST
mode?		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,	No □	
can the beacon be		
commanded off?		
Transmit Antenna	XAP = J	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,
Transmit Autom	VA7 - FC	J = LINEAR POLARIZATION NB= NARROWBEAM
Transmit Antenna	XAZ = EC	EC = EARTH COVERAGE
Orientation (XAZ)	ANTENNA CAIN C. ID:	NTIA FORMAT (XAD), EXAMPLE, FOR 16 DBI
Transmit Antenna	ANTENNA GAIN <u>0 dBi</u> ,	ANTENNA GAIN AND 30 DEGREE BEAMWIDTH
Dimension (XAD)	BEAMWIDTH <u>360</u> , XAD = XAD01 00G360B	XAD01 16G030B
	VYP - VYPOT 0003000	

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 97.4 APOGEE IN KILOMETERS 525, PERIGEE IN KILOMETERS 525, ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL 0.58, THE NUMBER OF SATELLITES IN THE SYSTEM 1 ORB = *ORB,97.4IN00525AP00525PE001.58H01NRT01	IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN TO1, EXAMPLE, REMO4 *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 MLTDN = 13:00 + 60 mins or 13:00-14:00 (Note: SpaceX notified use of LTDN, not	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)
	LTAN.)	
Earth Station Data	│ a (Receiver) at Each Earth Station Locatio	on
State (RSC)	RSC = South Africa	
City Name (RAL)	RAL = Pretoria	
Latitude (DDMMSS)	Lat = 255136 S	
Longitude (DDDMMSS)	Lon = 0282700 E	
Receive 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
Receive Antenna Orientation (RAZ)	RAZ = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), VOO TO V90, EXAMPLE, RAZ01 V00

Receive Antenna	ANTENNA GAIN16.2,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16 DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Dimensions (RAD)	BEAMWIDTH22,	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 METERS1339,	
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS6,	
	RAD =	
	RAD01 16.2G022B000-360A01339H006	
Receive Antenna	ANTENNA DIAMETERN/A,	
Additional	ANTENNA EFFICIENCY N/A,	
Information (For		
Parabolic		
Antennas)		
Number of	4 contacts per day	NUMBER OF TIMES THE SATELLITE WILL COMMUNICATE WITH THE EARTH STATION IN THE
Satellite Contacts		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		
Expected	8 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
	a (Receiver) at Each Earth Station Locatio	on
State (RSC)	RSC = Sweden	
City Name (RAL)	RAL = Boden	
Latitude	Lat = 654800 N	
(DDMMSS)		
Longitude	Lon = 0214048 E	
(DDDMMSS)		
Receive Antenna	RAP = J	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

Receive Antenna Dimensions (RAD) Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA GAIN16.2, BEAMWIDTH22, AZIMUTHAL RANGE360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS46, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS6	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
Number of Satellite Contacts Supported Per Day	11 contacts per day	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	8 minutes	AVERAGE DURATION OF EACH CONTACT
Farth Station Dat	 a (Receiver) at Each Earth Station Location	
State (RSC)	RSC = Spain	
City Name (RAL)	RAL = Puertollano	
Latitude (DDMMSS)	Lat = 384026 N	
Longitude (DDDMMSS)	Lon = 0040943 W	
Receive 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
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 GAIN14.8, BEAMWIDTH40, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS690, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS14, RAD = RAD03 14.8G040B000-360A00690H014	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	ANTENNA DIAMETERN/A, ANTENNA EFFICIENCYN/A,	
Antennas) Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Italy	
City Name (RAL)	RAL = Vimercate	
Latitude (DDMMSS)	Lat = 453536 N	
Longitude (DDDMMSS)	Lon = 0092144 E	
Receive 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
Receive Antenna Orientation (RAZ)	RAZ = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Danaities Automo	ANITENINA CAINI 44.0	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
Receive Antenna	ANTENNA GAIN14.8,	DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Dimensions (RAD)	BEAMWIDTH40,	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 METERS177,	
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS13,	
	RAD =	
	RAD04 14.8G040B000-360A00177H013	
Receive Antenna	ANTENNA DIAMETERN/A,	
Additional	ANTENNA EFFICIENCY N/A,	
Information (For		
Parabolic		
Antennas)		
Number of	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Italy	
City Name (RAL)	RAL = Lomazzo	
Latitude	Lat = 454150 N	
(DDMMSS)		
Longitude	Lon = 0090205 E	
(DDDMMSS)		
Receive Antenna	RAP = J	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

Receive Antenna Dimensions (RAD)	ANTENNA GAIN14.8, BEAMWIDTH40, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS296, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS25, RAD = RAD05 14.8G040B000-360A00296H025	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 DIAMETERN/A, ANTENNA EFFICIENCYN/A,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = United Kingdom	
City Name (RAL)	RAL = Unst, Shetland	
Latitude (DDMMSS)	Lat = 604452 N	
Longitude (DDDMMSS)	Lon = 0005128 W	
Receive 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
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	ANTENNA GAIN14.8,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
Dimensions (RAD)	BEAMWIDTH40,	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:
	LEVEL IN METERS19,	RAD01 16G030B001-360A00357H006
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS4,	
	RAD =	
	RAD06 14.8G040B000-360A00019H004	
Receive Antenna	ANTENNA DIAMETERN/A,	
Additional	ANTENNA EFFICIENCY N/A,	
Information (For		
Parabolic		
Antennas)		
Number of	<1 contact per day	NUMBER OF TIMES THE SATELLITE WILL COMMUNICATE WITH THE EARTH STATION IN THE
Satellite Contacts		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		
Expected	8 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	AND/OR MISSION PAYLOAD DATA
FCC notes:		
1. Use S-Note	S945.	
2 REM AGN Cubesat (Apex Aries 1)		

2. REM AGN, Cubesat, (Apex Aries 1)

Transmit Frequency:400.5 MHz		
Satellite Name: Apex Aries 1		
Data Field	Data Answer	Description/Comments
Transmit Power (PWR)	PWR = 2 W PWR02 W2	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	65.28 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		2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth	68.28 kHz	
-20 dB bandwidth	82.3 kHz	
-40 dB bandwidth	92 kHz	
-60 dB bandwidth	105 kHz	
Modulation Type	2GFSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	1.2 kbits/sec	INFORMATION DATA RATE
Forward Error	Is FEC used? Yes □ No ⊠	
Correction Coding	FEC Type:	
	FEC Rate:	
Total Symbol Rate	1.2 ksymbols/sec	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUTE TO THE SYMBOL MAPPER/MODULATOR.
Does transmitter	Yes ⊠	BEACON MODE IS NORMALLY CONSIDERED A REGULAR AND PERIODIC SHORT DURATION
have a beacon	No □	TRANSMISSION THAT IS OFTEN USED TO ASSIST
mode?		WITH TRACKING, DOPPLER COMPENSATION, OR SMALL SATELLITE IDENTIFICATION WHOSE
		TRANSMISSIONS ARE NOT LIMITED TO
		DURATIONS WHEN SUPPORTING GROUND
If transmitter has	Yes ⊠	STATIONS ARE VISIBLE.
a beacon mode,	No □	
can the beacon be	No 🗆	
commanded off?		
Transmit Antenna	XAP = J	POLARIZATIONS INCLUDE:
Polarization (XAP)		H = HORIZONTAL, V = VERTICAL,
		S = HORIZONTAL AND VERTICAL,
		L = LEFT HAND CIRCULAR, R = RIGHT HAND CIRCULAR,
		T = RIGHT AND LEFT HAND CIRCULAR,
Transmit Antonna	XAZ = EC	J = LINEAR POLARIZATION NB= NARROWBEAM
Transmit Antenna Orientation (XAZ)	\AZ - EC	EC = EARTH COVERAGE
Transmit Antenna	ANTENNA GAIN 0 dBi	NTIA FORMAT (XAD), EXAMPLE, FOR 16 DBI
Dimension (XAD)	BEAMWIDTH 360	ANTENNA GAIN AND 30 DEGREE BEAMWIDTH
=	XAD = XAD01 00G360B	, 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 ANGLE 97.4 APOGEE IN KILOMETERS 525, PERIGEE IN KILOMETERS 525, ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL 0. 58, THE NUMBER OF SATELLITES IN THE SYSTEM 1 ORB = *ORB,97.4IN00525AP00525PE001.58H01NRT01	IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN TO1, EXAMPLE, REMO4 *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	Mean Local Time of Ascending Node MLTDN = 13:00 + 60 mins or 13:00-14:00	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)
Orbits	(Note: SpaceX notified use of LTDN, not LTAN.)	
Farth Station Data	 a (Receiver) at Each Earth Station Location	on .
State (RSC)	RSC = South Africa	
City Name (RAL)	RAL = Pretoria	
Latitude (DDMMSS)	Lat = 255136 S	
Longitude (DDDMMSS)	Lon = 0282700 E	
Receive 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
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	ANTENNA GAIN16.2,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
Dimensions (RAD)	BEAMWIDTH22,	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 METERS1339,	RAD01 16G030B001-360A00357H006
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS6	
	, in the rend,	
	RAD =	
	RAD01 16.2G022B000-360A01339H006	
Receive Antenna	ANTENNA DIAMETERN/A,	
Additional	ANTENNA EFFICIENCYN/A,	
Information (For	ANTENNA EFFICIENCYN	
Parabolic		
Antennas) Number of	A contacts nor day	NUMBER OF TIMES THE SATELLITE WILL
Satellite Contacts	4 contacts per day	COMMUNICATE WITH THE EARTH STATION IN THE
		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		AVERAGE DURATION OF FACU CONTACT
Expected	8 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	7.1.5, 61.1.1.65.61.7.1.25.1.5
	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Sweden	
City Name (RAL)	RAL = Boden	
Latitude	Lat = 654800 N	
(DDMMSS)		
Longitude	Lon = 0214048 E	
(DDDMMSS)		
Receive Antenna	RAP = J	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

Receive Antenna Dimensions (RAD)	ANTENNA GAIN16.2, BEAMWIDTH22, AZIMUTHAL RANGE360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS46, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS6	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
	RAD = RAD02 16.2G022B000-360A00046H006	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETERN/A, ANTENNA EFFICIENCYN/A,	
Number of Satellite Contacts Supported Per Day	11 contacts per day	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	8 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
Earth Station Dat	□ a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Spain	
City Name (RAL)	RAL = Puertollano	
Latitude (DDMMSS)	Lat = 384026 N	
Longitude (DDDMMSS)	Lon = 0040943 W	
Receive 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
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 GAIN14.8, BEAMWIDTH40, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS690, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS14,	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
	RAD = RAD03 14.8G040B000-360A00690H014	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETERN/A, ANTENNA EFFICIENCYN/A,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	la (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Italy	
City Name (RAL)	RAL = Vimercate	
Latitude (DDMMSS)	Lat = 453536 N	
Longitude (DDDMMSS)	Lon = 0092144 E	
Receive 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
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 GAIN14.8, BEAMWIDTH40, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS177, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS13, 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
	RAD04 14.8G040B001-360A00177H013	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETERN/A, ANTENNA EFFICIENCYN/A,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 minutes	AVERAGE DURATION OF EACH CONTACT
Supported	Satellite Health and Status Data ⊠	SATELLITE HEALTH AND STATUS TELEMETRY
Operations	Mission Payload Data □	AND/OR MISSION PAYLOAD DATA
	Wilsold Future =	
Farth Station Data	□ a (Receiver) at Each Earth Station Locatio	nn
State (RSC)	RSC = Italy	J
City Name (RAL)	RAL = Lomazzo	
Latitude (DDMMSS)	Lat = 454150 N	
Longitude (DDDMMSS)	Lon = 0090205 E	
Receive 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
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) Receive Antenna	ANTENNA GAIN14.8, BEAMWIDTH40, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS296, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS25, RAD = RAD05 14.8G040B000-360A00296H025 ANTENNA DIAMETERN/A,	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
Additional Information (For	ANTENNA EFFICIENCYN/A,	
Parabolic		
Antennas)		
Number of Satellite Contacts Supported Per Day	<1 contact per day	NUMBER OF TIMES THE SATELLITE WILL COMMUNICATE WITH THE EARTH STATION IN THE SPACE TO EARTH DIRECTION (DOWNLINKS) EACH DAY
Expected	8 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	
Forth Station Date	 a (Receiver) at Each Earth Station Location	
State (RSC)	RSC = United Kingdom	
City Name (RAL)	RAL = Unst, Shetland	
Latitude	Lat = 604452 N	
(DDMMSS)		
Longitude	Lon = 0005128 W	
(DDDMMSS)		
Receive 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
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	ANTENNA CAIN 140	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
	ANTENNA GAIN14.8,	DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Dimensions (RAD)	BEAMWIDTH40,	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 METERS19,	
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS4,	
	RAD =	
	RAD06 14.8G040B000-360A00019H004	
Receive Antenna	ANTENNA DIAMETERN/A,	
Additional	ANTENNA EFFICIENCY N/A,	
Information (For		
Parabolic		
Antennas)		
Number of	<1 contact per day	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	8 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
FCC notes:		
1. Use S-Note	S945.	
2. REM AGN, 0	Cubesat, (Apex Aries 1)	

Transmit Frequency: 401.5 MHz		
Satellite Name: Apex Aries 1		
Data Field	Data Answer	Description/Comments
Transmit Power (PWR)	PWR = 2 W PWR02 W2	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	65.28 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		2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth	68.28 kHz	
-20 dB bandwidth	82.3 kHz	
-40 dB bandwidth	92 kHz	
-60 dB bandwidth	105 kHz	
Modulation Type	2GFSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	1.2 kbits/sec	INFORMATION DATA RATE
Forward Error Correction Coding	Is FEC used? Yes □ No ⊠ FEC Type:, FEC Rate:,	
Total Symbol Rate	1.2 ksymbols/s	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 a beacon mode, can the beacon be commanded off?	Yes ⊠ No □	
Transmit Antenna 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
Transmit Antenna Orientation (XAZ)	XAZ = EC	NB= NARROWBEAM EC = EARTH COVERAGE

T	ANITENIALA CAINL	NTIA FORMAT (XAD), EXAMPLE, FOR 16 DBI
Transmit Antenna	ANTENNA GAIN <u>0</u> ,	ANTENNA GAIN AND 30 DEGREE BEAMWIDTH
Dimension (XAD)	BEAMWIDTH	XAD01 16G030B
	XAD = XAD01 00G360B	
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 97.4 , APOGEE IN KILOMETERS 525 , PERIGEE IN KILOMETERS 525 , ORBITAL PERIOD IN HOURS 1 AND	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
	FRACTIONS OF HOURS IN DECIMAL 0. 58 , THE NUMBER OF SATELLITES IN THE SYSTEM 1 ,	IN THE SYSTEM, THEN T01, EXAMPLE, REM04 *ORB,98.0IN00510AP00510PE001.58H01NRT01, AND FOR SPACE-TO-SPACE COMMUNICATIONS WITH ANOTHER NONGEOSTATIONARY SATELLITE ADD AN ADDITIONAL
	ODD -	*ORB FOR IT ENDING IN R01, EXAMPLE, REM05
	ORB = *ORB 07 41NOOF3F ADOOF3FDF001 F9H01NDT01	*ORB,72.9IN03209AP00655PE013.46H01NRR01
F	*ORB,97.4IN00525AP00525PE001.58H01NRT01	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S
For SunSynchronous Nongeostationary	Mean Local Time of Ascending Node MLTDN = 13:00 + 60 mins or 13:00-14:00	ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)
Orbits	(Note: SpaceX notified use of LTDN, not LTAN.)	
Earth Station Data	a (Receiver) at Each Earth Station Locatio	on
State (RSC)	RSC = South Africa	
City Name (RAL)	RAL = Pretoria	
Latitude (DDMMSS)	Lat = 255136 S	
Longitude (DDDMMSS)	Lon = 0282700 E	
Receive 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
Receive Antenna Orientation (RAZ)	RAZ = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

B	ANITENINA CAINI 46.3	EVANDLE ASSUMING NONGEOSTATIONARY 16
Receive Antenna	ANTENNA GAIN16.2,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16 DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Dimensions (RAD)	BEAMWIDTH22,	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 METERS1339,	
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS6,	
	RAD =	
	RAD01 16.2G022B000-360A01339H006	
Receive Antenna	ANTENNA DIAMETERN/A,	
Additional	ANTENNA EFFICIENCY N/A,	
Information (For		
Parabolic		
Antennas)		
Number of	4 contacts per day	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	8 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
Earth Station Dat	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Sweden	
City Name (RAL)	RAL = Boden	
Latitude	Lat = 654800 N	
(DDMMSS)		
Longitude	Lon = 0214048 E	
(DDDMMSS)		
Receive Antenna	RAP = J	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

Receive Antenna Dimensions (RAD)	ANTENNA GAIN16.2, BEAMWIDTH22, AZIMUTHAL RANGE360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS46, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS6	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 DIAMETERN/A, ANTENNA EFFICIENCYN/A,	
Number of Satellite Contacts Supported Per Day	11 contacts per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Spain	
City Name (RAL)	RAL = Puertollano	
Latitude (DDMMSS)	Lat = 384026 N	
Longitude (DDDMMSS)	Lon = 0040943 W	
Receive 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
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) Receive Antenna Additional Information (For	ANTENNA GAIN14.8, BEAMWIDTH40, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS690, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS14, RAD = RAD03 14.8G040B000-360A00690H014 ANTENNA DIAMETERN/A, ANTENNA EFFICIENCYN/A,	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
Parabolic Antennas)		
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	Receiver) at Each Earth Station Locatio	on
State (RSC)	RSC = Italy	
City Name (RAL)	RAL = Vimercate	
Latitude (DDMMSS)	Lat = 453536 N	
Longitude (DDDMMSS)	Lon = 0092144 E	
Receive 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
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 GAIN14.8, BEAMWIDTH40, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS177, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS13,	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
	RAD = RAD04 14.8G040B001-360A00177H013	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETERN/A, ANTENNA EFFICIENCYN/A,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Italy	
City Name (RAL)	RAL = Lomazzo	
Latitude (DDMMSS)	Lat = 454150 N	
Longitude (DDDMMSS)	Lon = 0090205 E	
Receive 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
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 GAIN14.8, BEAMWIDTH40, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS296, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS25, RAD = RAD05 14.8G040B000-360A00296H025	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	ANTENNA DIAMETERN/A, ANTENNA EFFICIENCYN/A,	
Antennas)		
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Farth Station Data	□ a (Receiver) at Each Earth Station Locatio	on
State (RSC)	RSC = United Kingdom	
City Name (RAL)	RAL = Unst, Shetland	
Latitude (DDMMSS)	Lat = 604452 N	
Longitude (DDDMMSS)	Lon = 0005128 W	
Receive 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
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 GAIN14.8, BEAMWIDTH40, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS19, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS4, RAD = RAD06 14.8G040B000-360A00019H004	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	ANTENNA DIAMETERN/A,	
Additional	ANTENNA EFFICIENCY N/A,	
Information (For		
Parabolic		
Antennas)		
Number of	<1 contact per day	NUMBER OF TIMES THE SATELLITE WILL COMMUNICATE WITH THE EARTH STATION IN THE
Satellite Contacts		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		
Expected	8 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	AND/ON WISSION FATEUAD DATA
FCC notes:		
1. Use S-Note	S945.	
2. REM AGN, (Cubesat, (Apex Aries 1)	

Transmit Frequency: 2287.5 MHz		
Satellite Name: Apex Aries 1		
Data Field	Data Answer	Description/Comments
Transmit Power (PWR)	PWR = 0.143 W PWR01 W0.143	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	168.8 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		2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth	170 kHz	7
-20 dB bandwidth	200 kHz	7
-40 dB bandwidth	240 kHz	7
-60 dB bandwidth	400 kHz	7
Modulation Type	BPSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	54.7 kbits/sec	INFORMATION DATA RATE
Forward Error Correction Coding	Is FEC used? Yes ⊠ No □ FEC Type:Reed-Solomon and ½ CC_, FEC Rate:0.563,	
Total Symbol Rate	125 ksymbols/sec	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 a beacon mode, can the beacon be commanded off?	Yes □ 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	XAZ = EC	NB= NARROWBEAM
Orientation (XAZ)		EC = EARTH COVERAGE
Transmit Antenna Dimension (XAD)	ANTENNA GAIN <u>6</u> , BEAMWIDTH <u>70</u> , XAD = XAD02 06G070B	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 ANGLE 97.4 APOGEE IN KILOMETERS 525 PERIGEE IN KILOMETERS 525 ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL 0.58 THE NUMBER OF SATELLITES IN THE SYSTEM 1 ORB = *ORB,97.4IN00525AP00525PE001.58H01NRT01	IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN TO1, EXAMPLE, REMO4 *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 MLTDN = 13:00 + 60 mins or 13:00-14:00	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)
Orbits	(Note: SpaceX notified use of LTDN, not LTAN.)	
Farth Station Data	 a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = South Africa	
City Name (RAL)	RAL = Pretoria	
Latitude (DDMMSS)	Lat = 255136 S	
Longitude (DDDMMSS)	Lon = 0282700 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), VOO TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD) Receive Antenna Additional	ANTENNA GAIN40, BEAMWIDTH0.97, AZIMUTHAL RANGE000-270, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS1339, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS6, RAD = RAD07 40G.97B000-270A01339H006 ANTENNA DIAMETER6.0, ANTENNA EFFICIENCY0.5,	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
Information (For Parabolic Antennas)		
Number of Satellite Contacts Supported Per Day	4 contacts per day	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	8 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
Earth Station Dat	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Sweden	
City Name (RAL)	RAL = Boden	
Latitude (DDMMSS)	Lat = 654800 N	
Longitude (DDDMMSS)	Lon = 0214048 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN40, BEAMWIDTH0.97, AZIMUTHAL RANGE000-270, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS46, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS6, 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
	RAD08 40G.97B000-270A00046H006	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER6.0, ANTENNA EFFICIENCY0.5,	
Number of Satellite Contacts Supported Per Day	11 contacts per day	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	8 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
Farth Station Data	│ a (Receiver) at Each Earth Station Location	l nn
State (RSC)	RSC = Australia	
City Name (RAL)	RAL = Currans Hill	
Latitude (DDMMSS)	Lat = 340224 S	
Longitude (DDDMMSS)	Lon = 1504612 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD) Receive Antenna Additional	ANTENNA GAIN16, BEAMWIDTH1.83, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS89, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS10, RAD = RAD09 16G1.83B000-360A00089H010 ANTENNA DIAMETER5.4, ANTENNA EFFICIENCY0.5,	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
Information (For Parabolic Antennas)		
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Bahrain	
City Name (RAL)	RAL = Zallaq	
Latitude (DDMMSS)	Lat = 260300	
Longitude (DDDMMSS)	Lon = 0503000	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN16, BEAMWIDTH1.83, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS5, 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
	RAD10 16G1.83B000-360A00005H010	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER5.4, ANTENNA EFFICIENCY0.5,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 minutes	AVERAGE DURATION OF EACH CONTACT
Supported	Satellite Health and Status Data ⊠	SATELLITE HEALTH AND STATUS TELEMETRY
Operations	Mission Payload Data	AND/OR MISSION PAYLOAD DATA
Foul Cours Dat	/Paris Ast Fact Fact Chaire Land	
	a (Receiver) at Each Earth Station Location	on T
State (RSC)	RSC = Ireland	
City Name (RAL)	RAL = Dublin	
Latitude (DDMMSS)	Lat = 532400 N	
Longitude (DDDMMSS)	Lon = 0061312 W	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN16, BEAMWIDTH1.83, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS38, 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
	RAD11 16G1.83B000-360A00038H010	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER5.4, ANTENNA EFFICIENCY0.5,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 minutes	AVERAGE DURATION OF EACH CONTACT
Supported	Satellite Health and Status Data ⊠	SATELLITE HEALTH AND STATUS TELEMETRY
Operations	Mission Payload Data	AND/OR MISSION PAYLOAD DATA
	·	
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Southern Australia	
City Name (RAL)	RAL = Peterborough	
Latitude (DDMMSS)	Lat = 325743 S	
Longitude (DDDMMSS)	Lon = 1385058 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna	ANTENNA GAIN34.6,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
Dimensions (RAD)	BEAMWIDTH2.4,	DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Difficultions (10.12)	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 METERS540,	RAD01 16G030B001-360A00357H006
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS	
	114 1412113,	
	RAD =	
	RAD12 34.6G2.4B000-360A00540H2.2	
Receive Antenna		
Additional	ANTENNA EFFICIENCY 406F	
	ANTENNA EFFICIENCY4965,	
Information (For		
Parabolic		
Antennas)	d soutest you do.	NUMBER OF TIMES THE SATELLITE WILL
Number of	<1 contact per day	COMMUNICATE WITH THE EARTH STATION IN THE
Satellite Contacts		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		AVERAGE BURNETION OF FACULORITAGE
Expected	8 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	AND/ON WISSION PATEOAD DATA
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Western Australia	
City Name (RAL)	RAL = Nangetty	
Latitude	Lat = 290037 S	
(DDMMSS)		
Longitude	Lon = 1152030 E	
(DDDMMSS)		
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA
Orientation (RAZ)		MINIMUM OPERATING ANGLE OF
		ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01

AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS270, THE ANTENNA HEIGHT ABOVE TERRAIN N METERS2.2, RAD = RAD13 34.6G2.4B000-360A00270H2.2	METERS, AND ANTENNA HEIGHT ABOVE TERRAIN OF 6 METERS: RAD01 16G030B001-360A00357H006
ANTENNA DIAMETER3.7,	
ANTENNA EFFICIENCY4965,	
1 contact per day	NUMBER OF TIMES THE SATELLITE WILL
	COMMUNICATE WITH THE EARTH STATION IN THE SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
	DAY
3 minutes	AVERAGE DURATION OF EACH CONTACT
	CATELLITE LICALTH AND STATUS TELEMETRY
	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA
Mission Payload Data ∟	
Descional at Each Fouth Chatian League	
-	on
at - 402738 N	
on = 492908 E	
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,
RAZ = RAZ01 V00	J = LINEAR POLARIZATION THE EARTH STATION RECEIVER ANTENNA
	MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), VOO TO V90, EXAMPLE, RAZ01
	HE SITE ELEVATION ABOVE MEAN SEA EVEL IN METERS

Receive Antenna Dimensions (RAD) Receive Antenna	ANTENNA GAIN34.6, BEAMWIDTH2.4, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS210, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2, RAD = RAD14 34.6G2.4B000-360A00210H2.2	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
Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER3.7, ANTENNA EFFICIENCY4965,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Bulgaria	
City Name (RAL)	RAL = Plana	
Latitude (DDMMSS)	Lat = 422858 N	
Longitude (DDDMMSS)	Lon = 0232643 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN35.8, BEAMWIDTH2.2, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS1106, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS4, 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
	RAD15 35.8G2.2B000-360A01106H004	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER, ANTENNA EFFICIENCY3356,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 minutes	AVERAGE DURATION OF EACH CONTACT
Supported	Satellite Health and Status Data ⊠	SATELLITE HEALTH AND STATUS TELEMETRY
Operations	Mission Payload Data	AND/OR MISSION PAYLOAD DATA
	a (Receiver) at Each Earth Station Location	on T
State (RSC)	RSC = Iceland	
City Name (RAL)	RAL = Blönduós	
Latitude (DDMMSS)	Lat = 653850 N	
Longitude (DDDMMSS)	Lon = 0201445 W	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN34.6, BEAMWIDTH2.4, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS53, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2,	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
	RAD = RAD16 34.6G2.4B000-360A00053H2.2	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER 3.7 , ANTENNA EFFICIENCY	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	□ a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Italy	
City Name (RAL)	RAL = Vimercate	
Latitude (DDMMSS)	Lat = 453536 N	
Longitude (DDDMMSS)	Lon = 0092144 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

EA
NUMBER OF TIMES THE SATELLITE WILL
COMMUNICATE WITH THE EARTH STATION IN THE
SPACE TO EARTH DIRECTION (DOWNLINKS) EACH DAY
AVERAGE DURATION OF EACH CONTACT
CATCULITE UEALTH AND CTATUS TELEMETRY
SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA
ocation
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 RECEIVER ANTENNA
MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), VOO TO V90, EXAMPLE, RAZ01
_

Receive Antenna	ANTENNA GAIN34.6,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
Dimensions (RAD)	BEAMWIDTH2.4,	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:
	LEVEL IN METERS462,	RAD01 16G030B001-360A00357H006
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS,	
	RAD =	
	RAD18 34.6G2.4B000-360A00462H2.2	
Receive Antenna	ANTENNA DIAMETER3.7,	
Additional	ANTENNA EFFICIENCY4965,	
Information (For		
Parabolic		
Antennas)		
Number of	<1 contact per day	NUMBER OF TIMES THE SATELLITE WILL
Satellite Contacts	,	COMMUNICATE WITH THE EARTH STATION IN THE
Supported Per		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH DAY
Day		
Expected	8 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
	,	
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = New Zealand	
City Name (RAL)	RAL = Awarua	
Latitude	Lat = 463141 S	
(DDMMSS)		
Longitude	Lon = 1682245 E	
(DDDMMSS)		
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA
Orientation (RAZ)		MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), VOO TO V90, EXAMPLE, RAZO1
, ,		V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN34.6, BEAMWIDTH2.4, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS16, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2, RAD = RAD19 34.6G2.4B000-360A00016H2.2	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 EFFICIENCY4965,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Dat	□ a (Receiver) at Each Earth Station Locatio	on
State (RSC)	RSC = Azores, Portugal	
City Name (RAL)	RAL = Santa Maria	
Latitude (DDMMSS)	Lat = 365951 N	
Longitude (DDDMMSS)	Lon = 0250814 W	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN34.6, BEAMWIDTH2.4, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS194, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2, RAD = RAD20 34.6G2.4B000-360A00194H2.2	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 EFFICIENCY4965,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	□ a (Receiver) at Each Earth Station Locati	on
State (RSC)	RSC = United Kingdom	
City Name (RAL)	RAL = Unst, Shetland	
Latitude (DDMMSS)	Lat = 604452 N	
Longitude (DDDMMSS)	Lon = 0005128 W	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN34.6, BEAMWIDTH2.4, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS19, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2, RAD = RAD21 34.6G2.4B000-360A00019H2.2	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	ANTENNA DIAMETER 3.7 ,	
Additional	ANTENNA EFFICIENCY .4965 ,	
Information (For	ANTENNA ETTICIENCI4505,	
Parabolic		
Antennas)		AND A DEED OF TIMES THE CATELLITE WILL
Number of	<1 contact per day	NUMBER OF TIMES THE SATELLITE WILL COMMUNICATE WITH THE EARTH STATION IN THE
Satellite Contacts		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		
Expected	8 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
FCC notes:	,	1
1. Use S-Note	S945.	
2 DEN4 ACN (Subsect (Amor Aries 1)	

2. REM AGN, Cubesat, (Apex Aries 1)

Transmit Frequency: 2287.5 MHz		
Satellite Name: Apex Aries 1		
Data Field	Data Answer	Description/Comments
Transmit Power (PWR)	PWR = 0.85 W PWR01 W0.85	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	1 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		2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth	1.02 MHz	7
-20 dB bandwidth	1.08 MHz	7
-40 dB bandwidth	1.14 MHz	7
-60 dB bandwidth	1.20 MHz	7
Modulation Type	BPSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	54.7 kbits/sec	INFORMATION DATA RATE
Forward Error Correction Coding	Is FEC used? Yes ⊠ No ☐ FEC Type:Reed-Solomon and ½ CC_, FEC Rate:0.563,	
Total Symbol Rate	125 ksymbols/sec	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 a beacon mode, can the beacon be commanded off?	Yes 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	XAZ = EC	NB= NARROWBEAM
Orientation (XAZ)		EC = EARTH COVERAGE
Transmit Antenna Dimension (XAD)	ANTENNA GAIN 5 , BEAMWIDTH 70 , XAD = XAD02 05G070B	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 ANGLE 97.4 APOGEE IN KILOMETERS 525 PERIGEE IN KILOMETERS 525 ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL 0.58 THE NUMBER OF SATELLITES IN THE SYSTEM 1 ORB = *ORB,97.4IN00525AP00525PE001.58H01NRT01	IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN TO1, EXAMPLE, REMO4 *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 MLTDN = 13:00 + 60 mins or 13:00-14:00 (Note: SpaceX notified use of LTDN, not	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)
Orbits	LTAN.)	
Farth Station Data	 a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = South Africa	
City Name (RAL)	RAL = Pretoria	
Latitude (DDMMSS)	Lat = 255136 S	
Longitude (DDDMMSS)	Lon = 0282700 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), VOO TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN40, BEAMWIDTH0.97, AZIMUTHAL RANGE000-270, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS1339, THE ANTENNA HEIGHT ABOVE TERRAIN	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
	IN METERS6, RAD = RAD07 40G.97B000-270A01339H006	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER6.0, ANTENNA EFFICIENCY0.5,	
Number of Satellite Contacts Supported Per Day	4 contacts per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Sweden	
City Name (RAL)	RAL = Boden	
Latitude (DDMMSS)	Lat = 654800 N	
Longitude (DDDMMSS)	Lon = 0214048 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN40, BEAMWIDTH0.97, AZIMUTHAL RANGE000-270, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS46, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS6, 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	RAD08 40G.97B000-270A00046H006 ANTENNA DIAMETER6.0, ANTENNA EFFICIENCY0.5,	
Parabolic Antennas)		
Number of Satellite Contacts Supported Per Day	11 contacts per day	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	8 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
Earth Station Data	│ a (Receiver) at Each Earth Station Location) on
State (RSC)	RSC = Australia	
City Name (RAL)	RAL = Currans Hill	
Latitude (DDMMSS)	Lat = 340224 S	
Longitude (DDDMMSS)	Lon = 1504612 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD) Receive Antenna Additional	ANTENNA GAIN16, BEAMWIDTH1.83, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS10, RAD = RAD09 16G1.83B000-360A00089H010 ANTENNA DIAMETER5.4, ANTENNA EFFICIENCY 0.5,	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
Information (For Parabolic Antennas)	ANTENNA EFFICIENCI	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Bahrain	
City Name (RAL)	RAL = Zallaq	
Latitude (DDMMSS)	Lat = 260300 N	
Longitude (DDDMMSS)	Lon = 0503000 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

	T	T 5// 10/ 5 100/ 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10/ 10
Receive Antenna	ANTENNA GAIN16,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16 DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Dimensions (RAD)	BEAMWIDTH1.83	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 METERS5,	
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS10,	
	RAD =	
	RAD10 16G1.83B000-360A00005H010	
Receive Antenna	ANTENNA DIAMETER5.4,	
Additional	ANTENNA EFFICIENCY0.5,	
Information (For		
Parabolic		
Antennas)		
Number of	<1 contact per day	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	8 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
	,	
Earth Station Dat	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Ireland	
City Name (RAL)	RAL = Dublin	
Latitude	Lat = 532400 N	
(DDMMSS)		
Longitude	Lon = 0061312 W	
(DDDMMSS)		
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA
Orientation (RAZ)		MINIMUM OPERATING ANGLE OF
3.16.1661011 (11/12)		ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01

Receive Antenna Dimensions (RAD)	ANTENNA GAIN16	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)	RAD11 16G1.83B000-360A00038H010 ANTENNA DIAMETER5.4, ANTENNA EFFICIENCY0.5,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Southern Australia	
City Name (RAL)	RAL = Peterborough	
Latitude (DDMMSS)	Lat = 325743 S	
Longitude (DDDMMSS)	Lon = 1385058 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD) Receive Antenna	ANTENNA GAIN34.6, BEAMWIDTH2.4, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS540, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2, RAD = RAD12 34.6G2.4B000-360A00540H2.2 ANTENNA DIAMETER3.7,	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
Additional Information (For Parabolic Antennas)	ANTENNA EFFICIENCY4965,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Western Australia	
City Name (RAL)	RAL = Nangetty	
Latitude (DDMMSS)	Lat = 290037 S	
Longitude (DDDMMSS)	Lon = 1152030 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN34.6, BEAMWIDTH2.4, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS270, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2, RAD = RAD13 34.6G2.4B000-360A00270H2.2	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	ANTENNA DIAMETER3.7, ANTENNA EFFICIENCY4965,	
Antennas) Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Azerbaijan	
City Name (RAL)	RAL = Absheron	
Latitude (DDMMSS)	Lat = 402758 N	
Longitude (DDDMMSS)	Lon = 492908 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD) Receive Antenna Additional Information (For	ANTENNA GAIN34.6, BEAMWIDTH2.4, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS210, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2, RAD = RAD14 34.6G2.4B000-360A00210H2.2 ANTENNA DIAMETER3.7, ANTENNA EFFICIENCY4965,	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
Parabolic		
Antennas) Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	Receiver) at Each Earth Station Locatio	on
State (RSC)	RSC = Bulgaria	
City Name (RAL)	RAL = Plana	
Latitude (DDMMSS)	Lat = 422858 N	
Longitude (DDDMMSS)	Lon = 0232643 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD) Receive Antenna Additional Information (For	ANTENNA GAIN35.8, BEAMWIDTH2.2, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS1106, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS4, RAD = RAD15 35.8G2.2B000-360A01106H004 ANTENNA DIAMETER4.5, ANTENNA EFFICIENCY3356,	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
Parabolic		
Antennas)		
Number of Satellite Contacts Supported Per Day	<1 contact per day	NUMBER OF TIMES THE SATELLITE WILL COMMUNICATE WITH THE EARTH STATION IN THE SPACE TO EARTH DIRECTION (DOWNLINKS) EACH DAY
Expected	8 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	AND/ON WISSION PATEOAD DATA
Earth Station Data	a (Receiver) at Each Earth Station Locatio	on
State (RSC)	RSC = Iceland	
City Name (RAL)	RAL = Blönduós	
Latitude (DDMMSS)	Lat = 653850 N	
Longitude (DDDMMSS)	Lon = 0201445 W	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD) Receive Antenna Additional Information (For	ANTENNA GAIN34.6, BEAMWIDTH2.4, AZIMUTHAL RANGE000-360_, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS53, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2, RAD = RAD16 34.6G2.4B000-360A00053H2.2 ANTENNA DIAMETER3.7, ANTENNA EFFICIENCY4965,	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
Parabolic		
Antennas)		
Number of Satellite Contacts Supported Per Day	<1 contact per day	NUMBER OF TIMES THE SATELLITE WILL COMMUNICATE WITH THE EARTH STATION IN THE SPACE TO EARTH DIRECTION (DOWNLINKS) EACH DAY
Expected	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Italy	
City Name (RAL)	RAL = Vimercate	
Latitude	Lat = 453536 N	
(DDMMSS) Longitude	Lon = 0092144 E	
(DDDMMSS)	LOII	
Receive Antenna	RAP = R	POLARIZATIONS INCLUDE:
Polarization (RAP)	NOI - N	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) Receive Antenna	ANTENNA GAIN 35, BEAMWIDTH 3.1, AZIMUTHAL RANGE 000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 177, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 13, RAD = RAD17 35G3.1B000-360A00177H013	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
Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER3.0, ANTENNA EFFICIENCY4965,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Sri Lanka	
City Name (RAL)	RAL = Kandy	
Latitude (DDMMSS)	Lat = 071627 N	
Longitude (DDDMMSS)	Lon = 0804329 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD) Receive Antenna	ANTENNA GAIN 34.6, BEAMWIDTH 2.4, AZIMUTHAL RANGE 000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 462, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 2.2, RAD = RAD18 34.6G2.4B000-360A00462H2.2 ANTENNA DIAMETER 3.7, ANTENNA DIAMETER 3.7,	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
Additional Information (For Parabolic Antennas)	ANTENNA EFFICIENCY4965,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = New Zealand	
City Name (RAL)	RAL = Awarua	
Latitude (DDMMSS)	Lat = 463141 S	
Longitude (DDDMMSS)	Lon = 1682245 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD) Receive Antenna Additional	ANTENNA GAIN34.6, BEAMWIDTH2.4, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS16, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2, RAD = RAD19 34.6G2.4B000-360A00016H2.2 ANTENNA DIAMETER3.7, ANTENNA EFFICIENCY4965,	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
Information (For Parabolic Antennas)		
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Azores, Portugal	
City Name (RAL)	RAL = Santa Maria	
Latitude (DDMMSS)	Lat = 365951 N	
Longitude (DDDMMSS)	Lon = 0250814 W	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

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Receive Antenna	ANTENNA GAIN34.6,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16 DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Dimensions (RAD)	BEAMWIDTH2.4,	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 METERS194,	NAD01 100030B001-300A0033711000
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS2.2,	
	RAD =	
	RAD20 34.6G2.4B000-360A00194H2.2	
Receive Antenna	ANTENNA DIAMETER3.7,	
Additional	ANTENNA EFFICIENCY	
Information (For	//// LIVION ETT TELEVET	
Parabolic		
Antennas)	<1 contact nor day	NUMBER OF TIMES THE SATELLITE WILL
Number of	<1 contact per day	COMMUNICATE WITH THE EARTH STATION IN THE
Satellite Contacts		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		
Expected	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = United Kingdom	
City Name (RAL)	RAL = Unst, Shetland	
Latitude	Lat = 604452 N	
(DDMMSS)		
Longitude	Lon = 0005128 W	
(DDDMMSS)		
Receive Antenna	RAP = R	POLARIZATIONS INCLUDE:
Polarization (RAP)	11/21 - 11	H = HORIZONTAL,
i Olalization (NAP)		V = VERTICAL,
		S = HORIZONTAL AND VERTICAL, L = LEFT HAND CIRCULAR,
		R = RIGHT HAND CIRCULAR,
		T = RIGHT AND LEFT HAND CIRCULAR,
Danaities Automotive	DA7 DA704 V00	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 Dimensions (RAD)	ANTENNA GAIN34.6, BEAMWIDTH2.4, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS19, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2, RAD = RAD21 34.6G2.4B000-360A00019H2.2	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 DIAMETER 3.7 ANTENNA EFFICIENCY .4965 ,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
FCC notes: 1. Use S-Note 2. REM AGN, (S945. Cubesat, (Apex Aries 1)	

Transmit Frequency: 8212.5 MHz		
Satellite Name: Apex Aries 1		
Data Field	Data Answer	Description/Comments
Transmit Power (PWR)	PWR = 1 W PWR01 W1	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	13.5 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		2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth	65 MHz	
-20 dB bandwidth	75 MHz	
-40 dB bandwidth	85 MHz	
-60 dB bandwidth	100 MHz	
Modulation Type	16APSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	103 mbits/sec	INFORMATION DATA RATE
Forward Error	Is FEC used? Yes $oxtimes$ No $oxtimes$	
Correction Coding	FEC Type: <u>LDPC 2/3</u> ,	
	FEC Rate: 0.67,	
Total Symbol Rate	69.01 msymbol/s	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUTE TO THE SYMBOL MAPPER/MODULATOR.
Does transmitter	Yes □	BEACON MODE IS NORMALLY CONSIDERED A
have a beacon	No ⊠	REGULAR AND PERIODIC SHORT DURATION TRANSMISSION THAT IS OFTEN USED TO ASSIST
mode?		WITH TRACKING, DOPPLER COMPENSATION, OR SMALL SATELLITE IDENTIFICATION WHOSE TRANSMISSIONS ARE NOT LIMITED TO DURATIONS WHEN SUPPORTING GROUND
		STATIONS ARE VISIBLE.
If transmitter has a beacon mode, can the beacon be commanded off?	Yes □ No □	
Transmit Antenna	XAP = R	POLARIZATIONS INCLUDE:
Polarization (XAP)		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	XAZ = EC	NB= NARROWBEAM
Orientation (XAZ)		EC = EARTH COVERAGE
Transmit Antenna	ANTENNA GAIN17 dBi,	NTIA FORMAT (XAD), EXAMPLE, FOR 16 DBI ANTENNA GAIN AND 30 DEGREE BEAMWIDTH
Dimension (XAD)	BEAMWIDTH 18,	XAD01 16G030B
	XAD = XAD03 17G018B	

Type of satellite	Type = NONGEOSTATIONARY	CHOOSE EITHER:
(State = SPCE)		GEOSTATIONARY OR NONGEOSTATIONARY
(City = Geo or		
Nongeo)		
For Geostationary	Longitude =	IF ANY SATELLITES ARE GEOSTATIONARY, REPORT
Satellites	Longitude –	ITS LATITUDE AS 000000N (XLA AND/OR RLA) AND
- Satemees		REPORT ITS LONGITUDE IN DDDMMSS FORMAT (XLG AND/OR RLG).
For	INCLINATION ANGLE 97.4deg ,	IF ANY SATELLITES ARE NONGEOSTATIONARY,
Nongeostationary	APOGEE IN KILOMETERS 525 km	REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, PERIGEE IN KILOMETERS,
(Orbital Data)	PERIGEE IN KILOMETERS525 km,	ORBITAL PERIOD IN HOURS AND FRACTIONS OF
	ORBITAL PERIOD IN HOURS1_AND	HOURS IN DECIMAL, THE NUMBER OF SATELLITES
	FRACTIONS OF HOURS IN	IN THE SYSTEM, THEN TO1, EXAMPLE, REM04
	DECIMAL <u>0.58</u> ,	*ORB,98.0IN00510AP00510PE001.58H01NRT01,
	THE NUMBER OF SATELLITES IN THE	AND FOR SPACE-TO-SPACE COMMUNICATIONS WITH ANOTHER
	SYSTEM	NONGEOSTATIONARY SATELLITE ADD AN
		ADDITIONAL *ORB FOR IT ENDING IN R01, EXAMPLE, REM05
	ORB =	*ORB,72.9IN03209AP00655PE013.46H01NRR01
	*ORB,97.4IN00525AP00525PE001.58H01NRT01	
For	Mean Local Time of Ascending Node	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN
SunSynchronous	MLTDN = 13:00 + 60 mins or 13:00-14:00	EXPRESSED AS UNIT OF TIME (HH:MM)
Nongeostationary		
Orbits	(Note: SpaceX notified use of LTDN, not	
	LTAN.)	
Earth Station Data	 a (Receiver) at Each Earth Station Location	l on
State (RSC)	RSC = South Africa	
City Name (RAL)	RAL = Pretoria	
Latitude	Lat = 255136 S	
(DDMMSS)		
Longitude	Lon = 0282700 E	
(DDDMMSS)		
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF
Orientation (RAZ)		ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01
		V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN52, BEAMWIDTH0.2, AZIMUTHAL RANGE_000-270, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS1339, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS6, RAD = RAD22 52G0.2B000-270A01339H006	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 DIAMETER6.0, ANTENNA EFFICIENCY0.5,	
Number of Satellite Contacts Supported Per Day	4 contacts per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Sweden	
City Name (RAL)	RAL = Boden	
Latitude (DDMMSS)	Lat = 654800 N	
Longitude (DDDMMSS)	Lon = 0214048 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna	ANTENNA GAIN52,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16 DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL RANGE FROM 001-360, SITE ELEVATION OF 357
Dimensions (RAD)	BEAMWIDTH0.2,	
	AZIMUTHAL RANGE_000-270,	METERS, AND ANTENNA HEIGHT ABOVE TERRAIN
	THE SITE ELEVATION ABOVE MEAN SEA	OF 6 METERS: RAD01 16G030B001-360A00357H006
	LEVEL IN METERS46,	KAD01 100030B001-300A0033711000
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS6,	
	RAD =	
	RAD23 52G0.2B000-270A00046H006	
Receive Antenna	ANTENNA DIAMETER6.0,	
Additional	ANTENNA EFFICIENCY0.5,	
Information (For		
Parabolic		
Antennas)		
Number of	11 contacts per day	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	8 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
FCC notes:		
1. Use S-Note	S945.	
2. REM AGN, 0	Cubesat, (Apex Aries 1)	

Transmit Frequency: 8212.5 MHz			
Satellite Name: Apex Aries 1			
Data Field	Data Answer	Description/Comments	
Transmit Power	PWR = 2 W	TRANSMIT POWER SUPPLIED TO THE ANTENNA	
(PWR)	PWR01 W2	INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT	
Necessary Bandwidth	100 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		2-SIDED EMISSION BANDWIDTH VALUES	
-3 dB bandwidth	65 MHz		
-20 dB bandwidth	75 MHz		
-40 dB bandwidth	85 MHz		
-60 dB bandwidth	100 MHz		
Modulation Type	16APSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.	
Data Rate	103 mbits/sec	INFORMATION DATA RATE	
Forward Error	Is FEC used? Yes $oxtimes$ No $oxtimes$		
Correction Coding	FEC Type: <u>LDPC 2/3</u> ,		
	FEC Rate: <u>0.67</u> ,		
Total Symbol Rate	69.01 msymbols/sec	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUTE TO THE SYMBOL MAPPER/MODULATOR.	
Does transmitter	Yes □	BEACON MODE IS NORMALLY CONSIDERED A	
have a beacon	No ⊠	REGULAR AND PERIODIC SHORT DURATION TRANSMISSION THAT IS OFTEN USED TO ASSIST	
mode?		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,	No □		
can the beacon be			
commanded off?			
Transmit Antenna	XAP = R	POLARIZATIONS INCLUDE:	
Polarization (XAP)		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	XAZ = EC	NB= NARROWBEAM EC = EARTH COVERAGE	
Orientation (XAZ)	ANITENNA CANA 47 15:		
Transmit Antenna	ANTENNA GAIN 17 dBi,	NTIA FORMAT (XAD), EXAMPLE, FOR 16 DBI ANTENNA GAIN AND 30 DEGREE BEAMWIDTH	
Dimension (XAD)	BEAMWIDTH <u>18</u> ,	XAD01 16G030B	
	XAD = XAD03 17G018B	1	

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 97.4deg , APOGEE IN KILOMETERS 525 km , PERIGEE IN KILOMETERS 525 km , ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL 0.58 , THE NUMBER OF SATELLITES IN THE SYSTEM 1 , ORB = *ORB,97.4IN00525AP00525PE001.58H01NRT01	IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN TO1, EXAMPLE, REMO4 *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 MLTDN = 13:00 + 60 mins or 13:00-14:00 (Note: SpaceX notified use of LTDN, not LTAN.)	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	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = South Africa	
City Name (RAL)	RAL = Pretoria	
Latitude (DDMMSS)	Lat = 255136 S	
Longitude (DDDMMSS)	Lon = 0282700 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD) Receive Antenna Additional	ANTENNA GAIN52	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
Information (For Parabolic Antennas)		
Number of Satellite Contacts Supported Per Day	4 contacts per day	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	8 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
Earth Station Dat	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Sweden	
City Name (RAL)	RAL = Boden	
Latitude (DDMMSS)	Lat = 654800 N	
Longitude (DDDMMSS)	Lon = 0214048 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna	ANTENNA GAIN52,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
Dimensions (RAD)	BEAMWIDTH 0.2,	DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL RANGE FROM 001-360, SITE ELEVATION OF 357
	AZIMUTHAL RANGE 000-270 ,	METERS, AND ANTENNA HEIGHT ABOVE TERRAIN
	THE SITE ELEVATION ABOVE MEAN SEA	OF 6 METERS:
	LEVEL IN METERS 46 ,	RAD01 16G030B001-360A00357H006
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS6,	
	RAD =	
	RAD23 52G0.2B000-270A00046H006	
Receive Antenna	ANTENNA DIAMETER6.0,	
Additional	ANTENNA EFFICIENCY0.5,	
Information (For		
Parabolic		
Antennas)		
Number of	11 contacts per day	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	8 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
FCC notes:		
1. Use S-Note	S945.	
2. REM AGN, 0	Cubesat, (Apex Aries 1)	

Transmit Frequency: 8212.5 MHz		
Satellite Name: Apex Aries 1		
Data Field	Data Answer	Description/Comments
Transmit Power (PWR)	PWR = 1 W PWR02 W1	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	13.5 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		2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth	65 MHz	
-20 dB bandwidth	75 MHz	
-40 dB bandwidth	85 MHz	
-60 dB bandwidth	100 MHz	
Modulation Type	16APSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	103 mbits/sec	INFORMATION DATA RATE
Forward Error	Is FEC used? Yes $oxtimes$ No $oxtimes$	
Correction Coding	FEC Type: <u>LDPC 2/3</u> ,	
	FEC Rate: 0.67,	
Total Symbol Rate	69.01 msymbols/s	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUTE TO THE SYMBOL MAPPER/MODULATOR.
Does transmitter	Yes □	BEACON MODE IS NORMALLY CONSIDERED A
have a beacon	No ⊠	REGULAR AND PERIODIC SHORT DURATION TRANSMISSION THAT IS OFTEN USED TO ASSIST
mode?		WITH TRACKING, DOPPLER COMPENSATION, OR SMALL SATELLITE IDENTIFICATION WHOSE TRANSMISSIONS ARE NOT LIMITED TO DURATIONS WHEN SUPPORTING GROUND
If the many it to a bod	V	STATIONS ARE VISIBLE.
If transmitter has a beacon mode,	Yes 🗆	
can the beacon be	No 🗆	
commanded off?		
Transmit Antenna	XAP = R	POLARIZATIONS INCLUDE:
Polarization (XAP)	77.11 - 11	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	XAZ = EC	NB= NARROWBEAM
Orientation (XAZ)		EC = EARTH COVERAGE
Transmit Antenna	ANTENNA GAIN17 dBi,	NTIA FORMAT (XAD), EXAMPLE, FOR 16 DBI ANTENNA GAIN AND 30 DEGREE BEAMWIDTH
Dimension (XAD)	BEAMWIDTH <u>18</u> ,	XAD01 16G030B
	XAD = XAD03 17G018B	

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 97.4deg , APOGEE IN KILOMETERS 525 km , PERIGEE IN KILOMETERS 525 km , ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL 0.58 , THE NUMBER OF SATELLITES IN THE SYSTEM 1 , ORB = *ORB,97.4IN00525AP00525PE001.58H01NRT01	IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN TO1, EXAMPLE, REMO4 *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 MLTDN = 13:00 + 60 mins or 13:00-14:00 (Note: SpaceX notified use of LTDN, not	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)
	LTAN.)	
Earth Station Data	□ a (Receiver) at Each Earth Station Locatio	on
State (RSC)	RSC = Australia	
City Name (RAL)	RAL = Currans Hill	
Latitude (DDMMSS)	Lat = 340224 S	
Longitude (DDDMMSS)	Lon = 1504612 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), VOO TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD) Receive Antenna Additional	ANTENNA GAIN30.5, BEAMWIDTH 0.46, AZIMUTHAL RANGE _000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 89, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 10, RAD = RAD24 30G.46B000-360A00089H010 ANTENNA DIAMETER 5.4, ANTENNA EFFICIENCY 0.5,	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
Information (For Parabolic Antennas)		
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Dat	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Bahrain	
City Name (RAL)	RAL = Zallaq	
Latitude (DDMMSS)	Lat = 260300 N	
Longitude (DDDMMSS)	Lon = 0503000 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN30.5, BEAMWIDTH0.46, AZIMUTHAL RANGE_000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS5, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS10, RAD = RAD25 30G.46B000-360A00005H010	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	ANTENNA DIAMETER5.4, ANTENNA EFFICIENCY0.5,	
Antennas)		
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 minutes	AVERAGE DURATION OF EACH CONTACT
Supported	Satellite Health and Status Data	SATELLITE HEALTH AND STATUS TELEMETRY
Operations	Mission Payload Data ⊠	AND/OR MISSION PAYLOAD DATA
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Ireland	
City Name (RAL)	RAL = Dublin	
Latitude	Lat = 532400 N	
(DDMMSS)		
Longitude (DDDMMSS)	Lon = 0061312 W	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN30.5, BEAMWIDTH0.46, AZIMUTHAL RANGE_000-360, THE SITE ELEVATION ABOVE MEAN SEA	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:
	LEVEL IN METERS38, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS10,	RAD01 16G030B001-360A00357H006
	RAD = RAD26 30G.46B000-360A00038H010	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER5.4, ANTENNA EFFICIENCY0.5,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Southern Australia	
City Name (RAL)	RAL = Peterborough	
Latitude (DDMMSS)	Lat = 325743 S	
Longitude (DDDMMSS)	Lon = 1385058 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna	ANTENNA GAIN47,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
Dimensions (RAD)	BEAMWIDTH 0.6 ,	DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Difficusions (KAD)		RANGE FROM 001-360, SITE ELEVATION OF 357
	AZIMUTHAL RANGE_000-360, THE SITE ELEVATION ABOVE MEAN SEA	METERS, AND ANTENNA HEIGHT ABOVE TERRAIN OF 6 METERS:
		RAD01 16G030B001-360A00357H006
	LEVEL IN METERS540,	
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS,	
	242	
	RAD =	
	RAD27 47G.60B000-360A00540H2.2	
Receive Antenna	ANTENNA DIAMETER 3.7,	
Additional	ANTENNA EFFICIENCY0.4965,	
Information (For		
Parabolic		
Antennas)		
Number of	<1 contact per day	NUMBER OF TIMES THE SATELLITE WILL COMMUNICATE WITH THE EARTH STATION IN THE
Satellite Contacts		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		
Expected	8 minutes	AVERAGE DURATION OF EACH CONTACT
Duration of Each		
Contact		
Supported	Satellite Health and Status Data \square	SATELLITE HEALTH AND STATUS TELEMETRY
Operations	Mission Payload Data ⊠	AND/OR MISSION PAYLOAD DATA
Earth Station Data	a (Receiver) at Each Earth Station Locatio	on
State (RSC)	RSC = Western Australia	
City Name (RAL)	RAL = Nangetty	
Latitude	Lat = 290037 S	
(DDMMSS)		
Longitude	Lon = 1152030 E	
(DDDMMSS)		
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA
Orientation (RAZ)		MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), VOO TO V90, EXAMPLE, RAZ01
		V00

Receive Antenna Dimensions (RAD) Receive Antenna	ANTENNA GAIN47, BEAMWIDTH 0.60, AZIMUTHAL RANGE _000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS 270, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS 4.0, RAD = RAD28 47G.60B000-360A00270H004 ANTENNA DIAMETER 3.7,	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
Additional Information (For Parabolic Antennas)	ANTENNA EFFICIENCY0.4965,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Azerbaijan	
City Name (RAL)	RAL = Absheron	
Latitude (DDMMSS)	Lat = 402758 N	
Longitude (DDDMMSS)	Lon = 492908 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN47, BEAMWIDTH0.6, AZIMUTHAL RANGE_000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS210, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS4.0, RAD = RAD29 47G.60B000-360A00210H004	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	ANTENNA DIAMETER3.7, ANTENNA EFFICIENCY0.4965,	
Antennas) Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Bulgaria	
City Name (RAL)	RAL = Plana	
Latitude (DDMMSS)	Lat = 422858 N	
Longitude (DDDMMSS)	Lon = 0232643 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN47, BEAMWIDTH0.63, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS1106, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS4, RAD = RAD30 47G.63B000-360A01106H004	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 DIAMETER4.5, ANTENNA EFFICIENCY3356,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Iceland	
City Name (RAL)	RAL = Blönduós	
Latitude (DDMMSS)	Lat = 653850 N	
Longitude (DDDMMSS)	Lon = 0201445 W	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

<u> </u>	T	EVANABLE ACCUMUNG NONCEGGTATIONARY AC
Receive Antenna	ANTENNA GAIN47,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16 DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Dimensions (RAD)	BEAMWIDTH0.60,	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: RAD01 16G030B001-360A00357H006
	LEVEL IN METERS53,	KADUI 16GU3UBUU1-36UAUU357HUU6
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS,	
	RAD =	
	RAD31 47G.60B000-360A00053H2.2	
Receive Antenna	ANTENNA DIAMETER3.7,	
Additional	ANTENNA EFFICIENCY0.4965,	
Information (For		
Parabolic		
Antennas)		
Number of	<1 contact per day	NUMBER OF TIMES THE SATELLITE WILL COMMUNICATE WITH THE EARTH STATION IN THE
Satellite Contacts		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		
Expected	8 minutes	AVERAGE DURATION OF EACH CONTACT
Duration of Each		
Contact		
Supported	Satellite Health and Status Data	SATELLITE HEALTH AND STATUS TELEMETRY
Operations		AND/OR MISSION PAYLOAD DATA
Орегаціонз	Mission Payload Data	
Fauth Chatian Dat	- (Deceived) at Feel Feeth Ctation Leads	
	a (Receiver) at Each Earth Station Locati	on
State (RSC)	RSC = Sri Lanka	
City Name (RAL)	RAL = Kandy	
Latitude	Lat = 071627 N	
(DDMMSS)		
Longitude	Lon = 0804329 E	
(DDDMMSS)		
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA
Orientation (RAZ)		MINIMUM OPERATING ANGLE OF
Silentation (NAZ)		ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00
		1 400

Receive Antenna Dimensions (RAD) Receive Antenna	ANTENNA GAIN47, BEAMWIDTH 0.60, AZIMUTHAL RANGE _000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS462, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2, RAD = RAD32 47G.60B000-360A00462H2.2 ANTENNA DIAMETER3.7,	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
Additional Information (For Parabolic Antennas)	ANTENNA EFFICIENCY0.4965,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = New Zealand	
City Name (RAL)	RAL = Awarua	
Latitude (DDMMSS)	Lat = 463141 S	
Longitude (DDDMMSS)	Lon = 1682245 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN47, BEAMWIDTH0.60, AZIMUTHAL RANGE_000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS16, THE ANTENNA HEIGHT ABOVE TERRAIN	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
	IN METERS2.2, RAD = RAD33 47G.60B000-360A00016H2.2	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER3.7, ANTENNA EFFICIENCY0.4965,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Azores, Portugal	
City Name (RAL)	RAL = Santa Maria	
Latitude (DDMMSS)	Lat = 365951 N	
Longitude (DDDMMSS)	Lon = 0250814 W	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN47, BEAMWIDTH0.60, AZIMUTHAL RANGE _000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS194, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2	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
	RAD = RAD34 47G.60B000-360A00194H2.2	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER3.7, ANTENNA EFFICIENCY0.4965,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = United Kingdom	
City Name (RAL)	RAL = Unst, Shetland	
Latitude (DDMMSS)	Lat = 604452 N	
Longitude (DDDMMSS)	Lon = 0005128 W	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN47, BEAMWIDTH0.6, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS19, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2,	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
	RAD35 47G.60B000-360A00019H2.2	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER3.7, ANTENNA EFFICIENCY0.4965,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
FCC notes: 1. Use S-Note 2. REM AGN, 0	S945. Cubesat, (Apex Aries 1)	

Transmit Frequency: 8212.5 MHz		
Satellite Name: Apex Aries 1		
Data Field	Data Answer	Description/Comments
Transmit Power (PWR)	PWR = 2 W PWR02 W2	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	100 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		2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth	65 MHz	
-20 dB bandwidth	75 MHz	
-40 dB bandwidth	85 MHz	
-60 dB bandwidth	100 MHz	
Modulation Type	16APSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	103 mbits/sec	INFORMATION DATA RATE
Forward Error	Is FEC used? Yes $oxtimes$ No $oxtimes$	
Correction Coding	FEC Type: <u>LDPC 2/3</u> ,	
	FEC Rate: 0.67,	
Total Symbol Rate	69.01 Msymbols/sec	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUTE TO THE SYMBOL MAPPER/MODULATOR.
Does transmitter	Yes □	BEACON MODE IS NORMALLY CONSIDERED A
have a beacon	No ⊠	REGULAR AND PERIODIC SHORT DURATION TRANSMISSION THAT IS OFTEN USED TO ASSIST
mode?		WITH TRACKING, DOPPLER COMPENSATION, OR SMALL SATELLITE IDENTIFICATION WHOSE
		TRANSMISSIONS ARE NOT LIMITED TO DURATIONS WHEN SUPPORTING GROUND
If transmitter has	Yes □	STATIONS ARE VISIBLE.
a beacon mode,	No □	
can the beacon be	NO L	
commanded off?		
Transmit Antenna	XAP = R	POLARIZATIONS INCLUDE:
Polarization (XAP)		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	XAZ = EC	NB= NARROWBEAM EC = EARTH COVERAGE
Orientation (XAZ)		
Transmit Antenna	ANTENNA GAIN 17 dBi,	NTIA FORMAT (XAD), EXAMPLE, FOR 16 DBI ANTENNA GAIN AND 30 DEGREE BEAMWIDTH
Dimension (XAD)	BEAMWIDTH 18 ,	XAD01 16G030B
	XAD = XAD03 17G018B	

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 97.4deg , APOGEE IN KILOMETERS 525 km , PERIGEE IN KILOMETERS 525 km , ORBITAL PERIOD IN HOURS 1 AND FRACTIONS OF HOURS IN DECIMAL 0.58 , THE NUMBER OF SATELLITES IN THE SYSTEM 1 ORB = *ORB,97.4IN00525AP00525PE001.58H01NRT01	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 TO1, EXAMPLE, REMO4 *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 MLTDN = 13:00 + 60 mins or 13:00-14:00 (Note: SpaceX notified use of LTDN, not	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)
	LTAN.)	
Earth Station Data	□ a (Receiver) at Each Earth Station Locatio	on
State (RSC)	RSC = Australia	
City Name (RAL)	RAL = Currans Hill	
Latitude (DDMMSS)	Lat = 340224 S	
Longitude (DDDMMSS)	Lon = 1504612 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), VOO TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD) Receive Antenna	ANTENNA GAIN30.5, BEAMWIDTH0.46, AZIMUTHAL RANGE _000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS89, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS10, RAD = RAD24 30.5G.46B000-360A00089H010 ANTENNA DIAMETER5.4,	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
Additional Information (For Parabolic Antennas)	ANTENNA EFFICIENCY0.5,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Bahrain	
City Name (RAL)	RAL = Zallaq	
Latitude (DDMMSS)	Lat = 260300 N	
Longitude (DDDMMSS)	Lon = 0503000 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN30.5, BEAMWIDTH0.46, AZIMUTHAL RANGE_000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS5, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS10, RAD = RAD25 30.5G.46B000-360A00005H010	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	ANTENNA DIAMETER5.4, ANTENNA EFFICIENCY0.5,	
Antennas) Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Ireland	
City Name (RAL)	RAL = Dublin	
Latitude (DDMMSS)	Lat = 532400 N	
Longitude (DDDMMSS)	Lon = 0061312 W	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN30.5, BEAMWIDTH0.46, AZIMUTHAL RANGE _000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS38, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS10, RAD = RAD26 30.5G.46B000-360A00038H010	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 DIAMETER5.4, ANTENNA EFFICIENCY0.5,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Southern Australia	
City Name (RAL)	RAL = Peterborough	
Latitude (DDMMSS)	Lat = 325743 S	
Longitude (DDDMMSS)	Lon = 1385058 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

	ANITENINA CAIN 4T	EVANADI E ACCUMUNG NONCEOCTATIONIA DV 46
Receive Antenna	ANTENNA GAIN47,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16 DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Dimensions (RAD)	BEAMWIDTH0.6,	RANGE FROM 001-360, SITE ELEVATION OF 357
	AZIMUTHAL RANGE_000-360,	METERS, AND ANTENNA HEIGHT ABOVE TERRAIN OF 6 METERS:
	THE SITE ELEVATION ABOVE MEAN SEA	RAD01 16G030B001-360A00357H006
	LEVEL IN METERS540,	
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS,	
	RAD =	
	RAD27 47G.60B000-360A00540H2.2	
Receive Antenna	ANTENNA DIAMETER3.7,	
Additional	ANTENNA EFFICIENCY0.4965,	
Information (For		
Parabolic		
Antennas)		
Number of	<1 contact per day	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	8 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
Operations	Wilssion Fayload Data 🖂	
Earth Station Data	□ a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Western Australia	
City Name (RAL)	RAL = Nangetty	
Latitude	Lat = 290037 S	
(DDMMSS)		
Longitude	Lon = 1152030 E	
(DDDMMSS)	1132330 1	
Receive Antenna	RAP = R	POLARIZATIONS INCLUDE:
Polarization (RAP)	100 - 10	H = HORIZONTAL,
i Sidi ization (NAF)		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
	NAZ - NAZUI VUU	MINIMUM OPERATING ANGLE OF
Orientation (RAZ)		ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01
		V00
L	1	1

Receive Antenna Dimensions (RAD)	ANTENNA GAIN47, BEAMWIDTH0.60, AZIMUTHAL RANGE_000-360,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16 DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL RANGE FROM 001-360, SITE ELEVATION OF 357
	THE SITE ELEVATION ABOVE MEAN SEA	METERS, AND ANTENNA HEIGHT ABOVE TERRAIN OF 6 METERS: RAD01 16G030B001-360A00357H006
	LEVEL IN METERS270, THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS	
	,	
	RAD =	
	RAD28 47G.60B000-360A00270H2.2	
Receive Antenna	ANTENNA DIAMETER3.7,	
Additional	ANTENNA EFFICIENCY0.4965,	
Information (For		
Parabolic		
Antennas)	4	NUMBER OF TIMES THE SATELLITE WILL
Number of	<1 contact per day	COMMUNICATE WITH THE EARTH STATION IN THE
Satellite Contacts Supported Per		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Day		DAY
Expected	8 minutes	AVERAGE DURATION OF EACH CONTACT
Duration of Each	o minutes	
Contact		
Supported	Satellite Health and Status Data	SATELLITE HEALTH AND STATUS TELEMETRY
Operations	Mission Payload Data ⊠	AND/OR MISSION PAYLOAD DATA
Earth Station Data	a (Receiver) at Each Earth Station Locatio	on
State (RSC)	RSC = Azerbaijan	
City Name (RAL)	RAL = Absheron	
Latitude	Lat = 402758 N	
(DDMMSS)		
Longitude	Lon = 492908 E	
(DDDMMSS)		POLARIZATIONS INCLUDE
Receive Antenna	RAP = 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, J = LINEAR POLARIZATION
Receive Antenna	RAZ = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA
Orientation (RAZ)		MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), VOO TO V90, EXAMPLE, RAZ01
, ,		V00

D	ANITENINA CAINI 47	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
Receive Antenna	ANTENNA GAIN47,	DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Dimensions (RAD)	BEAMWIDTH0.60,	RANGE FROM 001-360, SITE ELEVATION OF 357
	AZIMUTHAL RANGE_000-360,	METERS, AND ANTENNA HEIGHT ABOVE TERRAIN OF 6 METERS:
	THE SITE ELEVATION ABOVE MEAN SEA	RAD01 16G030B001-360A00357H006
	LEVEL IN METERS210,	
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS,	
	RAD =	
	RAD29 47G.60B000-360A00210H2.2	
Receive Antenna	ANTENNA DIAMETER3.7,	
Additional	ANTENNA EFFICIENCY0.4965,	
Information (For		
Parabolic		
Antennas)		
Number of	<1 contact per day	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	8 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
•		
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Bulgaria	
City Name (RAL)	RAL = Plana	
Latitude	Lat = 422858 N	
(DDMMSS)		
Longitude	Lon = 0232643 E	
(DDDMMSS)		
Receive Antenna	RAP = R	POLARIZATIONS INCLUDE:
Polarization (RAP)		H = HORIZONTAL,
. 5.626.011 (10.11)		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)	10.201.000	MINIMUM OPERATING ANGLE OF
Sheritation (NAZ)		ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01
		V00
		V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN47, BEAMWIDTH0.63, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS1106, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS4, RAD = RAD30 47G.63B000-360A01106H004	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 DIAMETER4.5, ANTENNA EFFICIENCY0.3356,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Iceland	
City Name (RAL)	RAL = Blönduós	
Latitude (DDMMSS)	Lat = 653850 N	
Longitude (DDDMMSS)	Lon = 0201445 W	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD) Receive Antenna Additional	ANTENNA GAIN47, BEAMWIDTH0.60, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS53, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2, RAD = RAD31 47G.60B000-360A00053H2.2 ANTENNA DIAMETER3.7, ANTENNA EFFICIENCY, 0.4965,	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
Information (For Parabolic Antennas)	ANTENNA ETTICIENCI0.4903,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Sri Lanka	
City Name (RAL)	RAL = Kandy	
Latitude (DDMMSS)	Lat = 071627 N	
Longitude (DDDMMSS)	Lon = 0804329 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN47, BEAMWIDTH0.60, AZIMUTHAL RANGE_000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS462, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS	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
	RAD = RAD32 47G.60B000-360A00462H2.2	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER3.7, ANTENNA EFFICIENCY0.4965,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = New Zealand	
City Name (RAL)	RAL = Awarua	
Latitude (DDMMSS)	Lat = 463141 S	
Longitude (DDDMMSS)	Lon = 1682245 E	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

	ANITENINA CAINI 4T	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
Receive Antenna	ANTENNA GAIN47,	DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL
Dimensions (RAD)	BEAMWIDTH0.60,	RANGE FROM 001-360, SITE ELEVATION OF 357
	AZIMUTHAL RANGE_000-360,	METERS, AND ANTENNA HEIGHT ABOVE TERRAIN OF 6 METERS:
	THE SITE ELEVATION ABOVE MEAN SEA	RAD01 16G030B001-360A00357H006
	LEVEL IN METERS16,	
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS,	
	RAD =	
	RAD33 47G.60B000-360A00016H2.2	
Receive Antenna	ANTENNA DIAMETER3.7,	
Additional	ANTENNA EFFICIENCY0.4965,	
Information (For		
Parabolic		
Antennas)		
Number of	<1 contact per day	NUMBER OF TIMES THE SATELLITE WILL
Satellite Contacts		COMMUNICATE WITH THE EARTH STATION IN THE
Supported Per		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH DAY
Day		
Expected	8 minutes	AVERAGE DURATION OF EACH CONTACT
Duration of Each	8 minutes	
Contact		
Supported	Satellite Health and Status Data	SATELLITE HEALTH AND STATUS TELEMETRY
Operations		AND/OR MISSION PAYLOAD DATA
Operations	Mission Payload Data ⊠	
1	<u> </u>	
	a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = Azores, Portugal	
City Name (RAL)	RAL = Santa Maria	
Latitude	Lat = 365951 N	
(DDMMSS)		
Longitude	Lon = 0250814 W	
(DDDMMSS)		
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA
Orientation (RAZ)		MINIMUM OPERATING ANGLE OF
		ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN47, BEAMWIDTH0.60, AZIMUTHAL RANGE_000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS194, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2, 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
	RAD34 47G.60B000-360A00194H2.2	
Receive Antenna Additional Information (For Parabolic Antennas)	ANTENNA DIAMETER 3.7 , ANTENNA EFFICIENCY 0.4965 ,	
Number of Satellite Contacts Supported Per Day	<1 contact per day	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	8 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
Earth Station Data	│ a (Receiver) at Each Earth Station Location	on
State (RSC)	RSC = United Kingdom	
City Name (RAL)	RAL = Unst, Shetland	
Latitude (DDMMSS)	Lat = 604452 N	
Longitude (DDDMMSS)	Lon = 0005128 W	
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 = RAZ01 V00	THE EARTH STATION RECEIVER ANTENNA MINIMUM OPERATING ANGLE OF ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01 V00

Receive Antenna Dimensions (RAD)	ANTENNA GAIN47, BEAMWIDTH0.6, AZIMUTHAL RANGE000-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS19, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS2.2,	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
	RAD =	
	RAD35 47G.60B000-360A00019H2.2	
Receive Antenna	ANTENNA DIAMETER 3.7 3.7 4005	
Additional	ANTENNA EFFICIENCY0.4965,	
Information (For		
Parabolic		
Antennas)		NUMBER OF TIMES THE SATELLITE WILL
Number of	<1 contact per day	COMMUNICATE WITH THE EARTH STATION IN THE
Satellite Contacts		SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		AVERAGE DURATION OF FACIL CONTACT
Expected	8 minutes	AVERAGE DURATION OF EACH CONTACT
Duration of Each		
Contact	_	
Supported	Satellite Health and Status Data \square	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA
Operations	Mission Payload Data 🗵	
FCC notes:		
1. Use S-Note	S945.	
2. REM AGN, Cubesat, (Apex Aries 1)		