

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: GALAXY 16		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): Years	j. Number of transponders offered on a common carrier basis:
c. Construction Completion Date:		g. Total Number of Transponders: 48	k. Total Common Carrier Transponder Bandwidth: MHz
d1. Est Launch Date Begin:	d2. Est Launch Date End:	h. Total Transponder Bandwidth (no. transponders x Bandwidth) 1728 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)		
5925	M	6425	M	R	Fixed Satellite Service
3700	M	4200	M	T	Fixed Satellite Service
14000	M	14500	M	R	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): 99 W		b. Alternate Orbital Longitude (Degrees E/W):		c. Reason for orbital location selection: REPLACES GALAXY-4R
Longitudinal Tolerance or E/W Station-Keeping:		f. Inclination Excursion or N/S Station-Keeping Tolerance: 0.05 Degrees	Range of orbital are in which adequate service can be provided (Optional): Degrees E/W g. Westernmost: h. Easternmost:	
d. Toward West: 0.05 Degrees				
e. Toward East: 0.05 Degrees				
i. Reason for service are selection (Optional):				

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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)
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NO NGSO DATA FILED

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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.
1	S		CONTINENTAL USA, HAWAII, ALASKA, PUERTO RICO, PORTIONS OF CANADA AND MEXICO
2	S		GLOBAL

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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
CHU	R	31	25	0.16	0.16	27.5	Y	0	1				528	3.8	-106.5	31	1
CVU	R	31	25	0.16	0.16	27.5	Y	90	1				528	3.8	-106.5	31	1
CHD	T	29.2	25.2	0.16	0.16	30	Y	0	1	2	28.2	43.7					
CVD	T	29.2	25.2	0.16	0.16	30	Y	90	1	2	28.2	43.7					
KHU	R	33.3	27.3	0.16	0.16	27	Y	0	1				519	6.1	-104.1	31	1
KVU	R	33.3	27.3	0.16	0.16	27	Y	90	1				519	6.1	-104.1	31	1
KHD	T	32.8	26.8	0.16	0.16	30	Y	0	1	2	81.3	51.9					
KVD	T	32.8	26.8	0.16	0.16	30	Y	90	1	2	81.3	51.9					
UPC	T	32.8	26.8	0.16	0.16	30	Y	0	1		0.02	16.3					
UPC	T	32.8	26.8	0.16	0.16	30	Y	90	1		0.02	16.3					
OMN	R	5.4	-0.6	0.16	0.16	18.5	Y		2				9235	-34.3	-97.8		
OMN	T	5.6	-3.9	0.16	0.16	20	Y		2	6.8	9.3	15.3					
CMD	R	31	25	0.16	0.16	27.5	Y	0	1				27610	-13.4	-119.3		
CMD	R	31	25	0.16	0.16	27.5	Y	90	1				27610	-13.4	-119.3		
TM	T	29.2	22.6	0.16	0.16	30	Y	0	1	7.3	0.07	17.9					

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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
CHU	R	C	-99		SCHEDULE_S_CUP					
CVU	R	C	-99		SCHEDULE_S_CUP					
CHD	T	C	-99		SCHEDULE_S_CDN	-152	-149.5	-149.3	-149.2	-149.1
CVD	T	C	-99		SCHEDULE_S_CDN	-152	-149.5	-149.3	-149.2	-149.1
KHU	R	C	-99		SCHEDULE_S_KUP					
KVU	R	C	-99		SCHEDULE_S_KUP					
KHD	T	C	-99		SCHEDULE_S_KDN					
KVD	T	C	-99		SCHEDULE_S_KDN					
UPC	T	C	-99		SCHEDULE_S_KDN					
UPC	T	C	-99		SCHEDULE_S_KDN					
OMN	R	C	-99	SCHEDULE_S_OMNR						
OMN	T	C	-99	SCHEDULE_S_OMNT		-165.9	-165.8	-165.7	-165.6	-165.5
CMD	R	C	-99		SCHEDULE_S_CUP					
CMD	R	C	-99		SCHEDULE_S_CUP					
TM	T	C	-99		SCHEDULE_S_CDN	-163.3	-163.2	-163.1	-163	-162.9

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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)
CU1	36	R	5945	V	C
CU2	36	R	5965	H	C
CU3	36	R	5985	V	C
CU4	36	R	6005	H	C
CU5	36	R	6025	V	C
CU6	36	R	6045	H	C
CU7	36	R	6065	V	C
CU8	36	R	6085	H	C
CU9	36	R	6105	V	C
CU10	36	R	6125	H	C
CU11	36	R	6145	V	C
CU12	36	R	6165	H	C
CU13	36	R	6185	V	C
CU14	36	R	6205	H	C
CU15	36	R	6225	V	C
CU16	36	R	6245	H	C
CU17	36	R	6265	V	C
CU18	36	R	6285	H	C
CU19	36	R	6305	V	C
CU20	36	R	6325	H	C
CU21	36	R	6345	V	C
CU22	36	R	6365	H	C
CU23	36	R	6385	V	C
CU24	36	R	6405	H	C
CD1	36	T	3720	H	C
CD2	36	T	3740	V	C
CD3	36	T	3760	H	C
CD4	36	T	3780	V	C
CD5	36	T	3800	H	C
CD6	36	T	3820	V	C

(a) Transponder ID	(b) Transponder Gain (dB)	Receive Band		Transmit Band	
		(c) Channel No.	(d) Beam ID	(e) Channel No.	(f) Beam ID
1C	127.3	CU1	CVUP	CD1	CHDN
3C	127.3	CU3	CVUP	CD3	CHDN
5C	127.3	CU5	CVUP	CD5	CHDN
7C	127.3	CU7	CVUP	CD7	CHDN
9C	127.3	CU9	CVUP	CD9	CHDN
11C	127.3	CU11	CVUP	CD11	CHDN
13C	127.3	CU13	CVUP	CD13	CHDN
15C	127.3	CU15	CVUP	CD15	CHDN
17C	127.3	CU17	CVUP	CD17	CHDN
19C	127.3	CU19	CVUP	CD19	CHDN
21C	127.3	CU21	CVUP	CD21	CHDN
23C	127.3	CU23	CVUP	CD23	CHDN
2C	127.3	CU2	CHUP	CD2	CVDN
4C	127.3	CU4	CHUP	CD4	CVDN
6C	127.3	CU6	CHUP	CD6	CVDN
8C	127.3	CU8	CHUP	CD8	CVDN
10C	127.3	CU10	CHUP	CD10	CVDN
12C	127.3	CU12	CHUP	CD12	CVDN
14C	127.3	CU14	CHUP	CD14	CVDN
16C	127.3	CU16	CHUP	CD16	CVDN
18C	127.3	CU18	CHUP	CD18	CVDN
20C	127.3	CU20	CHUP	CD20	CVDN
22C	127.3	CU22	CHUP	CD22	CVDN
24C	127.3	CU24	CHUP	CD24	CVDN
1K	134.4	KU1	KVUP	KD1	KHDN
3K	134.4	KU3	KVUP	KD3	KHDN
5K	134.4	KU5	KVUP	KD5	KHDN
7K	134.4	KU7	KVUP	KD7	KHDN
9K	134.4	KU9	KVUP	KD9	KHDN
11K	134.4	KU11	KVUP	KD11	KHDN

CD7	36	T	3840	H	C
CD8	36	T	3860	V	C
CD9	36	T	3880	H	C
CD10	36	T	3900	V	C
CD11	36	T	3920	H	C
CD12	36	T	3940	V	C
CD13	36	T	3960	H	C
CD14	36	T	3980	V	C
CD15	36	T	4000	H	C
CD16	36	T	4020	V	C
CD17	36	T	4040	H	C
CD18	36	T	4060	V	C
CD19	36	T	4080	H	C
CD20	36	T	4100	V	C
CD21	36	T	4120	H	C
CD22	36	T	4140	V	C
CD23	36	T	4160	H	C
CD24	36	T	4180	V	C
KU1	36	R	14020	V	C
KU2	36	R	14040	H	C
KU3	36	R	14060	V	C
KU4	36	R	14080	H	C
KU5	36	R	14100	V	C
KU6	36	R	14120	H	C
KU7	36	R	14140	V	C
KU8	36	R	14160	H	C
KU9	36	R	14180	V	C
KU10	36	R	14200	H	C
KU11	36	R	14220	V	C
KU12	36	R	14240	H	C
KU13	36	R	14260	V	C
KU14	36	R	14280	H	C
KU15	36	R	14300	V	C
KU16	36	R	14320	H	C
KU17	36	R	14340	V	C
KU18	36	R	14360	H	C
KU19	36	R	14380	V	C
KU20	36	R	14400	H	C
KU21	36	R	14420	V	C

13K	134.4	KU13	KVUP	KD13	KHDN
15K	134.4	KU15	KVUP	KD15	KHDN
17K	134.4	KU17	KVUP	KD17	KHDN
19K	134.4	KU19	KVUP	KD19	KHDN
21K	134.4	KU21	KVUP	KD21	KHDN
23K	134.4	KU23	KVUP	KD23	KHDN
2K	134.4	KU2	KHUP	KD2	KVDN
4K	134.4	KU4	KHUP	KD4	KVDN
6K	134.4	KU6	KHUP	KD6	KVDN
8K	134.4	KU8	KHUP	KD8	KVDN
10K	134.4	KU10	KHUP	KD10	KVDN
12K	134.4	KU12	KHUP	KD12	KVDN
14K	134.4	KU14	KHUP	KD14	KVDN
16K	134.4	KU16	KHUP	KD16	KVDN
18K	134.4	KU18	KHUP	KD18	KVDN
20K	134.4	KU20	KHUP	KD20	KVDN
22K	134.4	KU22	KHUP	KD22	KVDN
24K	134.4	KU24	KHUP	KD24	KVDN
TM1				TM1	TM
TM2				TM2	TM
TM3				TM3	OMNT
TM4				TM4	OMNT
UPC1				UPC1	KVDN
UPC2				UPC2	KHDN
CMD1		CMD1	CHUP		
CMD2		CMD2	CVUP		
CMD3		CMD3	OMNR		
CMD4		CMD4	OMNR		

KU22	36	R	14440	H	C
KU23	36	R	14460	V	C
KU24	36	R	14480	H	C
KD1	36	T	11720	H	C
KD2	36	T	11740	V	C
KD3	36	T	11760	H	C
KD4	36	T	11780	V	C
KD5	36	T	11800	H	C
KD6	36	T	11820	V	C
KD7	36	T	11840	H	C
KD8	36	T	11860	V	C
KD9	36	T	11880	H	C
KD10	36	T	11900	V	C
KD11	36	T	11920	H	C
KD12	36	T	11940	V	C
KD13	36	T	11960	H	C
KD14	36	T	11980	V	C
KD15	36	T	12000	H	C
KD16	36	T	12020	V	C
KD17	36	T	12040	H	C
KD18	36	T	12060	V	C
KD19	36	T	12080	H	C
KD20	36	T	12100	V	C
KD21	36	T	12120	H	C
KD22	36	T	12140	V	C
KD23	36	T	12160	H	C
KD24	36	T	12180	V	C
CMD1	1000	R	5928.75	H	T
CMD2	1000	R	6424.25	V	T
CMD3	1000	R	5928.75	L	T
CMD4	1000	R	6424.25	L	T
TM1	500	T	4196	H	T
TM2	500	T	4197	H	T
TM3	500	T	4196	R	T
TM4	500	T	4197	R	T
UPC1	25	T	11701	V	C
UPC2	25	T	12195	H	C

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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	30M1G7W	30133	4	36863	0.75		6.1	13.2
D2	6M77G7W	6771	4	6000	0.5		3.9	7.3
D3	77K0G7W	77	4	64	0.5		6.8	12.2
D4	30M1G7W	30133	4	36863	0.75		6.1	12.6
D5	6M77G7W	6771	4	6000	0.5		3.9	11.8
D6	77K0G7W	77	4	64	0.5		6.8	13.9
D7	1M23G7W	1229	2	512	0.5		3.4	10.9
D8	307KG7W	307	2	128	0.5		3.4	9.8

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Page 8: Analog Modulation

S12. ANALOG MODULATION PARAMETERS For each analog emission provide:

(a) Analog Mod. ID	(b) Emission Designator	(c) Assigned Bandwidth (kHz)	(d) Signal Type	(e) Channels per Carrier	Multi-channel Telephony				(j) Video Standard NTSC, PAL, etc.	(k) Video Noise- Weighting (dB)	(l) Video and SCPC/FM Modulation Index	(m) SCPC/FM Compander, Preemphasis, and Noise Weighting (dB)	(n) Total C/N Performance Objective (dB)	(o) Single Entry C/I Objective (dB)
					(f) Ave. Companded Talker Level (dBm0)	(g) Bottom Baseband Freq. (MHz)	(h) Top Baseband Freq. (MHz)	(i) RMS Modulation Index						
A1	36M0F3F	36000	TV/FM	1					NTSC	12.8	2.6		10	13.9
A2	36M0F3F	36000	TV/FM	1					NTSC	12.8	2.6		10	16

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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.		
1C	24C	D1		1		G16_SCHDU	0	51	17.4	23.4	39.7	43.7	-157.1	20.9
1C	24C	D2		3	10300	G16_SCHDU	0	51	11	17	30.8	34.8	-159.6	19.1
1C	24C	D3		287	100	G16_SCHDU	0	51	-8.2	-2.2	11.6	15.6	-159.3	20.9
1C	24C		A1	1		G16_SCHDU	4	51	17.4	23.4	39.7	43.7	-148.4	26.2
1K	24K	D4		1		G16_SCHDU	0	58.1	17.7	23.7	45.9	51.9		22.3
1K	24K	D5		3	10300	G16_SCHDU	0	58.1	2.2	8.2	36.9	42.9		22.3
1K	24K	D6		242	100	G16_SCHDU	0	58.1	-16.1	-10.1	20.6	24.6		22.3
1K	24K	D7		24	1450	G16_SCHDU	0	58.1	-7.1	-3.1	29.6	33.6		22.3
1K	24K	D8		90	400	G16_SCHDU	0	46.4	-4.5	-0.5	20.5	24.5		34.6
1K	24K		A2	1		G16_SCHDU	4	58.1	17.7	23.7	45.9	51.9		26.7

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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): No

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**Page 11:
Characteristics and
Certifications**

S15. SPACECRAFT PHYSICAL CHARACTERISTICS:

S15a. Mass of spacecraft without fuel (kg): 1859.3	Spacecraft Dimensions (meters)	Probability of Survival to End of Life (0.0 - 1.0)
S15b. Mass of fuel and disposables at launch (kg): 2545.8		
S15c. Mass of spacecraft and fuel at launch (kg): 4405.1	S15f. Length (m): 24.8	S15i. Payload: 0.91
S15d. Mass of fuel, in orbit, at beginning of life (kg): 716	S15g. Width (m): 6.4	S15j. Bus: 0.866
S15e. Deployed Area of Solar Array (square meters): 74.5	S15h. Height (m): 6.4	S15k. Total: 0.788

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): 7241	(f): 7241	(k): 7241	(p): 7241
Bus (Watts):	(b): 1900	(g): 966	(l): 1900	(q): 966
Total (Watts):	(c): 9141	(h): 8207	(m): 9141	(r): 8207
Solar Array (Watts):	(d): 10148	(i): 9218	(n): 9871	(s): 8965
Depth of Battery Discharge (%):	(e) 75 %	(j) %	(o) 77.6 %	(t) %

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.