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 I	INFORMATION	Complete for	all satellite	applications.
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a. Space Station or Satellite Network Name: USASAT-27M,31G	e. Estimated Date of Placement into Service: 7/17/2007	i Will the space station(s) operate on a Common Carrier Basis: N
b. Construction Commencement Date: 7/17/2004	f. Estimated Lifetime of Satellite(s): 12 Years	j. Number of transponders offered on a common carrier basis:
c. Construction Completion Date: 12/16/2006	g. Total Number of Transponders: 2	k. Total Common Carrier Transponder Bandwidth: MHz
d. Estimated Launch Date: 2/16/2007	h. Total Transponder Bandwidth (no. transponders x Bandwidth) 10 MHz	I. 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							
Lower Frequency	Lower Frequency (_Hz) Upper Frequency (_Hz)		_Hz)	e. T/R Mode	f. 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)		· · · · · · · · · · · · · · · · · · ·				
2000	M	2020	M	R	Mobile-Satellite Service				
2180	M	2200	М	Т	Mobile-Satellite Service				
28.35	G	28.60	G	R	Feeder Link for Mobile Satellite Service in FSS				
29.25	G	29.50	G	R	Feeder Link for Mobile Satellite Service in FSS				
18.30	G	18.80	G	Т	Feeder Link for Mobile Satellite Service in FSS				

S3. ORBITAL INFORMATION FOR GEOSTATIONARY SATELLITES ONLY:

a. Nominal Orbital Longitude 121 W	(Degrees E/\	W):	b. Alternate Orbital Longitude (Degrees E/W):					c. Reason for orbital location selection:			
Longitudinal Tolerance or E/\(^1\) d. Toward West: e. Toward East:		f. Inclination N/S Station-I Tolerance:		Range of orbital are in which provided (Optional): g. Westernmost: h. Easternmost:	ch adequate serv <u>Degrees</u>	ice can be <u>E/W</u>					
i. Reason for service are	. Reason for service are selection (Optional):										

Page 2: NGSO Orbits

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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	(f) No. of	(g) Inclination	(h) Orbital	(i) Apogee (km)	(j) Perigee (km)	(k) Right Ascension	(I) Argument of	Active Service Arc Range (Degre		e (Degrees)
Plane No.	Satellites in	Angle (degrees)	Period			of the Ascending	Perigee	(m) Begin	(n) End	(o) Other
	Plane		(Seconds)			Node (Deg.)	(Degrees)	Angle	Angle	. ,

S5. INITIAL SATELLITE PHASE ANGLE For each satellite in each orbital plane, provide the intital phase angle.

(a) Orbital	(b) Satellite	(c) Initial
Plane No.	Number	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)	(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.
CONUS	S	Continental United States
AK	S	Alaska
HI	S	Hawaii
PRC	S	Puerto Rico and Virgin Islands

Page 3: Service Areas

Page 4: Antenna Beams

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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	ain	Pointing	Rotational	Cross-	ization	Alignment Rel.	Area ID	(k)	(I) Effective	(m)	(n)	(o) G/T	(p) Min.	Input Attenu	uator (dB)
ID	Mode	(c) Peak (dBi)	(d) Edge (dBi)	Error (Degrees)	Error (Degrees)	Polar Iso- lation (dB)	Switch- able? (Y/N)	Equatorial Plane (Degrees)		Input Losses (dB)	Output Power (W)	Max. EIRP (dBW)	System Noice Temp (k)	Max. Gain Pt.	Saturation Flux Density (dBW/m2)	(q) Max. Value	(r) Step Size
1-153	T	45	44	0.1			N		CONUS	2.2	747	73					
1-153	R	44.5	43.5	0.1			N		CONUS				595	16	-138	10	1
154	Т	42	40	0.1			N		AK	2.2	93	61					
154	R	41.5	39.5	0.1			N		AK				595	13	-141	10	1
155	Т	40	39	0.1			N		HI	2.2	93	59					
155	R	39.5	38.5	0.1			N		HI				595	11	-143	10	1
156	Т	42	41	0.1			N		PRC	2.2	93	61					
156	R	41.5	40.5	0.1			N		PRC				595	13	-141	10	1

Page 5: Beam Diagrams

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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)	(b)	(c) Co-or	(d) GSO	(e) NGSO Antenna Gain	(f) GSO Antenna		Max. Power F	Flux Density (dB	W/M2/Hz)	
Beam	T/R	Cross	Ref.	Contour Description	Gain Contour Data	At Angle of	Arrival above ho	orizontal (for em	ission with high	hest PFD)
ID	Mode	Polar Mode ("C"	Orbital Longitude	(Figure/Table/ Exhibit)	/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 6: Channels and Transponders

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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)
STX	5000	T	2190	R	С
S RX1	5000	R	2010	R	С
S RX2	5000	R	2010	L	С
KA TX	500000	Т	18550	R	С
KA R1	250000	R	28475	L	С
KA R2	250000	R	29375	L	С

(a)	(b)	Receive	Band	Transmit Band		
Transponder ID	Transponder Gain (dB)	(c) Channel No.	(d) Beam ID	(e) Channel No.	(f) Beam ID	
FWD	130	KA R1	1-153	S TX	1-153	
RTN1	130	S RX1	1-153	KA TX	1-153	
RTN2	130	S RX2	1-153	KA TX	1-153	

Page 7: Digital Modulation

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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	Processing	(h) Total C/N Performance Objective (dB)	
TBD								

Page 8: Analog Modulation

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S12. ANALOG MODULATION PARAMETERS For each analog emission provide:

(a)	(b) Emission	(c)	(d) Signal	(e)	Multi-channel Telephony			u,	(k) Video	(I) Video	(m) SCPC/FM	` '	()	
Analog Mod. ID	Designator	Assigned Bandwidth (kHz)	Туре	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.	- 3 - 3	and SCPC/FM Modulation Index	Compander, Preemphasis, and Noise Weighting (dB)	Performance Objective (dB)	Entry C/I Objective (dB)
TBD														

Page 9: Typical Emissions

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

Associated		Modulation ID		(-,	()	(g)Noise Budget	(h) Energy	Receive Band (Assoc. Transmit Stn)			Transmit Band (This Space Station)			
(a) Start	Transponder ID Range (a) Start (b) End		(d) Analog (Table S12)	per Transponder	-1 3	Reference (Table No.)	Dispersal Bandwidth (kHz)	(i)Assoc. Stn. Max.	Assoc. Station Transmit Power (dBW)		EIRP (dBW)		Power Flux	(o)Assoc. Stn
(3)	,	S11)					, ,	Antenna Gain (dBi)	(j) Min.	(k) Max.	(I) Min.	(m) Max.	Density (dBW/m2/Hz)	Rec. G/T (dB/K)
TBD														

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Page 10: TT and C

1 CC Form 312 - Schedule 3. (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): Yes

Remote Control (TT C) Location(s):

S14a: Street Address:
To Be Determined

S14b. City:

S14c. County:

S14d. State/Country

S14e. Zip Code:

S14f. Telephone Number:

S14g. Call Sign of Control Station (if appropriate):

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Page 11: Characteristics and Certifications

S15. SPACECRAFT PHYSICAL CHARACTERISTICS:

S15a: Mass of spacecraft without fuel (kg): 2262	Spacecraft Dimensions (meters)	Probability of Survival to End of Life (0.0 - 1.0)
S15b. Mass of fuel and disposables at launch (kg): 5407		
S15c. Mass of spacecraft and fuel at launch (kg): 5401	S15f. Length (m): 2.7	S15i. Payload: 0.79
S15d. Mass of fuel, in orbit, at beginning of life (kg): 168	S15g. Width (m): 3.3	S15j. Bus: 0.89
S15e. Deployed Area of Solar Array (square meters): 45.6	S15h. Height (m): 5	S15k. Total: 0.7

S16. SPACECRAFT ELECTRICAL CHARACTERISTICS:

Spacecraft Subsystem		ver (Watts) At ng of Life	Electrical Power (Watts) At End of Life					
	At Equinox	At Solstice	At Equinox	At Solstice				
Payload (Watts):	^{(a):} 5927	^{(f):} 5927	^{(k):} 5927	^{(p):} 5927				
Bus (Watts):	^{(b):} 1899	^{(g):} 1034	^{(l):} 1899	^{(q):} 1034				
Total (Watts):	^{(c):} 7826	^{(h):} 6961	^(m) 7826	^{(r):} 6961				
Solar Array (Watts):	^{(d):} 10016	^{(i):} 8324	^{(n):} 9246	^{(s):} 7741				
Depth of Battery Discharge (%):	^(e) 76.8 %	^(j) 0 %	⁽⁰⁾ 76.8 %	^(t) 0 %				

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) me	?	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								

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