Approved by OMD Control Number 3060-0678
Estimated Burden Hours: 80

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: MSAT-1		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): 10 Years	j. Number of transponders offered on a common carrier basis:
c. Construction Completion Date:		g. Total Number of Transponders:	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) 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 opera
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)		
1530	M	1559	M	T	Mobile-Satellite Service
1631.5	M	1660.5	M	R	Mobile-Satellite Service
13	G	13.25	G	R	Feeder Link for Mobile Satellite Service in FSS
10.75	G	10.95	G	T	Feeder Link for Mobile Satellite Service in FSS
14.000	G	14.001	G	R	Satellite Command
14.499	G	14.5	G	R	Satellite Command
11.70085	G	11.70115	G	T	Satellite Telemetry
11.7026	G	11.7029	G	T	Satellite Telemetry

S3. ORBITAL INFORMATION FOR GEOSTATIONARY SATELLITES ONLY:

a. Nominal Orbital Longitude (Degrees E/W): 107.5 W	b. Alternate Orbital Longitude (Degrees E/W):		c. Reason for orbital location selection:
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: 6.5 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):			

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:

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

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.
LA1	S	MSAT-1-NAmericaSA.g	CONUS, Alaska, Canada and other as shown
LA2	S	MSAT-1-HI-SA.gxt	Hawaii
KU1	S	MSAT-1-Ku-SA.gxt	USA, Canada and other as shown
OMNI	S	MSAT-1-OMNI-SA.gxt	GLOBAL

FEDERAL COMMUNICATIONS COMMISSION **Page 4: Antenna Beams**
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 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
LE1	T			0.12	0.2				LA1			57.3					
LR1	R			0.12	0.2				LA1					3.2			
LE2	T			0.12	0.2				LA1			57.3					
LR2	R			0.12	0.2				LA1					3.2			
LE3	T			0.12	0.2				LA1			57.3					
LR3	R			0.12	0.2				LA1					3.2			
LE4	T			0.12	0.2				LA1			57.3					
LR4	R			0.12	0.2				LA1					3.2			
LE5	T			0.12	0.2				LA1			57.3					
LR5	R			0.12	0.2				LA1					-0.8			
LE6	T			0.12	0.2				LA2			57.3					
LR6	R			0.12	0.2				LA2					-0.8			
KU1E	T			0.12	0.2				KU1			36.2					
KU1R	R			0.12	0.2				KU1					-3.6			
OMNI	T			0.12	0.2				OMNI			7.4					
OMNI	R			0.12	0.2				OMNI					-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
LE1	T	C			LE1_E.gxt					
LR1	R	C			LE1_R.gxt					
LE2	T	C			LE2_E.gxt					
LR2	R	C			LE2_R.gxt					
LE3	T	C			LE3_E.gxt					
LR3	R	C			LE3_R.gxt					
LE4	T	C			LE4_E.gxt					
LR4	R	C			LE4_R.gxt					
LE5	T	C			LE5_E.gxt					
LR5	R	C			LE5_R.gxt					
LE6	T	C			LE6_E.gxt					
LR6	R	C			LE6_R.gxt					
KU1E	T	C			KU1_E.gxt					
KU1R	R	C			KU1_R.gxt					
OMNI	T	C			OMN_E.gxt					
OMNI	R	C			OMN_R.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:

(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)
KUD	200000	T	10850	V	C
KUU	200000	R	13125	H	C
LD	29000	T	1544.5	R	C
LU	29000	R	1646	R	C
THG1	300	T	11701	H	T
TOMN1	300	T	11701	V	T
COMHG	1000	R	14000.5	H	T
COMNI	1000	R	14449.5	V	T
THG2	300	T	11702.75	H	T
TOMN2	300	T	11702.75	V	T
BEAC1	1	T	10753.5	V	C
BEAC2	1	T	10751	V	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
FWD1	1	KUU	KU1R	LD	LE1
FWD2	1	KUU	KU1R	LD	LE2
FWD3	1	KUU	KU1R	LD	LE3
FWD4	1	KUU	KU1R	LD	LE4
FWD5	1	KUU	KU1R	LD	LE5
FWD6	1	KUU	KU1R	LD	LE6
RET1	1	LU	LR1	KUD	KU1E
RET2	1	LU	LR2	KUD	KU1E
RET3	1	LU	LR3	KUD	KU1E
RET4	1	LU	LR4	KUD	KU1E
RET5	1	LU	LR5	KUD	KU1E
RET6	1	LU	LR6	KUD	KU1E
CMDOM		COMNI	OMNIR		
CMDHG		COMHG	KU1R		
TELO1				TOMN1	OMNIE
TELO2				TOMN2	OMNIE
TELH1				THG1	KU1E
TELH2				THG2	KU1E
AFC1				BEAC1	KU1E
AFC2				BEAC2	KU1E

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)
CW1	1K00N	1						
GCS	6K00G1D	6						
MMS	5K00G1D	5						
DATAF	270KG1D	270						
DATA1	168KG1D	168						
DATA2	42K01D	42						
QPSKV	6K00G1D	6						

FEDERAL COMMUNICATIONS COMMISSION **Page 8: Analog Modulation**

SATELLITE SPACE STATION AUTHORIZATIONS

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

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						
TELE	300KG9W	300												
CMD	1M00GXD	1000												

FEDERAL COMMUNICATIONS COMMISSION **Page 9: Typical Emissions**
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		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.		
FWD1	FWD6	CW1										30		
FWD1	FWD6	GCS										34		
FWD1	FWD6	MMS										24.5		
FWD1	FWD6	DATAF										45		
RET1	RET6	CW1										9.1		
RET1	RET6	GCS										12.1		
RET1	RET6	MMS										-2.9		
RET1	RET6	DATAF										30		
CMDOM	CMDOM		CMD											
CMDHG	CMDHG		CMD											
TELO1	TELO2		TELEM									7.5		
TELH1	TELH2		TELEM									17.5		
AFC1	AFC2	CW1										10		
FWD1	FWD6	DATA1										34		
FWD1	FWD6	DATA2										32		
FWD1	FWD6	QPSKV										31		
RET1	RET6	DATA1										3.12		
RET1	RET6	DATA2										3.12		
RET1	RET6	QPSKV										8.8		

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

S15. SPACECRAFT PHYSICAL CHARACTERISTICS:

S16. SPACECRAFT ELECTRICAL CHARACTERISTICS:

S17. CERTIFICATIONS:

a. Are the power flux density limits of § 25.208 met?:	[X] **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?	[X] **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?	[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.

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