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:		e. Estimated Date of Placement into Service:	i Will the space station(s) operate on a Common Carrier Basis:
CIEL-2		1/10/2009	N
b. Construction Commencement Date:		f. Estimated Lifetime of Satellite(s):	j. Number of transponders offered on a common carrier basis:
3/6/2006		15 Years	0
c. Construction Completion Date:		g. Total Number of Transponders:	k. Total Common Carrier Transponder Bandwidth:
11/3/2008		161	0 MHz
d1. Est Launch Date Begin:	d2. Est Launch Date End:	h. Total Transponder Bandwidth (no. transponders x Bandwidth)	l. Orbit Type: Mark all boxes that apply:
12/6/2008	1/31/2009	4025 MHz	[X] 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				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)		
17.3	G	17.8	G	R	Feeder Link for Broadcasting Satellite Service in FSS
12.2	G	12.7	G	T	Broadcasting Satellite Service - Data
12.2	G	12.7	G	T	Broadcasting Satellite Service - Sound
12.2	G	12.7	G	T	Broadcasting Satellite Service - Video

S3. ORBITAL INFORMATION FOR GEOSTATIONARY SATELLITES ONLY:

a. Nominal Orbital Longitude (Degrees E/W):	b. Alternate Orbital Longitude (Degrees E/W):		c. Reason for orbital location selection:
128.85 W			Orbital location assigned to Canada for BSS operations.
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: 0.1 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):			

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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

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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)	(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.
CONUS	S	SA_CONUS-10DB.gxt	-10DB CONTOUR CONUS
CANADA	S	SA_CAN-10DB.gxt	-10DB CONTOUR CANADA
SB01	S	SA_SB01.gxt	-10DB CONTOUR SB01
SB04	S	SA_SB04.gxt	-10DB CONTOUR SB04
SB05	S	SA_SB05.gxt	-10DB CONTOUR SB05
SB06	S	SA_SB06.gxt	-10DB CONTOUR SB06
SB07	S	SA_SB07.gxt	-10DB CONTOUR SB07
SB08	S	SA_SB08.gxt	-10DB CONTOUR SB08
SB09	S	SA_SB09.gxt	-10DB CONTOUR SB09
SB10	S	SA_SB10.gxt	-10DB CONTOUR SB10
SB11	S	SA_SB11.gxt	-10DB CONTOUR SB11
SB12	S	SA_SB12.gxt	-10DB CONTOUR SB12
SB13	S	SA_SB13.gxt	-10DB CONTOUR SB13
SB14	S	SA_SB14.gxt	-10DB CONTOUR SB14
SB15	S	SA_SB15.gxt	-10DB CONTOUR SB15
SB16	S	SA_SB16.gxt	-10DB CONTOUR SB16
SB17	S	SA_SB17.gxt	-10DB CONTOUR SB17
SB18	S	SA_SB18.gxt	-10DB CONTOUR SB18
SB19	S	SA_SB19.gxt	-10DB CONTOUR SB19
SB20	S	SA_SB20.gxt	-10DB CONTOUR SB20
SB21	S	SA_SB21.gxt	-10DB CONTOUR SB21
SB22	S	SA_SB22.gxt	-10DB CONTOUR SB22
SB23	S	SA_SB23.gxt	-10DB CONTOUR SB23
SB24	S	SA_SB24.gxt	-10DB CONTOUR SB24
SB25	S	SA_SB25.gxt	-10DB CONTOUR SB25
SB26	S	SA_SB26.gxt	-10DB CONTOUR SB26
SB27	S	SA_SB27.gxt	-10DB CONTOUR SB27
SB28	S	SA_SB28.gxt	-10DB CONTOUR SB28
SB29	S	SA_SB29.gxt	-10DB CONTOUR SB29
SB30	S	SA_SB30.gxt	-10DB CONTOUR SB30

SB31	S	SA_SB31.gxt	-10DB CONTOUR SB31
SB32	S	SA_SB32.gxt	-10DB CONTOUR SB32
SB33	S	SA_SB33.gxt	-10DB CONTOUR SB33
SB34	S	SA_SB34.gxt	-10DB CONTOUR SB34
SB35	S	SA_SB35.gxt	-10DB CONTOUR SB35
SB36	S	SA_SB36.gxt	-10DB CONTOUR SB36
SB37	S	SA_SB37.gxt	-10DB CONTOUR SB37
SB38	S	SA_SB38.gxt	-10DB CONTOUR SB38
SB39	S	SA_SB39.gxt	-10DB CONTOUR SB39
SB40	S	SA_SB40.gxt	-10DB CONTOUR SB40
SB41	S	SA_SB41.gxt	-10DB CONTOUR SB41
SB42	S	SA_SB42.gxt	-10DB CONTOUR SB42
SB43	S	SA_SB43.gxt	-10DB CONTOUR SB43
SB44	S	SA_SB44.gxt	-10DB CONTOUR SB44
SB45	S	SA_SB45.gxt	-10DB CONTOUR SB45
SB46	S	SA_SB46.gxt	-10DB CONTOUR SB46
SB47	S	SA_SB47.gxt	-10DB CONTOUR SB47
SB48	S	SA_SB48.gxt	-10DB CONTOUR SB48
SB49	S	SA_SB49.gxt	-10DB CONTOUR SB49
SB50	S	SA_SB50.gxt	-10DB CONTOUR SB50
SB51	S	SA_SB51.gxt	-10DB CONTOUR SB51
SB52	S	SA_SB52.gxt	-10DB CONTOUR SB52
SB53	S	SA_SB53.gxt	-10DB CONTOUR SB53
SB54	S	SA_SB54.gxt	-10DB CONTOUR SB54
SB55	S	SA_SB55.gxt	-10DB CONTOUR SB55
TTC01T	S	TLM_SA.gxt	-20dB CONTOUR
TTC02C	S	Global_CMD.gxt	-10dB CONTOUR
R01	S	SA_R01.gxt	-10dB CONTOUR R01 Cheyenne
R02	S	SA_R02.gxt	-10dB CONTOUR R02 Gilbert
R08	S	SA_R08.gxt	-10dB CONTOUR R08 Calgary
R09	S	SA_R09.gxt	-10dB CONTOUR R09 Vancouver
R10	S	SA_R10.gxt	-10dB CONTOUR R10 Toronto
UL1	S	SA_UL01.gxt	-10dB CONTOUR UL01 Cheyenne
UL6	S	SA_UL06.gxt	-10dB CONTOUR UL06 Gilbert
UL21	S	SA_UL21.gxt	-10dB CONTOUR UL21 New Braunfels
UL31	S	SA_UL31.gxt	-10dB CONTOUR UL31 Monee
UL38	S	SA_UL38.gxt	-10dB CONTOUR UL38 Spokane
UL44	S	SA_UL44.gxt	-10dB CONTOUR UL44 Mt Jackson

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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
R01	R	50.64	40.64	0.05	0.2	30	N	0	R01				1202	8	-96	20	0.5
R02	R	50.74	40.74	0.05	0.2	30	N	0	R02				1175	8	-96	20	0.5
R08	R	47.63	37.63	0.05	0.2	30	N	0	R08				2338	8	-96	20	0.5
R09	R	49.95	39.95	0.05	0.2	30	N	0	R09				2338	8	-96	20	0.5
R10	R	51.11	41.11	0.05	0.2	30	N	0	R10				2338	8	-96	20	0.5
UL1	R	50.9	40.9	0.05	0.2	30	N	0	UL1				1202	8	-96	20	0.5
UL6	R	50.9	40.9	0.05	0.2	30	N	0	UL6				1175	8	-96	20	0.5
UL21	R	50.8	40.8	0.05	0.2	30	N	0	UL21				770	8	-96	20	0.5
UL31	R	51.1	41.1	0.05	0.2	30	N	0	UL31				770	8	-96	20	0.5
UL38	R	50.7	40.7	0.05	0.2	30	N	0	UL38				770	8	-96	20	0.5
UL44	R	51.5	41.5	0.05	0.2	30	N	0	UL44				770	8	-96	20	0.5
CAN	T	36.46	26.46	0.11	0.2	30	N	0	CANADA	2.7	91.2	56.06					
CAN	T	40.03	30.03	0.11	0.2	30	N	0	CONUS	2.7	154.88	61.93					
SB1	T	45.27	35.27	0.05	0.2	30	N	0	SB01	2.7	14.79	56.97					
SB4	T	48.58	38.58	0.05	0.2	30	N	0	SB04	2.7	6.31	56.58					
SB5	T	48.42	38.42	0.05	0.2	30	N	0	SB05	2.7	7.24	57.02					
SB6	T	48.89	38.89	0.05	0.2	30	N	0	SB06	2.7	6.92	57.29					
SB7	T	48.62	38.62	0.05	0.2	30	N	0	SB07	2.7	17.38	61.02					
SB8	T	48.7	38.7	0.05	0.2	30	N	0	SB08	2.7	7.24	57.3					
SB9	T	48.46	38.46	0.05	0.2	30	N	0	SB09	2.7	15.49	60.36					
SB10	T	48.93	38.93	0.05	0.2	30	N	0	SB10	2.7	9.55	58.73					
SB11	T	49.01	39.01	0.05	0.2	30	N	0	SB11	2.7	5.01	56.01					
SB12	T	49.31	39.31	0.05	0.2	30	N	0	SB12	2.7	4.79	56.11					
SB13	T	48.46	38.46	0.05	0.2	30	N	0	SB13	2.7	7.24	57.06					
SB14	T	49.36	39.36	0.05	0.2	30	N	0	SB14	2.7	11.48	59.96					
SB15	T	48.72	38.72	0.05	0.2	30	N	0	SB15	2.7	10.47	58.92					
SB16	T	49.1	39.1	0.05	0.2	30	N	0	SB16	2.7	6.76	57.4					
SB17	T	47.8	37.8	0.05	0.2	30	N	0	SB17	2.7	7.76	56.7					
SB18	T	48.72	38.72	0.05	0.2	30	N	0	SB18	2.7	17.78	61.22					

SB19	T	48.69	38.69	0.05	0.2	30	N	0	SB19	2.7	12.59	59.69						
SB20	T	48.4	38.4	0.05	0.2	30	N	0	SB20	2.7	9.77	58.3						
SB21	T	48.2	38.2	0.05	0.2	30	N	0	SB21	2.7	7.94	57.2						
SB22	T	48.21	38.2	0.05	0.2	30	N	0	SB22	2.7	10.23	58.31						
SB23	T	47.78	37.78	0.05	0.2	30	N	0	SB23	2.7	11.75	58.48						
SB24	T	48.09	38.09	0.05	0.2	30	N	0	SB24	2.7	12.02	58.89						
SB25	T	48.01	38.01	0.05	0.2	30	N	0	SB25	2.7	8.91	57.51						
SB26	T	47.82	37.82	0.05	0.2	30	N	0	SB26	2.7	12.3	58.72						
SB27	T	49.28	39.28	0.05	0.2	30	N	0	SB27	2.7	5.37	56.58						
SB28	T	47.98	37.98	0.05	0.2	30	N	0	SB28	2.7	6.76	56.28						
SB29	T	48.67	38.67	0.05	0.2	30	N	0	SB29	2.7	9.33	58.37						
SB30	T	48.43	38.43	0.05	0.2	30	N	0	SB30	2.7	9.55	58.23						
SB31	T	47.81	37.81	0.05	0.2	30	N	0	SB31	2.7	10.47	58.01						
SB32	T	48.64	38.64	0.05	0.2	30	N	0	SB32	2.7	5.01	55.64						
SB33	T	48.8	38.8	0.05	0.2	30	N	0	SB33	2.7	7.08	57.3						
SB34	T	48.77	38.77	0.05	0.2	30	N	0	SB34	2.7	12.3	59.67						
SB35	T	49.09	39.09	0.05	0.2	30	N	0	SB35	2.7	18.62	61.79						
SB36	T	48.45	38.45	0.05	0.2	30	N	0	SB36	2.7	9.12	58.05						
SB37	T	48.51	38.51	0.05	0.2	30	N	0	SB37	2.7	10.72	58.81						
SB38	T	48.14	38.14	0.05	0.2	30	N	0	SB38	2.7	13.8	59.54						
SB39	T	47.95	37.95	0.05	0.2	30	N	0	SB39	2.7	13.18	59.15						
SB40	T	48.62	38.62	0.05	0.2	30	N	0	SB40	2.7	11.22	59.12						
SB41	T	48.16	38.16	0.05	0.2	30	N	0	SB41	2.7	9.55	57.96						
SB42	T	48.61	38.61	0.05	0.2	30	N	0	SB42	2.7	12.3	59.51						
SB43	T	47.92	37.92	0.05	0.2	30	N	0	SB43	2.7	12.3	58.82						
SB44	T	48.59	38.59	0.05	0.2	30	N	0	SB44	2.7	8.71	57.99						
SB45	T	49.42	39.42	0.05	0.2	30	N	0	SB45	2.7	7.08	57.92						
SB46	T	49.13	39.13	0.05	0.2	30	N	0	SB46	2.7	7.08	57.63						
SB47	T	49.16	39.16	0.05	0.2	30	N	0	SB47	2.7	8.32	58.36						
SB48	T	48.96	38.96	0.05	0.2	30	N	0	SB48	2.7	11.22	59.46						
SB49	T	48.06	38.06	0.05	0.2	30	N	0	SB49	2.7	10.72	58.36						
SB50	T	48.63	38.63	0.05	0.2	30	N	0	SB50	2.7	10.47	58.83						
SB51	T	48.1	38.1	0.05	0.2	30	N	0	SB51	2.7	14.13	59.6						
SB52	T	48.29	38.29	0.05	0.2	30	N	0	SB52	2.7	8.71	57.69						
SB53	T	48.58	38.58	0.05	0.2	30	N	0	SB53	2.7	11.22	59.08						
SB54	T	48.83	38.83	0.05	0.2	30	N	0	SB54	2.7	12.59	59.83						
SB55	T	44.79	34.79	0.05	0.2	30	N	0	SB55	2.7	9.12	54.39						
TTC1	T	40.14	20.14	0.05	0.2	30	N	0	TTC01T	2.7	0.001	10						
TTC2	R	26.48	16.48	0.05	0.2	30	N	0	TTC02C				577	-0.8	-92	30	0.5	

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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) 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
SB1	T	C	-128.85		CO_SB01.gxt					
SB4	T	C	-128.85		CO_SB04.gxt					
SB5	T	C	-128.85		CO_SB05.gxt					
SB6	T	C	-128.85		CO_SB06.gxt					
SB7	T	C	-128.85		CO_SB07.gxt					
SB8	T	C	-128.85		CO_SB08.gxt					
SB9	T	C	-128.85		CO_SB09.gxt					
SB10	T	C	-128.85		CO_SB10.gxt					
SB11	T	C	-128.85		CO_SB11.gxt					
SB12	T	C	-128.85		CO_SB12.gxt					
SB13	T	C	-128.85		CO_SB13.gxt					
SB14	T	C	-128.85		CO_SB14.gxt					
SB15	T	C	-128.85		CO_SB15.gxt					
SB16	T	C	-128.85		CO_SB16.gxt					
SB17	T	C	-128.85		CO_SB17.gxt					
SB18	T	C	-128.85		CO_SB18.gxt					
SB19	T	C	-128.85		CO_SB19.gxt					
SB20	T	C	-128.85		CO_SB20.gxt					
SB21	T	C	-128.85		CO_SB21.gxt					
SB22	T	C	-128.85		CO_SB22.gxt					
SB23	T	C	-128.85		CO_SB23.gxt					
SB24	T	C	-128.85		CO_SB24.gxt					
SB25	T	C	-128.85		CO_SB25.gxt					
SB26	T	C	-128.85		CO_SB26.gxt					
SB27	T	C	-128.85		CO_SB27.gxt					
SB28	T	C	-128.85		CO_SB28.gxt					
SB29	T	C	-128.85		CO_SB29.gxt					
SB30	T	C	-128.85		CO_SB30.gxt					

SB31	T	C	-128.85		CO_SB31.gxt					
SB32	T	C	-128.85		CO_SB32.gxt					
SB33	T	C	-128.85		CO_SB33.gxt					
SB34	T	C	-128.85		CO_SB34.gxt					
SB35	T	C	-128.85		CO_SB35.gxt					
SB36	T	C	-128.85		CO_SB36.gxt					
SB37	T	C	-128.85		CO_SB37.gxt					
SB38	T	C	-128.85		CO_SB38.gxt					
SB39	T	C	-128.85		CO_SB39.gxt					
SB40	T	C	-128.85		CO_SB40.gxt					
SB41	T	C	-128.85		CO_SB41.gxt					
SB42	T	C	-128.85		CO_SB42.gxt					
SB43	T	C	-128.85		CO_SB43.gxt					
SB44	T	C	-128.85		CO_SB44.gxt					
SB45	T	C	-128.85		CO_SB45.gxt					
SB46	T	C	-128.85		CO_SB46.gxt					
SB47	T	C	-128.85		CO_SB47.gxt					
SB48	T	C	-128.85		CO_SB48.gxt					
SB49	T	C	-128.85		CO_SB49.gxt					
SB50	T	C	-128.85		CO_SB50.gxt					
SB51	T	C	-128.85		CO_SB51.gxt					
SB52	T	C	-128.85		CO_SB52.gxt					
SB53	T	C	-128.85		CO_SB53.gxt					
SB54	T	C	-128.85		CO_SB54.gxt					
SB55	T	C	-128.85		CO_SB55.gxt					
R01	R	C	-128.85		CO_R01.gxt					
R02	R	C	-128.85		CO_R02.gxt					
UL1	R	C	-128.85		CO_UL01.gxt					
UL6	R	C	-128.85		CO_UL06.gxt					
UL21	R	C	-128.85		CO_UL21.gxt					
UL31	R	C	-128.85		CO_UL31.gxt					
UL38	R	C	-128.85		CO_UL38.gxt					
UL44	R	C	-128.85		CO_UL44.gxt					
CAN	T	C	-128.85		CO_CONUS.gxt					
CAN	T	C	-128.85		CO_CAN.gxt					
R08	R	C	-128.85		CO_R08.gxt					
R09	R	C	-128.85		CO_R09.gxt					
R10	R	C	-128.85		CO_R10.gxt					
TTC1	T	C	-128.85		CO_TELEMETRY.gxt					

TTC2	R	C	-128.85		CO_COMMAND.gxt					

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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)
RX002	24000	R	17338.58	L	C
RX004	24000	R	17367.74	L	C
RX006	24000	R	17396.9	L	C
RX008	24000	R	17426.06	L	C
RX010	24000	R	17455.22	L	C
RX012	24000	R	17484.38	L	C
RX014	24000	R	17513.54	L	C
RX016	24000	R	17542.7	L	C
RX018	24000	R	17571.86	L	C
RX020	24000	R	17601.02	L	C
RX022	24000	R	17630.18	L	C
RX024	24000	R	17659.34	L	C
RX026	24000	R	17688.5	L	C
RX028	24000	R	17717.66	L	C
RX030	24000	R	17746.82	L	C
RX032	24000	R	17775.98	L	C
RX001	24000	R	17324	R	C
RX003	24000	R	17353.16	R	C
RX005	24000	R	17382.32	R	C
RX007	24000	R	17411.48	R	C
RX009	24000	R	17440.64	R	C
RX011	24000	R	17469.8	R	C
RX013	24000	R	17498.96	R	C
RX015	24000	R	17528.12	R	C
RX017	24000	R	17557.28	R	C
RX019	24000	R	17586.44	R	C
RX021	24000	R	17615.6	R	C
RX023	24000	R	17644.76	R	C
RX025	24000	R	17673.92	R	C
RX027	24000	R	17703.08	R	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
T0001	96.7	RX012	UL1	TX012	SB1
T0002	96.39	RX005	UL1	TX005	SB1
T0003	96.58	RX007	UL1	TX007	SB1
T0004	97.46	RX009	UL1	TX009	SB1
T0005	95.89	RX010	UL1	TX010	SB1
T0006	96.65	RX013	UL1	TX013	SB10
T0007	96.57	RX015	UL1	TX015	SB10
T0008	98.17	RX020	UL1	TX014	SB10
T0009	98.24	RX022	UL1	TX016	SB10
T0010	96.97	RX002	UL1	TX002	SB17
T0011	97.8	RX001	UL1	TX001	SB18
T0012	97.71	RX003	UL1	TX003	SB18
T0013	96.5	RX004	UL1	TX004	SB19
T0014	96.55	RX006	UL1	TX006	SB19
T0015	98.51	RX031	UL1	TX015	SB19
T0016	95.97	RX024	UL6	TX008	SB4
T0017	96.37	RX026	UL6	TX010	SB4
T0018	95.06	RX029	UL6	TX013	SB6
T0019	100.24	RX012	UL6	TX012	SB7
T0020	94.26	RX009	UL6	TX009	SB8
T0021	94.52	RX021	UL6	TX005	SB12
T0022	95.12	RX023	UL6	TX007	SB12
T0023	95.15	RX008	UL6	TX008	SB12
T0024	95.86	RX013	UL6	TX013	SB14
T0025	95.9	RX014	UL6	TX014	SB14
T0026	95.6	RX015	UL6	TX015	SB14
T0027	96.67	RX016	UL6	TX016	SB14
T0028	96.76	RX001	UL6	TX001	SB21
T0029	96.74	RX003	UL6	TX003	SB21
T0030	97.64	RX023	UL6	TX007	SB24

RX029	24000	R	17732.24	R	C
RX031	24000	R	17761.4	R	C
TX001	24000	T	12224	R	C
TX003	24000	T	12253.16	R	C
TX005	24000	T	12282.32	R	C
TX007	24000	T	12311.48	R	C
TX009	24000	T	12340.64	R	C
TX011	24000	T	12369.8	R	C
TX013	24000	T	12398.96	R	C
TX015	24000	T	12428.12	R	C
TX017	24000	T	12457.28	R	C
TX019	24000	T	12486.44	R	C
TX021	24000	T	12515.6	R	C
TX023	24000	T	12544.76	R	C
TX025	24000	T	12573.92	R	C
TX027	24000	T	12603.08	R	C
TX029	24000	T	12632.24	R	C
TX031	24000	T	12661.4	R	C
TX002	24000	T	12238.58	L	C
TX004	24000	T	12267.74	L	C
TX006	24000	T	12296.9	L	C
TX008	24000	T	12326.06	L	C
TX010	24000	T	12355.22	L	C
TX012	24000	T	12384.38	L	C
TX014	24000	T	12413.54	L	C
TX016	24000	T	12442.7	L	C
TX018	24000	T	12471.86	L	C
TX020	24000	T	12501.02	L	C
TX022	24000	T	12530.18	L	C
TX024	24000	T	12559.34	L	C
TX026	24000	T	12588.5	L	C
TX028	24000	T	12617.66	L	C
TX030	24000	T	12646.82	L	C
TX032	24000	T	12675.98	L	C

T0031	97.74	RX005	UL6	TX005	SB24
T0032	95.19	RX018	UL6	TX002	SB28
T0033	97.28	RX028	UL6	TX012	SB33
T0034	95.26	RX020	UL6	TX004	SB33
T0035	95.02	RX022	UL6	TX006	SB33
T0036	97.24	RX025	UL6	TX009	SB33
T0037	97.2	RX027	UL6	TX011	SB33
T0038	97.52	RX005	UL6	TX005	SB34
T0039	97.46	RX007	UL6	TX007	SB34
T0040	100.37	RX008	UL6	TX008	SB35
T0041	100.42	RX010	UL6	TX010	SB35
T0042	94.4	RX019	UL6	TX003	SB45
T0043	94.8	RX011	UL6	TX011	SB46
T0044	97.1	RX002	UL6	TX002	SB55
T0045	97.21	RX004	UL6	TX004	SB55
T0046	97.37	RX006	UL6	TX006	SB55
T0047	98.26	RX014	UL6	TX014	SB55
T0048	98.65	RX016	UL6	TX016	SB55
T0049	96.04	RX001	UL21	TX001	SB25
T0050	95.19	RX002	UL21	TX002	SB25
T0051	95.46	RX003	UL21	TX003	SB25
T0052	95.2	RX004	UL21	TX004	SB25
T0053	94.22	RX006	UL21	TX006	SB25
T0054	99.44	RX028	UL21	TX012	SB30
T0055	99.15	RX026	UL21	TX010	SB30
T0056	95.8	RX017	UL21	TX017	SB30
T0057	98.17	RX029	UL21	TX013	SB36
T0058	96.17	RX025	UL21	TX009	SB36
T0059	98.02	RX027	UL21	TX011	SB36
T0060	97.06	RX031	UL21	TX015	SB36
T0061	98.72	RX030	UL21	TX014	SB36
T0062	98.01	RX032	UL21	TX016	SB36
T0063	100.01	RX013	UL21	TX013	SB38
T0064	94.98	RX014	UL21	TX014	SB38
T0065	95.07	RX016	UL21	TX016	SB38
T0066	95.37	RX005	UL21	TX005	SB41
T0067	94.69	RX007	UL21	TX007	SB41
T0068	97.68	RX018	UL21	TX002	SB41
T0069	92.92	RX009	UL21	TX009	SB42

T0070	93.15	RX011	UL21	TX011	SB42
T0071	97.26	RX017	UL21	TX001	SB47
T0072	97.55	RX019	UL21	TX003	SB47
T0073	94.52	RX010	UL21	TX010	SB48
T0074	94.5	RX012	UL21	TX012	SB48
T0075	95.22	RX017	UL21	TX017	SB48
T0076	97.98	RX022	UL21	TX006	SB49
T0077	98.12	RX024	UL21	TX008	SB49
T0078	97.73	RX020	UL21	TX004	SB52
T0079	92.14	RX013	UL21	TX013	SB52
T0080	92.27	RX015	UL21	TX015	SB52
T0081	95.3	RX002	UL31	TX002	SB9
T0082	101.21	RX010	UL31	TX010	SB15
T0083	100.65	RX012	UL31	TX012	SB15
T0084	98.95	RX005	UL31	TX005	SB20
T0085	98.19	RX007	UL31	TX007	SB20
T0086	96.82	RX009	UL31	TX009	SB22
T0087	96.92	RX011	UL31	TX011	SB22
T0088	96.89	RX013	UL31	TX013	SB22
T0089	96.37	RX015	UL31	TX015	SB22
T0090	98.47	RX014	UL31	TX014	SB23
T0091	98.57	RX016	UL31	TX016	SB23
T0092	96.63	RX004	UL31	TX004	SB29
T0093	97.49	RX006	UL31	TX006	SB29
T0094	97.18	RX008	UL31	TX008	SB29
T0095	100.7	RX001	UL31	TX001	SB37
T0096	99.91	RX003	UL31	TX003	SB37
T0097	92.16	RX011	UL38	TX011	SB5
T0098	95.51	RX012	UL38	TX012	SB5
T0099	93.79	RX004	UL38	TX004	SB11
T0100	95.14	RX006	UL38	TX006	SB11
T0101	95.43	RX002	UL38	TX002	SB13
T0102	96.73	RX001	UL38	TX001	SB16
T0103	96.47	RX003	UL38	TX003	SB16
T0104	95.4	RX005	UL38	TX005	SB16
T0105	96.09	RX007	UL38	TX007	SB16
T0106	97.05	RX009	UL38	TX009	SB16
T0107	95.48	RX014	UL38	TX014	SB27
T0108	95.79	RX016	UL38	TX016	SB27

T0109	95.5	RX008	UL38	TX008	SB32
T0110	95.52	RX010	UL38	TX010	SB32
T0111	95.36	RX013	UL38	TX013	SB32
T0112	94.95	RX015	UL38	TX015	SB32
T0113	96.55	RX017	UL38	TX017	SB32
T0114	98.63	RX010	UL44	TX010	SB26
T0115	99.34	RX012	UL44	TX012	SB26
T0116	100.05	RX009	UL44	TX009	SB31
T0117	98.88	RX011	UL44	TX011	SB31
T0118	100.31	RX023	UL44	TX007	SB39
T0119	100.36	RX021	UL44	TX005	SB39
T0120	100.19	RX015	UL44	TX015	SB39
T0121	100.43	RX017	UL44	TX017	SB39
T0122	99.97	RX001	UL44	TX001	SB40
T0123	100.14	RX003	UL44	TX003	SB40
T0124	99.46	RX030	UL44	TX014	SB40
T0125	99.72	RX032	UL44	TX016	SB40
T0126	100.01	RX002	UL44	TX002	SB43
T0127	100.5	RX004	UL44	TX004	SB43
T0128	100.04	RX006	UL44	TX006	SB43
T0129	100.16	RX008	UL44	TX008	SB43
T0130	99.04	RX025	UL44	TX009	SB44
T0131	99.25	RX027	UL44	TX011	SB44
T0132	100.18	RX019	UL44	TX003	SB50
T0133	99.12	RX026	UL44	TX010	SB50
T0134	98.73	RX028	UL44	TX012	SB50
T0135	99.22	RX014	UL44	TX014	SB51
T0136	99.57	RX016	UL44	TX016	SB51
T0137	98.63	RX029	UL44	TX013	SB53
T0138	99.16	RX031	UL44	TX015	SB53
T0139	100.55	RX005	UL44	TX005	SB53
T0140	100.47	RX007	UL44	TX007	SB53
T0141	99.04	RX018	UL44	TX002	SB54
T0142	99.22	RX020	UL44	TX004	SB54
T0143	99.78	RX022	UL44	TX006	SB54
T0144	100.33	RX024	UL44	TX008	SB54
T0145	105.32	RX017	R01	TX017	CAN7
T0146	105.33	RX018	R01	TX018	CAN7
T0147	105.34	RX019	R01	TX019	CAN7

T0148	105.34	RX020	R01	TX020	CAN7
T0149	105.35	RX021	R01	TX021	CAN7
T0150	105.36	RX022	R01	TX022	CAN7
T0151	105.36	RX023	R01	TX023	CAN7
T0152	105.36	RX024	R01	TX024	CAN7
T0153	105.37	RX025	R01	TX025	CAN7
T0154	105.39	RX026	R01	TX026	CAN7
T0155	105.39	RX027	R01	TX027	CAN7
T0156	105.4	RX028	R01	TX028	CAN7
T0157	105.41	RX029	R01	TX029	CAN7
T0158	105.41	RX030	R01	TX030	CAN7
T0159	105.42	RX031	R01	TX031	CAN7
T0160	105.43	RX032	R01	TX032	CAN7
T0161	105.32	RX017	R02	TX017	CAN7
T0162	105.33	RX018	R02	TX018	CAN7
T0163	105.34	RX019	R02	TX019	CAN7
T0164	105.34	RX020	R02	TX020	CAN7
T0165	105.35	RX021	R02	TX021	CAN7
T0166	105.36	RX022	R02	TX022	CAN7
T0167	105.36	RX023	R02	TX023	CAN7
T0168	105.37	RX024	R02	TX024	CAN7
T0169	105.38	RX025	R02	TX025	CAN7
T0170	105.39	RX026	R02	TX026	CAN7
T0171	105.39	RX027	R02	TX027	CAN7
T0172	105.4	RX028	R02	TX028	CAN7
T0173	105.41	RX029	R02	TX029	CAN7
00174	105.41	RX030	R02	TX030	CAN7
00175	105.42	RX031	R02	TX031	CAN7
00176	105.43	RX032	R02	TX032	CAN7
T0177	94.07	RX008	UL21	TX008	SB25
T0178	104.02	RX017	R01	TX017	CAN4
T0179	104.03	RX018	R01	TX018	CAN4
T0180	104.04	RX019	R01	TX019	CAN4
T0181	104.04	RX020	R01	TX020	CAN4
T0182	104.05	RX021	R01	TX021	CAN4
T0183	104.06	RX022	R01	TX022	CAN4
T0184	104.06	RX023	R01	TX023	CAN4
T0185	104.07	RX024	R01	TX024	CAN4
T0186	104.08	RX025	R01	TX025	CAN4

T0187	104.09	RX026	R01	TX026	CAN4
T0188	104.09	RX027	R01	TX027	CAN4
T0189	104.1	RX028	R01	TX028	CAN4
T0190	104.11	RX029	R01	TX029	CAN4
T0191	104.11	RX030	R01	TX030	CAN4
T0192	104.12	RX031	R01	TX031	CAN4
T0193	104.13	RX032	R01	TX032	CAN4
T0194	104.02	RX017	R02	TX017	CAN4
T0195	104.03	RX018	R02	TX018	CAN4
T0196	104.04	RX019	R02	TX019	CAN4
T0197	104.04	RX020	R02	TX020	CAN4
T0198	104.05	RX021	R02	TX021	CAN4
T0199	104.06	RX022	R02	TX022	CAN4
T0200	104.06	RX023	R02	TX023	CAN4
T0201	104.07	RX024	R02	TX024	CAN4
T0202	104.08	RX025	R02	TX025	CAN4
T0203	104.09	RX026	R02	TX026	CAN4
T0245	92.93	RX020	R10	TX020	CAN4
T0246	92.94	RX021	R10	TX021	CAN4
T0247	92.95	RX022	R10	TX022	CAN4
T0248	92.95	RX023	R10	TX023	CAN4
T0249	92.96	RX024	R10	TX024	CAN4
T0250	92.97	RX025	R10	TX025	CAN4
T0251	92.98	RX026	R10	TX026	CAN4
T0252	92.98	RX027	R10	TX027	CAN4
T0253	92.99	RX028	R10	TX028	CAN4
T0254	93	RX029	R10	TX029	CAN4
T0255	93	RX030	R10	TX030	CAN4
T0256	93.01	RX031	R10	TX031	CAN4
T0257	93.02	RX032	R10	TX032	CAN4
T0204	104.09	RX027	R02	TX027	CAN4
T0205	104.1	RX028	R02	TX028	CAN4
T0206	104.11	RX029	R02	TX029	CAN4
T0207	104.11	RX030	R02	TX030	CAN4
T0208	104.12	RX031	R02	TX031	CAN4
T0209	104.13	RX032	R02	TX032	CAN4
T0210	96.39	RX017	R08	TX017	CAN4
T0211	96.4	RX018	R08	TX018	CAN4
T0212	96.41	RX019	R08	TX019	CAN4

T0213	96.41	RX020	R08	TX020	CAN4
T0214	96.42	RX021	R08	TX021	CAN4
T0215	96.43	RX022	R08	TX022	CAN4
T0216	96.43	RX023	R08	TX023	CAN4
T0217	96.44	RX024	R08	TX024	CAN4
T0218	96.45	RX025	R08	TX025	CAN4
T0219	96.46	RX026	R08	TX026	CAN4
T0220	96.46	RX027	R08	TX027	CAN4
T0221	96.47	RX028	R08	TX028	CAN4
T0222	96.47	RX029	R08	TX029	CAN4
T0223	96.48	RX030	R08	TX030	CAN4
T0224	96.49	RX031	R08	TX031	CAN4
T0225	96.5	RX032	R08	TX032	CAN4
T0226	94.07	RX017	R09	TX017	CAN4
T0227	94.08	RX018	R09	TX018	CAN4
T0228	94.08	RX019	R09	TX019	CAN4
T0229	94.09	RX020	R09	TX020	CAN4
T0230	94.09	RX021	R09	TX021	CAN4
T0231	94.11	RX022	R09	TX022	CAN4
T0232	94.11	RX023	R09	TX023	CAN4
T0233	94.12	RX024	R09	TX024	CAN4
T0234	94.13	RX025	R09	TX025	CAN4
T0235	94.14	RX026	R09	TX026	CAN4
T0236	94.14	RX027	R09	TX027	CAN4
T0237	94.15	RX028	R09	TX028	CAN4
T0238	94.16	RX029	R09	TX029	CAN4
T0239	94.16	RX030	R09	TX030	CAN4
T0240	94.17	RX031	R09	TX031	CAN4
T0241	94.18	RX032	R09	TX032	CAN4
T0242	92.91	RX017	R10	TX017	CAN4
T0243	92.92	RX018	R10	TX018	CAN4
T0244	92.93	RX019	R10	TX019	CAN4

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)
1	24M0G7W	24000	8	38333.96	0.6667	0	7.2	28
2	24M0G7W	24000	4	31698.48	0.8333	0	5.7	28
3	25M8G7W	25000	8	38333.96	0.6667	0	7.2	28
4	1M00G7W	1000	2	8		0		

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						

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		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.		
T0001	T0257	1		1		Ciel2_linkbud_		62.5	11	19	46	62	0	13.6
T0001	T0144	2		1		Ciel2_linkbud_s		62.5	11	19	51.8	61.8	0	13.6
T0001	T0144	3		1		Ciel2_linkbud_o		62.5	11	19	46	61.3	0	13.6

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): Yes

Remote Control (TT C) Location(s):

S14a: Street Address: 19 Edsall Drive			
S14b. City: Sussex	S14c. County:	S14d. State/Country NJ	S14e. Zip Code: 07461
S14f. Telephone Number: 973-823-6001	S14g. Call Sign of Control Station (if appropriate):		

Remote Control (TT C) Location(s):

S14a: Street Address: 18 Innovation Blvd			
S14b. City: Saskatoon	S14c. County:	S14d. State/Country SK	S14e. Zip Code: S7N 3R1
S14f. Telephone Number: 306-931-3425	S14g. Call Sign of Control Station (if appropriate):		

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

S15. SPACECRAFT PHYSICAL CHARACTERISTICS:

S15a: Mass of spacecraft without fuel (kg): 2620	Spacecraft Dimensions (meters)	Probability of Survival to End of Life (0.0 - 1.0)
S15b. Mass of fuel and disposables at launch (kg): 2968		
S15c. Mass of spacecraft and fuel at launch (kg): 5588	S15f. Length (m): 5.6	S15i. Payload: 0.817
S15d. Mass of fuel, in orbit, at beginning of life (kg): 997	S15g. Width (m): 8.8	S15j. Bus: 0.906
S15e. Deployed Area of Solar Array (square meters): 134.6	S15h. Height (m): 29.1	S15k. Total: 0.722

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): 11041	(f): 11041	(k): 11041	(p): 11041
Bus (Watts):	(b): 2222.2	(g): 1359.6	(l): 2165	(q): 1255.5
Total (Watts):	(c): 13263.2	(h): 12400.6	(m) 13206	(r): 12296.5
Solar Array (Watts):	(d): 18451	(i): 16457	(n): 15313	(s): 13973
Depth of Battery Discharge (%):	(e) 60.12 %	(j) %	(o) 63.96 %	(t) %

S17. CERTIFICATIONS:

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