



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

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 intital phase angle.

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

**NO NGSO DATA FILED**

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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.
KUL	S		North America, Hawaii, and the Caribbean
KDL	S		North America, Hawaii, and the Caribbean
CUL	S		North America, Hawaii, and the Caribbean
CDL	S		North America, Hawaii, and the Caribbean
GBL	S		Global

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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				
										(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														
KRV	R	1	1	0.15	0	30	Y	90	KUL				1	6.8	-95.9	1	1
KRH	R	1	1	0.15	0	30	Y	0	KUL				1	7.8	-96.9	1	1
KTV	T	1	1	0.15	0	30	Y	90	KDL	1	1	50.3					
KTH	T	1	1	0.15	0	30	Y	0	KDL	1	1	51.5					
CRV	R	1	1	0.15	0	30	Y	90	CUL				1	4.1	-101.1	1	1
CRH	R	1	1	0.15	0	30	Y	0	CUL				1	5.8	-103	1	1
CTV	T	1	1	0.15	0	30	Y	90	CDL	1	1	18.4					
CTH	T	1	1	0.15	0	30	Y	0	CDL	1	1	19.5					
GBLR	R	1	1	0.15	0	30	Y	90	GBL				1	-17.5	-90		
GBLT	T	1	1	0.15	0	30	Y	90	GBL	1	1	6					
GBLT	T	1	1	0.15	0	30	Y	90	GBL	1	1	6					

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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
KRV	R	C			see amc-2 gims contain					
KRH	R	C			see amc-2 gims contain					
CRV	R	C			Not used					
CRH	R	C			Not used					
KTV	T	C			see amc-2 gims contain	-1000	-1000	-1000	-1000	-1000
KTH	T	C			see amc-2 gims contain	-1000	-1000	-1000	-1000	-1000
CTV	T	C			see amc-2 gims contain	-166.8	-166.6	-166.3	-165.6	-164.3
CTH	T	C			see amc-2 gims contain	-166.2	-166	-165.7	-165.3	-165
GBLT	T	C			see Figure A-1 in Annex	-176	-175.9	-175.8	-175.7	-175.6
GBLT	T	C			see Figure A-1 in Annex	-176	-175.9	-175.8	-175.7	-175.6
GBLR	R	C			see Figure A-1 in Annex					

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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)
KR001	36000	R	14020	H	C
KR002	36000	R	14040	V	C
KR003	36000	R	14060	H	C
KR004	36000	R	14080	V	C
KR005	36000	R	14100	H	C
KR006	36000	R	14120	V	C
KR007	36000	R	14140	H	C
KR008	36000	R	14160	V	C
KR009	36000	R	14180	H	C
KR010	36000	R	14200	V	C
KR011	36000	R	14220	H	C
KR012	36000	R	14240	V	C
KR013	36000	R	14260	H	C
KR014	36000	R	14280	V	C
KR015	36000	R	14300	H	C
KR016	36000	R	14320	V	C
KR017	36000	R	14340	H	C
KR018	36000	R	14360	V	C
KR019	36000	R	14380	H	C
KR020	36000	R	14400	V	C
KR021	36000	R	14420	H	C
KR022	36000	R	14440	V	C
KR023	36000	R	14460	H	C
KR024	36000	R	14480	V	C
KT001	36000	T	11720	V	C
KT002	36000	T	11740	H	C
KT003	36000	T	11760	V	C
KT004	36000	T	11780	H	C
KT005	36000	T	11800	V	C
KT006	36000	T	11820	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
K0001	1	KR001	KRH	KT001	KTV
K0002	1	KR002	KRV	KT002	KTH
K0003	1	KR003	KRH	KT003	KTV
K0004	1	KR004	KRV	KT004	KTH
K0005	1	KR005	KRH	KT005	KTV
K0006	1	KR006	KRV	KT006	KTH
K0007	1	KR007	KRH	KT007	KTV
K0008	1	KR008	KRV	KT008	KTH
K0009	1	KR009	KRH	KT009	KTV
K0010	1	KR010	KRV	KT010	KTH
K0011	1	KR011	KRH	KT011	KTV
K0012	1	KR012	KRV	KT012	KTH
K0013	1	KR013	KRH	KT013	KTV
K0014	1	KR014	KRV	KT014	KTH
K0015	1	KR015	KRH	KT015	KTV
K0016	1	KR016	KRV	KT016	KTH
K0017	1	KR017	KRH	KT017	KTV
K0018	1	KR018	KRV	KT018	KTH
K0019	1	KR019	KRH	KT019	KTV
K0020	1	KR020	KRV	KT020	KTH
K0021	1	KR021	KRH	KT021	KTV
K0022	1	KR022	KRV	KT022	KTH
K0023	1	KR023	KRH	KT023	KTV
K0024	1	KR024	KRV	KT024	KTH
C0001	1	CR001	CRH	CT001	CTV
C0002	1	CR002	CRV	CT002	CTH
C0003	1	CR003	CRH	CT003	CTV
C0004	1	CR004	CRV	CT004	CTH
C0005	1	CR005	CRH	CT005	CTV
C0006	1	CR006	CRV	CT006	CTH

KT007	36000	T	11840	V	C
KT008	36000	T	11860	H	C
KT009	36000	T	11880	V	C
KT010	36000	T	11900	H	C
KT011	36000	T	11920	V	C
KT012	36000	T	11940	H	C
KT013	36000	T	11960	V	C
KT014	36000	T	11980	H	C
KT015	36000	T	12000	V	C
KT016	36000	T	12020	H	C
KT017	36000	T	12040	V	C
KT018	36000	T	12060	H	C
KT019	36000	T	12080	V	C
KT020	36000	T	12100	H	C
KT021	36000	T	12120	V	C
KT022	36000	T	12140	H	C
KT023	36000	T	12160	V	C
KT024	36000	T	12180	H	C
CR001	36000	R	5945	H	C
CR002	36000	R	5965	V	C
CR003	36000	R	5985	H	C
CR004	36000	R	6005	V	C
CR005	36000	R	6025	H	C
CR006	36000	R	6045	V	C
CR007	36000	R	6065	H	C
CR008	36000	R	6085	V	C
CR009	36000	R	6105	H	C
CR010	36000	R	6125	V	C
CR011	36000	R	6145	H	C
CR012	36000	R	6165	V	C
CR013	36000	R	6185	H	C
CR014	36000	R	6205	V	C
CR015	36000	R	6225	H	C
CR016	36000	R	6245	V	C
CR017	36000	R	6265	H	C
CR018	36000	R	6285	V	C
CR019	36000	R	6305	H	C
CR020	36000	R	6325	V	C
CR021	36000	R	6345	H	C

C0007		1	CR007	CRH	CT007	CTV
C0008		1	CR008	CRV	CT008	CTH
C0009		1	CR009	CRH	CT009	CTV
C0010		1	CR010	CRV	CT010	CTH
C0011		1	CR011	CRH	CT011	CTV
C0012		1	CR012	CRV	CT012	CTH
C0013		1	CR013	CRH	CT013	CTV
C0014		1	CR014	CRV	CT014	CTH
C0015		1	CR015	CRH	CT015	CTV
C0016		1	CR016	CRV	CT016	CTH
C0017		1	CR017	CRH	CT017	CTV
C0018		1	CR018	CRV	CT018	CTH
C0019		1	CR019	CRH	CT019	CTV
C0020		1	CR020	CRV	CT020	CTH
C0021		1	CR021	CRH	CT021	CTV
C0022		1	CR022	CRV	CT022	CTH
C0023		1	CR023	CRH	CT023	CTV
C0024		1	CR024	CRV	CT024	CTH
C1			TC	GBLRV		
T1					TM1	CTH
T2					TM2	GBLTV
T3					TM3	KTV

CR022	36000	R	6365	V	C
CR023	36000	R	6385	H	C
CR024	36000	R	6405	V	C
CT001	36000	T	3720	V	C
CT002	36000	T	3740	H	C
CT003	36000	T	3760	V	C
CT004	36000	T	3780	H	C
CT005	36000	T	3800	V	C
CT006	36000	T	3820	H	C
CT007	36000	T	3840	V	C
CT008	36000	T	3860	H	C
CT009	36000	T	3880	V	C
CT010	36000	T	3900	H	C
CT011	36000	T	3920	V	C
CT012	36000	T	3940	H	C
CT013	36000	T	3960	V	C
CT014	36000	T	3980	H	C
CT015	36000	T	4000	V	C
CT016	36000	T	4020	H	C
CT017	36000	T	4040	V	C
CT018	36000	T	4060	H	C
CT019	36000	T	4080	V	C
CT020	36000	T	4100	H	C
CT021	36000	T	4120	V	C
CT022	36000	T	4140	H	C
CT023	36000	T	4160	H	C
CT024	36000	T	4180	V	C
TC	800	R	6423.5	V	T
TM1	300	T	3700.5	H	T
TM2	300	T	4199.5	V	T
TM3	300	T	12198.0	V	T



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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)
KU_1	36M0G7W	36000	1	1	1		1	1
KU_2	4M34G7W	4340	1	1	1		1	1
KU_3	45K0G7W	45	1	1	1		1	1
KU_4	2M01G7W	2010	1	1	1		1	1
KU_5	1M09G7W	1092	1	1	1		1	1
KU_6	7M20G7W	7207	1	1	1		1	1



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

Associated Transponder ID Range (a) Start    (b) End		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 <sup>2</sup> /Hz)
						(j) Min.	(k) Max.		(l) Min.	(m) Max.			
K0001	K0024	KU_1		1							47.3		
K0001	K0024	KU_2		1							31.7		
K0001	K0024	KU_3		1							11		
K0001	K0024	KU_4		1							27.3		
K0001	K0024	KU_5		1							30.9		
K0001	K0024	KU_6		1							33.2		
C1	C1		A1	1									
T1	T1		A2	1							18		

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**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

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Characteristics and  
Certifications

**S15. SPACECRAFT PHYSICAL CHARACTERISTICS:**

S15a. Mass of spacecraft without fuel (kg): 1310.8	Spacecraft Dimensions (meters)	Probability of Survival to End of Life (0.0 - 1.0)
S15b. Mass of fuel and disposables at launch (kg): 1338.3		
S15c. Mass of spacecraft and fuel at launch (kg): 2649	S15f. Length (m): 26.8	S15i. Payload: 0.78
S15d. Mass of fuel, in orbit, at beginning of life (kg): 320	S15g. Width (m): 1.8	S15j. Bus: 0.88
S15e. Deployed Area of Solar Array (square meters): 75.5	S15h. Height (m): 3.78	S15k. Total: 0.69

**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): 3772	(f): 3740	(k): 3772	(p): 3740
Bus (Watts):	(b): 1089	(g): 674	(l): 1089	(q): 674
Total (Watts):	(c): 4861	(h): 4414	(m): 4861	(r): 4414
Solar Array (Watts):	(d): 6513	(i): 6212	(n): 5250	(s): 4836
Depth of Battery Discharge (%):	(e) 70 %	(i) 70 %	(o) 70 %	(t) 70 %

**S17. CERTIFICATIONS:**

a. Are the power flux density limits of § 25.208 met?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> 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?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> 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?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> 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.**

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