

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: INMARSAT 2GHZ		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): 12 Years	j. Number of transponders offered on a common carrier basis: 0
c. Construction Completion Date:		g. Total Number of Transponders: 1560	k. Total Common Carrier Transponder Bandwidth: 0 MHz
d1. Est Launch Date Begin:	d2. Est Launch Date End:	h. Total Transponder Bandwidth (no. transponders x Bandwidth) 390 MHz	l. Orbit Type: Mark all boxes that apply: <input checked="" type="checkbox"/> GSO <input type="checkbox"/> 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)		
2000	M	2020	M	R	Mobile-Satellite Service
2180	M	2200	M	T	Mobile-Satellite Service
13.8	G	14.0	G	R	Feeder Link for Mobile Satellite Service in FSS
11.5	G	11.7	G	T	Feeder Link for Mobile Satellite Service in FSS
13.9973	G	13.9987	G	R	Fixed Satellite Service
11.69791	G	11.69809	G	T	Fixed Satellite Service

S3. ORBITAL INFORMATION FOR GEOSTATIONARY SATELLITES ONLY:

a. Nominal Orbital Longitude (Degrees E/W): 113 W		b. Alternate Orbital Longitude (Degrees E/W):		c. Reason for orbital location selection: The orbital location was chosen because of feeder link spectrum availability and it provides reasonably high elevation angles to the majority of the service area. High elevation angles minimize the risk of signal blockage due to buildings and foliage.
Longitudinal Tolerance or E/W Station-Keeping:		f. Inclination Excursion or N/S Station-Keeping Tolerance:	Range of orbital are in which adequate service can be provided (Optional):	
d. Toward West:	0.05 Degrees	3 Degrees	g. Westernmost:	
e. Toward East:	0.05 Degrees		h. Easternmost:	
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.
SA1	S		CONUS, Alaska, Hawaii, Puerto Rico, U.S. Virgin Islands
SA2	S		CONUS

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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
SU	R	49	46	0.03	0.03	20	N		SA1				630	21		16	1
SD	T	49	46	0.03	0.03	20	N		SA1	4	1259	80					
KUH	R	27	24	0.1	0.1	30	N	0	SA2				625	-1		16	1
KUV	R	27	24	0.1	0.1	30	N	90	SA2				625	-1		16	1
KDH	T	27	24	0.1	0.1	30	N	0	SA2	2	31.6	42					
KDV	T	27	24	0.1	0.1	30	N	90	SA2	2	31.6	42					
OMN	R	0	-4	0.1	0.1	30	N	0	SA2				1100	-30.4			
OMN	R	0	-4	0.1	0.1	30	N	90	SA2				1100	-30.4			
OMN	T	0	-4	0.1	0.1	30	N	0	SA2	3	15.8	12					
OMN	T	0	-4	0.1	0.1	30	N	90	SA2	3	15.8	12					

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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
SU	R	C	-113		SU.GXT					
SD	T	C	-113		SD.GXT					
KUH	R	C	-113		KUH.GXT					
KUV	R	C	-113		KUV.GXT					
KDH	T	C	-113		KDH.GXT	-160.7	-160.4	-160.1	-159.8	-159.5
KDV	T	C	-113		KDV.GXT	-160.7	-160.4	-160.1	-159.8	-159.5
OMN	R	C	-113							
OMN	R	C	-113							
OMN	T	C	-113			-165.8	-165.8	-165.8	-165.8	-165.8
OMN	T	C	-113			-165.8	-165.8	-165.8	-165.8	-165.8

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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)
SU01	20000	R	2010	R	C
SD01	20000	T	2190	R	C
UL01	195000	R	13897.5	H	C
UL02	195000	R	13897.5	V	C
DL01	195000	T	11597.5	H	C
DL02	195000	T	11597.5	V	C
TC01	1400	R	13998	H	T
TC02	1400	R	13998	V	T
TC03	1400	R	13998	H	T
TC04	1400	R	13998	V	T
TM01	180	T	11698	H	T
TM02	180	T	11698	V	T
TM03	180	T	11698	H	T
TM04	180	T	11698	V	T

(a) Transponder ID	(b) Transponder Gain (dB)	Receive Band		Transmit Band	
		(c) Channel No.	(d) Beam ID	(e) Channel No.	(f) Beam ID
FL01	140	UL01	KUH	SD01	SD
FL02	140	UL02	KUV	SD01	SD
RL01	140	SU01	SU	DL01	KDH
RL02	140	SU01	SU	DL02	KDV
TC01		TC01	KUH		
TC02		TC02	KUV		
TC03		TC03	OMNUH		
TC04		TC04	OMNUV		
TM01				TM01	KDH
TM02				TM02	KDV
TM03				TM03	OMNDH
TM04				TM04	OMNDV

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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	500KG7W	500	4	160	0.25		-2.5	30
D2	500KG7W	500	4	320	0.5		1.1	27.3
D3	500KG7W	500	8	640	0.67		6.7	26.9
D4	500KD7W	500	16	960	0.75		10.3	26.8
D5	62K5G7W	62.5	4	20	0.25		-2.5	21.1
D6	125KG7W	125	4	80	0.5		1.1	24.8
D7	250KG7W	250	4	240	0.75		4.1	27.9
D8	500KD7W	500	8	720	0.75		8	32.1

Page 8: Analog Modulation

[illegible]

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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/m2/Hz)	(o) Assoc. Stn Rec. G/T (dB/K)
(a) Start	(b) End								(j) Min.	(k) Max.	(l) Min.	(m) Max.		
FL01	FL02	D1		390	500	FL-HH.doc		60.5	-0.2	2.8	51	54		-28
FL01	FL02	D2		390	500	FL-PM.doc		60.5	-2.8	0.2	48.3	51.3		-23
FL01	FL02	D3		390	500	FL-PT.doc		60.5	-3.2	-0.2	47.9	50.9		-17
FL01	FL02	D4		390	500	FL-NB.doc		60.5	-3.3	-0.3	47.7	50.7		-12
RL01	RL02	D5		3120	62.5	RL-HH.doc		-6	-0.9	2.1	-3.2	-0.2	-174.3	37
RL01	RL02	D6		1560	125	RL-PM.doc		-1	-0.7	2.3	3.5	6.5	-170.6	37
RL01	RL02	D7		780	250	RL-PT.doc		5	-1.6	1.4	9.6	12.6	-167.5	37
RL02	RL02	D8		166	500	RL-NB.doc		10.8	-1.2	1.8	16.8	19.8	-163.3	37
TC01	TC02		A1	1		TC-LB.doc		60.5	7.5	8.5				-4
TC03	TC04		A2	1		TC-OMN.doc		60.5	22.5	24.5				-30.4
TM01	TM02		A3	1		TM-LB.doc					17	20	-158.2	37
TM03	TM04		A4	1		TM-OMN.doc					8	12	-165.8	37

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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): Yes

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Page 11:
Characteristics and
Certifications

S15. SPACECRAFT PHYSICAL CHARACTERISTICS:

S15a. Mass of spacecraft without fuel (kg): 4200	Spacecraft Dimensions (meters)	Probability of Survival to End of Life (0.0 - 1.0)
S15b. Mass of fuel and disposables at launch (kg): 3300		
S15c. Mass of spacecraft and fuel at launch (kg): 7500	S15f. Length (m): 22	S15i. Payload: 0.74
S15d. Mass of fuel, in orbit, at beginning of life (kg): 500	S15g. Width (m): 56	S15j. Bus: 0.89
S15e. Deployed Area of Solar Array (square meters): 113	S15h. Height (m): 20	S15k. Total: 0.66

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): 14000	(f): 14000	(k): 14000	(p): 14000
Bus (Watts):	(b): 1200	(g): 800	(l): 1200	(q): 800
Total (Watts):	(c): 15200	(h): 14800	(m): 15200	(r): 14800
Solar Array (Watts):	(d): 17800	(i): 16700	(n): 16900	(s): 15300
Depth of Battery Discharge (%):	(e) 72 %	(j) %	(o) 72 %	(t) 72 %

S17. CERTIFICATIONS:

a. Are the power flux density limits of § 25.208 met?:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> 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?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> 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?	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> 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.