FCC 312	
<b>Schedule</b>	S

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

Page 1: General, Frequency Bands, and GSO Orbit

S1. 0	GENERAL	INFORMATION	Complete for al	l satellite	applications
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a. Space Station or Satellite No USASAT 30A	etwork Name:	e. Estimated Date of Placement into Service: 9/9/2014		i Will the space station(s) operate on a Common Carrier Basis:			
b. Construction Commenceme 9/1/2010	nt Date:	f. Estimated Lifetime of Satellite(s): 7.25 Y	'ears	j. Number of transponders offered on a common carrier basis:			
c. Construction Completion Da 4/13/2014	te:	g. Total Number of Transponders: 0		k. Total Common Carrier Transponder Bandwidth:  0 MHz			
d1. Est Launch Date Begin: 6/1/2014	d2. Est Launch Date End: 8/31/2014	h. Total Transponder Bandwidth (no. transponders 0	x Bandwidth) MHz	I. Orbit Type: Mark all boxes that apply:  GSO  X	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			f.
Lower Frequency (_	_Hz)	Upper Frequency (	_Hz)	e. T/R Mode	Nature of Service(s): List all that apply to this band
a. Numeric	b. Unit (K/M/G)	c. Numeric	d. Unit (K/M/G)		., .,
8025	M	8400	M	Т	Earth Exploration Satellite Service

S3. ORBITAL INFORMATION FOR GEOSTATIONARY SATELLITES ONLY:

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

S4b. Total Number of Orbital Planes in Network or System: 4 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.)	(I) Argument of Perigee (Degrees)	rvice Arc Rang (n) End Angle	
1	1	97.36	5670	521	506	156.763	90		
2	1	98.45	6013	795	780	156.251	90		
3	1								

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)			
1	1	0			
2	1	0			
3	1	0			

Page 2: NGSO Orbits

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)		(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.
0	S	0	0

Page 3: Service Areas

Page 4: Antenna Beams

FCC Form 312 - Schedule S: (Technical and Operational Description)

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

(a)	(b)	Isotropic	Antenna	(e)	(f)	(g) Min.	(h) Polar-	(i) Polarization	(j) Service		Transmit				Receive		
Beam	T/R	Ga			Rotational	Cross-	ization	Alignment Rel.	Area ID	(k) Input	(I) Effective	(m)	(n)	(o) G/T	(p) Min.	Input Attenu	uator (dB)
ID	Mode	(c) Peak		Error		Polar Iso-	Switch-	Equatorial		Losses	Output	Max.	System	Max.	Saturation	(q) Max.	(r) Step
		(dBi)	(dBi)	(Degrees)	(Degrees)	lation (dB)	able? (Y/N)	Plane (Degrees)		(dB)	Power (W)	EIRP (dBW)			Flux Density	Value	Size
							` '					` '	Temp (k)	(db/K)	(dBW/m2)		
WB-L	Т	27.6	26.6	1	0	24	Υ			6.2	2.4	30.5					
WB-R	T	27.6	26.6	1	0	24	Υ			6.2	2.4	30.5					
NB	Т	7	-10	0	0		N			5.8	2.3	10.6					
CMD	R	4	-10	0	0		N						580	-23.6	0		

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)	(b)	(c) Co-or	(d) GSO	(e) NGSO Antenna Gain	(f) GSO Antenna	Max. Power Flux Density (dBW/M2/Hz)  At Angle of Arrival above horizontal (for emission with highest P				
Beam	T/R	Cross	Ref.	Contour Description	7 (7 (1) glo 01 7 (1) Tul (1) above 110112011ta					hest PFD)
ID	Mode	Polar Mode ("C"	Orbital Longitude	(Figure/Table/ Exhibit)	(GXT File)	(g) 5 Deg	(h) 10 Deg	(i) 15 Deg	(j) 20 Deg	(k) 25 Deg
		or" X")	(Deg. E/W)							

Page 5: Beam Diagrams

Page 6: Channels and Transponders

FCC Form 312 - Schedule S: (Technical and Operational Description)

S9. SPACE STATION CHANNELS For each frequency channel provide:

e:	STU. SPACE	STATION II	RANSPU	שטאוי	:KS	For ea	cn tra	ınspon	aer pi	ovide:
					_			_		

(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)
WB-L	375000	Т	8185.0	L	С
WB-R	375000	Т	8185.0	R	С
NB-I	2695	T	8380.0	L	Т
NB-Q	5800	T	8380.0	L	Т
CMD	1316	R	2085.6875	R	T

(a)	(b)	Receive	Band	Transmit Band		
Transponder	Transponder	(c) Channel	(d) Beam	(e) Channel	(f) Beam ID	
ID	Gain (dB)	No.	ID	No.		

Page 7: Digital Modulation

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)
WB-L	375MG7D	375000	8	522600	0.871	0	24.7	26
WB-R	375MG7D	375000	8	522600	0.871	0	24.7	26
NB-I	2M70G7D	2695	2	32.768	0.5	0	11.2	32.5
NB-Q	5M80G7D	5800	2	524.8	0.5	0	11.2	32.5
CMD	1M32G1D	1316	2	64	1	0	18.8	

Page 8: Analog Modulation

FCC Form 312 - Schedule S: (Technical and Operational Description)

### S12. ANALOG MODULATION PARAMETERS For each analog emission provide:

(a)	(b) Emission	(c)	(d) Signal	(e)	Multi-channel Telephony			(j) Video	(k) Video	(I) Video	(m) SCPC/FM	(n) Total C/N	(o) Single	
Analog Mod. II		Assigned Bandwidth (kHz)	71 -	Channels per Carrier	(f) Ave. Companded Talker Level (dBm0)	(g) Bottom Baseband Freq. (MHz)	(h) Top Baseband Freq. (MHz)	(i) RMS Modulation Index	Standard NTSC, PAL, etc.	Noise- Weighting (dB)	and SCPC/FM Modulation Index	Compander, Preemphasis, and Noise Weighting (dB)	Performance Objective (dB)	Entry C/I Objective (dB)

Page 9: Typical Emissions

FCC Form 312 - Schedule S: (Technical and Operational Description)

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

-	sociated		ılation ID	(e) Carriers	( )	(0)	(3)	(3)	(h) Energy	Receive Band (Assoc. Transmit Stn)		Tra	nsmit Band	(This Space Stat	ion)
Transpoi	nder ID Range	(c) Digital	(d) Analog	per Transponder	Spacing (kHz)	Reference (Table No.)	Dispersal Bandwidth	(i)Assoc.	Assoc. Stati		EIRP	(dBW)	(n) Max. Power	( - )	
(a) Star	(b) End	(Table S11)	(Table S12)	·	,	<b>'</b>	(kHz)	Stn. Max. Antenna	Power (dBW)					Stn Rec. G/T	
								Gain (dBi)	(j) Min.	(k) Max.	(I) Min.	(m) Max.	(0.511/112/112)	(dB/K)	

# 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: 1601 Dry Creek Drive				
S14b. City: Longmont	S14c. County: Boulder		S14d. State/Country CO	S14e. Zip Code: 80503
Longmont	Doulder	_		00000
S14f. Telephone Number:		S14g. Call Sign of Control Stat	tion (if appropriate):	
303-684-4000				

### 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): 2403.4	Spacecraft Dimensions (meters)	Probability of Survival to End of Life (0.0 - 1.0)
S15b. Mass of fuel and disposables at launch (kg): 386.5		
S15c. Mass of spacecraft and fuel at launch (kg): 2789.9	S15f. Length (m): 7.118	S15i. Payload: 0.932
S15d. Mass of fuel, in orbit, at beginning of life (kg): 386.5	S15g. Width (m): 3.542	S15j. Bus: 0.8355
S15e. Deployed Area of Solar Array (square meters): 13.1	S15h. Height (m): 5.709	S15k. Total: 0.778

#### S16. SPACECRAFT ELECTRICAL CHARACTERISTICS:

Spacecraft Subsystem		ver (Watts) At ng of Life		ver (Watts) At of Life
	At Equinox	At Solstice	At Equinox	At Solstice
Payload (Watts):	<sup>(a):</sup> 480	<sup>(f):</sup> 480	<sup>(k):</sup> 480	<sup>(p):</sup> 480
Bus (Watts):	<sup>(b):</sup> 2640	<sup>(g):</sup> 2640	<sup>(l):</sup> 2640	<sup>(q):</sup> 2640
Total (Watts):	<sup>(c):</sup> 3120	<sup>(h):</sup> 3120	<sup>(m)</sup> 3120	<sup>(r):</sup> 3120
Solar Array (Watts):	<sup>(d):</sup> 3142	<sup>(i):</sup> 3142	<sup>(n):</sup> 3142	<sup>(s):</sup> 3142
Depth of Battery Discharge (%):	<sup>(e)</sup> 32 %	<sup>(j)</sup> 32 %	<sup>(o)</sup> 32 %	<sup>(t)</sup> 32 %

#### S17. CERTIFICATIONS:

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