FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

Harris Caprocks Communication, Inc.
Cape Liberty, NJ
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7700 Leesburg Pike, Suite 238
Falls Church, VA 22043
January 11, 2017

Skjei Telecom, Inc.

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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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

The following companies reported potential great circle interference conflicts that did not meet the objectives on a line-of-sight basis. When over-the-horizon losses are considered on the interfering paths, sufficient blockage exists to negate harmful interference from occurring with the proposed transmit-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

Blueline Communications
Capital Communications of America
CONSOLIDATED EDISON COMPANY OF NEW YORK
Cox Radio Inc
Eastern MLG LLC
Jefferson Microwave, LLC
Middlesex, County of
New Cingular Wireless PCS LLC - NJ
New Line Networks, LLC
NEW YORK CITY POLICE DEPARTMENT
PSEG Services Corporation
Texas Eastern Communications, LLC
Webline Holdings LLC

Skjei Telecom, Inc.

Site	Cape Liberty, NJ										
Desired Frequencies (MHz)		6353.20 - 6367.80	6305.0780 - 6311.60	6313.57-6323.0							
Into 1 Case#	Margin				Frequencies Affected						
177	32.5	Y			6375.14	0	0	0	0	0	0
1408	31.5	Y			6375.14	0	0	0	0	0	0
1479	27.3	Y			6375.14	0	0	0	0	0	0
1480	27.3	Y			6375.14	0	0	0	0	0	0
444	26.7	Y			6375.14	0	0	0	0	0	0
826	25.7		Y	Y	6315.84	0	0	0	0	0	0
1453	25.7		Y	Y	6315.84	0	0	0	0	0	0
1421	24.3	Y			6375.14	0	0	0	0	0	0
1013	18.3	Y			6375.14	0	0	0	0	0	0
1170	11.9		Y	Y	6286.19	6315.84	6345.49	6404.79	0	0	0
Desired Frequencies (MHz)		6353.20 - 6367.80	6305.0780 - 6311.60	6313.57-6323.0							
Into 2 Case #	Margin(dB)				Frequencies Affected						
106	47.7		Y		6286.19	0	0	0	0	0	0
1409	41.1	Y			6375.14	0	0	0	0	0	0
1065	27.2		Y	Y	6330.665	0	0	0	0	0	0
1066	27.2	Y			6389.965	0	0	0	0	0	0
84	23.3	Y	Y	Y	6197.24	6226.89	6256.54	6286.19	6315.84	6345.49	6375.14
101	23.3		Y	Y	6226.89	6286.19	6315.84	6345.49	0	0	0
43	9.2	Y			6375.14	0	0	0	0	0	0
1303	0.9	Y			6375.14	0	0	0	0	0	0
415	0.8	Y			6375.14	0	0	0	0	0	0
887	0.8	Y			6375.14	0	0	0	0	0	0

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones	Cape Liberty, NJ				
Into 1 Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
177	40.60164376	74.04322827	32.5	BOUND BROOK	Texas Eastern Communications, LLC
1408	40.4999975	73.34999639	31.5	OFFICE STD	Cox Radio Inc
1479	40.45339448	73.88751796	27.3	CCI806079	Blueline Communications
1480	40.45339448	73.88751796	27.3	CCI806079	Blueline Communications
444	40.5391482	74.02341671	26.7	GLEN GARDNER	Jefferson Microwave, LLC
826	40.53895344	74.02336141	25.7	NJ033	Webline Holdings LLC
1453	40.53895344	74.02336141	25.7	NJ033	Webline Holdings LLC
1421	40.45339448	73.88751796	24.3	CCI806079	Blueline Communications
1013	40.48685189	73.45934963	18.3	92869	Eastern MLG LLC
1170	40.67384573	74.04289911	11.9	TRENTON	PSEG Services Corporation
Into 2 Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
106	40.62865398	74.05224874	47.7	PSAC 1	NEW YORK CITY POLICE DEPARTMENT
1409	40.65618177	74.05456962	41.1	QES	NEW YORK CITY POLICE DEPARTMENT
1065	40.46749586	73.89044039	27.2	BAYARD ST	Middlesex, County of
1066	40.46749586	73.89044039	27.2	BAYARD ST	Middlesex, County of
84	40.32384993	73.86072967	23.3	HOPEWELL	New Cingular Wireless PCS LLC - NJ
101	40.32384993	73.86072967	23.3	HOPEWELL	New Cingular Wireless PCS LLC - NJ
43	40.66511334	74.07268188	9.2	ARTHUR KILL	CONSOLIDATED EDISON COMPANY OF NEW YORK
1303	40.67384573	74.04289911	0.9	PEN ARGYL	New Line Networks, LLC
415	40.67222818	74.04841849	0.8	1274813	Eastern MLG LLC
887	40.67384573	74.04289911	0.8	1043280	Capital Communications of America

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 11/11/2016

Company

ALGONQUIN GAS TRANSMISSION, LLC
Allentown SMSA Limited Partnership
AT&T Common Sys's
AT&T COMMON SYSTEMS
AT&T Corp.
AT&T Wireless Services 3 LLC - PA
Atlantic City Electric Company
Auburn Data Systems, LLC
AWC Networks
Berks County Department of Emergency Ser
BFI Licenses, LLC
Blueline Communications
Bucks County Dept. of Emergency Comm
Capital Communications of America
Carbon, County of 911 Center
Cellco Partnership - (W-NY)
Cellco Prtnrshp - Phil. Tri-State Rgn
Central Hudson Gas & Electric Corp.
Chester, County of
China Cat Productions LLC
City of New York
Commonwealth of Pennsylvania-Radio Proj.
Connecticut State Police Department
CONSOLIDATED EDISON COMPANY OF NEW YORK
Conterra Ultra Broadband, LLC
Coralinks
County of Burlington, Public Safety Cntr
County of Camden
County of Pike
County of Warren, NJ
Cox Radio Inc

Delaware County (PA) Emergency Services
Delaware Division of Communications
Delmarva Broadcasting Company
Delmarva Power and Light Company
Direct Broadcast Services, Inc.
Eastern MLG LLC
Eastern Pennsylvania EMS Council
ECW Wireless, LLC
Electric Railroad, LLC
EMS OF NORTHEAST PENNSYLVANIA
Essex County Sheriff's Office (NJ)
Eversource Energy Service Company
Exelon Generation Company, LLC
FELHC, INC
Garden State Transmissions
Gloucester, County of
Goosetown Network Services, LLC
Hammarlund Research LLC
High Voltage Communications LLC (CFN)
Higher Ground LLC
Highway Networks, LLC
iSignal
Jefferson Microwave, LLC
Kryptick Technologies
Lackawanna, County of
Limitless Mobile, LLC
Luzerne County 9-1-1
Mahwah Communications
Middlesex, County of
Mifflin Mobilecom
MONMOUTH, COUNTY OF
Monroe County Control Center (PA)
Montgomery County Of
Morris, County of
Nassau County Police Department
National Tower Company LLC
New Cingular Wireless PCS LLC - NJ
New Cingular Wireless PCS, LLC - PA
New Cingular Wireless PCS, LLC (NY)
New Jersey State Police
New Jersey Transit Rail Operations, Inc.
New Jersey Turnpike Authority-Pkwy Div
New Jersey, State of -NJ Transit
New Line Networks, LLC
NEW YORK CITY POLICE DEPARTMENT
New York Communications Co., Inc

NeXXCom Wireless LLC
Norfolk Southern Railway
Northeast Pennsylvania SMSA LTD Prtnrsh
OCEAN, COUNTY OF
Ocean, County of - Div of Wireless Tech.
Office of Emergency Telecom Services, NJ
Orange and Rockland Utilities, Inc.
Orange County Dept of Emergency Services
Orange Poughkeepsie SMSA LTD Partnership
Peco Energy Company
PEG Bandwidth, LLC
Pennsylvania Turnpike Commission
Perseus Technology Holdings USA Inc.
Pitt Power
Port Authority of New York & New Jersey
PSEG Services Corporation
Qoncept Holdings LLC
Rendezvous Communications LLC
SCS Networks
Suffolk County Police Department
Sullivan County DPW
SW Networks
Texas Eastern Communications, LLC
Transcontinental Gas Pipeline Corp.
Transwave Communication Systems, Inc.
Turtle Networks 6559
ULSTER COUNTY OF
Verizon Wireless (VAW) LLC-Pennsylvania
Webline Holdings LLC
WESTCHESTER, COUNTY OF
Wireless Applications Corporation
Wireless Internetwork LLC
World Class Wireless, LLC
WYOMING, COUNTY OF
xWave Engineering 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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations.”

Date:	11/11/2016
Job Number:	161111SKJTEL07

Administrative Information

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

Site Information — CAPE LIBERTY, NJ

Venue Name	
Latitude (NAD 83)	40° 39' 54.4" N
Longitude (NAD 83)	74° 4' 21.4" W
Climate Zone	B
Rain Zone	2
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information

Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	18° W to 34.5° West Longitude
Azimuth Range	113.7° to 128.3°
Corresponding Elevation Angles	16.7° / 28.1°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information — Transmit - FCC32

Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-10.0
	(dBW/MHz)	14.0
Maximum EIRP	(dBW/4 kHz)	31.7
	(dBW/MHz)	55.7
	(dBW)	60.7
Interference Objectives:	Long Term	-154.0 dBW/4 kHz 20%
	Short Term	-131.0 dBW/4 kHz 0.0025%

Frequency Information — Transmit 6.1 GHz

Emission / Frequency Range (MHz)	270KG7D - 3M20G7D / 6305.078 - 6311.6 270KG7D - 3M20G7D / 6313.57 - 6323.0 270KG7D – 3M20G7D / 6353.20 - 6367.80
Max Great Circle Coordination Distance	221.0 km / 137.3 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Coordination Values	**CAPE LIBERTY, NJ**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	40° 39' 54.4" N
Longitude (NAD 83)	74° 4' 21.4" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-10.0 (dBW/4 kHz)

			Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	112.61	-10.00	162.88
5	0.00	107.86	-10.00	162.88
10	0.00	103.08	-10.00	162.88
15	0.00	98.30	-10.00	162.88
20	0.00	93.52	-10.00	162.88
25	0.00	88.73	-10.00	162.88
30	0.00	83.94	-10.00	162.88
35	0.00	79.16	-10.00	162.88
40	0.00	74.38	-10.00	162.88
45	0.00	69.61	-10.00	162.88
50	0.00	64.86	-10.00	162.88
55	0.00	60.13	-10.00	162.88
60	0.00	55.43	-10.00	162.88
65	0.00	50.77	-10.00	162.88
70	0.00	46.15	-9.61	164.69
75	0.00	41.61	-8.48	170.00
80	0.00	37.15	-7.25	176.02
85	0.00	32.83	-5.91	182.87
90	0.00	28.70	-4.45	190.65
95	0.25	24.70	-2.82	190.59
100	0.25	21.28	-1.20	200.74
105	0.00	18.78	0.16	217.60
110	0.30	16.81	1.36	205.67
115	0.24	16.53	1.54	217.85
120	0.00	17.84	0.71	220.98
125	0.00	20.10	-0.58	213.14
130	0.00	23.19	-2.13	204.02
135	0.00	26.40	-3.54	195.65
140	0.00	29.45	-4.73	189.13
145	0.00	32.29	-5.73	183.82
150	0.00	34.99	-6.60	179.30
155	0.00	38.03	-7.50	174.75
160	0.00	41.40	-8.43	170.25
165	0.00	45.03	-9.34	165.94
170	0.00	48.85	-10.00	162.88
175	0.00	52.81	-10.00	162.88
180	0.26	56.81	-10.00	154.54
185	0.00	61.07	-10.00	162.88

Coordination Values **CAPE LIBERTY, NJ**

Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	40° 39' 54.4" N
Longitude (NAD 83)	74° 4' 21.4" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-10.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.57	65.18	-10.00	122.74
195	0.80	69.46	-10.00	113.28
200	1.01	73.81	-10.00	103.36
205	0.96	78.23	-10.00	105.49
210	0.76	82.67	-10.00	114.78
215	0.46	87.12	-10.00	131.18
220	0.32	91.54	-10.00	146.60
225	0.00	95.94	-10.00	162.88
230	0.00	100.34	-10.00	162.88
235	0.00	104.72	-10.00	162.88
240	0.00	109.07	-10.00	162.88
245	0.00	113.38	-10.00	162.88
250	0.00	117.65	-10.00	162.88
255	0.00	121.85	-10.00	162.88
260	0.00	125.96	-10.00	162.88
265	0.00	129.97	-10.00	162.88
270	0.00	133.83	-10.00	162.88
275	0.00	137.52	-10.00	162.88
280	0.00	140.98	-10.00	162.88
285	0.00	144.13	-10.00	162.88
290	0.00	146.89	-10.00	162.88
295	0.00	149.15	-10.00	162.88
300	0.00	150.79	-10.00	162.88
305	0.00	151.71	-10.00	162.88
310	0.00	151.83	-10.00	162.88
315	0.00	151.15	-10.00	162.88
320	0.00	149.14	-10.00	162.88
325	0.00	144.89	-10.00	162.88
330	0.00	140.50	-10.00	162.88
335	0.00	135.99	-10.00	162.88
340	0.00	131.40	-10.00	162.88
345	0.00	126.76	-10.00	162.88
350	0.00	122.07	-10.00	162.88
355	0.00	117.36	-10.00	162.88

Name	Latitude	Longitude
1	40.48333	-73.33333
2	40.445	-73.80167
3	40.16667	-73.82833
4	40.48167	-73.89333
5	40.526	-74.01167
6	40.5385	-74.02317
7	40.56667	-74.03117
8	40.6065	-74.04483
9	40.64367	-74.05717
10	40.65617	-74.0545
11	40.67383	-74.04283
P1	40.6651	-74.07261

ESV Break Point List

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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7700 Leesburg Pike, Suite 238
Falls Church, VA 22043

DATED: January 17, 2017

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

Harris Caprocks Communication, Inc.
Hubbards Glacier, AK
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7700 Leesburg Pike, Suite 238
Falls Church, VA 22043
December 29, 2016

Skjei Telecom, Inc.

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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. There will be spectrum restrictions due to interference considerations.

2. SUMMARY OF RESULTS

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Company

Skjei Telecom, Inc.

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 11/11/2016

Company

Alascom Inc
Alaska Power & Telephone

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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations.”

Date:	11/11/2016
Job Number:	161111SKJTEL10

Administrative Information	
Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**HUBBARD GLAC, AK**
Venue Name	
Latitude (NAD 83)	59° 50' 30.9" N
Longitude (NAD 83)	139° 40' 7.3" W
Climate Zone	B
Rain Zone	3
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information	
Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	180° W to 180° West Longitude
Azimuth Range	224.5° to 224.5°
Corresponding Elevation Angles	14.1° / 14.1°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-10.0
	(dBW/MHz)	14.0
Maximum EIRP	(dBW/4 kHz)	31.7
	(dBW/MHz)	55.7
	(dBW)	62.8
Interference Objectives:	Long Term	-154.0 dBW/4 kHz 20%
	Short Term	-131.0 dBW/4 kHz 0.0025%

Frequency Information	**Transmit 6.1 GHz**
Emission / Frequency Range (MHz)	270KG7D - 5M20G7D / 6356.0 - 6363.81
Max Great Circle Coordination Distance	237.2 km / 147.3 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Coordination Values	**HUBBARD GLAC, AK**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	59° 50' 30.9" N
Longitude (NAD 83)	139° 40' 7.3" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-10.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	133.80	-10.00	162.88
5	0.00	138.48	-10.00	162.88
10	0.00	143.09	-10.00	162.88
15	0.00	147.61	-10.00	162.88
20	1.07	152.47	-10.00	101.83
25	3.44	157.90	-10.00	100.00
30	5.06	162.99	-10.00	100.00
35	8.08	168.80	-10.00	100.00
40	9.06	173.28	-10.00	100.00
45	9.95	175.84	-10.00	100.00
50	10.28	173.29	-10.00	100.00
55	10.47	168.88	-10.00	100.00
60	11.27	164.23	-10.00	100.00
65	10.01	159.09	-10.00	100.00
70	6.58	153.47	-10.00	100.00
75	5.82	148.48	-10.00	100.00
80	6.56	143.79	-10.00	100.00
85	7.23	139.00	-10.00	100.00
90	8.98	134.25	-10.00	100.00
95	8.49	129.25	-10.00	100.00
100	7.89	124.25	-10.00	100.00
105	6.66	119.20	-10.00	100.00
110	5.76	114.20	-10.00	100.00
115	2.94	109.09	-10.00	100.00
120	4.65	104.27	-10.00	100.00
125	5.68	99.37	-10.00	100.00
130	2.30	94.38	-10.00	100.00
135	0.35	89.49	-10.00	142.86
140	0.36	84.63	-10.00	141.75
145	0.00	79.79	-10.00	162.88
150	0.00	74.95	-10.00	162.88
155	0.00	70.12	-10.00	162.88
160	0.00	65.29	-10.00	162.88
165	0.00	60.48	-10.00	162.88
170	0.00	55.69	-10.00	162.88
175	0.00	50.93	-10.00	162.88
180	0.00	46.20	-9.62	164.64
185	0.00	41.52	-8.46	170.10

Coordination Values	**HUBBARD GLAC, AK**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	59° 50' 30.9" N
Longitude (NAD 83)	139° 40' 7.3" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-10.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	36.91	-7.18	176.38
195	0.00	32.39	-5.76	183.63
200	0.00	28.02	-4.19	192.07
205	0.00	23.87	-2.45	202.22
210	0.00	20.09	-0.57	213.19
215	0.00	16.92	1.29	224.56
220	0.00	14.76	2.77	233.91
225	0.00	14.09	3.28	237.16
230	0.00	15.11	2.52	232.30
235	0.00	17.52	0.91	222.22
240	0.00	20.84	-0.97	210.80
245	0.00	24.72	-2.83	200.06
250	0.00	28.92	-4.53	190.19
255	0.00	33.33	-6.07	182.02
260	0.00	37.87	-7.46	174.98
265	0.00	42.50	-8.71	168.89
270	0.00	47.19	-9.85	163.58
275	0.00	51.93	-10.00	162.88
280	0.00	56.70	-10.00	162.88
285	0.00	61.49	-10.00	162.88
290	0.00	66.31	-10.00	162.88
295	0.00	71.13	-10.00	162.88
300	0.00	75.97	-10.00	162.88
305	0.00	80.81	-10.00	162.88
310	0.00	85.66	-10.00	162.88
315	0.00	90.51	-10.00	162.88
320	0.00	95.36	-10.00	162.88
325	0.00	100.21	-10.00	162.88
330	0.00	105.05	-10.00	162.88
335	0.00	109.88	-10.00	162.88
340	0.00	114.71	-10.00	162.88
345	0.00	119.52	-10.00	162.88
350	0.00	124.31	-10.00	162.88
355	0.00	129.07	-10.00	162.88

Name	Latitude	Longitude
1	59.84192	-139.6687
2	59.57774	-140.1249
3	59.47792	-140.0179
4	58.39556	-139.1286
5	59.47792	-140.018
6	59.56162	-142.7798

ESV Break Point List

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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7700 Leesburg Pike, Suite 238
Falls Church, VA 22043

DATED: December 29, 2016

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
Inside Passage, AK
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7700 Leesburg Pike, Suite 238
Falls Church, VA 22043
December 29, 2016

Skjei Telecom, Inc.

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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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

The following companies reported potential great circle interference conflicts that did not meet the objectives on a line-of-sight basis. When over-the-horizon losses are considered on the interfering paths, sufficient blockage exists to negate harmful interference from occurring with the proposed transmit-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

Alascom Inc
Alaska Power & Telephone

Skjei Telecom, Inc.

Site	Inside Passage								
Desired Frequencies (MHz)		6356.000 – 6363.8135							
	Summary			Frequencies Affected					
19	50.83437	Y		6197.24	6256.54	6315.84	6375.14	0	0
94	50.43437	Y		6226.89	6286.19	6345.49	6404.79	0	0
75	47.93437	Y		6345.49	0	0	0	0	0
73	43.86039	Y		6315.84	6375.14	0	0	0	0
17	41.1001	Y		6226.89	6256.54	6286.19	6345.49	6404.79	0
62	41.1001	Y		6345.49	0	0	0	0	0
37	40.73665	Y		6345.49	0	0	0	0	0
72	40.39956	Y		6375.14	0	0	0	0	0
36	39.27523	Y		6345.49	0	0	0	0	0
70	37.83665	Y		6197.24	6375.14	6404.79	0	0	0
33	36.6442	Y		6197.24	6256.54	6315.84	6375.14	0	0
69	36.37523	Y		6315.84	6375.14	6404.79	0	0	0
83	25.61481	Y		6315.84	6345.49	0	0	0	0
78	22.31481	Y		6315.84	6345.49	0	0	0	0
Desired Frequencies (MHz)		6356.000 – 6363.8135							
Into 2									
Case #	Margin(dB)			Frequencies Affected					
93	45.96039	Y		6197.24	6256.54	6315.84	6375.14	0	0
18	44.46039	Y		6226.89	6286.19	6345.49	6404.79	0	0
95	41.17523	Y		6315.84	6375.14	6404.79	0	0	0
91	41.13608	Y		6197.24	6375.14	6404.79	0	0	0
92	41.09956	Y		6197.24	6315.84	6375.14	0	0	0
25	36.7442	Y		6197.24	6256.54	6315.84	6375.14	0	0
26	31.95074	Y		6197.24	6256.54	6315.84	6375.14	0	0
34	31.95074	Y		6197.24	6256.54	6315.84	6375.14	0	0

12	24.47427	Y		6226.89	6345.49	0	0	0	0
35	24.27427	Y		6197.24	6226.89	6286.19	6345.49	0	0
67	20.27427	Y		6256.54	6375.14	0	0	0	0
51	11.87005	Y		6375.14	6404.79	0	0	0	0

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones					
Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
19	57.10146736	134.7085701	50.8343689	MANLEY	Alascom Inc
94	57.10146736	134.7085701	50.4343689	MANLEY	Alascom Inc
75	57.10146736	134.7085701	47.9343689	MANLEY	Alascom Inc
73	57.25436711	134.7290309	43.86039079	MANLEY	Alascom Inc
17	57.61858863	134.7713885	41.10009611	SO PASSAGE	Alascom Inc
62	57.61858863	134.7713885	41.10009611	SO PASSAGE	Alascom Inc
37	57.9524093	134.8525231	40.7366506	SO PASSAGE	Alascom Inc
72	57.61861224	134.771395	40.39955521	SO PASSAGE	Alascom Inc
36	58.18759813	134.9415483	39.27523064	PT HOWARD	Alascom Inc
70	57.9524093	134.8525231	37.8366506	SO PASSAGE	Alascom Inc
33	57.47396036	134.7475591	36.64419608	RODMAN	Alascom Inc
69	58.18759813	134.9415483	36.37523064	PT HOWARD	Alascom Inc
83	57.30169215	134.7330054	25.6148063	DUNCAN CANAL	Alascom Inc
78	57.30169215	134.7330054	22.3148063	DUNCAN CANAL	Alascom Inc
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
93	57.25436711	134.7290309	45.96039079	MANLEY	Alascom Inc
18	57.25436711	134.7290309	44.46039079	MANLEY	Alascom Inc
95	58.18759813	134.9415483	41.17523064	POINT HOWARD	Alascom Inc
91	57.95243375	134.852533	41.13607578	SO PASSAGE	Alascom Inc
92	57.61861224	134.771395	41.09955521	SO PASSAGE	Alascom Inc
25	57.47396036	134.7475591	36.74419608	RODMAN	Alascom Inc
26	57.73168643	134.7991749	31.95073871	MUD BAY	Alascom Inc
34	57.73168643	134.7991749	31.95073871	MUD BAY	Alascom Inc
12	56.7524393	134.5530922	24.47427249	MUD BAY	Alascom Inc
35	56.7524393	134.5530922	24.27427249	MUD BAY	Alascom Inc
67	56.7524393	134.5530922	20.27427249	MUD BAY	Alascom Inc

51	57.43381157	134.7441551	11.87004977	LNDIMW	Alaska Power & Telephone

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 11/11/2016

Company

AT&T COMMON SYSTEMS
AT&T Common Sys's
AT&T Common Systems
Alaska Power & Telephone Company
Alascom Inc
Alaska Power & Telephone

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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations.”

Date:	11/11/2016
Job Number:	161111SKJTEL11

Administrative Information

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

Site Information — INSIDE PASSA, AK

Venue Name	
Latitude (NAD 83)	58° 14' 33.2" N
Longitude (NAD 83)	134° 57' 46.8" W
Climate Zone	B
Rain Zone	3
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information

Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	180° W to 180° West Longitude
Azimuth Range	229.7° to 229.7°
Corresponding Elevation Angles	13.4° / 13.4°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information — Transmit - FCC32

Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-10.0
	(dBW/MHz)	14.0
Maximum EIRP	(dBW/4 kHz)	31.7
	(dBW/MHz)	55.7
	(dBW)	62.8
Interference Objectives:	Long Term	-154.0 dBW/4 kHz 20%
	Short Term	-131.0 dBW/4 kHz 0.0025%

Frequency Information — Transmit 6.1 GHz

Emission / Frequency Range (MHz)	270KG7D - 5M20G7D / 6356.0 - 6363.81
Max Great Circle Coordination Distance	291.9 km / 181.4 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Coordination Values	**INSIDE PASSA, AK**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	58° 14' 33.2" N
Longitude (NAD 83)	134° 57' 46.8" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-10.0 (dBW/4 kHz)

Transmit 6.1 GHz

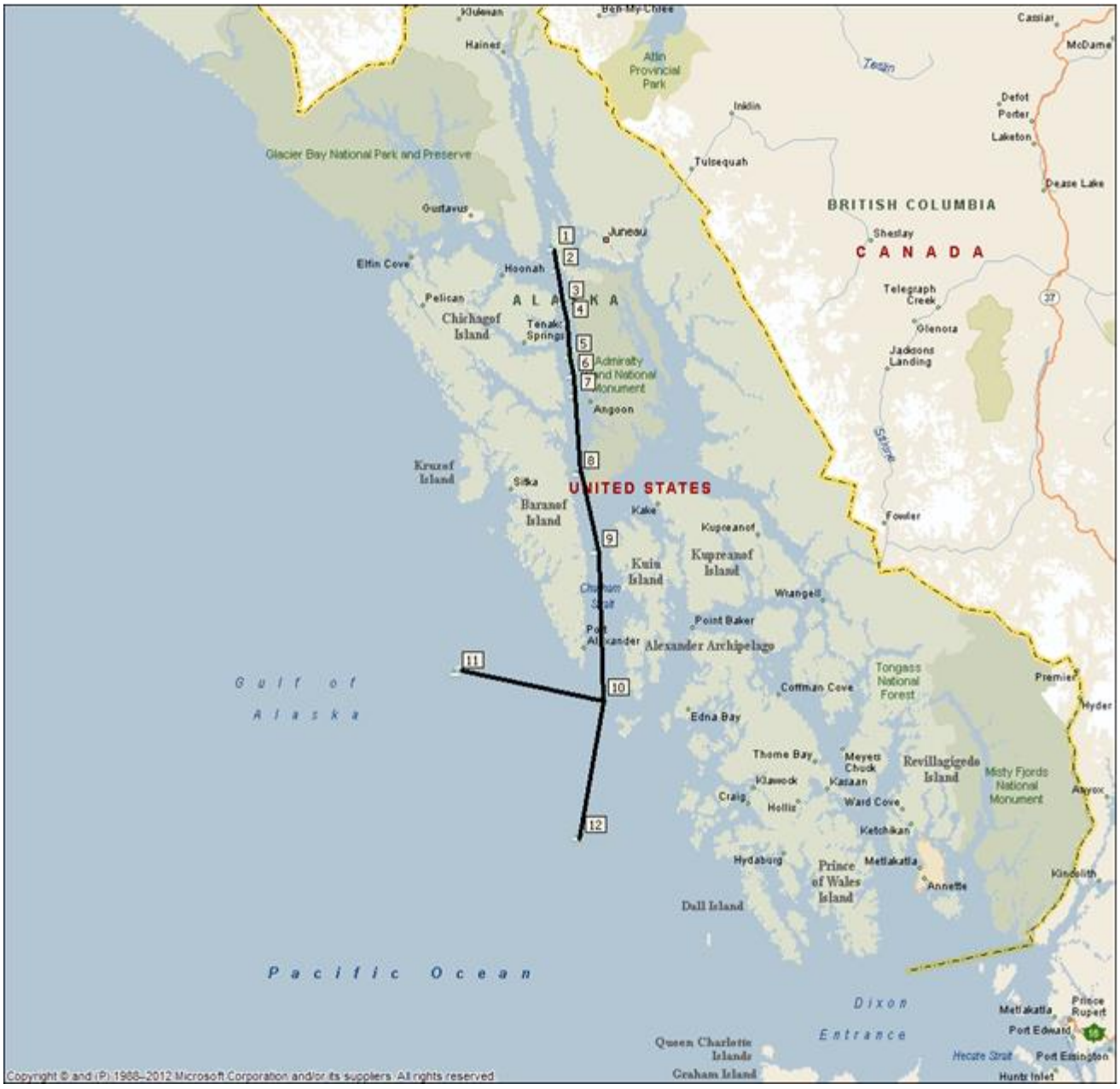
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	129.03	-10.00	200.77
5	0.24	133.84	-10.00	193.95
10	0.79	138.71	-10.00	133.15
15	0.91	143.43	-10.00	125.83
20	1.26	148.17	-10.00	116.53
25	1.71	152.88	-10.00	106.12
30	2.07	157.43	-10.00	100.00
35	1.83	161.42	-10.00	103.28
40	1.53	164.76	-10.00	110.33
45	2.03	167.75	-10.00	100.00
50	2.50	169.12	-10.00	100.00
55	2.77	168.14	-10.00	100.00
60	1.42	164.25	-10.00	112.78
65	0.85	160.30	-10.00	129.30
70	1.77	156.70	-10.00	104.75
75	3.24	152.83	-10.00	100.00
80	4.46	148.50	-10.00	100.00
85	5.44	143.89	-10.00	100.00
90	5.79	139.07	-10.00	100.00
95	6.43	134.25	-10.00	100.00
100	6.47	129.32	-10.00	100.00
105	7.55	124.46	-10.00	100.00
110	6.98	119.46	-10.00	100.00
115	5.65	114.42	-10.00	100.00
120	6.48	109.51	-10.00	100.00
125	5.51	104.52	-10.00	100.00
130	4.58	99.55	-10.00	100.00
135	2.99	94.58	-10.00	100.00
140	0.49	89.67	-10.00	154.87
145	0.00	84.81	-10.00	200.77
150	0.00	79.94	-10.00	200.77
155	0.00	75.09	-10.00	200.77
160	0.00	70.23	-10.00	200.77
165	0.00	65.39	-10.00	200.77
170	0.00	60.57	-10.00	200.77
175	0.00	55.75	-10.00	200.77
180	0.00	50.97	-10.00	200.77
185	0.00	46.21	-9.62	202.96

Coordination Values	**INSIDE PASSA, AK**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	58° 14' 33.2" N
Longitude (NAD 83)	134° 57' 46.8" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-10.0 (dBW/4 kHz)

			Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	41.50	-8.45	209.76
195	0.00	36.85	-7.16	217.49
200	0.00	32.28	-5.72	226.33
205	0.00	27.85	-4.12	236.53
210	0.00	23.63	-2.34	248.29
215	0.00	19.74	-0.39	259.98
220	0.00	16.45	1.60	274.38
225	0.00	14.15	3.23	287.01
230	0.00	13.38	3.84	291.89
235	0.00	14.38	3.05	285.60
240	0.00	16.85	1.34	272.43
245	0.00	20.25	-0.66	258.08
250	0.00	24.19	-2.59	246.59
255	0.00	28.44	-4.35	235.06
260	0.00	32.90	-5.93	225.06
265	0.00	37.48	-7.34	216.37
270	0.00	42.14	-8.62	208.78
275	0.00	46.86	-9.77	202.09
280	0.00	51.62	-10.00	200.77
285	0.00	56.41	-10.00	200.77
290	0.00	61.22	-10.00	200.77
295	0.00	66.05	-10.00	200.77
300	0.00	70.89	-10.00	200.77
305	0.00	75.75	-10.00	200.77
310	0.00	80.60	-10.00	200.77
315	0.00	85.47	-10.00	200.77
320	0.00	90.33	-10.00	200.77
325	0.00	95.19	-10.00	200.77
330	0.00	100.06	-10.00	200.77
335	0.00	104.91	-10.00	200.77
340	0.00	109.77	-10.00	200.77
345	0.00	114.61	-10.00	200.77
350	0.00	119.43	-10.00	200.77
355	0.00	124.25	-10.00	200.77

Name	Lat	Lon
1	58.24256	-134.963
2	58.13992	-134.923
3	57.97083	-134.86
4	57.87433	-134.821
5	57.70417	-134.795
6	57.60981	-134.769
7	57.51433	-134.751
8	57.12225	-134.718
9	56.73158	-134.544
10	55.98825	-134.496
11	56.12122	-135.859
12	55.30081	-134.712

ESV Break Point List



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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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7700 Leesburg Pike, Suite 238
Falls Church, VA 22043

DATED: December 29, 2016

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
Kailua Kona, HI
Satellite Earth Station on Vessel (ESV)

Prepared By:
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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. There will be spectrum restrictions due to interference considerations.

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A number of great circle interference cases were identified during the interference study of the proposed earth station. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

The following companies reported potential great circle interference conflicts that did not meet the objectives on a line-of-sight basis. When over-the-horizon losses are considered on the interfering paths, sufficient blockage exists to negate harmful interference from occurring with the proposed transmit-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

Hawaiian Telcom, Inc.
Hawaii State
New Cingular Wireless PCS LLC - Hawaii

Skjei Telecom, Inc.

Site									
Desired Frequencies (MHz)		6356.000 – 6363.8135							
		Summary		Frequencies Affected					
9	33.57284	Y		6249.128	6367.727	0	0	0	0
10	30.49338	Y		6345.49	6404.79	0	0	0	0
20	30.23167	Y		6256.54	6375.14	0	0	0	0
96	24.91516	Y		6345.49	0	0	0	0	0
69	12.92845	Y		6226.89	6286.19	6345.49	6404.79	0	0
147	8.869132	Y		6375.14	0	0	0	0	0
Notes									
Desired Frequencies (MHz)		6356.000 – 6363.8135							
Into 2									
Case #	Margin(dB)			Frequencies Affected					
144	30.57176	Y		6375.14	0	0	0	0	0
8	30.45602	Y		6345.49	6404.79	0	0	0	0
48	30.37176	Y		6375.14	0	0	0	0	0
155	5.969132	Y		6375.14	0	0	0	0	0

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones					
Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
9	19.64219119	156.0300102	33.57284212	KAMUELA	Hawaiian Telcom, Inc.
10	19.64219119	156.0300102	30.49338118	KAMUELA	Hawaiian Telcom, Inc.
20	19.63230555	155.9990009	30.2316665	KAMUELA	Hawaiian Telcom, Inc.
96	19.26499007	156.1110127	24.91516158	KAHUA RANCH	Hawaii State
69	19.63440454	155.9978021	12.92845476	HALEAKALA	Hawaiian Telcom, Inc.
147	19.00607543	156.0973033	8.869132042	NORTH KOHALA	New Cingular Wireless PCS LLC - Hawaii
Into 2 Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
144	19.76158527	156.0873082	30.57175826	HUMUULA	Hawaii State
8	19.76342941	156.0879906	30.45602227	HUMUULA	Hawaiian Telcom, Inc.
48	19.76158527	156.0873082	30.37175826	HUMUULA	Hawaii State
155	19.00607543	156.0973033	5.969132042	NORTH KOHALA	New Cingular Wireless PCS LLC - Hawaii

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 11/11/2016

Company
ACD Telecom Inc
HAWAII COUNTY OF
Hawaii Electric Light Co Inc
Hawaiian Telcom, Inc.
New Cingular Wireless PCS LLC - Hawaii
Hawaii State
Hawaiian Telcom, Inc.
Maui, County of
New Cingular Wireless PCS LLC - Hawaii
University of Hawaii
Verizon Wireless VAW LLC - (Hawaii)

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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations.”

Date:	11/11/2016
Job Number:	161111SKJTEL09

Administrative Information

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

Site Information — KAILUA KONA, HI

Venue Name	
Latitude (NAD 83)	19° 38' 21.4" N
Longitude (NAD 83)	155° 59' 45.6" W
Climate Zone	B
Rain Zone	4
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information

Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	180° W to 180° West Longitude
Azimuth Range	233.0° to 233.0°
Corresponding Elevation Angles	54.3° / 54.3°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information — Transmit - FCC32

Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-10.0
	(dBW/MHz)	14.0
Maximum EIRP	(dBW/4 kHz)	31.7
	(dBW/MHz)	55.7
	(dBW)	62.8
Interference Objectives:	Long Term	-154.0 dBW/4 kHz 20%
	Short Term	-131.0 dBW/4 kHz 0.0025%

Frequency Information — Transmit 6.1 GHz

Emission / Frequency Range (MHz)	270KG7D - 5M20G7D / 6356.0 - 6363.81
Max Great Circle Coordination Distance	162.9 km / 101.2 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Coordination Values	**KAILUA KONA, HI**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	19° 38' 21.4" N
Longitude (NAD 83)	155° 59' 45.6" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-10.0 (dBW/4 kHz)

Transmit 6.1 GHz

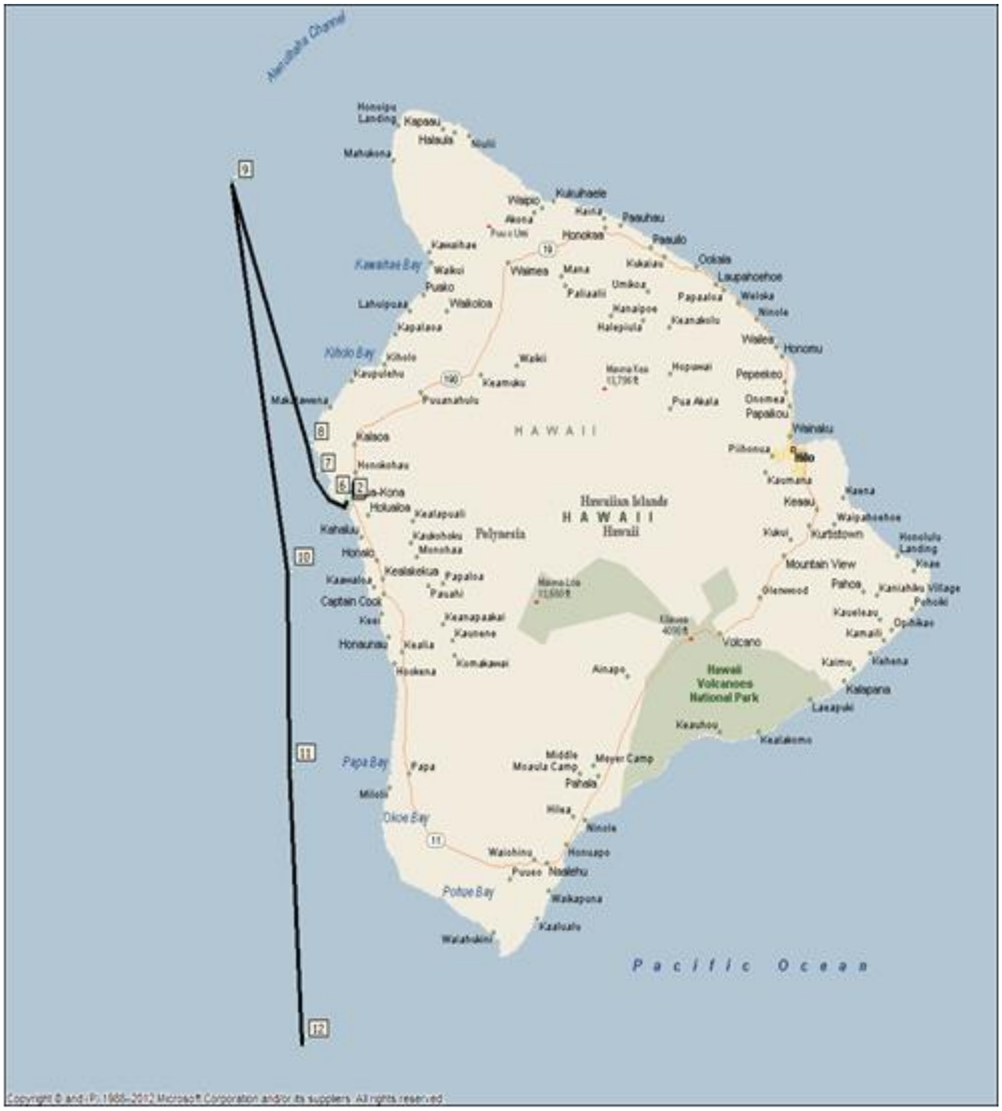
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	1.98	111.61	-10.00	100.00
5	2.24	114.32	-10.00	100.00
10	2.71	117.05	-10.00	100.00
15	3.43	119.85	-10.00	100.00
20	4.03	122.44	-10.00	100.00
25	4.63	124.87	-10.00	100.00
30	5.12	127.01	-10.00	100.00
35	5.56	128.86	-10.00	100.00
40	5.87	130.29	-10.00	100.00
45	5.99	131.20	-10.00	100.00
50	6.31	131.94	-10.00	100.00
55	6.63	132.30	-10.00	100.00
60	6.72	132.02	-10.00	100.00
65	6.58	131.15	-10.00	100.00
70	6.64	130.09	-10.00	100.00
75	6.66	128.65	-10.00	100.00
80	6.52	126.77	-10.00	100.00
85	6.35	124.59	-10.00	100.00
90	6.28	122.27	-10.00	100.00
95	6.05	119.64	-10.00	100.00
100	5.90	116.90	-10.00	100.00
105	5.56	113.93	-10.00	100.00
110	5.29	110.91	-10.00	100.00
115	4.85	107.74	-10.00	100.00
120	4.34	104.53	-10.00	100.00
125	3.96	101.35	-10.00	100.00
130	3.28	98.11	-10.00	100.00
135	2.77	94.94	-10.00	100.00
140	2.10	91.81	-10.00	100.00
145	1.33	88.77	-10.00	100.00
150	0.62	85.83	-10.00	120.01
155	0.00	83.00	-10.00	162.88
160	0.00	80.15	-10.00	162.88
165	0.00	77.35	-10.00	162.88
170	0.00	74.61	-10.00	162.88
175	0.00	71.96	-10.00	162.88
180	0.00	69.42	-10.00	162.88
185	0.00	66.99	-10.00	162.88

Coordination Values	**KAILUA KONA, HI**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	19° 38' 21.4" N
Longitude (NAD 83)	155° 59' 45.6" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-10.0 (dBW/4 kHz)

			Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	64.71	-10.00	162.88
195	0.00	62.60	-10.00	162.88
200	0.00	60.68	-10.00	162.88
205	0.00	58.97	-10.00	162.88
210	0.00	57.49	-10.00	162.88
215	0.00	56.28	-10.00	162.88
220	0.00	55.34	-10.00	162.88
225	0.00	54.69	-10.00	162.88
230	0.00	54.35	-10.00	162.88
235	0.00	54.32	-10.00	162.88
240	0.00	54.61	-10.00	162.88
245	0.00	55.20	-10.00	162.88
250	0.00	56.09	-10.00	162.88
255	0.00	57.25	-10.00	162.88
260	0.00	58.68	-10.00	162.88
265	0.00	60.35	-10.00	162.88
270	0.00	62.24	-10.00	162.88
275	0.00	64.32	-10.00	162.88
280	0.00	66.57	-10.00	162.88
285	0.00	68.97	-10.00	162.88
290	0.00	71.49	-10.00	162.88
295	0.00	74.12	-10.00	162.88
300	0.00	76.84	-10.00	162.88
305	0.00	79.64	-10.00	162.88
310	0.00	82.48	-10.00	162.88
315	0.00	85.37	-10.00	162.88
320	0.00	88.28	-10.00	162.88
325	0.26	91.20	-10.00	155.07
330	0.29	94.13	-10.00	150.04
335	0.54	97.09	-10.00	124.53
340	0.85	100.05	-10.00	110.61
345	1.10	102.99	-10.00	101.24
350	1.37	105.91	-10.00	100.00
355	1.70	108.80	-10.00	100.00

Name	Latitude	Longitude
1	19.63928	-155.996
2	19.63869	-155.996
3	19.63714	-155.996
4	19.63581	-155.997
5	19.63231	-155.999
6	19.64219	-156.03
7	19.67797	-156.06
8	19.72831	-156.075
9	20.14597	-156.23
10	19.52739	-156.116
11	19.214	-156.11
12	18.77317	-156.083

ESV Break Point List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Honaunau
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Honokaa
Hilo
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Volcano
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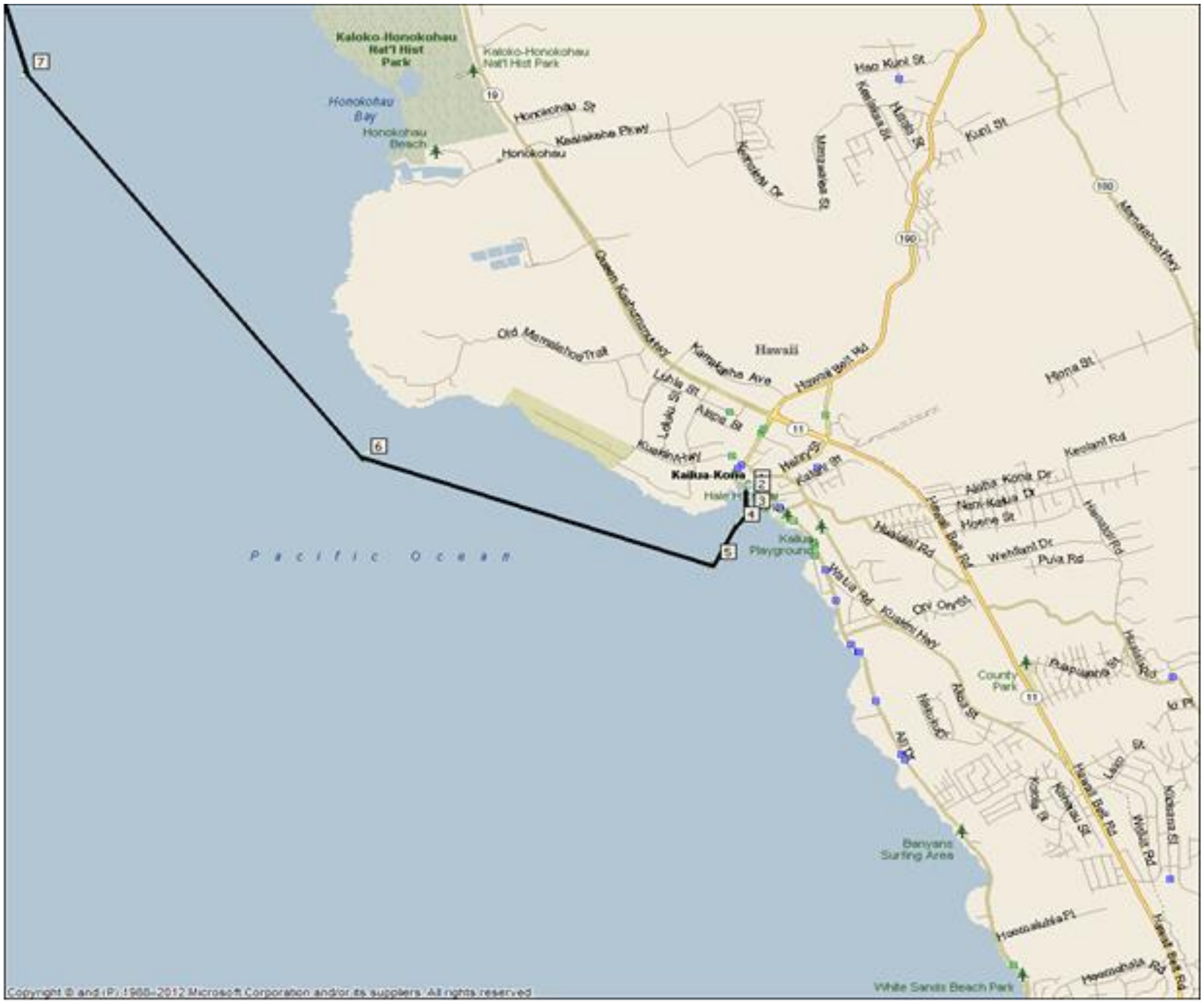
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Hao Kuni St
Kuni St
Old Mamalahoa Trail
Hawaii
Kamakaeha Ave
Hawaii Belt Rd
Hiona St
Luhia St
Alapa St
Kuakini Hwy
Kailua-Kona
Kailua Playground
Alahi Kona Dr
Hoene St
Wehilani Dr
Puia Rd
Keolani Rd
Hualalai Rd
Walua Rd
Kuakini Hwy
Alii Dr
Pacific Ocean
County Park
Banyans Surfing Area
Hoonaulahia Pl
White Sands Beach Park
Hawaii Belt Rd
7
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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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7700 Leesburg Pike, Suite 238
Falls Church, VA 22043

DATED: December 29, 2016

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Harris Caprocks Communication, Inc.
Kauia, HI
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7700 Leesburg Pike, Suite 238
Falls Church, VA 22043
December 29, 2016

Skjei Telecom, Inc.

TABLE OF CONTENTS

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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

The following companies reported potential great circle interference conflicts that did not meet the objectives on a line-of-sight basis. When over-the-horizon losses are considered on the interfering paths, sufficient blockage exists to negate harmful interference from occurring with the proposed transmit-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

Hawaiian Telcom, Inc.
Hawaii State
University of Hawaii

Skjei Telecom, Inc.

Site	Kauia								
Desired Frequencies (MHz)		6356.000 – 6363.8135							
		Summary		Frequencies Affected					
Notes									
Desired Frequencies (MHz)		6356.000 – 6363.8135							
Into 2									
Case #	Margin(dB)			Frequencies Affected					
17	46.72511	Y		6226.89	6345.49	0	0	0	0
134	15.34856	Y		6345.49	6404.79	0	0	0	0
32	14.34983	Y		6375.14	0	0	0	0	0

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones					
Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
Into 2 Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
17	21.86968246	159.4085044	46.7251077	KUKUIOLONO	Hawaiian Telcom, Inc.
134	21.94363155	159.2802097	15.34856107	MT KAALA	Hawaii State
32	21.94361687	159.2800224	14.34982693	MT KAALA	University of Hawaii

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 11/11/2016

Company
AT&T COMMON SYSTEMS
AT&T Common Sys's
AT&T Common Systems
Hawaiian Electric Company, Inc reginald.yang@heco.com
Hawaiian Telcom, Inc.
New Cingular Wireless PCS LLC - Hawaii
AT&T Corp.
Hawaii State
Hawaiian Telcom, Inc.
LIN License Company, LLC
New Cingular Wireless PCS LLC - Hawaii
University of Hawaii
HONOLULU CITY & COUNTY DEPT OF INFO TECH
County of Kauai Department of Police

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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations.”

Date:	11/11/2016
Job Number:	161111SKJTEL08

Administrative Information	
Status	ENGINEER PROPOSAL
Call Sign	
Licensee Code	SPACLK
Licensee Name	Harris CapRock Communications

Site Information	**KAUAI, HI**
Venue Name	
Latitude (NAD 83)	21° 57' 16.9" N
Longitude (NAD 83)	159° 21' 16.9" W
Climate Zone	B
Rain Zone	4
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information	
Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	180° W to 180° West Longitude
Azimuth Range	225.2° to 225.2°
Corresponding Elevation Angles	55.3° / 55.3°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-10.0
	(dBW/MHz)	14.0
Maximum EIRP	(dBW/4 kHz)	31.7
	(dBW/MHz)	55.7
	(dBW)	62.8
Interference Objectives:	Long Term	-154.0 dBW/4 kHz 20%
	Short Term	-131.0 dBW/4 kHz 0.0025%

Frequency Information	**Transmit 6.1 GHz**
Emission / Frequency Range (MHz)	270KG7D - 5M20G7D / 6356.0 - 6363.81
Max Great Circle Coordination Distance	162.9 km / 101.2 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Coordination Values	**KAUAI, HI**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	21° 57' 16.9" N
Longitude (NAD 83)	159° 21' 16.9" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-10.0 (dBW/4 kHz)

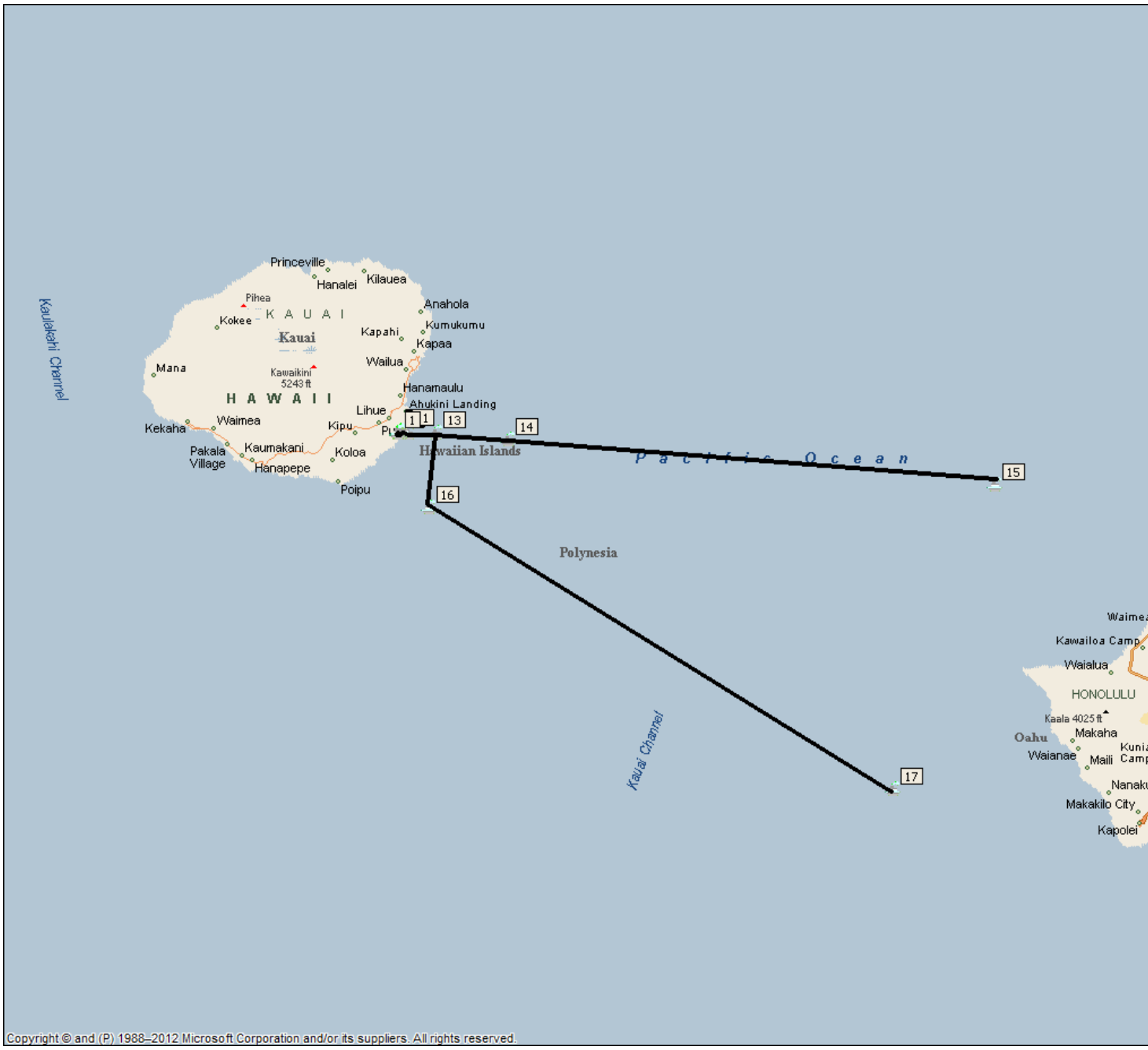
		Transmit 6.1 GHz		
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	1.23	114.43	-10.00	100.00
5	1.08	116.53	-10.00	101.54
10	1.00	118.49	-10.00	103.52
15	1.02	120.31	-10.00	103.10
20	0.87	121.77	-10.00	109.70
25	0.77	123.01	-10.00	114.70
30	0.74	124.04	-10.00	116.03
35	0.74	124.82	-10.00	115.89
40	0.74	125.29	-10.00	115.92
45	0.74	125.46	-10.00	116.00
50	0.68	125.26	-10.00	116.86
55	0.64	124.78	-10.00	118.82
60	0.81	124.19	-10.00	112.66
65	0.88	123.22	-10.00	109.05
70	0.93	121.95	-10.00	106.77
75	0.00	119.63	-10.00	162.88
80	0.00	117.89	-10.00	162.88
85	0.00	115.96	-10.00	162.88
90	0.00	113.85	-10.00	162.88
95	0.00	111.58	-10.00	162.88
100	0.00	109.18	-10.00	162.88
105	0.00	106.66	-10.00	162.88
110	0.00	104.05	-10.00	162.88
115	0.00	101.35	-10.00	162.88
120	0.00	98.60	-10.00	162.88
125	0.00	95.80	-10.00	162.88
130	0.00	92.97	-10.00	162.88
135	0.00	90.13	-10.00	162.88
140	0.00	87.28	-10.00	162.88
145	0.83	84.33	-10.00	111.69
150	1.42	81.35	-10.00	100.00
155	3.26	77.98	-10.00	100.00
160	5.26	74.38	-10.00	100.00
165	7.81	70.38	-10.00	100.00
170	9.85	66.40	-10.00	100.00
175	9.38	63.56	-10.00	100.00
180	9.56	60.54	-10.00	100.00
185	7.68	59.01	-10.00	100.00

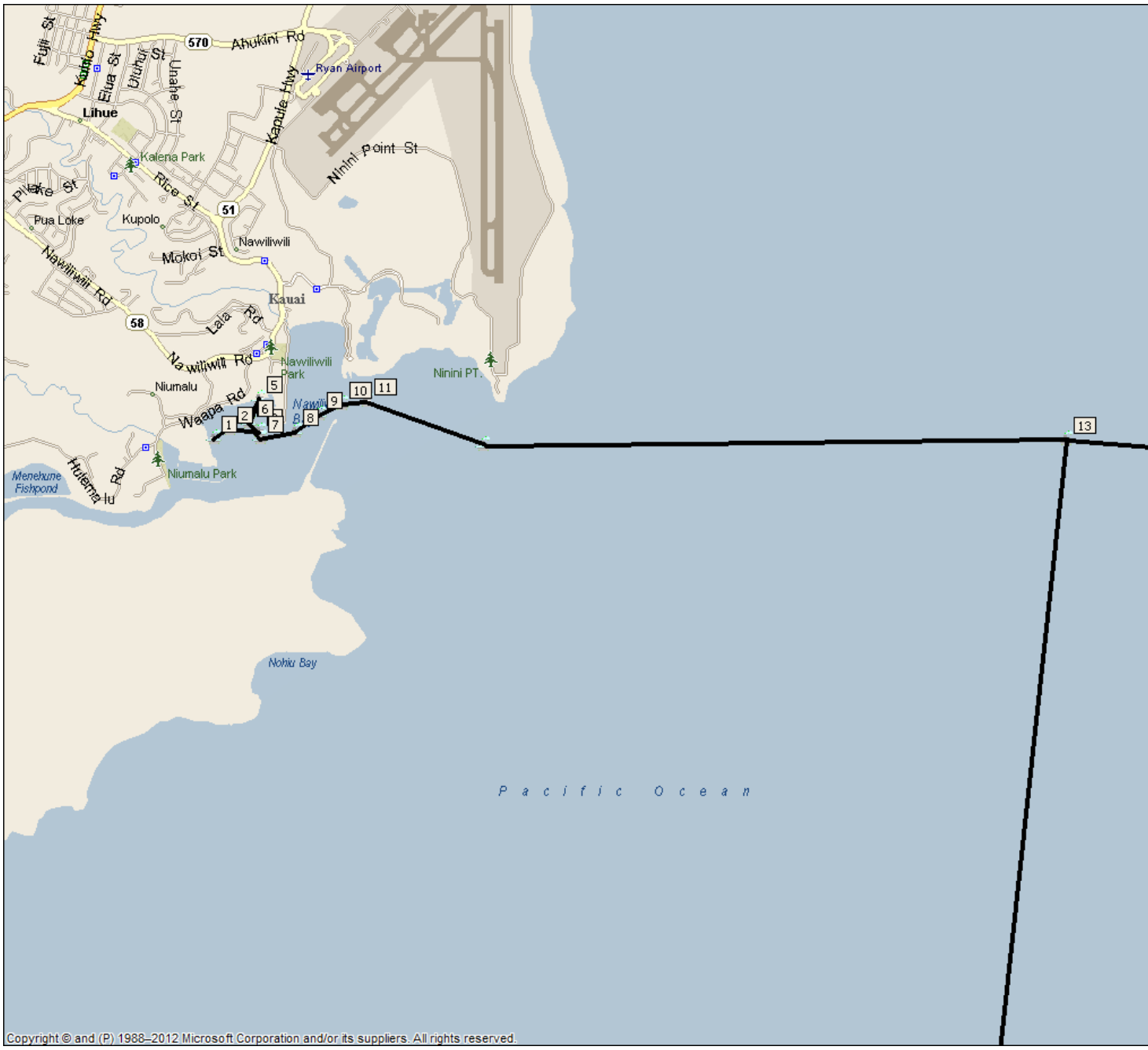
Coordination Values	**KAUAI, HI**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	21° 57' 16.9" N
Longitude (NAD 83)	159° 21' 16.9" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-10.0 (dBW/4 kHz)

			Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	7.64	56.60	-10.00	100.00
195	8.50	53.72	-10.00	100.00
200	9.04	51.26	-10.00	100.00
205	10.04	48.64	-10.00	100.00
210	9.41	47.79	-9.98	100.00
215	8.60	47.53	-9.92	100.00
220	8.82	46.69	-9.73	100.00
225	9.38	45.89	-9.54	100.00
230	6.82	48.63	-10.00	100.00
235	6.36	49.63	-10.00	100.00
240	4.81	52.01	-10.00	100.00
245	3.33	54.55	-10.00	100.00
250	2.67	56.54	-10.00	100.00
255	0.92	59.62	-10.00	107.46
260	1.31	61.11	-10.00	100.00
265	1.56	62.95	-10.00	100.00
270	1.87	64.97	-10.00	100.00
275	1.89	67.35	-10.00	100.00
280	1.92	69.87	-10.00	100.00
285	2.12	72.43	-10.00	100.00
290	1.96	75.25	-10.00	100.00
295	1.70	78.16	-10.00	100.00
300	1.81	81.01	-10.00	100.00
305	2.10	83.90	-10.00	100.00
310	2.30	86.86	-10.00	100.00
315	2.17	89.87	-10.00	100.00
320	2.10	92.86	-10.00	100.00
325	2.33	95.88	-10.00	100.00
330	2.57	98.89	-10.00	100.00
335	2.69	101.86	-10.00	100.00
340	2.72	104.76	-10.00	100.00
345	2.31	107.41	-10.00	100.00
350	1.60	109.75	-10.00	100.00
355	1.88	112.43	-10.00	100.00

Name	Latitude	Longitude
1	21.9518	-159.3582
2	21.9525	-159.357
3	21.9523	-159.3547
4	21.953	-159.3555
5	21.9547	-159.3547
6	21.953	-159.3554
7	21.9518	-159.3546
8	21.9523	-159.3518
9	21.9535	-159.35
10	21.9543	-159.3482
11	21.9545	-159.3463
12	21.9513	-159.3372
13	21.9517	-159.2917
14	21.9417	-159.1667
15	21.8667	-158.3333
16	21.8333	-159.3033
17	21.38467	-158.51

ESV Break Point List

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570
Ahukini Rd
Ryan Airport
Kapule Hwy
Lihue
Kalena Park
Ninini Point St
Piikea St
Rice St
51
Pua Loke
Kupolo
Nawiliwili
Mokoi St
Nawiliwili Rd
Kauai
58
Lala Rd
Nawiliwili Park
Ninini PT.
Niumalu
Waapa Rd
1
2
5
6
7
8
9
10
11
13
Niumalu Park
Menehune Fishpond
Hulemalu Rd
Nohiu Bay
P a c i f i c O c e a n
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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: 

Ken Ryan, P.E.
Principal Engineer
Skjei Telecom, Inc.
7700 Leesburg Pike, Suite 238
Falls Church, VA 22043

DATED: December 29, 2016

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for

Harris Caprocks Communication, Inc.
Monterey, CA
Satellite Earth Station on Vessel (ESV)

Prepared By:
Skjei Telecom, Inc.
7700 Leesburg Pike, Suite 238
Falls Church, VA 22043
December 29, 2016

Skjei Telecom, Inc.

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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. There will be spectrum restrictions 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. The Critical Contour Point method of determining worst case interference from the route and port sites was the interference method used. 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. In those cases were OH losses did not resolve the interference the ESV will mute transmission within an exclusion zone sufficient in size to preclude interference. Also note, that there are no unresolved coordination requests which would result in an exceedance of the maximum 180 megahertz of coordinated spectrum for all ESV operations in the coordination area in the 5925-6425 MHz band.

The following companies reported potential great circle interference conflicts that did not meet the objectives on a line-of-sight basis. When over-the-horizon losses are considered on the interfering paths, sufficient blockage exists to negate harmful interference from occurring with the proposed transmit-only earth station. The ESV will employ a GPS sensitive ability to cease transmission when traveling in certain exclusion zones. The interference cases and the location of the critical contour point (CCP), around which the exclusion zones exist are detailed in the tables below.

Company

Morgan Communications LLC
Monterey, County of
Silicon Valley Regional Interop Authorit
Pacific Gas and Electric Company

Skjei Telecom, Inc.

Site	Monterey							
Desired Frequencies (MHz)		6356.000 – 6363.8135						
Into 1			Frequencies Affected					
358	49.66905	Y	6365.26	0	0	0	0	0
489	25.75617	Y	6345.49	0	0	0	0	0
401	12.11248	Y	6375.14	0	0	0	0	0
Notes								
Desired Frequencies (MHz)		6356.000 – 6363.8135						
Into 2								
Case #	Margin(dB)		Frequencies Affected					
359	34.48413	Y	6365.26	0	0	0	0	0
87	29.89202	Y	6345.49	0	0	0	0	0
302	28.64276	Y	6315.84	6345.49	6375.14	0	0	0

Table 1 – ESV Interference Cases

Skjei Telecom, Inc.

Interference Zones	Monterey				
Into 1					
Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
358	36.63688513	121.8881671	49.66904538	HAWTHORNE	Morgan Communications LLC
489	36.92859351	122.3542919	25.75616677	FRAZIER	Silicon Valley Regional Interop Authorit
401	36.63347353	121.885269	12.11247696	SUNOL RIDGE	Pacific Gas and Electric Company
Into 2 Case #	CCP Latitude (dec.deg)	CCP Longitude (dec.deg.)	Margin (dB)	Victim Rx Site	Licensee
359	36.63688513	121.8881671	34.48412792	MONTEREY	Morgan Communications LLC
87	36.62971484	122.0609458	29.89202231	MT TORO	Monterey, County of
302	36.90399551	122.3148611	28.64275961	FREMONT PK	Pacific Gas and Electric Company

Table 2 - ESV CCP Locations
See Interference Analysis for Exclusion Zone Details

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 Skjei Telecom, Inc. 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 PCN letter dated 11/11/2016

Company

AT&T COMMON SYSTEMS
Alameda County of California
American Tower, LLC
CRYSTAL SMR INC.
County of San Mateo
County of Santa Cruz
East Bay Municipal Utility District
Field, David J
Higher Ground LLC
KGO Television Inc.
Lyon, Mike
Merced Irrigation District
Micronet Communications, Inc.
Monterey, County of
Northstar San Francisco License LLC
Pacific Coast Wireless Internet
Proxim Wireless Corporation
Razzo Link, Inc
SAN FRANCISCO CITY & COUNTY CALIFORNIA
San Joaquin County
San Jose, City of (ECOMM)
Santa Clara Valley Water District
Santa Clara, County of
Silicon Valley Regional Interop Authorit
Solano County Communications Division
The Internet Store, Inc.
Verizon Wireless
Wireless Applications Corporation
AC BidCO LLC
AT&T Mobility Wireless Operations Hldgs
CONTRA COSTA COUNTY COMMUNICATIONS DEPT.

California RSA NO. 4 Limited Partnership
California, State of
City & County of San Francisco PUC
Fresno MSA Limited Partnership
GTE Mobilnet of California LTD Partnersh
KGO Television, Inc.
KQED INC
MHO Networks
Marin County of California
Modesto Irrigation District
New Cingular Wireless PCS LLC - N CAL
Pacific Bell Tel Com dba AT&T California
Pacific Gas and Electric Company
Sacramento Valley Limited Partnership
San Francisco, City and County of
T-Mobile License LLC
Union Pacific Railroad Company
Verizon Wireless (VAW) LLC-N CA/NV
CONTRA COSTA COUNTY COMMUNICATIONS DEPT.
Marin County of California
CBS Broadcasting Inc
CBS Communication Services Inc
Etheric Networks, Inc.
KDTV License Partnership, G.P.
KQED INC
M.U.T. Licensing, LLC
Monterey County Superintendent of School
T-Mobile License LLC
Encina Communications Company
Morgan Communications LLC
Olympic Wireless, 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. The coordination contours include all the area within this route as well as all of the area seaward of this route within 200 km of the baseline of the United States or 200 km from any fixed service offshore installations.”

Date:	11/11/2016
Job Number:	161111SKJTEL06

Administrative Information

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

Site Information	**MONTEREY, CA**
Venue Name	
Latitude (NAD 83)	36° 36' 21.5" N
Longitude (NAD 83)	121° 53' 22.7" W
Climate Zone	B
Rain Zone	4
Ground Elevation (AMSL)	0.0 m / 0.0 ft

Link Information

Satellite Type	Geostationary
Mode	TO - Transmit-Only
Modulation	Digital
Satellite Arc	180° W to 180° West Longitude
Azimuth Range	249.6° to 249.6°
Corresponding Elevation Angles	16.8° / 16.8°
Antenna Centerline (AGL)	15.54 m / 51.0 ft

Antenna Information		**Transmit - FCC32**
Manufacturer		FCC REFERENCE
Model		32-25LOG(THETA)
Gain / Diameter		41.7 dBi / 2.4 m
3-dB / 15-dB Beamwidth		0.66° / 1.18°
Max Available RF Power	(dBW/4 kHz)	-10.0
	(dBW/MHz)	14.0
Maximum EIRP	(dBW/4 kHz)	31.7
	(dBW/MHz)	55.7
	(dBW)	62.8
Interference Objectives:	Long Term	-154.0 dBW/4 kHz 20%
	Short Term	-131.0 dBW/4 kHz 0.0025%

Frequency Information	**Transmit 6.1 GHz**
Emission / Frequency Range (MHz)	270KG7D - 5M20G7D / 6356.0 - 6363.81
Max Great Circle Coordination Distance	162.9 km / 101.2 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi

Coordination Values	**MONTEREY, CA**
Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	36° 36' 21.5" N
Longitude (NAD 83)	121° 53' 22.7" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-10.0 (dBW/4 kHz)

			Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	109.46	-10.00	162.88
5	0.00	114.21	-10.00	162.88
10	0.00	118.94	-10.00	162.88
15	0.00	123.65	-10.00	162.88
20	0.00	128.32	-10.00	162.88
25	0.00	132.94	-10.00	162.88
30	0.00	137.50	-10.00	162.88
35	0.00	141.98	-10.00	162.88
40	0.00	146.32	-10.00	162.88
45	0.00	150.49	-10.00	162.88
50	0.21	154.53	-10.00	161.02
55	0.21	158.04	-10.00	160.74
60	0.38	161.05	-10.00	139.87
65	0.65	163.25	-10.00	118.41
70	0.76	163.99	-10.00	115.05
75	0.98	163.35	-10.00	104.66
80	1.06	161.26	-10.00	102.12
85	1.06	158.17	-10.00	102.19
90	0.95	154.43	-10.00	105.91
95	0.93	150.38	-10.00	106.71
100	0.81	146.06	-10.00	112.68
105	0.80	141.64	-10.00	113.23
110	0.69	137.07	-10.00	116.23
115	0.72	132.48	-10.00	116.77
120	0.85	127.85	-10.00	110.66
125	1.43	123.24	-10.00	100.00
130	1.93	118.56	-10.00	100.00
135	2.29	113.81	-10.00	100.00
140	2.21	108.99	-10.00	100.00
145	2.34	104.17	-10.00	100.00
150	2.70	99.35	-10.00	100.00
155	2.73	94.50	-10.00	100.00
160	2.87	89.65	-10.00	100.00
165	3.30	84.79	-10.00	100.00
170	3.15	79.94	-10.00	100.00
175	2.62	75.12	-10.00	100.00
180	2.82	70.27	-10.00	100.00
185	2.85	65.44	-10.00	100.00

Coordination Values **MONTEREY, CA**

Licensee Name	Harris CapRock Communications
Latitude (NAD 83)	36° 36' 21.5" N
Longitude (NAD 83)	121° 53' 22.7" W
Ground Elevation (AMSL)	0.0 m / 0.0 ft
Antenna Centerline (AGL)	15.54 m / 51.0 ft
Antenna Model	FCC Reference 32-25LOG(THETA)
Antenna Mode	Transmit 6.1 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-10.0 (dBW/4 kHz)

Transmit 6.1 GHz

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	2.82	60.63	-10.00	100.00
195	2.94	55.81	-10.00	100.00
200	3.45	50.94	-10.00	100.00
205	2.94	46.30	-9.64	100.00
210	2.68	41.68	-8.50	100.00
215	2.74	37.04	-7.22	100.00
220	2.83	32.48	-5.79	100.00
225	3.17	27.94	-4.16	100.00
230	3.49	23.56	-2.30	100.00
235	3.66	19.56	-0.28	100.00
240	3.77	16.13	1.81	100.00
245	3.94	13.63	3.64	100.00
250	4.26	12.51	4.57	100.00
255	4.06	13.78	3.52	100.00
260	3.44	16.82	1.35	100.00
265	3.67	20.08	-0.57	100.00
270	3.15	24.33	-2.65	100.00
275	2.94	28.66	-4.43	100.00
280	2.66	33.19	-6.02	100.00
285	2.18	37.88	-7.46	100.00
290	1.94	42.55	-8.72	100.00
295	1.49	47.32	-9.88	100.00
300	1.16	52.09	-10.00	100.00
305	0.96	56.84	-10.00	105.32
310	0.46	61.66	-10.00	130.34
315	0.00	66.47	-10.00	162.88
320	0.00	71.23	-10.00	162.88
325	0.00	75.99	-10.00	162.88
330	0.00	80.77	-10.00	162.88
335	0.00	85.56	-10.00	162.88
340	0.00	90.34	-10.00	162.88
345	0.00	95.13	-10.00	162.88
350	0.00	99.91	-10.00	162.88
355	0.00	104.69	-10.00	162.88

Name	Latitude	Longitude
p1	36.6059722	-121.8896
1	36.63347	-121.8853
2	36.6529	-121.9018
3	36.675	-121.9018
4	36.2913	-123.2218
5	36.675	-121.95
6	37.3966	-123.1137

ESV Break Point List

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: 

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DATED: December 29, 2016