

**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: SES-129K		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: 24		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) 864 MHz		i. Orbit Type: Mark all boxes that apply: <input checked="" type="checkbox"/> GSO <input type="checkbox"/> 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)		
14.00	G	14.50	G	R	Fixed Satellite Service
11.70	G	12.20	G	T	Fixed Satellite Service
11.70	G	12.20	G	T	Direct to Home in the Fixed Fixed Satellite Service

**S3. ORBITAL INFORMATION FOR GEOSTATIONARY SATELLITES ONLY:**

a. Nominal Orbital Longitude (Degrees E/W): 129.1 W		b. Alternate Orbital Longitude (Degrees E/W):		c. Reason for orbital location selection: Avoids overlapping with the stationkeeping boxes of Ciel-2 and Galaxy-12, also located at the nominal 129 W orbit location	
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): <u>      Degrees      </u> <u>      E/W      </u>	
d. Toward West:	0.05 Degrees	e. Toward East:		g. Westernmost:	
	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)**

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)**

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.
K-DL	E		CONUS, Alaska, Hawaii, Mexico and parts of Canada and the Caribbean.
K-UL	E		CONUS, Alaska, Hawaii, Mexico and parts of Canada and the Caribbean

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

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														
KRH	R	35	25	0.15	0	30	Y	0	K-UL				550	7.6	-101.6	21	1
KRV	R	35	25	0.15	0	30	Y	90	K-UL				550	7.6	-101.6	21	1
KTH	T	33.5	23.5	0.15	0	30	Y	0	K-DL	3.5	134	54.8					
KTV	T	33.5	23.5	0.15	0	30	Y	90	K-DL	3.5	134	54.8					
KTR	T	33.5	23.5	0.15	0	30	Y		K-DL	3.5	134	54.8					
KTL	T	33.5	23.5	0.15	0	30	Y		K-DL	3.5	134	54.8					

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

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
KRH	R	C	-129.1		krh.gxt					
KRV	R	C	-129.1		krv.gxt					
KTH	T	C	-129.1		kth.gxt					
KTV	T	C	-129.1		ktv.gxt					
KTR	T	C	-129.1		ktr.gxt					
KTL	T	C	-129.1		ktl.gxt					

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

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)
KR01	36000	R	14020	H	C
KR02	36000	R	14040	V	C
KR03	36000	R	14060	H	C
KR04	36000	R	14080	V	C
KR05	36000	R	14100	H	C
KR06	36000	R	14120	V	C
KR07	36000	R	14140	H	C
KR08	36000	R	14160	V	C
KR09	36000	R	14180	H	C
KR10	36000	R	14200	V	C
KR11	36000	R	14220	H	C
KR12	36000	R	14240	V	C
KR13	36000	R	14260	H	C
KR14	36000	R	14280	V	C
KR15	36000	R	14300	H	C
KR16	36000	R	14320	V	C
KR17	36000	R	14340	H	C
KR18	36000	R	14360	V	C
KR19	36000	R	14380	H	C
KR20	36000	R	14400	V	C
KR21	36000	R	14420	H	C
KR22	36000	R	14440	V	C
KR23	36000	R	14460	H	C
KR24	36000	R	14480	V	C
KT01	36000	T	11720	V	C
KT02	36000	T	11740	H	C
KT03	36000	T	11760	V	C
KT04	36000	T	11780	H	C
KT05	36000	T	11800	V	C
KT06	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
K01	119.5	KR01	KRH	KT01	KTV
K03	119.5	KR03	KRH	KT03	KTV
K05	119.5	KR05	KRH	KT05	KTV
K07	119.5	KR07	KRH	KT07	KTV
K09	119.5	KR09	KRH	KT09	KTV
K11	119.5	KR11	KRH	KT11	KTV
K13	119.5	KR13	KRH	KT13	KTV
K15	119.5	KR15	KRH	KT15	KTV
K17	119.5	KR17	KRH	KT17	KTV
K19	119.5	KR19	KRH	KT19	KTV
K21	119.5	KR21	KRH	KT21	KTV
K23	119.5	KR23	KRH	KT23	KTV
K02	119.5	KR02	KRV	KT02	KTH
K04	119.5	KR04	KRV	KT04	KTH
K06	119.5	KR06	KRV	KT06	KTH
K08	119.5	KR08	KRV	KT08	KTH
K10	119.5	KR10	KRV	KT10	KTH
K12	119.5	KR12	KRV	KT12	KTH
K14	119.5	KR14	KRV	KT14	KTH
K16	119.5	KR16	KRV	KT16	KTH
K18	119.5	KR18	KRV	KT18	KTH
K20	119.5	KR20	KRV	KT20	KTH
K22	119.5	KR22	KRV	KT22	KTH
K24	119.5	KR24	KRV	KT24	KTH
TBC1				KBCC1	KTL
TBC2				KBCC2	KTR
K25	119.5	KR01	KRH	KT25	KTR
K26	119.5	KR02	KRV	KT26	KTL
K27	119.5	KR03	KRH	KT27	KTR
K28	119.5	KR04	KRV	KT28	KTL

KT07	36000	T	11840	V	C
KT08	36000	T	11860	H	C
KT09	36000	T	11880	V	C
KT10	36000	T	11900	H	C
KT11	36000	T	11920	V	C
KT12	36000	T	11940	H	C
KT13	36000	T	11960	V	C
KT14	36000	T	11980	H	C
KT15	36000	T	12000	V	C
KT16	36000	T	12020	H	C
KT17	36000	T	12040	V	C
KT18	36000	T	12060	H	C
KT19	36000	T	12080	V	C
KT20	36000	T	12100	H	C
KT21	36000	T	12120	V	C
KT22	36000	T	12140	H	C
KT23	36000	T	12160	V	C
KT24	36000	T	12180	H	C
KT25	36000	T	11720	R	C
KT26	36000	T	11740	L	C
KBCC1	400	T	11701	L	T
KBCC2	400	T	12199	R	T
KT27	36000	T	11760	R	C
KT28	36000	T	11780	L	C
KT29	36000	T	11800	R	C
KT30	36000	T	11820	L	C
KT31	36000	T	11840	R	C
KT32	36000	T	11860	L	C
KT33	36000	T	11880	R	C
KT34	36000	T	11900	L	C
KT35	36000	T	11920	R	C
KT36	36000	T	11940	L	C
KT37	36000	T	11960	R	C
KT38	36000	T	11980	L	C
KT39	36000	T	12000	R	C
KT40	36000	T	12020	L	C
KT41	36000	T	12040	R	C
KT42	36000	T	12060	L	C
KT43	36000	T	12080	R	C

K29	119.5	KR05	KRH	KT29	KTR
K30	119.5	KR06	KRV	KT30	KTL
K31	119.5	KR07	KRH	KT31	KTR
K32	119.5	KR08	KRV	KT32	KTL
K33	119.5	KR09	KRH	KT33	KTR
K34	119.5	KR10	KRV	KT34	KTL
K35	119.5	KR11	KRH	KT35	KTR
K36	119.5	KR12	KRV	KT36	KTL
K37	119.5	KR13	KRH	KT37	KTR
K38	119.5	KR14	KRV	KT38	KTL
K39	119.5	KR15	KRH	KT39	KTR
K40	119.5	KR16	KRV	KT40	KTL
K41	119.5	KR17	KRH	KT41	KTR
K42	119.5	KR18	KRV	KT42	KTL
K43	119.5	KR19	KRH	KT43	KTR
TCK		KUC1	KRH		
TBK1				KBCN1	KTH
TBK2				KBCN2	KTV
K44	119.5	KR20	KRV	KT44	KTL
K45	119.5	KR21	KRH	KT45	KTR
K46	119.5	KR22	KRV	KT46	KTL
K47	119.5	KR23	KRH	KT47	KTR
K48	119.5	KR24	KRV	KT48	KTL

KT44	36000	T	12100	L	C
KT45	36000	T	12120	R	C
KT46	36000	T	12140	L	C
KT47	36000	T	12160	R	C
KT48	36000	T	12180	L	C
KUC1	800	R	14499	H	T
KBCN1	400	T	11701	H	T
KBCN2	400	T	12199	V	T



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

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)
K_A	36M0G7W	36000	4	40000	0.69		6.4	19
K_B	27M0G7W	27000	4	32000	0.69		6.4	19
K_C	6M95G1W	6950	4	8000	0.69		6.4	19
K_D	5M00G1W	5000	4	6000	0.69		6.4	19
K_E	100KG1W	100	4	56	0.69		6.4	19
K_F	1M60G1W	1600	4	1544	0.69		6.4	19
K_G	36M0G7W	36000	8	50000	0.61		9.9	20



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

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)	(o) Assoc. Stn Rec. G/T (dB/K)
						(j) Min.	(k) Max.		(l) Min.	(m) Max.				
K01	K48	K_A		1		link budgets r1.		57.3	20	25	44.8	54.8	-146.7	20.9
K01	K48	K_B		1		link budgets r1.		57.3	20	25	43.6	53.6	-146.7	20.9
K01	K48	K_C		5	6950	link budgets r1.		53	8.9	14	34.7	44.7	-149.7	26.9
K01	K48	K_D		6	5000	link budgets r1.		53	8.9	14	33.2	43.2	-149.7	26.9
K01	K48	K_E		250	100	link budgets r1.		46.7	-2	3	16.2	26.2	-149.7	20.9
K01	K48	K_F		20	1544	link budgets r1.		46.7	8	13	28.3	38.3	-149.7	26.9
K01	K48	K_G		1		link budgets r1.		57.3	20	25	44.8	54.8	-146.7	26.9
K01	K48		K_H	1		link budgets r1.	2000	57.3	22	25	44.8	54.8	-134.2	20.9
TCK	TCK		K_TC	1		link budgets r1.		60.2	10	15				
TBK1	TBC2		K_TM	1		link budgets r1.					10	27	-155	34.6

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

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): #Error

**Remote Control (TT C) Location(s):**

S14a: Street Address: Woodbine TT&C			
S14b. City: Mt. Airy	S14c. County:	S14d. State/Country MD	S14e. Zip Code: 21771
S14f. Telephone Number: 410-549-4300		S14g. Call Sign of Control Station (if appropriate): E7169	

**Remote Control (TT C) Location(s):**

S14a: Street Address: Vernon Valley Spacecraft Operations			
S14b. City: Sussex	S14c. County:	S14d. State/Country NJ	S14e. Zip Code: 07461
S14f. Telephone Number: 973-823-6000		S14g. Call Sign of Control Station (if appropriate): WB81	

**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): 2346	Spacecraft Dimensions (meters)	Probability of Survival to End of Life (0.0 - 1.0)
S15b. Mass of fuel and disposables at launch (kg): 3146		
S15c. Mass of spacecraft and fuel at launch (kg): 5492	S15f. Length (m): 32.4	S15i. Payload: 0.932
S15d. Mass of fuel, in orbit, at beginning of life (kg): 1248.6	S15g. Width (m): 7.3	S15j. Bus: 0.88
S15e. Deployed Area of Solar Array (square meters): 32.4	S15h. Height (m): 7	S15k. Total: 0.823

**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): 13853	(f): 13853	(k): 13853	(p): 13853
Bus (Watts):	(b): 3265	(g): 1730	(l): 3265	(q): 1730
Total (Watts):	(c): 17118	(h): 15583	(m): 17118	(r): 15583
Solar Array (Watts):	(d): 21209	(i): 19010	(n): 19079	(s): 17286
Depth of Battery Discharge (%):	(e) 69.2 %	(j) 69.2 %	(o) 69.2 %	(t) 69.2 %

**S17. CERTIFICATIONS:**

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