

Ka-Band Earth Station – Taos, NM

Frequency Coordination Report

28 GHz



Prepared on Behalf of
HUGHES NETWORK
SYSTEMS LIMITED

January 9, 2019



COMSEARCH
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 Taos, NM, which will transmit at 28 GHz¹. 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 Taos, NM 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 Taos, NM 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 |
|----------|---------|-------------------|
| 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 Taos, NM. This data was circulated to all incumbent licensees in the shared 28 GHz frequency ranges.

Administrative Information

| | |
|---------------|--------------------------------|
| Call Sign | E170159 |
| Licensee Code | HUNESY |
| Licensee Name | HUGHES NETWORK SYSTEMS LIMITED |

Site Information

| | |
|-------------------------|-----------------------|
| | TAOS, NM |
| Latitude (NAD 83) | 36° 23' 16.0" N |
| Longitude (NAD 83) | 105° 35' 16.5" W |
| Climate Zone | A |
| Rain Zone | 2 |
| Ground Elevation (AMSL) | 2111.62 m / 6927.9 ft |

Link Information

| | |
|--------------------------------|---------------------------------|
| Satellite Type | Geostationary |
| Mode | TO - Transmit-Only |
| Modulation | Digital |
| Satellite Arc | 95.2° W to 95.2° West Longitude |
| Azimuth Range | 162.8° to 162.8° |
| Corresponding Elevation Angles | 46.4° / 46.4° |
| 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 |



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| | |
|------------------------------------|--------------------------------|
| Coordination Values | TAOS, NM |
| Licensee Name | HUGHES NETWORK SYSTEMS LIMITED |
| Latitude (NAD 83) | 36° 23' 16.0" N |
| Longitude (NAD 83) | 105° 35' 16.5" W |
| Ground Elevation (AMSL) | 2111.62 m / 6927.9 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) |

| Azimuth (°) | Horizon Elevation (°) | Antenna Discrimination (°) | Transmit 28.0 GHz | |
|-------------|-----------------------|----------------------------|--------------------|----------------------------|
| | | | Horizon Gain (dBi) | Coordination Distance (km) |
| 0 | 0.49 | 131.70 | -10.00 | 100.00 |
| 5 | 0.53 | 130.18 | -10.00 | 100.00 |
| 10 | 0.54 | 128.31 | -10.00 | 100.00 |
| 15 | 0.55 | 126.15 | -10.00 | 100.00 |
| 20 | 0.51 | 123.71 | -10.00 | 100.00 |
| 25 | 0.55 | 121.10 | -10.00 | 100.00 |
| 30 | 0.67 | 118.35 | -10.00 | 100.00 |
| 35 | 0.67 | 115.36 | -10.00 | 100.00 |
| 40 | 0.60 | 112.22 | -10.00 | 100.00 |
| 45 | 0.84 | 109.09 | -10.00 | 100.00 |
| 50 | 1.80 | 106.05 | -10.00 | 100.00 |
| 55 | 3.02 | 102.87 | -10.00 | 100.00 |
| 60 | 3.24 | 99.33 | -10.00 | 100.00 |
| 65 | 3.90 | 95.77 | -10.00 | 100.00 |
| 70 | 4.27 | 92.10 | -10.00 | 100.00 |
| 75 | 4.97 | 88.37 | -10.00 | 100.00 |
| 80 | 4.92 | 84.63 | -10.00 | 100.00 |
| 85 | 4.51 | 80.97 | -10.00 | 100.00 |
| 90 | 4.33 | 77.33 | -10.00 | 100.00 |
| 95 | 3.84 | 73.85 | -10.00 | 100.00 |
| 100 | 3.63 | 70.41 | -10.00 | 100.00 |
| 105 | 4.49 | 66.64 | -10.00 | 100.00 |
| 110 | 5.19 | 62.95 | -10.00 | 100.00 |
| 115 | 5.64 | 59.42 | -10.00 | 100.00 |
| 120 | 5.62 | 56.25 | -10.00 | 100.00 |
| 125 | 5.77 | 53.15 | -10.00 | 100.00 |
| 130 | 6.23 | 50.03 | -10.00 | 100.00 |
| 135 | 5.88 | 47.73 | -9.97 | 100.00 |
| 140 | 4.80 | 46.40 | -9.66 | 100.00 |
| 145 | 4.24 | 45.09 | -9.35 | 100.00 |
| 150 | 4.21 | 43.71 | -9.01 | 100.00 |
| 155 | 3.65 | 43.29 | -8.91 | 100.00 |
| 160 | 3.62 | 42.82 | -8.79 | 100.00 |
| 165 | 3.34 | 43.07 | -8.85 | 100.00 |
| 170 | 2.51 | 44.32 | -9.17 | 100.00 |
| 175 | 1.77 | 45.89 | -9.54 | 100.00 |
| 180 | 1.30 | 47.56 | -9.93 | 100.00 |
| 185 | 2.08 | 48.47 | -10.00 | 100.00 |



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| 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) |

| Azimuth (°) | Horizon Elevation (°) | Antenna Discrimination (°) | Transmit 28.0 GHz | |
|-------------|-----------------------|----------------------------|--------------------|----------------------------|
| | | | Horizon Gain (dBi) | Coordination Distance (km) |
| 190 | 2.11 | 50.42 | -10.00 | 100.00 |
| 195 | 0.66 | 53.77 | -10.00 | 100.00 |
| 200 | 0.60 | 56.23 | -10.00 | 100.00 |
| 205 | 0.62 | 58.85 | -10.00 | 100.00 |
| 210 | 0.55 | 61.72 | -10.00 | 100.00 |
| 215 | 0.41 | 64.76 | -10.00 | 100.00 |
| 220 | 0.36 | 67.88 | -10.00 | 100.00 |
| 225 | 0.30 | 71.10 | -10.00 | 100.00 |
| 230 | 0.00 | 74.47 | -10.00 | 100.00 |
| 235 | 0.00 | 77.80 | -10.00 | 100.00 |
| 240 | 0.00 | 81.19 | -10.00 | 100.00 |
| 245 | 0.00 | 84.60 | -10.00 | 100.00 |
| 250 | 0.00 | 88.05 | -10.00 | 100.00 |
| 255 | 0.00 | 91.50 | -10.00 | 100.00 |
| 260 | 0.00 | 94.94 | -10.00 | 100.00 |
| 265 | 0.00 | 98.36 | -10.00 | 100.00 |
| 270 | 0.00 | 101.75 | -10.00 | 100.00 |
| 275 | 0.00 | 105.09 | -10.00 | 100.00 |
| 280 | 0.00 | 108.37 | -10.00 | 100.00 |
| 285 | 0.00 | 111.55 | -10.00 | 100.00 |
| 290 | 0.00 | 114.64 | -10.00 | 100.00 |
| 295 | 0.00 | 117.60 | -10.00 | 100.00 |
| 300 | 0.00 | 120.40 | -10.00 | 100.00 |
| 305 | 0.00 | 123.02 | -10.00 | 100.00 |
| 310 | 0.00 | 125.44 | -10.00 | 100.00 |
| 315 | 0.00 | 127.60 | -10.00 | 100.00 |
| 320 | 0.22 | 129.68 | -10.00 | 100.00 |
| 325 | 0.27 | 131.31 | -10.00 | 100.00 |
| 330 | 0.31 | 132.58 | -10.00 | 100.00 |
| 335 | 0.42 | 133.54 | -10.00 | 100.00 |
| 340 | 0.39 | 133.95 | -10.00 | 100.00 |
| 345 | 0.39 | 133.99 | -10.00 | 100.00 |
| 350 | 0.45 | 133.65 | -10.00 | 100.00 |
| 355 | 0.48 | 132.88 | -10.00 | 100.00 |



5. Contact Information

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

| | |
|-----------------|---|
| Contact person: | Dennis Jimeno |
| Title: | Engineer III, Telecommunications |
| Company: | Comsearch |
| Address: | 19700 Janelia Farm Blvd., Ashburn, VA 20147 |
| Telephone: | 703-726-5858 |
| Fax: | 703-726-5599 |
| Email: | DJimeno@Comsearch.com |
| Web site: | www.comsearch.com |