Ka-Band Earth Station – Tucson, AZ

Frequency Coordination Report

28 GHz

Prepared on Behalf of
HUGHES NETWORK
SYSTEMS LIMITED

January 9, 2019

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A CommScope Company

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1. Summary of Results

On behalf of HUGHES NETWORK SYSTEMS LIMITED, Comsearch performed a coordination notice for all existing and proposed terrestrial licenses within the coordination contours of their proposed Ka-Band earth station in Tucson, AZ, 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 January 4, 2019.

No objections were received from any of the incumbent 28 GHz licensees. Our notification to the UMFUS incumbents was performed under the assumption that the earth station would be operating on a secondary basis to UMFUS L1 & L2 Block operations and a contact at Hughes Network Systems Limited has been provided in case any concerns may arise in the future.

2. 28 GHz Common Carrier and LTTS Coordination

In accordance with FCC Rules and Regulations, the Ka-Band earth station in Tucson, AZ 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
Frontier Southwest Incorporated	Nationwide

A notification letter and datasheets for the Ka-Band earth station in Tucson, AZ 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
Information Super Station, LLC	Continental US

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 – 28.6 GHz portion of the Ka-Band.

3. 28 GHz UMFUS Coordination

A Notification letter was sent to the following 28 GHz UMFUS licensees. 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	Channel	Area of Operation
DISH Network	L1, L2	County Based
Verizon	L1, L2	County Based

No objections were received from the UMFUS incumbents.

4. Earth Station Coordination Data

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

Administrative Information	
Call Sign	E170162
Licensee Code	HUNESY
Licensee Name	HUGHES NETWORK SYSTEMS LIMITED

Site Information	**TUCSON, AZ**
Latitude (NAD 83)	32° 10' 20.4" N
Longitude (NAD 83)	110° 57' 17.5" W
Climate Zone	A
Rain Zone	5
Ground Elevation (AMSL)	761.46 m / 2498.2 ft

Link Information	
Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	95.2° W to 95.2° West Longitude
Azimuth Range	152.1° to 152.1°
Corresponding Elevation Angles	48.8° / 48.8°
Antenna Centerline (AGL)	5.49 m / 18.0 ft

Antenna Information		**Transmit**
Manufacturer		SED
Model		10.0M
Gain / Diameter		67.1 dBi / 10.0 m
3-dB / 15-dB Beamwidth		0.08° / 0.16°
Max Available RF Power	(dBW/4 kHz)	-35.0
	(dBW/MHz)	-11.0
Maximum EIRP	(dBW/4 kHz)	32.1
	(dBW/MHz)	56.1
Interference Objectives:	Long Term	-151.0 dBW/4 kHz 20%
	Short Term	-128.0 dBW/4 kHz 0.0025%

Frequency Information	**Transmit 28.0 GHz**
Emission / Frequency Range (MHz)	450MG7W - 470MG7W / 27500.0 - 28600.0
Max Great Circle Coordination Distance	100.0 km / 62.1 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Coordination Values	**TUCSON, AZ**
Licensee Name	HUGHES NETWORK SYSTEMS LIMITED
Latitude (NAD 83)	32° 10' 20.4" N
Longitude (NAD 83)	110° 57' 17.5" W
Ground Elevation (AMSL)	761.46 m / 2498.2 ft
Antenna Centerline (AGL)	5.49 m / 18.0 ft
Antenna Mode	Transmit 28.0 GHz
Interference Objectives: Long Term	-151.0 dBW/4 kHz 20%
Short Term	-128.0 dBW/4 kHz 0.0025%
Max Available RF Power	-35.0 (dBW/4 kHz)

			Transmit 28.0 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	125.56	-10.00	100.00
5	0.00	123.54	-10.00	100.00
10	0.00	121.28	-10.00	100.00
15	0.00	118.82	-10.00	100.00
20	0.00	116.18	-10.00	100.00
25	0.00	113.38	-10.00	100.00
30	0.00	110.46	-10.00	100.00
35	0.00	107.44	-10.00	100.00
40	0.00	104.33	-10.00	100.00
45	0.00	101.15	-10.00	100.00
50	0.00	97.92	-10.00	100.00
55	0.00	94.66	-10.00	100.00
60	0.00	91.37	-10.00	100.00
65	0.00	88.08	-10.00	100.00
70	0.00	84.80	-10.00	100.00
75	0.22	81.50	-10.00	100.00
80	0.25	78.26	-10.00	100.00
85	0.28	75.07	-10.00	100.00
90	0.30	71.94	-10.00	100.00
95	0.32	68.90	-10.00	100.00
100	0.34	65.97	-10.00	100.00
105	0.36	63.17	-10.00	100.00
110	0.38	60.52	-10.00	100.00
115	0.37	58.07	-10.00	100.00
120	0.41	55.80	-10.00	100.00
125	0.37	53.82	-10.00	100.00
130	0.37	52.10	-10.00	100.00
135	0.34	50.70	-10.00	100.00
140	0.33	49.63	-10.00	100.00
145	0.33	48.89	-10.00	100.00
150	0.30	48.57	-10.00	100.00
155	0.29	48.62	-10.00	100.00
160	0.25	49.07	-10.00	100.00
165	0.23	49.87	-10.00	100.00
170	0.21	51.04	-10.00	100.00
175	0.00	52.68	-10.00	100.00
180	0.00	54.44	-10.00	100.00
185	0.00	56.46	-10.00	100.00

Coordination Values	**TUCSON, AZ**		
Licensee Name	HUGHES NETWORK SYSTEMS LIMITED		
Latitude (NAD 83)	32° 10' 20.4" N		
Longitude (NAD 83)	110° 57' 17.5" W		
Ground Elevation (AMSL)	761.46 m / 2498.2 ft		
Antenna Centerline (AGL)	5.49 m / 18.0 ft		
Antenna Mode	Transmit 28.0 GHz		
Interference Objectives: Long Term	-151.0 dBW/4 kHz	20%	
Short Term	-128.0 dBW/4 kHz	0.0025%	
Max Available RF Power	-35.0 (dBW/4 kHz)		

		Transmit 28.0 GHz		
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	58.72	-10.00	100.00
195	0.00	61.18	-10.00	100.00
200	0.20	63.71	-10.00	100.00
205	0.00	66.62	-10.00	100.00
210	0.00	69.54	-10.00	100.00
215	0.00	72.56	-10.00	100.00
220	0.00	75.67	-10.00	100.00
225	0.00	78.85	-10.00	100.00
230	0.00	82.08	-10.00	100.00
235	0.00	85.34	-10.00	100.00
240	0.00	88.63	-10.00	100.00
245	0.00	91.92	-10.00	100.00
250	0.00	95.20	-10.00	100.00
255	0.00	98.46	-10.00	100.00
260	0.32	101.75	-10.00	100.00
265	0.67	105.05	-10.00	100.00
270	0.60	108.17	-10.00	100.00
275	0.47	111.16	-10.00	100.00
280	0.69	114.20	-10.00	100.00
285	0.27	116.78	-10.00	100.00
290	0.00	119.24	-10.00	100.00
295	0.00	121.67	-10.00	100.00
300	0.00	123.89	-10.00	100.00
305	0.00	125.87	-10.00	100.00
310	0.32	127.86	-10.00	100.00
315	1.42	130.29	-10.00	100.00
320	1.17	131.18	-10.00	100.00
325	0.00	130.78	-10.00	100.00
330	0.00	131.13	-10.00	100.00
335	0.00	131.09	-10.00	100.00
340	0.00	130.68	-10.00	100.00
345	0.00	129.90	-10.00	100.00
350	0.00	128.77	-10.00	100.00
355	0.00	127.32	-10.00	100.00

5. Contact Information

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

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