

**S1. GENERAL INFORMATION** Complete for all satellite applications.

a. Space Station or Satellite Network Name: SATCOM SN-4		e. Estimated Date of Placement into Service: 6/18/1991		i. Will the space station(s) operate on a Common Carrier Basis: N	
b. Construction Commencement Date:		f. Estimated Lifetime of Satellite(s): 1 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) 1296 MHz		i. 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)		
5925	M	6425	M	R	Fixed Satellite Service
3700	M	4200	M	T	Fixed Satellite Service
14.00	G	14.50	G	R	Fixed Satellite Service
11.70	G	12.20	G	T	Fixed Satellite Service

**S3. ORBITAL INFORMATION FOR GEOSTATIONARY SATELLITES ONLY:**

a. Nominal Orbital Longitude (Degrees E/W): 172 E		b. Alternate Orbital Longitude (Degrees E/W):		c. Reason for orbital location selection:	
Longitudinal Tolerance or E/W Station-Keeping:		f. Inclination Excursion or N/S Station-Keeping Tolerance: Degrees	Range of orbital are in which adequate service can be provided (Optional): Degrees      E/W		
d. Toward West:      0.1 Degrees	e. Toward East:      0.1 Degrees		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:

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)

**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.
POR-C-UL	E		Pacific Ocean Region, G/T contours, Service area: -9 dB/K contour
POR-C-DL	E		Pacific Ocean Region, EIRP contours, Service area: 28 dBW contour
POR-KU-UL	E		Pacific Ocean Region, G/T contours, Service area: -6 dB/K contour
POR-KU-DL	E		Pacific Ocean Region, EIRP contours, Service area: 33 dBW contour
N/A			
N/A			

**FEDERAL COMMUNICATIONS COMMISSION**  
**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 Iso- lation (dB)	(h) Polar- ization Switch- able? (Y/N)	(i) Polarization Alignment Rel. Equatorial Plane (Degrees)	(j) Service Area ID	Transmit			Receive			Input Attenuator (dB)	
		(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)	(q) Max. Value	(r) Step Size
CRV	R	27.8	22.8	0.15	0	30	N	90	POR-C-UL				760	-1.1	-83	3	3
CTH	T	29.5	24.5	0.15	0	30	N	0	POR-C-DL	1	6.8	37.8					
CTV	T	28.2	13.2	0.15	0	30	N	90	POR-C-DL	1	6.8	36.5					
KRV	R	31.6	16.6	0.15	0	30	N	90	POR-KU-				891	2.1	-87	6	6
KTH	T	33.3	18.3	0.15	0	30	N	0	POR-KU-	1	23.9	47.1					

**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
CRH	R	C	172		CRH.gxt					
CRV	R	C	172		CRV.gxt					
CTH	T	C	172		CTH.gxt	-156	-156	-156	-156	-156
CTV	T	C	172		CTV.gxt	-157.8	-157.8	-157.8	-157.8	-157.8
KRV	R	C	172		KRV.gxt					
KTH	T	C	172		KTH.gxt	-151	-151	-151	-151	-151

**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: 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)
C1R	36000	R	5945	H	C
C2R	36000	R	5985	H	C
C3R	36000	R	6025	H	C
C4R	36000	R	6065	H	C
C5R	36000	R	6105	H	C
C6R	36000	R	6145	H	C
C7R	36000	R	5965	V	C
C8R	36000	R	6005	V	C
C9R	36000	R	6045	V	C
C10R	36000	R	6085	V	C
C11R	36000	R	6125	V	C
C12R	36000	R	6165	V	C
C13R	72000	R	6205	H	C
C14R	72000	R	6285	H	C
C15R	72000	R	6365	H	C
C16R	72000	R	6225	V	C
C17R	72000	R	6305	V	C
C18R	72000	R	6385	V	C
K1R	72000	R	14040	V	C
K2R	72000	R	14120	V	C
K3R	72000	R	14200	V	C
K4R	72000	R	14280	V	C
K5R	72000	R	14360	V	C
K6R	72000	R	14440	V	C
C1T	36000	T	3720	V	C
C2T	36000	T	3760	V	C
C3T	36000	T	3800	V	C
C4T	36000	T	3840	V	C
C5T	36000	T	3880	V	C
C6T	36000	T	3920	V	C

(a) Transponder ID	(b) Transponder Gain (dB)	Receive Band		Transmit Band	
		(c) Channel No.	(d) Beam ID	(e) Channel No.	(f) Beam ID
C1	106	C1R	CRH	C1T	CTV
C2	106	C2R	CRH	C2T	CTV
C3	106	C3R	CRH	C3T	CTV
C4	106	C4R	CRH	C4T	CTV
C5	106	C5R	CRH	C5T	CTV
C6	106	C6R	CRH	C6T	CTV
C7	108	C7R	CRV	C7T	CTH
C8	108	C8R	CRV	C8T	CTH
C9	108	C9R	CRV	C9T	CTH
C10	108	C10R	CRV	C10T	CTH
C11	108	C11R	CRV	C11T	CTH
C12	108	C12R	CRV	C12T	CTH
C13	106	C13R	CRH	C13T	CTV
C14	106	C14R	CRH	C14T	CTV
C15	106	C15R	CRH	C15T	CTV
C16	108	C16R	CRV	C16T	CTH
C17	108	C17R	CRV	C17T	CTH
C18	108	C18R	CRV	C18T	CTH
K1	114	K1R	KRV	K1T	KTH
K2	114	K2R	KRV	K2T	KTH
K3	114	K3R	KRV	K3T	KTH
K4	114	K4R	KRV	K4T	KTH
K5	114	K5R	KRV	K5T	KTH
K6	114	K6R	KRV	K6T	KTH

C7T	36000	T	3740	H	C
C8T	36000	T	3780	H	C
C9T	36000	T	3820	H	C
C10T	36000	T	3860	H	C
C11T	36000	T	3900	H	C
C12T	36000	T	3940	H	C
C13T	72000	T	3980	V	C
C14T	72000	T	4060	V	C
C15T	72000	T	4140	V	C
C16T	72000	T	4000	H	C
C17T	72000	T	4080	H	C
C18T	72000	T	4160	H	C
K1T	72000	T	11740	H	C
K2T	72000	T	11820	H	C
K3T	72000	T	11900	H	C
K4T	72000	T	11980	H	C
K5T	72000	T	12060	H	C
K6T	72000	T	12140	H	C

**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)
A	36M0G7W	36000	4	40000	0.691		6.8	19
B	6M95G1W	6950	4	8000	0.691		6.8	19
C	36M0G7W	36000	8	60000	0.614		9.9	22.1
D	36M0G7W	36000	16	110000	0.806		16.6	28.8
E	100KG1W	100	4	56	0.691		6.8	19
F	1M35G7W	1350	4	1544	0.691		6.8	19



**FEDERAL COMMUNICATIONS COMMISSION**  
**SATELLITE SPACE STATION AUTHORIZATIONS**  
**FCC Form 312 - Schedule S: (Technical and Operational Description)**

**Page 8: Analog Modulation**

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						
G	36M0F3F	36000	TV/FM	1					NTSC	12.8	1.29		12	26

**FEDERAL COMMUNICATIONS COMMISSION**  
**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 (a) Start (b) End		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) (j) Min. (k) Max.		EIRP (dBW) (l) Min. (m) Max.		(n) Max. Power Flux Density (dBW/m <sup>2</sup> /Hz)	(o) Assoc. Stn Rec. G/T (dB/K)
C1	C18	A		1		C_band_link_b		53.7	26	30	31	37	-165.1	23
C1	C18	B		5	6950	C_band_link_b		47.3	13	17	20	26	-168.9	23
C1	C18	C		1		C_band_link_b		53.7	26	30	31	37	-165.1	23
C1	C18	D		1		C_band_link_b		53.7	26	30	31	37	-165.1	29
C1	C18	E		360	100	C_band_link_b		47.3	6	10	1.4	7.4	-169.1	23
C1	C18	F		26	1350	C_band_link_b		47.3	13	17	12.9	18.9	-169	23
C1	C18		G	1		C_band_link_b	6000	53.7	22.5	26.5	31	37	-157.3	23
K1	K6	A		1		Ku_band_link_		57.2	26	30	37.5	47.5	-154.6	25.6
K1	K6	B		5	6950	Ku_band_link_		52.8	13	17	26.5	36.5	-158.4	25.6
K1	K6	C		1		Ku_band_link_		57.2	26	30	37.5	47.5	-154.6	25.6
K1	K6	D		1		Ku_band_link_		57.2	26	30	37.5	47.5	-154.6	35.6
K1	K6	E		360	100	Ku_band_link_		46.6	6	10	7.9	17.9	-158.6	25.6
K1	K6	F		26	1350	Ku_band_link_		52.8	13	17	19.4	29.4	-158.5	25.6
K1	K6		G	1		Ku_band_link_	6000	59.1	22.5	26.5	38	43	-151.3	25.6

**FEDERAL COMMUNICATIONS COMMISSION  
SATELLITE SPACE STATION AUTHORIZATIONS  
FCC Form 312 - Schedule S: (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): #Error

**Remote Control (TT C) Location(s):**

S14a: Street Address: Woodbine TT&C			
S14b. City: Mt. Airy	S14c. County:	S14d. State/Country MD	S14e. Zip Code: 21771
S14f. Telephone Number: 4105494300		S14g. Call Sign of Control Station (if appropriate): E7169	

**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): 572	Spacecraft Dimensions (meters)	Probability of Survival to End of Life (0.0 - 1.0)
S15b. Mass of fuel and disposables at launch (kg): 623		
S15c. Mass of spacecraft and fuel at launch (kg): 692	S15f. Length (m): 11.7	S15i. Payload: 0.5
S15d. Mass of fuel, in orbit, at beginning of life (kg): 120	S15g. Width (m): 1.6	S15j. Bus: 0.88
S15e. Deployed Area of Solar Array (square meters): 11.7	S15h. Height (m): 3	S15k. Total: 0.44

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): 1054	(f): 1054	(k): 1054	(p): 1054
Bus (Watts):	(b): 152	(g): 126	(l): 142	(q): 116
Total (Watts):	(c): 1206	(h): 1180	(m): 1196	(r): 1170
Solar Array (Watts):	(d): 1794	(i): 1631	(n): 1433	(s): 1303
Depth of Battery Discharge (%):	(e) 68 %	(j) 68 %	(o) 67 %	(t) 67 %

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 checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input 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.**