

**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 RB-2A		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): 15 Years		j. Number of transponders offered on a common carrier basis: 0	
c. Construction Completion Date:		g. Total Number of Transponders: 72		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) 2592 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)		
24.75	G	25.15	G	R	Feeder Link for Broadcasting Satellite Service in FSS
17.3	G	17.7	G	T	Broadcasting Satellite Service - Video

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

a. Nominal Orbital Longitude (Degrees E/W): 102.765 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:				Range of orbital are in which adequate service can be provided (Optional): <u>      </u> Degrees <u>      </u> E/W	
d. Toward West:            0.025 Degrees	e. Toward East:            0.025 Degrees		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:

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**

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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.
AK	S		Alaska
WA	S		Seattle and surrounding area
UT	S		Salt Lake City and surrounding area
TX	S		El Paso and surrounding area
NWUF	S		Moxee, WA and surrounding area
CONUS	S		Conus

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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 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)	
										(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
		(c) Peak (dBi)	(d) Edge (dBi)														
UL1	R	52	49	0.1		25	Y		NWUF				1417	20.5	-94	20	1
DL1	T	47.2	41.2	0.1		25	Y		AK	1.2	27.5	55.6					
DL2	T	47.4	41.4	0.1		25	Y		WA	3.5	6.6	55.6					
DL3	T	47.5	41.5	0.1		25	Y		UT	3.7	6.5	55.6					
DL4	T	47.8	41.8	0.1		25	Y		TX	4.1	6	55.6					
CMD	R	38.5	37.5	0.1		27	N		CONUS				17783	-4			
TLM	T	24	22	0.1		27	N		CONUS	2	14.4	35.6					

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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
UL1	R	C	-102.8		IRECTV RB-2 RX1.g					
DL1	T	C	-102.8		IRECTV RB-2 TX1.g					
DL2	T	C	-102.8		IRECTV RB-2 TX2.g					
DL3	T	C	-102.8		IRECTV RB-2 TX3.g					
DL4	T	C	-102.8		IRECTV RB-2 TX4.g					

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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)
T01	36000	T	17345	R	C
T02	36000	T	17345	L	C
T03	36000	T	17385	R	C
T04	36000	T	17385	L	C
T05	36000	T	17425	R	C
T06	36000	T	17425	L	C
T07	36000	T	17465	R	C
T08	36000	T	17465	L	C
T09	36000	T	17505	R	C
T10	36000	T	17505	L	C
T11	36000	T	17545	R	C
T12	36000	T	17545	L	C
T13	36000	T	17585	R	C
T14	36000	T	17585	L	C
T15	36000	T	17625	R	C
T16	36000	T	17625	L	C
T17	36000	T	17665	R	C
T18	36000	T	17665	L	C
R01	36000	R	24785	R	C
R02	36000	R	24785	L	C
R03	36000	R	24825	R	C
R04	36000	R	24825	L	C
R05	36000	R	24865	R	C
R06	36000	R	24865	L	C
R07	36000	R	24905	R	C
R08	36000	R	24905	L	C
R09	36000	R	24945	R	C
R10	36000	R	24945	L	C
R11	36000	R	24985	R	C
R12	36000	R	24985	L	C

(a) Transponder ID	(b) Transponder Gain (dB)	Receive Band		Transmit Band	
		(c) Channel No.	(d) Beam ID	(e) Channel No.	(f) Beam ID
UT011	150	R11	UL1	T11	DL3
UT012	150	R12	UL1	T12	DL3
UT013	150	R13	UL1	T13	DL3
UT014	150	R14	UL1	T14	DL3
UT015	150	R15	UL1	T15	DL3
UT016	150	R16	UL1	T16	DL3
UT017	150	R17	UL1	T17	DL3
UT018	150	R18	UL1	T18	DL3
TX001	150	R01	UL1	T01	DL4
TX002	150	R02	UL1	T02	DL4
TX003	150	R03	UL1	T03	DL4
TX004	150	R04	UL1	T04	DL4
TX005	150	R05	UL1	T05	DL4
TX006	150	R06	UL1	T06	DL4
TX007	150	R07	UL1	T07	DL4
TX008	150	R08	UL1	T08	DL4
TX009	150	R09	UL1	T09	DL4
TX010	150	R10	UL1	T10	DL4
TX011	150	R11	UL1	T11	DL4
TX012	150	R12	UL1	T12	DL4
TX013	150	R13	UL1	T13	DL4
TX014	150	R14	UL1	T14	DL4
TX015	150	R15	UL1	T15	DL4
TX016	150	R16	UL1	T16	DL4
TX017	150	R17	UL1	T17	DL4
TX018	150	R18	UL1	T18	DL4
CMD1		CMD1	CMD		
CMD2		CMD2	CMD		
TLM1				TLM1	TLM
TLM2				TLM2	TLM

R13	36000	R	25025	R	C
R14	36000	R	25025	L	C
R15	36000	R	25065	R	C
R16	36000	R	25065	L	C
R17	36000	R	25105	R	C
R18	36000	R	25105	L	C
CMD1	1300	R	29255	L	T
CMD2	1300	R	29497	L	T
TLM1	106	T	18302.25	R	T
TLM2	106	T	18302.75	L	T

AK001	150	R01	UL1	T01	DL1
AK002	150	R02	UL1	T02	DL1
AK003	150	R03	UL1	T03	DL1
AK004	150	R04	UL1	T04	DL1
AK005	150	R05	UL1	T05	DL1
AK006	150	R06	UL1	T06	DL1
AK007	150	R07	UL1	T07	DL1
AK008	150	R08	UL1	T08	DL1
AK009	150	R09	UL1	T09	DL1
AK010	150	R10	UL1	T10	DL1
AK011	150	R11	UL1	T11	DL1
AK012	150	R12	UL1	T12	DL1
AK013	150	R13	UL1	T13	DL1
AK014	150	R14	UL1	T14	DL1
AK015	150	R15	UL1	T15	DL1
AK016	150	R16	UL1	T16	DL1
AK017	150	R17	UL1	T17	DL1
AK018	150	R18	UL1	T18	DL1
WA001	150	R01	UL1	T01	DL2
WA002	150	R02	UL1	T02	DL2
WA003	150	R03	UL1	T03	DL2
WA004	150	R04	UL1	T04	DL2
WA005	150	R05	UL1	T05	DL2
WA006	150	R06	UL1	T06	DL2
WA007	150	R07	UL1	T07	DL2
WA008	150	R08	UL1	T08	DL2
WA009	150	R09	UL1	T09	DL2
WA010	150	R10	UL1	T10	DL2
WA011	150	R11	UL1	T11	DL2
WA012	150	R12	UL1	T12	DL2
WA013	150	R13	UL1	T13	DL2
WA014	150	R14	UL1	T14	DL2
WA015	150	R15	UL1	T15	DL2
WA016	150	R16	UL1	T16	DL2
WA017	150	R17	UL1	T17	DL2
WA018	150	R18	UL1	T18	DL2
UT001	150	R01	UL1	T01	DL3
UT002	150	R02	UL1	T02	DL3
UT003	150	R03	UL1	T03	DL3

UT004	150	R04	UL1	T04	DL3
UT005	150	R05	UL1	T05	DL3
UT006	150	R06	UL1	T06	DL3
UT007	150	R07	UL1	T07	DL3
UT008	150	R08	UL1	T08	DL3
UT009	150	R09	UL1	T09	DL3
UT010	150	R10	UL1	T10	DL3



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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)
DTH	36M0G7W	36000	4	34800	0.58		3.8	16

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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						
TLM	106KG9D	106		1									5.5	17.7
CMD	1M30F9D	1300		1									9.5	21.7

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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)		EIRP (dBW)		(n) Max. Power Flux Density (dBW/m <sup>2</sup> /Hz)	(o) Assoc. Stn Rec. G/T (dB/K)
(j) Min.	(k) Max.	(l) Min.	(m) Max.											
UT001	UT018	DTH		1				66.3	1.6	7.6	49.6	55.6	-122	18
TX001	TX018	DTH		1				66.3	1.6	7.6	49.6	55.6	-122	18
WA001	WA018	DTH		1				66.3	1.6	7.6	49.6	55.6	-122	18
AK001	AK018	DTH		1				66.3	1.6	7.6	55.6	61.6	-116	21.8
CMD1	CMD2		CMD	1				66.3	23.7	23.7	90	90		
TLM1	TLM2		TLM	1				24	-5.9	11.6	18.1	35.6	-126.4	31

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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 Angele	S14d. State/Country CA	S14e. Zip Code: 90810
S14f. Telephone Number: 310 525 5590		S14g. Call Sign of Control Station (if appropriate):	

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Characteristics and  
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S15. SPACECRAFT PHYSICAL CHARACTERISTICS:

S15a. Mass of spacecraft without fuel (kg): 3550	Spacecraft Dimensions (meters)	Probability of Survival to End of Life (0.0 - 1.0)
S15b. Mass of fuel and disposables at launch (kg): 2450		
S15c. Mass of spacecraft and fuel at launch (kg): 6000	S15f. Length (m): 48	S15i. Payload: 0.6
S15d. Mass of fuel, in orbit, at beginning of life (kg): 300	S15g. Width (m): 7.5	S15j. Bus: 0.85
S15e. Deployed Area of Solar Array (square meters): 80	S15h. Height (m): 8.5	S15k. Total: 0.51

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): 16000	(f): 16000	(k): 16000	(p): 16000
Bus (Watts):	(b): 1800	(g): 700	(l): 1800	(q): 700
Total (Watts):	(c): 17800	(h): 16700	(m): 17800	(r): 16700
Solar Array (Watts):	(d): 22000	(i): 19650	(n): 18500	(s): 17200
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?	<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.**