

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: DIRECTV 9S(K)		e. Estimated Date of Placement into Service: 7/15/2006		i. Will the space station(s) operate on a Common Carrier Basis: N	
b. Construction Commencement Date: 11/1/2003		f. Estimated Lifetime of Satellite(s): 15 Years		j. Number of transponders offered on a common carrier basis: 0	
c. Construction Completion Date: 11/30/2005		g. Total Number of Transponders: 2		k. Total Common Carrier Transponder Bandwidth: 0 MHz	
d1. Est Launch Date Begin: 1/1/2006	d2. Est Launch Date End: 6/30/2006	h. Total Transponder Bandwidth (no. transponders x Bandwidth) 1000 MHz		l. 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				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)		
28.35	G	28.6	G	R	Fixed Satellite Service
29.25	G	29.5	G	R	Fixed Satellite Service
29.5	G	30.0	G	R	Fixed Satellite Service
18.3	G	18.8	G	T	Fixed Satellite Service
19.7	G	20.2	G	T	Fixed Satellite Service

S3. ORBITAL INFORMATION FOR GEOSTATIONARY SATELLITES ONLY:

a. Nominal Orbital Longitude (Degrees E/W): 101.125 W		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:		
d. Toward West:	0.05 Degrees	Range of orbital are in which adequate service can be provided (Optional): g. Westernmost: h. Easternmost:		
e. Toward East:	0.05 Degrees	0.05 Degrees		
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.
LABC	S		Area around Los Angeles, CA
MWBC	S		Area around Minneapolis, MN
TUSCAZ	S		Area around Tuscon, AZ
BOISEID	S		Area around Boise, ID

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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
UL1	R	47.6	46.3	0.08		27	Y		LABC				3548	12.1	-105	31	1
UL2	R	48.4	47.3	0.08		27	Y		BOISEID				4266	12.1	-105	31	1
DL1	T	50.1	49.5	0.08		27	N		TUSCAZ	3.9	0.36	41.8					
DL2	T	52.4	51.6	0.08		27	N		MWBC	3.9	0.21	41.8					

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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
RB02	T	C	-101		RB02_C.gxt					
BB03	T	C	-101		BB03_C.gxt					
RB04	T	C	-101		RB04_C.gxt					
RB05	T	C	-101		RB05_C.gxt					
RB06	T	C	-101		RB06_C.gxt					
BB07	T	C	-101		BB07_C.gxt					
BB08	T	C	-101		BB08_C.gxt					
BB09	T	C	-101		BB09_C.gxt					
BB10	T	C	-101		BB10_C.gxt					
BB11	T	C	-101		BB11_C.gxt					
CB12	T	C	-101		CB12_C.gxt					
CB13	T	C	-101		CB13_C.gxt					
CB14	T	C	-101		CB14_C.gxt					
CB15	T	C	-101		CB15_C.gxt					
CB16	T	C	-101		CB16_C.gxt					
CB17	T	C	-101		CB17_C.gxt					
CB18	T	C	-101		CB18_C.gxt					
CB19	T	C	-101		CB19_C.gxt					
CB20	T	C	-101		CB20_C.gxt					
BB21	T	C	-101		BB21_C.gxt					
DL1	T	C	-101		S Ka DL Tucson_final					
DL2	T	C	-101		S Ka DL MWBC_final					
BB22	T	C	-101		BB22_C.gxt					
BB23	T	C	-101		BB23_C.gxt					
BB24	T	C	-101		BB24_C.gxt					
RB25	T	C	-101		RB25_C.gxt					
RB26	T	C	-101		RB26_C.GXT					
UL1	R	C	-101		S Ka UL LABC_final					

UL2	R	C	-101		S Ka UL BOIS_final.g					
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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)
RL001	250000	R	28475	L	C
RR001	250000	R	28475	R	C
RL002	250000	R	29375	L	C
RR002	250000	R	29375	R	C
RL003	500000	R	29750	L	C
RR003	500000	R	29750	R	C
TL002	250000	T	18675	L	C
TR002	250000	T	18675	R	C
TL003	500000	T	19950	L	C
TR003	500000	T	19950	R	C
CMD	1000	R	17795	R	T
TLM1	1000	T	12695.5	R	T
TLM2	1000	T	12696.5	R	T
TL001	250000	T	18425	L	C
TR001	250000	T	18425	R	C

(a) Transponder ID	(b) Transponder Gain (dB)	Receive Band		Transmit Band	
		(c) Channel No.	(d) Beam ID	(e) Channel No.	(f) Beam ID
BH001	107	RL001	UL1	TR002	DL1
BH002	107	RR001	UL1	TL002	DL2
BH003	107	RL002	UL1	TR001	DL1
BH004	107	RR002	UL1	TL001	DL2
BH005	107	RL003	UL2	TR003	DL1
BH006	107	RR003	UL2	TL003	DL2

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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)
BSS1	24M0G7W	24000	4	30320	0.758		6.8	20
BSS2	36M0G7W	36000	4	45.48	0.758		6.8	20
BSS3	54M0G7W	54000	4	68.22	0.758		6.8	20

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/m ² /Hz)	(o) Assoc. Stn Rec. G/T (dB/K)
(a) Start	(b) End								(j) Min.	(k) Max.	(l) Min.	(m) Max.		
BH001	BH004	BSS1		8	30000			58.5	19	19	50.8	50.8	-134	32.9
BH001	BH004	BSS2		6	40000			66.8	14.3	14.3	49.6	49.6	-136	41
BH001	BH004	BSS3		4	60000			66.8	15.2	15.2	47.8	47.8	-138	41
BH005	BH006	BSS1		16	30000			58.5	19	19	50.8	50.8	-134	32.9
BH005	BH006	BSS2		12	40000			66.8	14.3	14.3	49.6	49.6	-136	41
BH005	BH006	BSS3		8	60000			66.8	15.2	15.2	47.8	47.8	-138	41

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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

Remote Control (TT C) Location(s):

S14a: Street Address: 1600 Forbes Way			
S14b. City: Long Beach	S14c. County: Los Angeles	S14d. State/Country CA	S14e. Zip Code: 90810
S14f. Telephone Number: 310-525-5590		S14g. Call Sign of Control Station (if appropriate):	

Remote Control (TT C) Location(s):

S14a: Street Address: 33E Telegraph Rd.			
S14b. City: Fillmore	S14c. County: Ventura	S14d. State/Country CA	S14e. Zip Code: 93015
S14f. Telephone Number: 805-524-4444		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): 2364	Spacecraft Dimensions (meters)	Probability of Survival to End of Life (0.0 - 1.0)
S15b. Mass of fuel and disposables at launch (kg): 3140		
S15c. Mass of spacecraft and fuel at launch (kg): 5685	S15f. Length (m): 31.3	S15i. Payload: 0.85
S15d. Mass of fuel, in orbit, at beginning of life (kg): 984	S15g. Width (m): 12.1	S15j. Bus: 0.84
S15e. Deployed Area of Solar Array (square meters): 59.6	S15h. Height (m): 7.5	S15k. Total: 0.73

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): 7581	(f): 7581	(k): 7581	(p): 7581
Bus (Watts):	(b): 2845	(g): 1788	(l): 2845	(q): 1788
Total (Watts):	(c): 10696	(h): 9639	(m): 10696	(r): 9639
Solar Array (Watts):	(d): 12710	(i): 11442	(n): 11820	(s): 10641
Depth of Battery Discharge (%):	(e) 80 %	(j) 0 %	(o) 80 %	(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) met?	☒ 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.