

Ka-Band Earth Station – Melbourne, FL

Frequency Coordination Report

28 GHz



Prepared on Behalf of
Harris CapRock
Communications

January 7, 2015



COMSEARCH
A CommScope Company



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1. Summary of Results

On behalf of Harris CapRock Communications, Comsearch performed a coordination notice for all existing and proposed terrestrial licenses within the coordination contours of their proposed Ka-Band earth station in Melbourne, Florida, 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 5, 2015.

No objections were received from any of the incumbent 28 GHz licensees. Our notification to the LMDS incumbents was performed under the assumption that the earth station would be operating on a secondary basis to LMDS Block A operations and a contact at Harris CapRock Communications has been provided in case any concerns may arise in the future.

2. 28 GHz Common Carrier and LTTTS Coordination

In accordance with FCC Rules and Regulations, the Ka-Band earth station in Melbourne, Florida 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 licensee on December 5, 2014. This licensee is authorized to operate temporary fixed operations from 27.5 to 29.5 GHz on a nationwide basis.

| Licensee | Authorized Geographic Area |
|----------|----------------------------|
| Verizon | Continental US |

A notification letter and datasheets for the Ka-Band earth station in Melbourne, Florida were also sent to the following 28 GHz local television transmission licensee on December 5, 2014. This licensee is authorized to operate temporary fixed operations from 27.5 to 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 27.6 – 29.1 GHz portion of the Ka-Band.

3. 28 GHz LMDS Coordination

A Notification letter was sent to the following 28 GHz LMDS licensees on December 5, 2014. The proposed earth station will operate on frequencies that overlap Block A of the LMDS service. The total frequency allocation for Block A of the LMDS spectrum appears below.

Block A: 27.500-28.350 GHz
29.100-29.250 GHz
31.075-31.225 GHz

| Licensee | Market | Market Name |
|--------------------------------|--------|-------------------------------------|
| Wireless Distribution Services | BTA239 | Lakeland-Winter Haven, FL |
| Rainier Connect | BTA326 | Ocala, FL |
| Straight Path Spectrum | BTA336 | Orlando, FL |
| T-Mobile ² | BTA336 | Orlando, FL |
| Nextlink/XO | BTA440 | Tampa-St. Petersburg-Clearwater, FL |
| T-Mobile ³ | BTA440 | Tampa-St. Petersburg-Clearwater, FL |
| Nextlink/XO | BTA469 | West Palm Beach-Boca Raton, FL |
| T-Mobile ⁴ | BTA469 | West Palm Beach-Boca Raton, FL |

No objections were received from the LMDS incumbents.

² T-Mobile has acquired LMDS spectrum from Straight Path in the Orlando, FL Basic Trading Area (BTA).

³ T-Mobile has acquired LMDS spectrum from Nextlink Wireless / XO in the Tampa-St. Petersburg-Clearwater, FL BTA.

⁴ T-Mobile has acquired LMDS spectrum from Nextlink Wireless / XO in the West Palm Beach-Boca Raton, FL BTA.

4. Earth Station Coordination Data

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

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
 (703)726-5662 <http://www.comsearch.com>

Date: 12/01/2014
 Job Number: <PCNJobCode>

Administrative Information

Status ENGINEER PROPOSAL
 Call Sign <PCNCallSign>
 Licensee Code SPACLK
 Licensee Name Harris CapRock Communications

Site Information**MELBOURNE, FL**

Venue Name
 Latitude (NAD 83) 28° 1' 51.2" N
 Longitude (NAD 83) 80° 35' 55.7" W
 Climate Zone B
 Rain Zone 1
 Ground Elevation (AMSL) 5.76 m / 18.9 ft

Link Information

Satellite Type Medium Earth Orbit
 Mode TO - Transmit-Only
 Modulation Digital
 Minimum Elevation Angle 10.0°
 Azimuth Range 0.0° to 360°
 Antenna Centerline (AGL) 2.74 m / 9.0 ft

Antenna Information**Transmit - FCC32**

Manufacturer Harris
 Model ST5000-1.2
 Gain / Diameter 48.5 dBi / 1.2 m
 3-dB / 15-dB Beamwidth 0.60° / 1.40°

Max Available RF Power (dBW/4 kHz) -14.0
 (dBW/MHz) 10.0

Maximum EIRP (dBW/4 kHz) 34.5
 (dBW/MHz) 58.5

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)
 1M00G7D - 216MG7D / 27652.0 - 27868.0
 1M00G7D - 216MG7D / 27912.0 - 28128.0
 1M00G7D - 216MG7D / 28172.0 - 28388.0
 1M00G7D - 216MG7D / 28601.0 - 28817.0
 1M00G7D - 216MG7D / 28855.0 - 29071.0

Max Great Circle Coordination Distance 149.1 km / 92.6 mi
 Precipitation Scatter Contour Radius 100.0 km / 62.1 mi

COMSEARCH**Earth Station Data Sheet**

19700 Janelia Farm Boulevard, Ashburn, VA 20147
 (703)726-5662 <http://www.comsearch.com>

| | |
|------------------------------------|-------------------------------|
| Coordination Values | MELBOURNE, FL |
| Licensee Name | Harris CapRock Communications |
| Latitude (NAD 83) | 28° 1' 51.2" N |
| Longitude (NAD 83) | 80° 35' 55.7" W |
| Ground Elevation (AMSL) | 5.76 m / 18.9 ft |
| Antenna Centerline (AGL) | 2.74 m / 9.0 ft |
| Antenna Model | Harris 1.2 Meter |
| 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 | -14.0 (dBW/4 kHz) |

| Azimuth (°) | Horizon Elevation (°) | Antenna Discrimination (°) | Transmit 28.0 GHz | |
|-------------|--------------------------|-------------------------------|-----------------------|-------------------------------|
| | | | Horizon Gain (dBi) | Coordination Distance (km) |
| 0 | 0.00 | 94.45 | -10.00 | 100.00 |
| 5 | 0.00 | 89.45 | -10.00 | 100.00 |
| 10 | 0.00 | 84.45 | -10.00 | 100.00 |
| 15 | 0.00 | 79.45 | -10.00 | 100.00 |
| 20 | 0.00 | 74.45 | -10.00 | 100.00 |
| 25 | 0.00 | 69.45 | -10.00 | 100.00 |
| 30 | 0.00 | 64.45 | -10.00 | 100.00 |
| 35 | 0.00 | 59.45 | -10.00 | 100.00 |
| 40 | 0.00 | 54.45 | -10.00 | 100.00 |
| 45 | 0.00 | 49.45 | -10.00 | 100.00 |
| 50 | 0.00 | 44.45 | -10.00 | 100.00 |
| 55 | 0.00 | 39.45 | -9.65 | 100.00 |
| 60 | 0.00 | 34.45 | -8.45 | 100.00 |
| 65 | 0.00 | 29.45 | -7.12 | 107.74 |
| 70 | 0.00 | 24.45 | -5.61 | 112.89 |
| 75 | 0.00 | 19.46 | -3.90 | 118.48 |
| 80 | 0.00 | 14.46 | -1.93 | 124.56 |
| 85 | 0.00 | 9.46 | 0.35 | 131.09 |
| 90 | 0.00 | 4.47 | 2.91 | 135.06 |
| 95 | 0.00 | 0.68 | 5.41 | 142.31 |
| 100 | 0.00 | 5.56 | 6.74 | 146.48 |
| 105 | 0.00 | 10.56 | 5.78 | 143.43 |
| 110 | 0.00 | 15.55 | 3.37 | 136.34 |
| 115 | 0.00 | 20.55 | 0.78 | 132.27 |
| 120 | 0.00 | 25.55 | -1.53 | 125.73 |
| 125 | 0.00 | 30.55 | -3.43 | 119.96 |
| 130 | 0.00 | 35.55 | -5.02 | 114.85 |
| 135 | 0.00 | 40.55 | -6.37 | 110.31 |
| 140 | 0.00 | 45.55 | -7.54 | 106.24 |
| 145 | 0.00 | 50.55 | -8.55 | 100.00 |
| 150 | 0.00 | 55.55 | -9.42 | 100.00 |
| 155 | 0.00 | 60.55 | -10.00 | 100.00 |
| 160 | 0.00 | 65.55 | -10.00 | 100.00 |
| 165 | 0.00 | 70.55 | -10.00 | 100.00 |
| 170 | 0.00 | 75.55 | -10.00 | 100.00 |
| 175 | 0.00 | 80.55 | -10.00 | 100.00 |
| 180 | 0.00 | 85.55 | -10.00 | 100.00 |
| 185 | 0.00 | 90.55 | -10.00 | 100.00 |

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| Latitude (NAD 83) | 28° 1' 51.2" N |
| Longitude (NAD 83) | 80° 35' 55.7" W |
| Ground Elevation (AMSL) | 5.76 m / 18.9 ft |
| Antenna Centerline (AGL) | 2.74 m / 9.0 ft |
| Antenna Model | Harris 1.2 Meter |
| 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 | -14.0 (dBW/4 kHz) |

| Azimuth (°) | Horizon Elevation (°) | Antenna Discrimination (°) | Transmit 28.0 GHz | |
|-------------|--------------------------|-------------------------------|-----------------------|-------------------------------|
| | | | Horizon Gain (dBi) | Coordination Distance (km) |
| 190 | 0.00 | 95.55 | -10.00 | 100.00 |
| 195 | 0.00 | 100.55 | -10.00 | 100.00 |
| 200 | 0.00 | 105.55 | -10.00 | 100.00 |
| 205 | 0.00 | 110.55 | -10.00 | 100.00 |
| 210 | 0.00 | 115.55 | -9.42 | 100.00 |
| 215 | 0.00 | 120.55 | -8.55 | 100.00 |
| 220 | 0.00 | 125.55 | -7.54 | 106.24 |
| 225 | 0.00 | 130.55 | -6.37 | 110.31 |
| 230 | 0.00 | 135.55 | -5.02 | 114.85 |
| 235 | 0.00 | 140.55 | -3.43 | 119.96 |
| 240 | 0.00 | 145.55 | -1.53 | 125.74 |
| 245 | 0.00 | 150.55 | 0.81 | 132.35 |
| 250 | 0.00 | 155.55 | 3.54 | 136.80 |
| 255 | 0.00 | 160.54 | 6.24 | 144.87 |
| 260 | 0.00 | 165.54 | 7.54 | 149.10 |
| 265 | 0.00 | 170.54 | 6.22 | 144.81 |
| 270 | 0.00 | 175.53 | 3.52 | 136.74 |
| 275 | 0.00 | 179.32 | 0.79 | 132.29 |
| 280 | 0.00 | 174.44 | -1.60 | 125.53 |
| 285 | 0.00 | 169.44 | -3.65 | 119.29 |
| 290 | 0.00 | 164.45 | -5.41 | 113.57 |
| 295 | 0.00 | 159.45 | -6.95 | 108.33 |
| 300 | 0.00 | 154.45 | -8.31 | 100.25 |
| 305 | 0.00 | 149.45 | -9.52 | 100.00 |
| 310 | 0.00 | 144.45 | -10.00 | 100.00 |
| 315 | 0.00 | 139.45 | -10.00 | 100.00 |
| 320 | 0.00 | 134.45 | -10.00 | 100.00 |
| 325 | 0.00 | 129.45 | -10.00 | 100.00 |
| 330 | 0.00 | 124.45 | -10.00 | 100.00 |
| 335 | 0.00 | 119.45 | -10.00 | 100.00 |
| 340 | 0.00 | 114.45 | -10.00 | 100.00 |
| 345 | 0.00 | 109.45 | -10.00 | 100.00 |
| 350 | 0.00 | 104.45 | -10.00 | 100.00 |
| 355 | 0.00 | 99.45 | -10.00 | 100.00 |

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 Mode TO - Transmit-Only
 Modulation Digital
 Minimum Elevation Angle 10.0°
 Azimuth Range 0.0° to 360°
 Antenna Centerline (AGL) 2.74 m / 9.0 ft

Antenna Information**Transmit - FCC32**

Manufacturer Harris
 Model ST5000-2.4
 Gain / Diameter 54.7 dBi / 2.4 m
 3-dB / 15-dB Beamwidth 0.14° / 0.32°

Max Available RF Power (dBW/4 kHz) -9.8
 (dBW/MHz) 14.2

Maximum EIRP (dBW/4 kHz) 44.9
 (dBW/MHz) 68.9

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)
 1M00G7D - 216MG7D / 27652.0 - 27868.0
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 1M00G7D - 216MG7D / 28601.0 - 28817.0
 1M00G7D - 216MG7D / 28855.0 - 29071.0

Max Great Circle Coordination Distance 168.6 km / 104.8 mi
 Precipitation Scatter Contour Radius 100.0 km / 62.1 mi

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| Antenna Centerline (AGL) | 2.74 m / 9.0 ft |
| Antenna Model | Harris 2.4 Meter |
| 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 | -9.8 (dBW/4 kHz) |

| Azimuth (°) | Horizon Elevation (°) | Antenna Discrimination (°) | Transmit 28.0 GHz | |
|-------------|--------------------------|-------------------------------|-----------------------|-------------------------------|
| | | | Horizon Gain (dBi) | Coordination Distance (km) |
| 0 | 0.00 | 94.45 | -10.00 | 112.26 |
| 5 | 0.00 | 89.45 | -10.00 | 112.26 |
| 10 | 0.00 | 84.45 | -10.00 | 112.26 |
| 15 | 0.00 | 79.45 | -10.00 | 112.26 |
| 20 | 0.00 | 74.45 | -10.00 | 112.26 |
| 25 | 0.00 | 69.45 | -10.00 | 112.26 |
| 30 | 0.00 | 64.45 | -10.00 | 112.26 |
| 35 | 0.00 | 59.45 | -10.00 | 112.26 |
| 40 | 0.00 | 54.45 | -10.00 | 112.26 |
| 45 | 0.00 | 49.45 | -10.00 | 112.26 |
| 50 | 0.00 | 44.45 | -10.00 | 112.26 |
| 55 | 0.00 | 39.45 | -9.65 | 113.45 |
| 60 | 0.00 | 34.45 | -8.45 | 117.36 |
| 65 | 0.00 | 29.45 | -7.12 | 121.56 |
| 70 | 0.00 | 24.45 | -5.61 | 126.08 |
| 75 | 0.00 | 19.46 | -3.90 | 130.96 |
| 80 | 0.00 | 14.46 | -1.93 | 133.35 |
| 85 | 0.00 | 9.46 | 0.35 | 139.71 |
| 90 | 0.00 | 4.47 | 2.91 | 147.68 |
| 95 | 0.00 | 0.68 | 5.41 | 156.29 |
| 100 | 0.00 | 5.56 | 6.74 | 163.72 |
| 105 | 0.00 | 10.56 | 5.78 | 157.61 |
| 110 | 0.00 | 15.55 | 3.37 | 149.20 |
| 115 | 0.00 | 20.55 | 0.78 | 141.00 |
| 120 | 0.00 | 25.55 | -1.53 | 134.41 |
| 125 | 0.00 | 30.55 | -3.43 | 132.24 |
| 130 | 0.00 | 35.55 | -5.02 | 127.80 |
| 135 | 0.00 | 40.55 | -6.37 | 123.82 |
| 140 | 0.00 | 45.55 | -7.54 | 120.24 |
| 145 | 0.00 | 50.55 | -8.55 | 117.04 |
| 150 | 0.00 | 55.55 | -9.42 | 114.18 |
| 155 | 0.00 | 60.55 | -10.00 | 112.26 |
| 160 | 0.00 | 65.55 | -10.00 | 112.26 |
| 165 | 0.00 | 70.55 | -10.00 | 112.26 |
| 170 | 0.00 | 75.55 | -10.00 | 112.26 |
| 175 | 0.00 | 80.55 | -10.00 | 112.26 |
| 180 | 0.00 | 85.55 | -10.00 | 112.26 |
| 185 | 0.00 | 90.55 | -10.00 | 112.26 |

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| Antenna Centerline (AGL) | 2.74 m / 9.0 ft |
| Antenna Model | Harris 2.4 Meter |
| 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 | -9.8 (dBW/4 kHz) |

| Azimuth (°) | Horizon Elevation (°) | Antenna Discrimination (°) | Transmit 28.0 GHz | |
|-------------|--------------------------|-------------------------------|-----------------------|-------------------------------|
| | | | Horizon Gain (dBi) | Coordination Distance (km) |
| 190 | 0.00 | 95.55 | -10.00 | 112.26 |
| 195 | 0.00 | 100.55 | -10.00 | 112.26 |
| 200 | 0.00 | 105.55 | -10.00 | 112.26 |
| 205 | 0.00 | 110.55 | -10.00 | 112.26 |
| 210 | 0.00 | 115.55 | -9.42 | 114.18 |
| 215 | 0.00 | 120.55 | -8.55 | 117.04 |
| 220 | 0.00 | 125.55 | -7.54 | 120.24 |
| 225 | 0.00 | 130.55 | -6.37 | 123.82 |
| 230 | 0.00 | 135.55 | -5.02 | 127.80 |
| 235 | 0.00 | 140.55 | -3.43 | 132.24 |
| 240 | 0.00 | 145.55 | -1.53 | 134.41 |
| 245 | 0.00 | 150.55 | 0.81 | 141.08 |
| 250 | 0.00 | 155.55 | 3.54 | 149.76 |
| 255 | 0.00 | 160.54 | 6.24 | 159.30 |
| 260 | 0.00 | 165.54 | 7.54 | 168.61 |
| 265 | 0.00 | 170.54 | 6.22 | 159.23 |
| 270 | 0.00 | 175.53 | 3.52 | 149.69 |
| 275 | 0.00 | 179.32 | 0.79 | 141.02 |
| 280 | 0.00 | 174.44 | -1.60 | 134.22 |
| 285 | 0.00 | 169.44 | -3.65 | 131.66 |
| 290 | 0.00 | 164.45 | -5.41 | 126.68 |
| 295 | 0.00 | 159.45 | -6.95 | 122.08 |
| 300 | 0.00 | 154.45 | -8.31 | 117.82 |
| 305 | 0.00 | 149.45 | -9.52 | 113.86 |
| 310 | 0.00 | 144.45 | -10.00 | 112.26 |
| 315 | 0.00 | 139.45 | -10.00 | 112.26 |
| 320 | 0.00 | 134.45 | -10.00 | 112.26 |
| 325 | 0.00 | 129.45 | -10.00 | 112.26 |
| 330 | 0.00 | 124.45 | -10.00 | 112.26 |
| 335 | 0.00 | 119.45 | -10.00 | 112.26 |
| 340 | 0.00 | 114.45 | -10.00 | 112.26 |
| 345 | 0.00 | 109.45 | -10.00 | 112.26 |
| 350 | 0.00 | 104.45 | -10.00 | 112.26 |
| 355 | 0.00 | 99.45 | -10.00 | 112.26 |



5. Contact Information

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

| | |
|-----------------|--|
| Contact person: | Joanna Lynch |
| Title: | Manager, Spectrum & Data Solutions |
| Company: | Comsearch |
| Address: | 19700 Janelia Farm Blvd., Ashburn, VA 20147 |
| Telephone: | 703-726-5711 |
| Fax: | 703-726-5599 |
| Email: | jlynch@comsearch.com |
| Web site: | www.comsearch.com |