Ka-Band Earth Station – Molokai, HI

Frequency Coordination Report

28 GHz

Prepared on Behalf of
SPACE EXPLORATION HOLDINGS

August 24, 2021

COMSEARCH®
A CommScope Company

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1. Summary of Results

On behalf of SPACE EXPLORATION HOLDINGS, Comsearch performed a coordination notice under Section 25.203(c) and Section 25.136(a)(4) of the FCC's rules for all existing and proposed terrestrial licenses within the coordination contours of their proposed Ka-Band earth station in Molokai, HI, which will transmit at 28 GHz[1]. Prior-notification letters were sent to the licensees and a copy of the notification data is provided in section four of this report. The earth station coordination was finalized on August 24, 2021.

No objections were received from any of the incumbent 28 GHz licensees.

2. 28 GHz Common Carrier and LTTS Coordination

In accordance with FCC Rules and Regulations, the Ka-Band earth station in Molokai, HI was prior-coordinated by Comsearch. A notification letter and datasheets for this earth station were sent to the following 28 GHz common carrier fixed microwave licensees. These licensees are authorized to operate temporary fixed operations from 27.5 – 29.5 GHz on a nationwide basis or local basis.

Licensee	Authorized Geographic Area
None Found	

A notification letter and datasheets for the Ka-Band earth station in Molokai, HI were also sent to the following 28 GHz local television transmission licensee. This licensee is authorized to operate temporary fixed operations from 27.5 – 29.5 GHz on a nationwide basis.

Licensee	Authorized Geographic Area
None Found	

No objections were received from the common carrier or local television transmission service incumbents.

[1] The proposed earth station will operate in the 27.5 – 29.1 GHz & 29.5 – 30.0 GHz portion of the Ka-Band.

3. 28 GHz UMFUS Coordination

There were two 28 GHz UMFUS licensee identified within the coordination distance of the proposed earth station. The proposed earth station will operate on frequencies that overlap Channel L1 & L2 of the UMFUS service. The total frequency allocation for Channels L1 & L2 of the UMFUS spectrum appears below.

Channel: **L1** 27.500 - 27.925 GHz
L2 27.925 - 28.350 GHz

Licensee	Authorized Geographic Area
McBride Spectrum Partners	Market Based
Verizon	Market Based

No objections were received from the UMFUS incumbents within coordination distance.

4. Earth Station Coordination Data

This section presents the data pertinent to the proposed Ka-Band earth station in Molokai, HI. This data was circulated to all incumbent licensees in the shared 28 GHz frequency ranges.

Job Number:	210708COMSGE01
Administrative Information	
Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACEX
Licensee Name	Space Exploration Holdings
Site Information	**MOLOKAI, HI**
Venue Name	
Latitude (NAD 83)	21° 6' 33.6" N
Longitude (NAD 83)	157° 3' 50.2" W
Climate Zone	B
Rain Zone	4
Ground Elevation (AMSL)	28.94 m / 95.0 ft
Link Information	
Satellite Type	Low Earth Orbit
Mode	TR - Transmit-Receive
Modulation	Digital
Minimum Elevation Angle	25.0°
Azimuth Range	0.0° to 360°
Antenna Centerline (AGL)	1.7 m / 5.6 ft

Antenna Information		**Receive - FCC32**		**Transmit - FCC32**
Model		1.47 meter		1.47 meter
Gain / Diameter		46.9 dBi / 1.5 m		49.5 dBi / 1.5 m
3-dB / 15-dB Beamwidth		0.77° / 1.70°		0.49° / 1.17°
Max Available RF Power	(dBW/4 kHz)			-39.8
	(dBW/MHz)			-15.8
Maximum EIRP	(dBW/4 kHz)			9.7
	(dBW/MHz)			33.7
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%

Frequency Information	**Receive 18.0 GHz**	**Transmit 28.0 GHz**
Emission / Frequency Range (MHz)	62M5D7W - 480MD7W / 17800.0 - 18600.0 62M5D7W - 480MD7W / 18800.0 - 19300.0	62M5D7W - 480MD7W / 27500.0 - 29100.0 62M5D7W - 480MD7W / 29500.0 - 30000.0
Max Great Circle Coordination Distance	262.0 km / 162.8 mi	125.0 km / 77.7 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

Coordination Values	**MOLOKAI, HI**		
Licensee Name	Space Exploration Holdings		
Latitude (NAD 83)	21° 6' 33.6" N		
Longitude (NAD 83)	157° 3' 50.2" W		
Ground Elevation (AMSL)	28.94 m / 95.0 ft		
Antenna Centerline (AGL)	1.7 m / 5.6 ft		
Antenna Model	SpaceX 1.47 meter		
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz 20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power		-39.8 (dBW/4 kHz)	

			Receive 18.0 GHz		Transmit 28.0 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	3.18	74.91	-3.00	262.00	-3.00	125.00
5	3.10	73.33	-3.00	262.00	-3.00	125.00
10	2.94	71.80	-3.00	262.00	-3.00	125.00
15	3.12	70.65	-3.00	262.00	-3.00	125.00
20	2.75	69.20	-3.00	262.00	-3.00	125.00
25	2.64	68.10	-3.00	262.00	-3.00	125.00
30	2.44	67.08	-3.00	262.00	-3.00	125.00
35	2.69	66.65	-3.00	262.00	-3.00	125.00
40	2.89	66.39	-3.00	262.00	-3.00	125.00
45	3.18	66.40	-3.00	262.00	-3.00	125.00
50	2.82	65.96	-3.00	262.00	-3.00	125.00
55	2.88	66.13	-3.00	262.00	-3.00	125.00
60	2.97	66.53	-3.00	262.00	-3.00	125.00
65	2.78	66.84	-3.00	262.00	-3.00	125.00
70	2.72	67.46	-3.00	262.00	-3.00	125.00
75	2.75	68.34	-3.00	262.00	-3.00	125.00
80	2.65	69.29	-3.00	262.00	-3.00	125.00
85	2.36	70.24	-3.00	262.00	-3.00	125.00
90	2.27	71.52	-3.00	262.00	-3.00	125.00
95	1.87	72.74	-3.00	262.00	-3.00	125.00
100	1.35	74.06	-3.00	262.00	-3.00	125.00
105	0.82	75.56	-3.00	262.00	-3.00	125.00
110	0.29	77.23	-3.00	262.00	-3.00	125.00
115	0.00	79.16	-3.00	262.00	-3.00	125.00
120	0.00	81.28	-3.00	262.00	-3.00	125.00
125	0.00	83.46	-3.00	262.00	-3.00	125.00
130	0.00	85.68	-3.00	262.00	-3.00	125.00
135	0.00	87.92	-3.00	262.00	-3.00	125.00
140	0.00	90.18	-3.00	262.00	-3.00	125.00
145	0.00	92.44	-3.00	262.00	-3.00	125.00
150	0.00	94.68	-3.00	262.00	-3.00	125.00
155	0.00	96.89	-3.00	262.00	-3.00	125.00
160	0.00	99.06	-3.00	262.00	-3.00	125.00
165	0.00	101.17	-3.00	262.00	-3.00	125.00
170	0.00	103.22	-3.00	262.00	-3.00	125.00
175	0.00	105.17	-3.00	262.00	-3.00	125.00
180	0.00	107.03	-3.00	262.00	-3.00	125.00
185	0.00	108.76	-3.00	262.00	-3.00	125.00

Coordination Values	**MOLOKAI, HI**			
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Ground Elevation (AMSL)	28.94 m / 95.0 ft			
Antenna Centerline (AGL)	1.7 m / 5.6 ft			
Antenna Model	SpaceX 1.47 meter			
Antenna Mode	Receive 18.0 GHz		Transmit 28.0 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
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Max Available RF Power		-39.8 (dBW/4 kHz)		

			Receive 18.0 GHz		Transmit 28.0 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	110.37	-3.00	262.00	-3.00	125.00
195	0.00	111.83	-3.00	262.00	-3.00	125.00
200	0.00	113.13	-3.00	262.00	-3.00	125.00
205	0.00	114.25	-3.00	262.00	-3.00	125.00
210	0.00	115.19	-3.00	262.00	-3.00	125.00
215	0.00	115.93	-3.00	262.00	-3.00	125.00
220	0.00	116.45	-3.00	262.00	-3.00	125.00
225	0.00	116.77	-3.00	262.00	-3.00	125.00
230	0.00	116.86	-3.00	262.00	-3.00	125.00
235	0.00	116.73	-3.00	262.00	-3.00	125.00
240	0.00	116.38	-3.00	262.00	-3.00	125.00
245	0.00	115.82	-3.00	262.00	-3.00	125.00
250	0.00	115.06	-3.00	262.00	-3.00	125.00
255	0.00	114.09	-3.00	262.00	-3.00	125.00
260	0.00	112.94	-3.00	262.00	-3.00	125.00
265	0.58	111.15	-3.00	262.00	-3.00	125.00
270	1.11	109.32	-3.00	262.00	-3.00	125.00
275	1.50	107.50	-3.00	262.00	-3.00	125.00
280	1.78	105.68	-3.00	262.00	-3.00	125.00
285	2.14	103.74	-3.00	262.00	-3.00	125.00
290	1.07	102.41	-3.00	262.00	-3.00	125.00
295	1.21	100.38	-3.00	262.00	-3.00	125.00
300	0.98	98.42	-3.00	262.00	-3.00	125.00
305	1.27	96.25	-3.00	262.00	-3.00	125.00
310	1.44	94.11	-3.00	262.00	-3.00	125.00
315	1.67	91.96	-3.00	262.00	-3.00	125.00
320	1.96	89.83	-3.00	262.00	-3.00	125.00
325	2.30	87.76	-3.00	262.00	-3.00	125.00
330	2.47	85.73	-3.00	262.00	-3.00	125.00
335	2.67	83.75	-3.00	262.00	-3.00	125.00
340	2.87	81.85	-3.00	262.00	-3.00	125.00
345	3.08	80.04	-3.00	262.00	-3.00	125.00
350	3.18	78.27	-3.00	262.00	-3.00	125.00
355	3.18	76.55	-3.00	262.00	-3.00	125.00

5. Contact Information

For questions or information regarding the 28 GHz Frequency Coordination Report, please contact:

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