SilverSat NTIA Space record data form

NTIA requires the following data for space related experiments using government shared spectrum. For each transmit frequency, please provide the data for both ends of the transmit-receive link. Use Part A to describe the satellite to ground information. Part B is for all ground to space transmit links.

This form provides data for the SilverSat spacecraft. It downlinks and uplinks at 437.175 MHz.

Part A: Space to Earth Downlink Data

Satellite Transmitter Data (Required for Each Frequency)

Telemetry

Transmit Frequency: 437.175 MHZ			
Satellite Name: Silv	Satellite Name: SilverSat		
Data Field	Data Answer	Description/Comments	
Transmit Power (PWR)	PWR = 0.63W 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	14.4 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	14.4 kHz		
-20 dB bandwidth	NA		
-40 dB bandwidth	NA		
-60 dB bandwidth	NA		
Modulation Type	GMSK	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.	
Data Rate	8,997 bps	INFORMATION DATA RATE	
Forward Error Correction Coding	Is FEC used? Yes ⊠ No □ FEC Type:Reed Solomon, FEC Rate:255,239	,	
Total Symbol Rate	9,600 sps	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUTE TO THE SYMBOL MAPPER/MODULATOR.	
Does transmitter have a beacon mode?	Yes □ No ⊠	BEACON MODE IS NORMALLY CONSIDERED A REGULAR AND PERIODIC SHORT DURATION TRANSMISSION THAT IS OFTEN USED TO ASSIST WITH TRACKING, DOPPLER COMPENSATION, OR SMALL SATELLITE IDENTIFICATION WHOSE TRANSMISSIONS ARE NOT LIMITED TO DURATIONS WHEN SUPPORTING GROUND STATIONS ARE VISIBLE.	

If transmitter has	Yes 🗆	
a beacon mode,	No □	
commanded off?		
Transmit Antenna Polarization (XAP)	XAP = L	POLARIZATIONS INCLUDE: H = HORIZONTAL, V = VERTICAL, S = HORIZONTAL AND VERTICAL, L = LEFT HAND CIRCULAR, R = RIGHT HAND CIRCULAR, T = RIGHT AND LEFT HAND CIRCULAR, J = LINEAR POLARIZATION
Transmit Antenna Orientation (XAZ)	XAZ = NB	NB= NARROWBEAM EC = EARTH COVERAGE
Transmit Antenna Dimension (XAD)	ANTENNA GAIN0, BEAMWIDTH60, XAD = XAD01 00G060B	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 ANGLE51.6, APOGEE IN KILOMETERS422, PERIGEE IN KILOMETERS416, ORBITAL PERIOD IN HOURS _1AND FRACTIONS OF HOURS IN DECIMAL55, THE NUMBER OF SATELLITES IN THE SYSTEM1, ORB = ORB,51.6IN00422AP00416PE001.55H01NRT01	IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, PERIGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN T01, EXAMPLE, REM04 *ORB,98.0IN00510AP00510PE001.58H01NRT01, AND FOR SPACE-TO-SPACE COMMUNICATIONS WITH ANOTHER NONGEOSTATIONARY SATELLITE ADD AN ADDITIONAL *ORB FOR IT ENDING IN R01, EXAMPLE, REM05 *ORB,72.9IN03209AP00655PE013.46H01NRR01
For SunSynchronous Nongeostationary Orbits	Mean Local Time of Ascending Node (MLTAN) =	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)
Earth Station Data	a (Receiver) at Each Earth Station Locati	on
State (RSC)	RSC = MD	
City Name (RAL)	RAL = GLENN DALE	
Latitude (DDMMSS)	Lat = 390043 N	

Longitude (DDDMMSS)	Lon = 0765022 W	
Receive Antenna Polarization (RAP) Receive Antenna Orientation (RAZ)	RAP = L RAZ = RAZ01 V10	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), V00 TO V90, EXAMPLE, RAZ01 V00
Receive Antenna Dimensions (RAD)	ANTENNA GAIN15.5, BEAMWIDTH30, AZIMUTHAL RANGE_001-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS35, 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 Parabolic Antennas) Number of Satellite Contacts Supported Per Day	RAD01 16G030B001-360A00035H006 ANTENNA DIAMETER, ANTENNA EFFICIENCY, N/A 2	NUMBER OF TIMES THE SATELLITE WILL COMMUNICATE WITH THE EARTH STATION IN THE SPACE TO EARTH DIRECTION (DOWNLINKS) EACH DAY
Expected Duration of Each Contact	6 minutes	AVERAGE DURATION OF EACH CONTACT
Supported Operations FCC notes:	Satellite Health and Status Data ⊠ Mission Payload Data ⊠	SATELLITE HEALTH AND STATUS TELEMETRY AND/OR MISSION PAYLOAD DATA
1 Lico S Noto SO/F		

- 1. Use S-Note S945.
- 2. REM AGN, Cubesat, SilverSat

Beacon

Beacon		
Transmit Frequency	v: 437.175 MHZ	
Satellite Name: SilverSat		
Data Field	Data Answer	Description/Comments
Transmit Power (PWR)	PWR = 0.63W 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	150 Hz	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	150 Hz	
-20 dB bandwidth	NA	
-40 dB bandwidth	NA	
-60 dB bandwidth	NA	
Modulation Type	ООК	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	n/a – Morse code	INFORMATION DATA RATE
Forward Error Correction Coding	Is FEC used? Yes □ No ☒ FEC Type:, FEC Rate:,	
Total Symbol Rate	n/a – Morse code	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 = L	POLARIZATIONS INCLUDE: H = HORIZONTAL, V = VERTICAL, S = HORIZONTAL AND VERTICAL, L = LEFT HAND CIRCULAR, R = RIGHT HAND CIRCULAR, T = RIGHT AND LEFT HAND CIRCULAR, J = LINEAR POLARIZATION
Transmit Antenna Orientation (XAZ)	XAZ = NB	NB= NARROWBEAM EC = EARTH COVERAGE

T	ANITENINIA CAINI O	NTIA FORMAT (XAD), EXAMPLE, FOR 16 DBI
Transmit Antenna	ANTENNA GAIN0,	ANTENNA GAIN AND 30 DEGREE BEAMWIDTH
Dimension (XAD)	BEAMWIDTH60,	XAD01 16G030B
	XAD =	
	XAD01 00G060B	
Type of satellite	Type =	CHOOSE EITHER: GEOSTATIONARY OR NONGEOSTATIONARY
(State = SPCE)	NONGEOSTATIONARY	GEOSTATIONARY OR NONGEOSTATIONARY
(City = Geo or		
Nongeo)		
For Geostationary	Longitude =	IF ANY SATELLITES ARE GEOSTATIONARY, REPORT
Satellites		ITS LATITUDE AS 000000N (XLA AND/OR RLA) AND
		REPORT ITS LONGITUDE IN DDDMMSS FORMAT (XLG AND/OR RLG).
For	INCLINATION ANGLE51.6,	IF ANY SATELLITES ARE NONGEOSTATIONARY,
Nongeostationary	APOGEE IN KILOMETERS422,	REPORT ITS INCLINATION ANGLE, APOGEE
(Orbital Data)	PERIGEE IN KILOMETERS 416 ,	IN KILOMETERS, PERIGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF
(Orbital Data)	ORBITAL PERIOD IN HOURS 1 AND	HOURS IN DECIMAL, THE NUMBER OF SATELLITES
		IN THE SYSTEM, THEN TO1, EXAMPLE,
	FRACTIONS OF HOURS IN	REM04
	DECIMAL55,	*ORB,98.0IN00510AP00510PE001.58H01NRT01, AND FOR SPACE-TO-SPACE
	THE NUMBER OF SATELLITES IN THE	COMMUNICATIONS WITH ANOTHER
	SYSTEM1,	NONGEOSTATIONARY SATELLITE ADD AN
		*ORB FOR IT ENDING IN R01, EXAMPLE, REM05
	ORB =	*ORB,72.9IN03209AP00655PE013.46H01NRR01
	ORB,51.6IN00422AP00416PE001.55H01NRT01	,
For	Mean Local Time of Ascending Node	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S
SunSynchronous	(MLTAN) =	ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)
Nongeostationary		EXTRESSED AS ONLY OF THAT (THENWIN)
Orbits		
Farth Station Dat	a (Receiver) at Each Earth Station Locati	ion
State (RSC)	RSC = MD	
City Name (RAL)	RAL = GLENN DALE	
Latitude	Lat = 390043 N	
	Lat - 590045 N	
(DDMMSS)		
Longitude	Lon = 0765022 W	
(DDDMMSS)		
Receive Antenna	RAP = L	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 =	THE EARTH STATION RECEIVER ANTENNA
Orientation (RAZ)	RAZ01 V10	MINIMUM OPERATING ANGLE OF
'		ELEVATION (RAZ), V00 TO V90, EXAMPLE, RAZ01
	1	1

Receive Antenna	ANTENNA GAIN15.5,	EXAMPLE ASSUMING NONGEOSTATIONARY, 16
Dimensions (RAD)	BEAMWIDTH30,	DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL RANGE FROM 001-360, SITE ELEVATION OF 357
	AZIMUTHAL RANGE_001-360,	METERS, AND ANTENNA HEIGHT ABOVE TERRAIN
	THE SITE ELEVATION ABOVE MEAN SEA	OF 6 METERS:
	LEVEL IN METERS35,	RAD01 16G030B001-360A00357H006
	THE ANTENNA HEIGHT ABOVE TERRAIN	
	IN METERS _6,	
	RAD =	
	RAD01 16G030B001-360A00035H006	
Receive Antenna	ANTENNA DIAMETER,	
Additional	ANTENNA EFFICIENCY,	
Information (For		
Parabolic	N/A	
Antennas)		
Number of	2	NUMBER OF TIMES THE SATELLITE WILL
Satellite Contacts		COMMUNICATE WITH THE EARTH STATION IN THE SPACE TO EARTH DIRECTION (DOWNLINKS) EACH
Supported Per		DAY
Day		
Expected	6 minutes	AVERAGE DURATION OF EACH CONTACT
Duration of Each		
Contact		
Supported	Satellite Health and Status Data ⊠	SATELLITE HEALTH AND STATUS TELEMETRY
Operations	Mission Payload Data 🗵	AND/OR MISSION PAYLOAD DATA
FCC notes:		
2 Har C Nata	COAF	

- 3. Use S-Note S945.
- 4. REM AGN, Cubesat, SilverSat

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

Earth Station Transmitter Data (Required for Each Frequency at Each Earth Station Location)

Transmit Frequency: 437.175 MHz			
State (XSC)	XSC = MD		
City Name (XAL)	XAL = GLENN DALE		
Latitude	Lat = 390043 N		
(DDMMSS)			
Longitude	Lon = 0765022 W		
(DDDMMSS)			
Transmit Power	PWR =	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2	
(PWR)	PWR01 W14	TRANSMIT POWER UNITS INCLUDE:	
		W = WATT,	
		K = KILOWATT, M = MEGAWATT	
Necessary	14.4 kHz	THE WIDTH OF FREQUENCY BAND WHICH IS JUST	
Bandwidth		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	14.4 kHz		
-20 dB bandwidth	NA		
-40 dB bandwidth	NA		
-60 dB bandwidth	NA		
Modulation Type	NA	THE METHOD USED TO SUPERIMPOSE DATA ON	
Data Rate	8,997 bps	THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK. INFORMATION DATA RATE	
Forward Error	Is FEC used? Yes ⊠ No □		
Correction Coding	FEC Type: Reed Solomon,		
correction counts	FEC Rate:		
	(255,239)		
Total Symbol Rate	9,600 sps	DATA RATE COMBINED WITH FEC AND FRAME	
,		OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUTE TO THE SYMBOL	
		MAPPER/MODULATOR.	
Transmit Antenna	XAP = L	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 =	THE EARTH STATION TRANSMITTER ANTENNA	
Orientation (XAZ)	XAZ01 V10	MINIMUM OPERATING ANGLE OF	
	-	ELEVATION (XAZ), V00 TO V90, EXAMPLE, XAZ01 V00	

Transmit Antenna Dimensions (XAD)	ANTENNA GAIN15.5, BEAMWIDTH30, AZIMUTHAL RANGE001-360, THE SITE ELEVATION ABOVE MEAN SEA LEVEL IN METERS35, THE ANTENNA HEIGHT ABOVE TERRAIN IN METERS6, XAD = XAD01 16G030B001-360A00035H006	EXAMPLE ASSUMING NONGEOSTATIONARY, 16 DBI GAIN, 30 DEGREE BEAMWIDTH, AZIMUTHAL RANGE FROM 001-360, SITE ELEVATION OF 357 METERS, AND ANTENNA HEIGHT ABOVE TERRAIN OF 6 METERS: XAD01 16G030B001-360A00357H006
Transmit Antenna Additional Information (For Parabolic	ANTENNA DIAMETER, ANTENNA EFFICIENCY, N/A	
Antennas)		
Number of Satellite Contacts Supported Per Day	2	NUMBER OF TIMES THE EARTH STATION WILL COMMUNICATE WITH THE STATELLITE IN THE EARTH TO SPACE DIRECTION (UPINKS) EACH DAY
Expected	6	AVERAGE DURATION OF EACH CONTACT
Duration of Each		
Contact		
Satellite Receive Specifications		
Receive Antenna Polarization (RAP)	RAP = L	POLARIZATIONS INCLUDE: H = HORIZONTAL, V = VERTICAL, S = HORIZONTAL AND VERTICAL, L = LEFT HAND CIRCULAR, R = RIGHT HAND CIRCULAR, T = RIGHT AND LEFT HAND CIRCULAR, J = LINEAR POLARIZATION
Receive Antenna Orientation (RAZ)	RAZ = NB	NB= NARROWBEAM EC = EARTH COVERAGE
Receive Antenna Dimension (RAD)	ANTENNA GAIN0, BEAMWIDTH60, RAD = RAD01 00G060B	NTIA FORMAT(RAD), EXAMPLE, FOR 16 DBI ANTENNA GAIN AND 30 DEGREE BEAMWIDTH RAD01 16G030B
Type of satellite (State = SPCE) City = Geo or Nongeo	Type = NONGEOSTATIONARY	CHOOSE EITHER: GEOSTATIONARY OR NONGEOSTATIONARY
For Geostationary Satellites	Longitude =	IF ANY SATELLITES ARE GEOSTATIONARY, REPORT ITS LATITUDE AS 000000N (XLA AND/OR RLA) AND REPORT ITS LONGITUDE IN DDDMMSS FORMAT (XLG AND/OR RLG).

For Nongeostationary (Orbital Data)	INCLINATION ANGLE51.6, APOGEE IN KILOMETERS422, PERIGEE IN KILOMETERS416, ORBITAL PERIOD IN HOURS _1AND FRACTIONS OF HOURS IN DECIMAL55, THE NUMBER OF SATELLITES IN THE SYSTEM1, ORB = ORB,51.6IN00422AP00416PE001.55H01NRR01	IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, PERIGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN T01, EXAMPLE, REM04 *ORB,98.0IN00510AP00510PE001.58H01NRT01, AND FOR SPACE-TO-SPACE COMMUNICATIONS WITH ANOTHER NONGEOSTATIONARY SATELLITE ADD AN ADDITIONAL *ORB FOR IT ENDING IN R01, EXAMPLE, REM05 *ORB,72.9IN03209AP00655PE013.46H01NRR01
For SunSynchronous Nongeostationary Orbits	Mean Local Time of Ascending Node (MLTAN) = NA	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)