

FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
(Technical and Operational Description)

S1. GENERAL INFORMATION Complete for all satellite applications.

a. Space Station or Satellite Network Name: STAR ONE C5		e. Estimated Date of Placement into Service:	i. Will the space station(s) operate on a Common Carrier Basis: N
b. Construction Commencement Date:		f. Estimated Lifetime of Satellite(s): 15 Years	j. Number of transponders offered on a common carrier basis: 0
c. Construction Completion Date:		g. Total Number of Transponders: 76	k. Total Common Carrier Transponder Bandwidth: 0 MHz
d1. Est Launch Date Begin:	d2. Est Launch Date End:	h. Total Transponder Bandwidth (no. transponders x Bandwidth) 2733 MHz	l. Orbit Type: Mark all boxes that apply: ☒ GSO ☐ NGSO

S2. OPERATING FREQUENCY BANDS Identify the frequency range and transmit/receive mode for all frequency bands in which this station will oper
Also indicate the nature of service(s) for each frequency band.

Frequency Band Limits				e. T/R Mode	f. Nature of Service(s): List all that apply to this band
Lower Frequency (. Hz)		Upper Frequency (. Hz)			
a. Numeric	b. Unit (K/M/G)	c. Numeric	d. Unit (K/M/G)		
5850	M	6425	M	R	Fixed Satellite Service
3625	M	4200	M	T	Fixed Satellite Service
13750	M	14000	M	R	Fixed Satellite Service
14000	M	14500	M	R	Fixed Satellite Service
10950	M	11200	M	T	Fixed Satellite Service
11450	M	11700	M	T	Fixed Satellite Service
11700	M	12200	M	T	Fixed Satellite Service

S3. ORBITAL INFORMATION FOR GEOSTATIONARY SATELLITES ONLY:

a. Nominal Orbital Longitude (Degrees E/W): 68 W		b. Alternate Orbital Longitude (Degrees E/W):		c. Reason for orbital location selection: The Brazilian telecommunications authority has authorized Star One to operate the Star One C5 satellite at 68°W.L.
Longitudinal Tolerance or E/W Station-Keeping:		f. Inclination Excursion or N/S Station-Keeping Tolerance:	Range of orbital are in which adequate service can be provided (Optional):	
d. Toward West:	0.05 Degrees	0.1 Degrees	g. Westernmost:	
e. Toward East:	0.05 Degrees		h. Easternmost:	
i. Reason for service are selection (Optional):				

**FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
FCC Form 312 - Schedule S: (Technical and Operational Description)**

Page 2: NGSO Orbits

S4. ORBITAL INFORMATION FOR NON-GEOSTATIONARY SATELLITES ONLY

S4a. Total Number of Satellites in Network or System:

S4c. Celestial Reference Body (Earth, Sun, Moon, etc.):

S4b. Total Number of Orbital Planes in Network or System:

S4d. Orbit Epoch Date:

For each Orbital Plane Provide:

(e) Orbital Plane No.	(f) No. of Satellites in Plane	(g) Inclination Angle (degrees)	(h) Orbital Period (Seconds)	(i) Apogee (km)	(j) Perigee (km)	(k) Right Ascension of the Ascending Node (Deg.)	(l) Argument of Perigee (Degrees)	Active Service Arc Range (Degrees)		
								(m) Begin Angle	(n) End Angle	(o) Other

S5. INITIAL SATELLITE PHASE ANGLE For each satellite in each orbital plane, provide the initial phase angle.

(a) Orbital Plane No.	(b) Satellite Number	(c) Initial Phase Angle (Degrees)
-----------------------	----------------------	-----------------------------------

NO NGSO DATA FILED

**FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
FCC Form 312 - Schedule S: (Technical and Operational Description)**

Page 3: Service Areas

S6. SERVICE AREA CHARACTERISTICS for each service area provide:

(a) Service Area ID	(b) Type of Associated Station (Earth or Space)	(c) Service Area Diagram File Name (GXT File)	(d) Service Area Description. Provide list of geographic areas (state postal codes or ITU 3-ltr codes), satellites or Figure No. of Service Area Diagram.
SA1	S		-6 dB contour of beam R2CUH
SA2	S		-6 dB contour of beam R2CUV
SA3	S		-6 dB contour of beam R2KUH
SA4	S		-6 dB contour of beam R2KUV
SA5	S		-6 dB contour of beam NAUH
SA6	S		-6 dB contour of beam NAUV
SA7	S		-6 dB contour of beam SAUH
SA8	S		-6 dB contour of beam SAUV
SA9	S		-6 dB contour of beam R2CDH
SA10	S		-6 dB contour of beam R2CDV
SA11	S		-6 dB contour of beam R2KDH
SA12	S		-6 dB contour of beam R2KDV
SA13	S		-6 dB contour of beam NADH
SA14	S		-6 dB contour of beam NADV
SA15	S		-6 dB contour of beam SADH
SA16	S		-6 dB contour of beam SADV
SA17	S		Visible Earth

FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
FCC Form 312 - Schedule S: (Technical and Operational Description)

Page 4: Antenna Beams

S7. SPACE STATION ANTENNA BEAM CHARACTERISTICS For each antenna beam provide:

(a) Beam ID	(b) T/R Mode	Isotropic Antenna Gain		(e) Pointing Error (Degrees)	(f) Rotational Error (Degrees)	(g) Min. Cross- Polar Iso- lation (dB)	(h) Polar- ization Switch- able? (Y/N)	(i) Polarization Alignment Rel. Equatorial Plane (Degrees)	(j) Service Area ID	Transmit			Receive				
		(c) Peak (dBi)	(d) Edge (dBi)							(k) Input Losses (dB)	(l) Effective Output Power (W)	(m) Max. EIRP (dBW)	(n) System Noise Temp (k)	(o) G/T Max. Gain Pt. (db/K)	(p) Min. Saturation Flux Density (dBW/m2)	Input Attenuator (dB)	
																(q) Max. Value	(r) Step Size
R2C	R	29	23	0.09	0.02	27	N	0	SA1				631	1	-96	18	0.5
R2C	R	29	23	0.09	0.02	27	N	90	SA2				631	1	-96	18	0.5
R2K	R	32	26	0.09	0.02	27	N	0	SA3				635	4	-93	18	1
R2K	R	32	26	0.09	0.02	27	N	90	SA4				635	4	-93	18	1
NAU	R	36	30	0.09	0.02	27	N	0	SA5				625	8	-93	18	1
NAU	R	36	30	0.09	0.02	27	N	90	SA6				625	8	-93	18	1
SAU	R	36	30	0.09	0.02	27	N	0	SA7				625	8	-93	18	1
SAU	R	36	30	0.09	0.02	27	N	90	SA8				625	8	-93	18	1
R2C	T	29	23	0.09	0.02	27	N	0	SA9	2.8	15.8	41					
R2C	T	29	23	0.09	0.02	27	N	90	SA10	2.8	15.8	41					
R2K	T	32	26	0.09	0.02	27	N	0	SA11	2.8	79.4	51					
R2K	T	32	26	0.09	0.02	27	N	90	SA12	2.8	79.4	51					
NAD	T	36	30	0.09	0.02	27	N	0	SA13	2.5	50.1	53					
NAD	T	36	30	0.09	0.02	27	N	90	SA14	2.5	50.1	53					
SAD	T	36	30	0.09	0.02	27	N	0	SA15	2.5	50.1	53					
SAD	T	36	30	0.09	0.02	27	N	90	SA16	2.5	50.1	53					
OMN	R	0	-4	0.09	0.02	30	N		SA17				9240	-39.7	-87		
OMN	R	0	-4	0.09	0.02	30	N		SA17				9240	-39.7	-87		
OMN	T	0	-4	0.09	0.02	30	N		SA17	4.3	20	13					
OMN	T	0	-4	0.09	0.02	30	N		SA17	4.3	20	13					

FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
FCC Form 312 - Schedule S: (Technical and Operational Description)

Page 5: Beam Diagrams

S8. ANTENNA BEAM DIAGRAMS For each beam pattern provide the reference to the graphic image and numerical data:
Also provide the power flux density levels in each beam that result from the emission with the highest power flux density.

(a) Beam ID	(b) T/R Mode	(c) Co-or Cross Polar Mode ("C" or" X")	(d) GSO Ref. Orbital Longitude (Deg. E/W)	(e) NGSO Antenna Gain Contour Description (Figure/Table/ Exhibit)	(f) GSO Antenna Gain Contour Data (GXT File)	Max. Power Flux Density (dBW/M2/Hz)				
						At Angle of Arrival above horizontal (for emission with highest PFD)				
						(g) 5 Deg	(h) 10 Deg	(i) 15 Deg	(j) 20 Deg	(k) 25 Deg
R2C	R	C	-68		R2CUH.gxt					
R2C	R	C	-68		R2CUV.gxt					
R2K	R	C	-68		R2KUH.gxt					
R2K	R	C	-68		R2KUV.gxt					
NAU	R	C	-68		NAUH.gxt					
NAU	R	C	-68		NAUV.gxt					
SAU	R	C	-68		SAUH.gxt					
SAU	R	C	-68		SAUV.gxt					
R2C	T	C	-68		R2CDH.gxt	-164.8	-164.4	-164	-163.6	-163.3
R2C	T	C	-68		R2CDV.gxt	-164.8	-164.4	-164	-163.6	-163.3
R2K	T	C	-68		R2KDH.gxt	-160.3	-159.7	-156.6	-155.2	-154.6
R2K	T	C	-68		R2KDV.gxt	-160.3	-159.7	-156.6	-155.2	-154.6
NAD	T	C	-68		NADH.gxt	-150.9	-150.8	-150.7	-150.6	-150.4
NAD	T	C	-68		NADV.gxt	-150.9	-150.8	-150.7	-150.6	-150.4
SAD	T	C	-68		SADH.gxt	-169.8	-169.7	-169.6	-168.5	-163.6
SAD	T	C	-68		SADV.gxt	-169.8	-169.7	-169.6	-168.5	-163.6
OMN	T	C	-68			-166	-166	-166	-166	-166
OMN	T	C	-68			-166	-166	-166	-166	-166

FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
FCC Form 312 - Schedule S: (Technical and Operational Description)

Page 6: Channels and Transponders

S9. SPACE STATION CHANNELS For each frequency channel provide: S10. SPACE STATION TRANSPONDERS For each transponder provide:

(a) Channel No.	(B) Assigned Bandwidth (kHz)	(c) T/R Mode	(d) Center Frequency (MHz)	(e) Polarization (H, V, L, R)	(f) TTC or Comm Channel (T or C)
CU001	33000	R	5866.5	V	C
CU002	36000	R	5885	H	C
CU004	36000	R	5925	H	C
CU006	36000	R	5965	H	C
CU008	36000	R	6005	H	C
CU010	36000	R	6045	H	C
CU012	36000	R	6085	H	C
CU014	36000	R	6125	H	C
CU016	36000	R	6165	H	C
CU018	36000	R	6205	H	C
CU020	36000	R	6245	H	C
CU022	36000	R	6285	H	C
CU024	36000	R	6325	H	C
CU026	36000	R	6365	H	C
CU028	36000	R	6405	H	C
CU003	36000	R	5905	V	C
CU005	36000	R	5945	V	C
CU007	36000	R	5985	V	C
CU009	36000	R	6025	V	C
CU011	36000	R	6065	V	C
CU013	36000	R	6105	V	C
CU015	36000	R	6145	V	C
CU017	36000	R	6185	V	C
CU019	36000	R	6225	V	C
CU021	36000	R	6265	V	C
CU023	36000	R	6305	V	C
CU025	36000	R	6345	V	C
CU027	36000	R	6385	V	C
KU001	36000	R	13775	H	C
KU003	36000	R	13815	H	C

(a) Transponder ID	(b) Transponder Gain (dB)	Receive Band		Transmit Band	
		(c) Channel No.	(d) Beam ID	(e) Channel No.	(f) Beam ID
TK055	125	KU019	R2KUH	KD031	R2KDV
TK057	125	KU021	R2KUH	KD033	R2KDV
TK059	125	KU023	R2KUH	KD035	R2KDV
TK061	125	KU025	R2KUH	KD037	R2KDV
TK063	125	KU027	R2KUH	KD039	R2KDV
TK065	125	KU029	R2KUH	KD041	R2KDV
TK067	125	KU031	R2KUH	KD043	R2KDV
TK069	125	KU033	R2KUH	KD045	R2KDV
TK071	125	KU035	R2KUH	KD047	R2KDV
TK050	125	KU014	R2KUV	KD026	R2KDH
TK052	125	KU016	R2KUV	KD028	R2KDH
TK054	125	KU018	R2KUV	KD030	R2KDH
TK056	125	KU020	R2KUV	KD032	R2KDH
TK058	125	KU022	R2KUV	KD034	R2KDH
TK060	125	KU024	R2KUV	KD036	R2KDH
TK062	125	KU026	R2KUV	KD038	R2KDH
TK064	125	KU028	R2KUV	KD040	R2KDH
TK066	125	KU030	R2KUV	KD042	R2KDH
TK068	125	KU032	R2KUV	KD044	R2KDH
TK070	125	KU034	R2KUV	KD046	R2KDH
TK072	125	KU036	R2KUV	KD048	R2KDH
CM01		CMD01	R2CUV		
CM02		CMD02	R2CUH		
CM03		CMD03	OMNUL		
CM04		CMD04	OMNUR		
TM01				TLM01	R2CDH
TM02				TLM02	R2CDV
TM03				TLM03	OMNDL
TM04				TLM04	OMNDR
BN01				BCN01	R2KDH

KU005	36000	R	13855	H	C
KU007	36000	R	13895	H	C
KU009	36000	R	13935	H	C
KU011	36000	R	13975	H	C
KU002	36000	R	13779	V	C
KU004	36000	R	13819	V	C
KU006	36000	R	13859	V	C
KU008	36000	R	13899	V	C
KU010	36000	R	13939	V	C
KU012	36000	R	13979	V	C
KU013	36000	R	14020	H	C
KU015	36000	R	14060	H	C
KU017	36000	R	14100	H	C
KU019	36000	R	14140	H	C
KU021	36000	R	14180	H	C
KU023	36000	R	14220	H	C
KU025	36000	R	14260	H	C
KU027	36000	R	14300	H	C
KU029	36000	R	14340	H	C
KU031	36000	R	14380	H	C
KU033	36000	R	14420	H	C
KU035	36000	R	14460	H	C
KU014	36000	R	14040	V	C
KU016	36000	R	14080	V	C
KU018	36000	R	14120	V	C
KU020	36000	R	14160	V	C
KU022	36000	R	14200	V	C
KU024	36000	R	14240	V	C
KU026	36000	R	14280	V	C
KU028	36000	R	14320	V	C
KU030	36000	R	14360	V	C
KU032	36000	R	14400	V	C
KU034	36000	R	14440	V	C
KU036	36000	R	14480	V	C
CD001	33000	T	3641.5	H	C
CD002	36000	T	3660	V	C
CD004	36000	T	3700	V	C
CD006	36000	T	3740	V	C
CD008	36000	T	3780	V	C

BN02				BCN02	R2KDV
TC001	116	CU001	R2CUV	CD001	R2CDH
TC003	116	CU003	R2CUV	CD003	R2CDH
TC005	116	CU005	R2CUV	CD005	R2CDH
TC007	116	CU007	R2CUV	CD007	R2CDH
TC009	116	CU009	R2CUV	CD009	R2CDH
TC011	116	CU011	R2CUV	CD011	R2CDH
TC013	116	CU013	R2CUV	CD013	R2CDH
TC015	116	CU015	R2CUV	CD015	R2CDH
TC017	116	CU017	R2CUV	CD017	R2CDH
TC019	116	CU019	R2CUV	CD019	R2CDH
TC021	116	CU021	R2CUV	CD021	R2CDH
TC023	116	CU023	R2CUV	CD023	R2CDH
TC025	116	CU025	R2CUV	CD025	R2CDH
TC027	116	CU027	R2CUV	CD027	R2CDH
TC002	116	CU002	R2CUH	CD002	R2CDV
TC004	116	CU004	R2CUH	CD004	R2CDV
TC006	116	CU006	R2CUH	CD006	R2CDV
TC008	116	CU008	R2CUH	CD008	R2CDV
TC010	116	CU010	R2CUH	CD010	R2CDV
TC012	116	CU012	R2CUH	CD012	R2CDV
TC014	116	CU014	R2CUH	CD014	R2CDV
TC016	116	CU016	R2CUH	CD016	R2CDV
TC018	116	CU018	R2CUH	CD018	R2CDV
TC020	116	CU020	R2CUH	CD020	R2CDV
TC022	116	CU022	R2CUH	CD022	R2CDV
TC024	116	CU024	R2CUH	CD024	R2CDV
TC026	116	CU026	R2CUH	CD026	R2CDV
TC028	116	CU028	R2CUH	CD028	R2CDV
TK001	118	KU001	NAUH	KD001	NADV
TK003	118	KU003	NAUH	KD003	NADV
TK005	118	KU005	NAUH	KD005	NADV
TK007	118	KU007	NAUH	KD007	NADV
TK009	118	KU009	NAUH	KD009	NADV
TK011	118	KU011	NAUH	KD011	NADV
TK002	118	KU002	NAUV	KD002	NADH
TK004	118	KU004	NAUV	KD004	NADH
TK006	118	KU006	NAUV	KD006	NADH
TK008	118	KU008	NAUV	KD008	NADH

CD010	36000	T	3820	V	C
CD012	36000	T	3860	V	C
CD014	36000	T	3900	V	C
CD016	36000	T	3940	V	C
CD018	36000	T	3980	V	C
CD020	36000	T	4020	V	C
CD022	36000	T	4060	V	C
CD024	36000	T	4100	V	C
CD026	36000	T	4140	V	C
CD028	36000	T	4180	V	C
CD003	36000	T	3680	H	C
CD005	36000	T	3720	H	C
CD007	36000	T	3760	H	C
CD009	36000	T	3800	H	C
CD011	36000	T	3840	H	C
CD013	36000	T	3880	H	C
CD015	36000	T	3920	H	C
CD017	36000	T	3960	H	C
CD019	36000	T	4000	H	C
CD021	36000	T	4040	H	C
CD023	36000	T	4080	H	C
CD025	36000	T	4120	H	C
CD027	36000	T	4160	H	C
KD001	36000	T	10970	V	C
KD003	36000	T	11010	V	C
KD005	36000	T	11050	V	C
KD007	36000	T	11090	V	C
KD009	36000	T	11130	V	C
KD011	36000	T	11170	V	C
KD002	36000	T	10974	H	C
KD004	36000	T	11014	H	C
KD006	36000	T	11054	H	C
KD008	36000	T	11094	H	C
KD010	36000	T	11134	H	C
KD012	36000	T	11174	H	C
KD013	36000	T	11470	V	C
KD015	36000	T	11510	V	C
KD017	36000	T	11550	V	C
KD019	36000	T	11590	V	C

TK010	118	KU010	NAUV	KD010	NADH
TK012	118	KU012	NAUV	KD012	NADH
TK013	120	KU001	NAUH	KD001	R2KDV
TK015	120	KU003	NAUH	KD003	R2KDV
TK017	120	KU005	NAUH	KD005	R2KDV
TK019	120	KU007	NAUH	KD007	R2KDV
TK021	120	KU009	NAUH	KD009	R2KDV
TK023	120	KU011	NAUH	KD011	R2KDV
TK014	120	KU002	NAUV	KD002	R2KDH
TK016	120	KU004	NAUV	KD004	R2KDH
TK018	120	KU006	NAUV	KD006	R2KDH
TK020	120	KU008	NAUV	KD008	R2KDH
TK022	120	KU010	NAUV	KD010	R2KDH
TK024	120	KU012	NAUV	KD012	R2KDH
TK025	118	KU001	SAUH	KD013	SADV
TK027	118	KU003	SAUH	KD015	SADV
TK029	118	KU005	SAUH	KD017	SADV
TK031	118	KU007	SAUH	KD019	SADV
TK033	118	KU009	SAUH	KD021	SADV
TK035	118	KU011	SAUH	KD023	SADV
TK026	118	KU002	SAUV	KD014	SADH
TK028	118	KU004	SAUV	KD016	SADH
TK030	118	KU006	SAUV	KD018	SADH
TK032	118	KU008	SAUV	KD020	SADH
TK034	118	KU010	SAUV	KD022	SADH
TK036	118	KU012	SAUV	KD024	SADH
TK037	120	KU001	SAUH	KD013	R2KDV
TK039	120	KU003	SAUH	KD015	R2KDV
TK041	120	KU005	SAUH	KD017	R2KDV
TK043	120	KU007	SAUH	KD019	R2KDV
TK045	120	KU009	SAUH	KD021	R2KDV
TK047	120	KU011	SAUH	KD023	R2KDV
TK038	120	KU002	SAUV	KD014	R2KDH
TK040	120	KU004	SAUV	KD016	R2KDH
TK042	120	KU006	SAUV	KD018	R2KDH
TK044	120	KU008	SAUV	KD020	R2KDH
TK046	120	KU010	SAUV	KD022	R2KDH
TK048	120	KU012	SAUV	KD024	R2KDH
TK049	125	KU013	R2KUH	KD025	R2KDV

KD021	36000	T	11630	V	C
KD023	36000	T	11670	V	C
KD014	36000	T	11474	H	C
KD016	36000	T	11514	H	C
KD018	36000	T	11554	H	C
KD020	36000	T	11594	H	C
KD022	36000	T	11634	H	C
KD024	36000	T	11674	H	C
KD025	36000	T	11720	V	C
KD027	36000	T	11760	V	C
KD029	36000	T	11800	V	C
KD031	36000	T	11840	V	C
KD033	36000	T	11880	V	C
KD035	36000	T	11920	V	C
KD037	36000	T	11960	V	C
KD039	36000	T	12000	V	C
KD041	36000	T	12040	V	C
KD043	36000	T	12080	V	C
KD045	36000	T	12120	V	C
KD047	36000	T	12160	V	C
KD026	36000	T	11740	H	C
KD028	36000	T	11780	H	C
KD030	36000	T	11820	H	C
KD032	36000	T	11860	H	C
KD034	36000	T	11900	H	C
KD036	36000	T	11940	H	C
KD038	36000	T	11980	H	C
KD040	36000	T	12020	H	C
KD042	36000	T	12060	H	C
KD044	36000	T	12100	H	C
KD046	36000	T	12140	H	C
KD048	36000	T	12180	H	C
CMD01	820	R	6424.5	V	T
CMD02	820	R	6424.5	H	T
CMD03	820	R	6424.5	L	T
CMD04	820	R	6424.5	R	T
TLM01	200	T	4199	H	T
TLM02	200	T	4199.5	V	T
TLM03	200	T	4199	L	T

TK051	125	KU015	R2KUH	KD027	R2KDV
TK053	125	KU017	R2KUH	KD029	R2KDV

TLM04	200	T	4199.5	R	T
BCN01	25	T	11700.5	H	T
BCN02	25	T	12198.8	V	T

FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
FCC Form 312 - Schedule S: (Technical and Operational Description)

Page 7: Digital Modulation

S11. DIGITAL MODULATION PARAMETERS For each digital emission provide:

(a) Digital Mod. ID	(b) Emission Designator	(c) Assigned Bandwidth (kHz)	(d) No. of Phases	(e) Uncoded Data Rate (kbps)	(f) FEC Error Correction Coding Rate	(g) CDMA Processing Gain (dB)	(h) Total C/N Performance Objective (dB)	(i) Single Entry C/I Objective (dB)
D1	614KG7W	614	4	512	0.5		5.7	17.9
D2	1M64G7W	1640	4	2048	0.75		8.5	20.7
D3	5M50G7W	5500	8	8448	0.614		9.4	21.6
D4	17M9G7W	17900	8	34368	0.768		12.4	24.6
D5	36M0G7W	36000	4	48400	0.806		7.8	20

Page 8: Analog Modulation

[illegible]

FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
FCC Form 312 - Schedule S: (Technical and Operational Description)

Page 9: Typical Emissions

S13. TYPICAL EMISSIONS For each planned type of emission provide:

Associated Transponder ID Range		Modulation ID		(e) Carriers per Transponder	(f) Carrier Spacing (kHz)	(g) Noise Budget Reference (Table No.)	(h) Energy Dispersal Bandwidth (kHz)	Receive Band (Assoc. Transmit Stn)			Transmit Band (This Space Station)			
		(c) Digital (Table S11)	(d) Analog (Table S12)					(i) Assoc. Stn. Max. Antenna Gain (dBi)	Assoc. Station Transmit Power (dBW)		EIRP (dBW)		(n) Max. Power Flux Density (dBW/m ² /Hz)	(o) Assoc. Stn Rec. G/T (dB/K)
(a) Start	(b) End								(j) Min.	(k) Max.	(l) Min.	(m) Max.		
TC001	TC028	D1		48	750	R2C-R2C 614K		47.5	1.2	7.2	15.4	21.4	-162.6	22.4
TC001	TC028	D2		18	1975	R2C-R2C 1M64		51.3	2.5	8.5	20.2	26.2	-162.1	23.5
TC001	TC028	D3		5	6875	R2C-R2C 5M50		47.5	11.5	17.5	25.6	31.6	-161.9	26.7
TC001	TC028	D4		2	18000	R2C-R2C 17M9		53.5	11	17	30.5	36.5	-162.2	27.9
TC001	TC028	D5		1		R2C-R2C 36M0		53.5	18.6	24.6	35	41	-160.8	23.5
TK001	TK012	D1		48	750	NA-NA 614K.do		54.5	-3.9	2.1	26.5	32.5	-151.8	24.4
TK001	TK012	D2		18	1975	NA-NA 1M64.d		54.5	1	7	31.3	37.3	-151.3	28
TK001	TK012	D3		5	6875	NA-NA 5M50.d		58.3	3.8	9.8	37.6	43.6	-150.2	34.5
TK001	TK012	D4		2	18000	NA-NA 17M9.d		58.3	9.3	15.3	42.5	48.5	-150.5	32.6
TK001	TK012	D5		1		NA-NA 36M0.d		60.5	15.5	21.5	47	53	-149	26.7
TK013	TK024	D1		48	750	NA-R2K 614K.d		54.5	-1.8	4.2	26	32	-152.4	24.4
TK013	TK024	D2		18	1975	NA-R2K 1M64.		54.5	2.4	8.4	30.2	36.2	-152.4	28
TK013	TK024	D3		5	6875	NA-R2K 5M50.		58.3	4.4	10.4	36	42	-151.9	34.5
TK013	TK024	D4		2	18000	NA-R2K 17M9.		58.3	9.3	15.3	40.5	46.5	-152.5	32.6
TK013	TK024	D5		1		NA-R2K 36M0.		60.5	15.5	21.5	45	51	-151.1	26.7
TK025	TK036	D1		48	750	SA-SA 614K.do		54.5	-3.9	2.1	26.5	32.5	-151.4	24.7
TK025	TK036	D2		18	1975	SA-SA 1M64.d		54.5	1	7	31.3	37.3	-151	28.4
TK025	TK036	D3		5	6875	SA-SA 5M50.d		58.3	3.8	9.8	37.6	43.6	-149.8	34.9
TK025	TK036	D4		2	18000	SA-SA 17M9.d		58.3	9.3	15.3	42.5	48.5	-150.1	33
TK025	TK036	D5		1		SA-SA 36M0.d		60.5	15.5	21.5	47	53	-148.6	27
TK037	TK048	D1		48	750	SA-R2K 614K.d		54.5	-1.8	4.2	26	32	-152.4	24.7
TK037	TK048	D2		18	1975	SA-R2K 1M64.		54.5	2.4	8.4	30.2	36.2	-152.4	28.4
TK037	TK048	D3		5	6875	SA-R2K 5M50.		58.3	4.4	10.4	36	42	-151.9	34.9
TK037	TK048	D4		2	18000	SA-R2K 17M9.		58.3	9.3	15.3	40.5	46.5	-152.5	33
TK037	TK048	D5		1		SA-R2K 36M0.		60.5	15.5	21.5	45	51	-151.1	27
TK049	TK072	D1		48	750	R2K-R2K 614K.		54.7	-2	4	26	32	-152.4	25
TK049	TK072	D2		18	1975	R2K-R2K 1M64		53	3.9	9.9	30.2	36.2	-152.4	28.7
TK049	TK072	D3		5	6875	R2K-R2K 5M50		59.1	3.6	9.6	36	42	-151.9	35.2
TK049	TK072	D4		2	18000	R2K-R2K 17M9		57.2	14.4	20.4	40.5	46.5	-152.5	35.2

TK049	TK072	D5		1		R2K-R2K 36M0		60.7	15.3	21.3	45	51	-151.1	27.3
CM01	CM02		A1	1		CMD1 LB.doc		53.8	-2.9	1.1				
CM03	CM04		A1	1		CMD2 LB.doc		53.8	24.6	29.6				
TM01	TM02		A2	1		TLM1 LB.doc					15	18	-161.2	26.2
TM03	TM04		A2	1		TLM2 LB.doc					9	13	-166	28
BN01	BN02		A3	1		BCN LB.doc					3	9	-153.2	29.4

**FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
FCC Form 312 - Schedule S: (Technical and Operational Description)**

Page 10: TT and C

S14. Is the space station(s) controlled and monitored remotely? If Yes, provide the location and telephone number of the TT and C control point(s): Yes

Remote Control (TT C) Location(s):

S14a. Street Address: Estação de Guaratiba			
S14b. City: Guaratiba	S14c. County: Rio de Janeiro	S14d. State/Country	S14e. Zip Code: 23.020-715
S14f. Telephone Number: +552121214400		S14g. Call Sign of Control Station (if appropriate):	

**FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
FCC Form 312 - Schedule S: (Technical and Operational Description)**

**Page 11:
Characteristics and
Certifications**

S15. SPACECRAFT PHYSICAL CHARACTERISTICS:

S15a. Mass of spacecraft without fuel (kg): 2250	Spacecraft Dimensions (meters)	Probability of Survival to End of Life (0.0 - 1.0)
S15b. Mass of fuel and disposables at launch (kg): 2430		
S15c. Mass of spacecraft and fuel at launch (kg): 4680	S15f. Length (m): 40.7	S15i. Payload: 0.815
S15d. Mass of fuel, in orbit, at beginning of life (kg): 1200	S15g. Width (m): 7.5	S15j. Bus: 0.866
S15e. Deployed Area of Solar Array (square meters): 79.7	S15h. Height (m): 6.2	S15k. Total: 0.706

S16. SPACECRAFT ELECTRICAL CHARACTERISTICS:

Spacecraft Subsystem	Electrical Power (Watts) At Beginning of Life		Electrical Power (Watts) At End of Life	
	At Equinox	At Solstice	At Equinox	At Solstice
Payload (Watts):	(a): 10759	(f): 10759	(k): 10759	(p): 10759
Bus (Watts):	(b): 1756	(g): 970	(l): 1756	(q): 970
Total (Watts):	(c): 12505	(h): 11729	(m): 12505	(r): 11729
Solar Array (Watts):	(d): 14350	(i): 13030	(n): 13202	(s): 12671
Depth of Battery Discharge (%):	(e) 75 %	(j) 75 %	(o) 75 %	(t) 75 %

S17. CERTIFICATIONS:

a. Are the power flux density limits of § 25.208 met?	☒ YES	☐ NO	☐ N/A
b. Are the appropriate service area coverage requirements of § 25.143(b)(ii) and (iii), or § 25.145(c)(1) and (2) met?	☐ YES	☐ NO	☒ N/A
c. Are the frequency tolerances of § 25.202(e) and the out-of-band emission limits of § 25.202(f)(1), (2) and (3) met?	☒ YES	☐ NO	☐ N/A

In addition to the information required in this Form, the space station applicant is required to provide all the information specified in Section 25.114 of the Commission's rules, 47 C.F.R. § 25.114.