FCC 312 Schedule S	FEDERAL COMMUNICATIONS COMMISSION SATELLITE SPACE STATION AUTHORIZATIONS (Technical and Operational Description)	Page 1: General, Frequency Bands, and GSO Orbit

S1. GENERAL INFORMATION Complete for all satellite applications.

a. Space Station or Satellite Network Name: VIASAT-89W		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:
c. Construction Completion Date:		g. Total Number of Transponders: 24	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) 2640 MHz	l. Orbit Type: Mark all boxes that apply: [X] 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)		
28600	M	29100	M	R	Fixed Satellite Service
18800	M	19300	M	T	Fixed Satellite Service

S3. ORBITAL INFORMATION FOR GEOSTATIONARY SATELLITES ONLY:

a. Nominal Orbital Longitude (Degrees E/W): 88.9 W	b. Alternate Orbital Longitude (Degrees E/W):		c. Reason for orbital location selection: The 88.9 W.L. location has been selected in order to avoid physical collision with an operational satellite at the 89 W.L. orbital location. It is also creates a two degree separation with a proposed Ka-band satellite network at 90.9 W.L.
Longitudinal Tolerance or E/W Station-Keeping: d. Toward West: 0.05 Degrees e. Toward East: 0.05 Degrees	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:	
i. Reason for service are selection (Optional):			

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S4. ORBITAL INFORMATION FOR NON-GEOSTATIONARY SATELLITES ONLY

S4a. Total Number of Satellites in Network or System:

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

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

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.
SA1	S		-6 dB contour of the uplink CONUS beam.
SA2	S		-6 dB contour of the downlink CONUS beam.
SA3	S		-6 dB contour of the uplink South American beam.
SA4	S		-6 dB contour of the downlink South American beam.

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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 Isolation (dB)	(h) Polarization Switchable? (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 Noice 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
NAR	R	35.5	29.5	0.12	0.12	30	N		SA1				795	6.5	-98.2	25	1
SARL	R	35.5	29.5	0.12	0.12	30	N		SA3				795	6.5	-98.2	25	1
NATL	T	35	29	0.12	0.12	30	N		SA2	1	15.9	47					
SAT	T	35	29	0.12	0.12	30	N		SA4	1	15.9	47					

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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
NAR	R	C	-88.9		NARR.gxt					
SARL	R	C	-88.9		SARL.gxt					
NATL	T	C	-88.9		NATL.gxt	-152.8	-153.3	-149.5	-144.3	-140.6
SAT	T	C	-88.9		SATR.gxt	-147.7	-146.2	-144	-141.6	-139.2

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S9. SPACE STATION CHANNELS For each frequency channel 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)
UL01	110000	R	28667	R	C
UL02	110000	R	28789	R	C
UL03	110000	R	28911	R	C
UL04	110000	R	29033	R	C
UL05	110000	R	28667	L	C
UL06	110000	R	28789	L	C
UL07	110000	R	28911	L	C
UL08	110000	R	29033	L	C
DL01	110000	T	18867	L	C
DL02	110000	T	18989	L	C
DL03	110000	T	19111	L	C
DL04	110000	T	19233	L	C
DL05	110000	T	18867	R	C
DL06	110000	T	18989	R	C
DL07	110000	T	19111	R	C
DL08	110000	T	19233	R	C

S10. SPACE STATION TRANSPONDERS For each transponder provide:

(a) Transponder ID	(b) Transponder Gain (dB)	Receive Band		Transmit Band	
		(c) Channel No.	(d) Beam ID	(e) Channel No.	(f) Beam ID
T0001	125.5	UL01	NARR	DL01	NATL
T0002	125.5	UL02	NARR	DL02	NATL
T0003	125.5	UL03	NARR	DL03	NATL
T0004	125.5	UL04	NARR	DL04	NATL
T0005	125.5	UL01	NARR	DL05	SATR
T0006	125.5	UL02	NARR	DL06	SATR
T0007	125.5	UL03	NARR	DL07	SATR
T0008	125.5	UL04	NARR	DL08	SATR
T0009	125.5	UL05	SARL	DL05	SATR
T0010	125.5	UL06	SARL	DL06	SATR
T0011	125.5	UL07	SARL	DL07	SATR
T0012	125.5	UL08	SARL	DL08	SATR
T0013	125.5	UL05	SARL	DL01	NATL
T0014	125.5	UL06	SARL	DL02	NATL
T0015	125.5	UL07	SARL	DL03	NATL
T0016	125.5	UL08	SARL	DL04	NATL

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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)
D1	110MG7D	110000	8	1711876	0.747		8.4	20.6
D2	110MG7D	110000	4	1217680	0.797		5.1	17.3
D3	25M0G7D	25000	8	38907	0.747		8.4	20.6
D4	25M0G7D	25000	4	20729	0.597		2.6	14.8

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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						

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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)			
								(i)Assoc. Stn. Max. Antenna Gain (dBi)	Assoc. Station Transmit Power (dBW)		EIRP (dBW)		(n) Max. Power Flux Density (dBW/m2/Hz)	(o)Assoc. Stn Rec. G/T (dB/K)
(a) Start	(b) End	(c) Digital (Table S11)	(d) Analog (Table S12)						(j) Min.	(k) Max.	(l) Min.	(m) Max.		
T0001	T0016	D1		1		LB1.doc		65	7	13	41	47	-134.9	38.2
T0001	T0016	D2		1		LB2.doc		65	2	8	41	47	-134.9	38.2
T0001	T0016	D3		4	27500	LB3.doc		65	3.2	9.2	32.5	38.5	-137	38.2
T0001	T0016	D4		4	27500	LB4.doc		65	-5.3	0.7	32.5	38.5	-137	38.2

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

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S15. SPACECRAFT PHYSICAL CHARACTERISTICS:

S15a: Mass of spacecraft without fuel (kg): 3370	Spacecraft Dimensions (meters)	Probability of Survival to End of Life (0.0 - 1.0)
S15b. Mass of fuel and disposables at launch (kg): 5193		
S15c. Mass of spacecraft and fuel at launch (kg): 8563	S15f. Length (m): 8.6	S15i. Payload: 0.882
S15d. Mass of fuel, in orbit, at beginning of life (kg): 1560	S15g. Width (m): 4.3	S15j. Bus: 0.858
S15e. Deployed Area of Solar Array (square meters): 86.7	S15h. Height (m): 8.6	S15k. Total: 0.757

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): 14880	(f): 14800	(k): 14800	(p): 14800
Bus (Watts):	(b): 2500	(g): 1350	(l): 2500	(q): 1350
Total (Watts):	(c): 17380	(h): 16230	(m) 17380	(r): 16230
Solar Array (Watts):	(d): 22596	(i): 20174	(n): 20677	(s): 18660
Depth of Battery Discharge (%):	(e) 73.2 %	(j) %	(o) 76.3 %	(t) %

S17. CERTIFICATIONS:

a. Are the power flux density limits of § 25.208 met?:		**YES**		**NO**	X	**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**	X	**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?	X	**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.