

**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: HORIZONS 2		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): Years		j. Number of transponders offered on a common carrier basis:	
c. Construction Completion Date:		g. Total Number of Transponders: 20		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) 864 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)		
14000	M	14500	M	R	Fixed Satellite Service
11700	M	12200	M	T	Broadcasting Satellite Service - Video

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

a. Nominal Orbital Longitude (Degrees E/W): 84.85 E		b. Alternate Orbital Longitude (Degrees E/W):		c. Reason for orbital location selection: Provide broadcast satellite service to Russia and surrounding region.	
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): Degrees      E/W	
d. Toward West:	0.05 Degrees	e. Toward East:		g. Westernmost:	
	0.05 Degrees	0.05 Degrees		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 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.
1	S		RUSSIA, KAZAKASTAN AND PORTIONS OF EUROPE
2	S		GLOBAL

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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				
										(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														
RHU	R	36.2	30.2	0.11	0.11	30	N	0	1					8.1	-105.1	25	1
RVU	R	35.9	29.9	0.11	0.11	30	N	90	1					8.1	-105.1	25	1
RHD	T	34.4	28.4	0.11	0.11	30	N	0	1			50.8					
RVD	T	34.4	28.4	0.11	0.11	30	N	90	1			53.6					
CMD	R	36.2	26.2	0.11	0.11		N	0	1					-5.3	-119.6		
CMD	R	35.9	25.9	0.11	0.11		N	90	1					-5.3	-119.6		
CMD	R	2.8	-1.2	0.11	0.11		N	2						-33.4	-91.5		
CMD	R	13.2	6.2	0.11	0.11		N	2						-28.9	-96.1		
TLMH	T	34.4	24.4	0.11	0.11		N	0	1			23					
TLM	T	2.9	-1.1	0.11	0.11		N	2				7					
TLM	T	13.3	6.3	0.11	0.11		N	2				15					
UPK	T	21	17	0.11	0.11		N	0	2			16.2					
UPK	T	21	17	0.11	0.11		N	90	2			16.2					

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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
RHU	R	C	84.85		rhup.gxt					
RVU	R	C	84.85		rvup.gxt					
RHD	T	C	84.85		rhdn.gxt					
RVD	T	C	84.85		rvdn.gxt					
CMD	R	C	84.85		cmdh.gxt					
CMD	R	C	84.85		cmdv.gxt					
CMD	R	C	84.85	cmdo.pdf						
CMD	R	C	84.85	cmdw.pdf						
TLMH	T	C	84.85		tlmh.gxt					
TLM	T	C	84.85	tlmo.pdf						
TLM	T	C	84.85	tlmw.pdf						
UPK	T	C	84.85	upkh.pdf						
UPK	T	C	84.85	upkv.pdf						

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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)
KU001	36000	R	14020	V	C
KU002	36000	R	14060	V	C
KU003	36000	R	14100	V	C
KU004	36000	R	14140	V	C
KU005	36000	R	14180	V	C
KU006	36000	R	14220	V	C
KU007	36000	R	14260	V	C
KU008	36000	R	14300	V	C
KU009	36000	R	14340	V	C
KU010	36000	R	14380	V	C
KU011	36000	R	14420	V	C
KU012	36000	R	14460	V	C
KU013	72000	R	14058	H	C
KU014	72000	R	14138	H	C
KU015	72000	R	14218	H	C
KU016	72000	R	14298	H	C
KU017	36000	R	14360	H	C
KU018	36000	R	14400	H	C
KU019	36000	R	14440	H	C
KU020	36000	R	14480	H	C
KD001	36000	T	11720	H	C
KD002	36000	T	11760	H	C
KD003	36000	T	11800	H	C
KD004	36000	T	11840	H	C
KD005	36000	T	11880	H	C
KD006	36000	T	11920	H	C
KD007	36000	T	11960	H	C
KD008	36000	T	12000	H	C
KD009	36000	T	12040	H	C
KD010	36000	T	12080	H	C

(a) Transponder ID	(b) Transponder Gain (dB)	Receive Band		Transmit Band	
		(c) Channel No.	(d) Beam ID	(e) Channel No.	(f) Beam ID
K0001	130.1	KU001	RVUP	KD001	RHDN
K0002	130.1	KU002	RVUP	KD002	RHDN
K0003	130.1	KU003	RVUP	KD003	RHDN
K0004	130.1	KU004	RVUP	KD004	RHDN
K0005	130.1	KU005	RVUP	KD005	RHDN
K0006	130.1	KU006	RVUP	KD006	RHDN
K0007	130.1	KU007	RVUP	KD007	RHDN
K0008	130.1	KU008	RVUP	KD008	RHDN
K0009	130.1	KU009	RVUP	KD009	RHDN
K0010	130.1	KU010	RVUP	KD010	RHDN
K0011	130.1	KU011	RVUP	KD011	RHDN
K0012	130.1	KU012	RVUP	KD012	RHDN
K0013	132.6	KU013	RHUP	KD013	RVDN
K0014	132.6	KU014	RHUP	KD014	RVDN
K0015	132.6	KU015	RHUP	KD015	RVDN
K0016	132.6	KU016	RHUP	KD016	RVDN
K0017	130	KU017	RHUP	KD017	RVDN
K0018	130	KU018	RHUP	KD018	RVDN
K0019	130	KU019	RHUP	KD019	RVDN
K0020	130	KU020	RHUP	KD020	RVDN

KD011	36000	T	12120	H	C
KD012	36000	T	12160	H	C
KD013	72000	T	11758	V	C
KD014	72000	T	11838	V	C
KD015	72000	T	11918	V	C
KD016	72000	T	11998	V	C
KD017	36000	T	12060	V	C
KD018	36000	T	12100	V	C
KD019	36000	T	12140	V	C
KD020	36000	T	12180	V	C
CMD1	1000	R	14000.5	H	T
CMD2	1000	R	14499.5	V	T
CMD3	1000	R	14000.5	L	T
CMD4	1000	R	14499.5	L	T
TLM1	500	T	12196	H	T
TLM2	500	T	12198.625	H	T
TLM3	500	T	12196	R	T
TLM4	500	T	12198.625	R	T
UPC1	8	T	11701.5	V	T
UPC2	8	T	12198	H	T

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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)
D1	72M0G7W	72000	4	49150	0.5		3.4	16.4
D2	36M0G7W	36000	4	29575	0.5		3.4	16.9
D3	10M3G7W	10300	4	6000	0.5		3.9	12.5
D4	100KG7W	100	4	64	0.5		3	11.8
D5	1M45G7W	1450	2	512	0.5		3.4	11.7
D6	400KG7W	400	2	128	0.5		3.4	10.7



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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						
A1	36M0F3F	36000	TV/FM	1					PAL	15.6	1.5		10	19.8

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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.									
K0001	K0020		A1	1	36000	H2 SCHEDULE	4000	56.9	17.9	23.9	44.8	50.8	-141.3	25
K0001	K0020	D2		1	36000	NOTE.txt		56.9	17.6	23.6	42.8	48.8	-152.1	22.3
K0001	K0020	D3		2	10300	NOTE.txt		56.9	-0.4	5.6	35.7	41.7	-152.7	22.3
K0001	K0020	D4		285	100	NOTE.txt		56.9	-20.7	-14.7	15.5	21.5	-153.4	22.3
K0001	K0020	D5		17	1450	NOTE.txt		56.9	-8.6	-2.6	27.5	33.5	-153.5	22.3
K0001	K0020	D6		90	400	NOTE.txt		46.4	-7.4	-1.4	18.2	24.2	-156.8	33.1
K0001	K0020		A1	1	36000	NOTE.txt	4000	56.9	17.9	23.9	45	51	-141.1	25
K0001	K0020	D2		1	36000	NOTE.txt		56.9	17.3	23.3	42.8	48.8	-152.1	22.3
K0001	K0020	D3		2	10300	NOTE.txt		56.9	-0.4	5.6	35.9	41.9	-152.5	22.3
K0001	K0020	D4		286	100	NOTE.txt		56.9	-20.7	-14.7	15.6	21.6	-153.3	22.3
K0001	K0020	D5		18	1450	NOTE.txt		56.9	-8.7	-2.7	27.6	33.6	-153.4	22.3
K0001	K0020	D6		90	400	NOTE.txt		46.4	-7.3	-1.3	18.5	24.5	-156.5	33.1
K0001	K0020		A1	2	36000	NOTE.txt	4000	56.9	17.9	23.9	43.3	49.3	-142.8	26.7
K0001	K0020	D1		1	72000	NOTE.txt		56.9	17.8	23.8	45.8	51.8	-152.1	22.3
K0001	K0020	D3		5	10300	NOTE.txt		56.9	-0.2	5.8	35.7	41.7	-152.7	22.3
K0001	K0020	D4		542	100	NOTE.txt		56.9	-20.4	-14.4	15.5	21.5	-153.4	22.3
K0001	K0020	D5		34	1450	NOTE.txt		56.9	-8.4	-2.4	27.5	33.5	-153.5	22.3
K0001	K0020	D6		180	400	NOTE.txt		46.4	-6.7	-0.7	18	24	-157	33.1

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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: 3400 INTERNATIONAL DRIVE, NW			
S14b. City: WASHINGTON DC	S14c. County:	S14d. State/Country DC	S14e. Zip Code: 20008
S14f. Telephone Number: 202-944-7701		S14g. Call Sign of Control Station (if appropriate):	

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S15. SPACECRAFT PHYSICAL CHARACTERISTICS:

S16. SPACECRAFT ELECTRICAL CHARACTERISTICS:

S17. CERTIFICATIONS:

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