

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
UltiSat
SAN JUAN, PR
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
March 21, 2016

TABLE OF CONTENTS

1. CONCLUSIONS	3
2. SUMMARY OF RESULTS	4
3. SUPPLEMENTAL SHOWING	5
4. EARTH STATION COORDINATION DATA.....	6
5. CERTIFICATION.....	10

1. CONCLUSIONS

An interference study considering all existing, proposed and prior coordinated microwave facilities within the coordination contours of the proposed earth station demonstrates that this site will operate satisfactorily with the common carrier microwave environment. Further, there will be no restrictions of its operation due to interference considerations.

2. SUMMARY OF RESULTS

A number of great circle interference cases were identified during the interference study of the proposed earth station. Each of the cases, which exceeded the interference objective on a line-of-sight basis, was profiled and the propagation losses estimated using NBS TN101 (Revised) techniques. The losses were found to be sufficient to reduce the signal levels to acceptable magnitudes in every case.

3. SUPPLEMENTAL SHOWING

Pursuant to Part 25.203(c) of the FCC Rules and Regulations, the satellite earth station proposed in this application was coordinated by Comsearch using computer techniques and in accordance with Part 25 of the FCC Rules and Regulations.

Coordination data for this earth station was sent to the below listed carriers with a letter dated 01/28/2016.

Company

ALL AMERICAN CABLE AND RADIO INC
AT&T Mobility Puerto Rico
AT&T Mobility Virgin Islands, Inc.
Aeronet Wireless Broadband LLC
Broadband Telecommunications Network
Critical Hub Networks, Inc.
EVERTEC, INC
INTERISLAND TELEPHONE CORPORATION
Iniciativa Tecnologica Centro Oriental
Neptunomedia, Inc.
Osnet Wireless Corporation
PR Wireless, Inc.
PREPA Networks, LLC.
Puerto Rico Commonwealth
Puerto Rico Commonwealth of State Police
Puerto Rico Electric Power Authority
Puerto Rico Telephone Company, Inc.
Sprintcom, Inc
Sprintcom, Inc. Puerto Rico
Surge Communications LLC
T-Mobile Puerto Rico LLC

4. EARTH STATION COORDINATION DATA

This section presents the data pertinent to frequency coordination of the proposed earth station that was circulated to all carriers within its coordination contours.

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 <http://www.comsearch.com>

Date: 03/21/2016
Job Number: 160128COMSGE10

Administrative Information

Status ENGINEER PROPOSAL
Call Sign
Licensee Code ULITSA
Licensee Name UltiSat

Site Information SAN JUAN, PR

Venue Name
Latitude (NAD 83) 18° 6' 37.0" N
Longitude (NAD 83) 66° 9' 8.0" W
Climate Zone B
Rain Zone 1
Ground Elevation (AMSL) 430.0 m / 1410.8 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 22° W to 22° West Longitude
Azimuth Range 107.8° to 107.8°
Corresponding Elevation Angles 36.0° / 36.0°
Antenna Centerline (AGL) 2.74 m / 9.0 ft

Antenna Information

		Receive - FCC32		Transmit - FCC32	
Manufacturer		Prodelin		Prodelin	
Model		1251		1251	
Gain / Diameter		38.0 dBi / 2.4 m		42.0 dBi / 2.4 m	
3-dB / 15-dB Beamwidth		2.30° / 4.60°		1.36° / 2.72°	
Max Available RF Power	(dBW/4 kHz)			-10.0	
	(dBW/MHz)			14.0	
Maximum EIRP	(dBW/4 kHz)			32.0	
	(dBW/MHz)			56.0	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-154.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%

Frequency Information

	Receive 4.0 GHz	Transmit 6.1 GHz
Emission / Frequency Range (MHz)	87K0G7D - 100KG7D / 3700.0 - 4200.0	87K0G7D - 100KG7D / 5925.0 - 6047.0 87K0G7D - 100KG7D / 6080.0 - 6171.0 87K0G7D - 100KG7D / 6243.0 - 6270.0 87K0G7D - 100KG7D / 6303.0 - 6319.0 87K0G7D - 100KG7D / 6372.0 - 6425.0
Max Great Circle Coordination Distance	412.2 km / 256.1 mi	162.9 km / 101.2 mi
Precipitation Scatter Contour Radius	555.5 km / 345.2 mi	100.0 km / 62.1 mi

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Coordination Values

SAN JUAN, PR

Licensee Name UltiSat
Latitude (NAD 83) 18° 6' 37.0" N
Longitude (NAD 83) 66° 9' 8.0" W
Ground Elevation (AMSL) 430.0 m / 1410.8 ft
Antenna Centerline (AGL) 2.74 m / 9.0 ft
Antenna Model Prodelin 2.4 Meter
Antenna Mode Receive 4.0 GHz Transmit 6.1 GHz
Interference Objectives: Long Term -156.0 dBW/MHz 20% -154.0 dBW/4 kHz 20%
Short Term -146.0 dBW/MHz 0.01% -131.0 dBW/4 kHz 0.0025%
Max Available RF Power -10.0 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	1.04	104.48	-10.00	251.16	-10.00	102.48
5	0.70	100.39	-10.00	291.38	-10.00	115.93
10	0.65	96.32	-10.00	298.71	-10.00	118.43
15	0.70	92.25	-10.00	291.22	-10.00	115.87
20	0.58	88.17	-10.00	308.62	-10.00	121.91
25	0.54	84.10	-10.00	315.65	-10.00	124.45
30	0.37	80.07	-10.00	356.03	-10.00	140.46
35	0.46	76.04	-10.00	332.49	-10.00	130.72
40	0.57	72.03	-10.00	310.36	-10.00	122.54
45	0.32	68.16	-10.00	371.76	-10.00	146.69
50	0.00	64.42	-10.00	412.20	-10.00	162.88
55	0.78	60.35	-10.00	279.75	-10.00	113.82
60	1.09	56.53	-10.00	248.19	-10.00	101.29
65	0.65	53.19	-10.00	299.09	-10.00	118.56
70	0.71	49.79	-10.00	289.38	-10.00	117.13
75	0.79	46.57	-9.70	280.84	-9.70	114.11
80	2.26	42.60	-8.73	197.31	-8.73	100.00
85	2.89	39.40	-7.89	179.34	-7.89	100.00
90	4.49	35.68	-6.81	149.05	-6.81	100.00
95	6.03	32.30	-5.73	136.08	-5.73	100.00
100	7.31	29.60	-4.78	136.06	-4.78	100.00
105	7.32	28.77	-4.47	137.26	-4.47	100.00
110	8.32	27.73	-4.08	135.90	-4.08	100.00
115	8.77	28.07	-4.21	134.07	-4.21	100.00
120	9.82	28.69	-4.44	130.27	-4.44	100.00
125	9.26	31.44	-5.44	128.16	-5.44	100.00
130	10.09	33.62	-6.16	123.32	-6.16	100.00
135	10.68	36.50	-7.06	117.71	-7.06	100.00
140	12.81	38.95	-7.76	107.91	-7.76	100.00
145	14.29	42.29	-8.66	100.00	-8.66	100.00
150	12.27	47.32	-9.88	103.99	-9.88	100.00
155	13.30	51.21	-10.00	100.00	-10.00	100.00
160	13.30	55.60	-10.00	100.00	-10.00	100.00
165	13.37	60.03	-10.00	100.00	-10.00	100.00
170	12.86	64.64	-10.00	100.99	-10.00	100.00
175	13.33	69.08	-10.00	100.00	-10.00	100.00
180	12.76	73.72	-10.00	101.46	-10.00	100.00
185	13.69	78.21	-10.00	100.00	-10.00	100.00

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Coordination Values

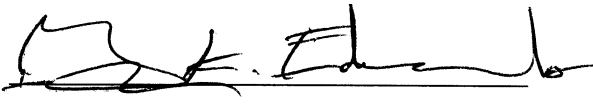
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Short Term	-146.0 dBW/MHz	0.01%	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power			-10.0 (dBW/4 kHz)	

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Receive 4.0 GHz		Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	13.58	82.83	-10.00	100.00	-10.00	100.00
195	12.89	87.46	-10.00	100.87	-10.00	100.00
200	10.77	92.03	-10.00	110.33	-10.00	100.00
205	9.27	96.47	-10.00	115.37	-10.00	100.00
210	8.09	100.80	-10.00	118.00	-10.00	100.00
215	8.09	105.19	-10.00	118.00	-10.00	100.00
220	6.62	109.27	-10.00	119.58	-10.00	100.00
225	5.71	113.29	-10.00	123.95	-10.00	100.00
230	4.71	117.13	-10.00	133.99	-10.00	100.00
235	4.07	120.92	-10.00	139.67	-10.00	100.00
240	3.82	124.70	-10.00	144.30	-10.00	100.00
245	3.87	128.46	-10.00	143.30	-10.00	100.00
250	2.45	131.24	-10.00	182.85	-10.00	100.00
255	2.36	134.46	-10.00	185.95	-10.00	100.00
260	2.51	137.59	-10.00	180.85	-10.00	100.00
265	2.67	140.43	-10.00	175.25	-10.00	100.00
270	2.67	142.75	-10.00	175.44	-10.00	100.00
275	2.33	144.30	-10.00	187.09	-10.00	100.00
280	1.95	145.21	-10.00	202.16	-10.00	100.00
285	0.93	144.87	-10.00	260.97	-10.00	106.92
290	0.52	144.49	-10.00	319.18	-10.00	125.74
295	0.00	143.41	-10.00	412.20	-10.00	162.88
300	0.34	142.59	-10.00	365.41	-10.00	144.17
305	1.15	141.64	-10.00	244.98	-10.00	100.00
310	1.14	139.45	-10.00	245.29	-10.00	100.11
315	1.11	136.85	-10.00	247.29	-10.00	100.93
320	1.23	134.03	-10.00	240.04	-10.00	100.00
325	1.33	130.92	-10.00	234.56	-10.00	100.00
330	1.07	127.39	-10.00	249.60	-10.00	101.86
335	1.05	123.83	-10.00	250.82	-10.00	102.35
340	0.86	120.06	-10.00	269.20	-10.00	110.02
345	0.81	116.26	-10.00	275.76	-10.00	112.40
350	1.00	112.44	-10.00	253.92	-10.00	103.58
355	1.18	108.52	-10.00	242.90	-10.00	100.00

5. CERTIFICATION

I HEREBY CERTIFY THAT I AM THE TECHNICALLY QUALIFIED PERSON RESPONSIBLE FOR THE PREPARATION OF THE FREQUENCY COORDINATION DATA CONTAINED IN THIS APPLICATION, THAT I AM FAMILIAR WITH PARTS 101 AND 25 OF THE FCC RULES AND REGULATIONS, THAT I HAVE EITHER PREPARED OR REVIEWED THE FREQUENCY COORDINATION DATA SUBMITTED WITH THIS APPLICATION, AND THAT IT IS COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: 

Gary K. Edwards
Senior Manager
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: March 21, 2016