

**Exhibit C**  
**Port Canaveral, Florida Frequency Coordination  
Report**

**COMSEARCH**  
**Earth Station Data Sheet**

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



**COMSEARCH**<sup>®</sup>  
A CommScope Company

July 17, 2015

Re: Harris CapRock Communications  
PORT CANAVERAL, FL  
Temporary Transmit-Only Earth Station  
Operation Dates: 07/20/2015 - 01/20/2016  
Job Number: 150717COMSGE11

Dear Frequency Coordinator:

On behalf of Harris CapRock Communications, we are forwarding the attached coordination data for a Temporary Transmit-Only Earth Station to be located at the site referenced above.

This earth station will transmit only on the satellite(s) and frequency or frequencies as described in the attached data. Please do not report cases involving 4 GHz facilities or problems involving non-active paths or frequencies outside the specified range.

If there are any questions concerning this coordination notice, please contact Comsearch.

Sincerely,

COMSEARCH

Gary K. Edwards  
Senior Manager  
[gedwards@comsearch.com](mailto:gedwards@comsearch.com)

Enclosure(s)

# COMSEARCH

## Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147  
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Date: 07/17/2015  
Job Number: 150717COMSGE11

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### Administrative Information

Status: TEMPORARY (Operation from 07/20/2015 to 01/20/2016)  
Call Sign: TEMP01  
Licensee Code: SPACLK  
Licensee Name: Harris CapRock Communications

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### Site Information

#### PORT CANAVERAL, FL

Venue Name  
Latitude (NAD 83): 28° 24' 31.8" N  
Longitude (NAD 83): 80° 36' 37.9" W  
Climate Zone: B  
Rain Zone: 1  
Ground Elevation (AMSL): 0.0 m / 0.0 ft

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### Link Information

Satellite Type: Geostationary  
Mode: TO - Transmit-Only  
Modulation: Digital  
Satellite Arc: 29.5° W to 129° West Longitude  
Azimuth Range: 111.0° to 247.1°  
Corresponding Elevation Angles: 25.7° / 28.1°  
Antenna Centerline (AGL): 3.66 m / 12.0 ft

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### Antenna Information

#### Transmit - FCC32

Antenna Model: Harris 2.4 Meter  
Gain / Diameter: 38.0 dBi / 2.4 m  
3-dB / 15-dB Beamwidth: 1.00° / 2.00°

Max Available RF Power (dBW/4 kHz): -18.7  
(dBW/MHz): 5.3

Maximum EIRP (dBW/4 kHz): 19.3  
(dBW/MHz): 43.3

Interference Objectives: Long Term: -154.0 dBW/4 kHz 20%  
Short Term: -131.0 dBW/4 kHz 0.0025%

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### Frequency Information

#### Transmit 6.1 GHz

Emission / Frequency Range (MHz): 1M00G7D - 20M0G7D / 5925.0 - 6425.0

Max Great Circle Coordination Distance: 154.3 km / 95.9 mi  
Precipitation Scatter Contour Radius: 100.0 km / 62.1 mi

# COMSEARCH

## Earth Station Data Sheet

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<b>Coordination Values</b>	<b>PORT CANAVERAL, FL</b>		
Licensee Name	Harris CapRock Communications		
Latitude (NAD 83)	28° 24' 31.8" N		
Longitude (NAD 83)	80° 36' 37.9" W		
Ground Elevation (AMSL)	0.0 m / 0.0 ft		
Antenna Centerline (AGL)	3.66 m / 12.0 ft		
Antenna Model	Harris 2.4 Meter		
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	-18.7 (dBW/4 kHz)		

			Transmit 6.1 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	108.84	-10.00	129.28
5	0.00	104.38	-10.00	129.28
10	0.00	99.90	-10.00	129.28
15	0.00	95.40	-10.00	129.28
20	0.00	90.90	-10.00	129.28
25	0.00	86.39	-10.00	129.28
30	0.00	81.89	-10.00	129.28
35	0.00	77.40	-10.00	129.28
40	0.00	72.94	-10.00	129.28
45	0.00	68.49	-10.00	129.28
50	0.00	64.09	-10.00	129.28
55	0.00	59.74	-10.00	129.28
60	0.00	55.45	-10.00	129.28
65	0.00	51.24	-10.00	129.28
70	0.00	47.14	-9.84	129.81
75	0.22	43.08	-8.86	130.83
80	0.00	39.42	-7.89	136.39
85	0.00	35.90	-6.88	140.05
90	0.00	32.72	-5.87	143.85
95	0.00	29.97	-4.92	147.57
100	0.00	27.79	-4.10	150.76
105	0.00	26.33	-3.51	153.20
110	0.00	25.70	-3.25	154.30
115	0.00	25.98	-3.36	153.82
120	0.00	27.12	-3.83	151.86
125	0.00	29.03	-4.57	148.84
130	0.00	31.56	-5.48	145.36
135	0.00	34.59	-6.47	141.56
140	0.00	37.99	-7.49	137.83
145	0.00	41.62	-8.48	134.34
150	0.00	45.09	-9.35	131.40
155	0.00	48.29	-10.00	129.28
160	0.00	51.13	-10.00	129.28
165	0.00	53.50	-10.00	129.28
170	0.00	55.32	-10.00	129.28
175	0.00	56.46	-10.00	129.28
180	0.00	56.85	-10.00	129.28
185	0.00	56.46	-10.00	129.28

# COMSEARCH

## Earth Station Data Sheet

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### Coordination Values

### PORT CANAVERAL, FL

Licensee Name	Harris CapRock Communications		
Latitude (NAD 83)	28° 24' 31.8" N		
Longitude (NAD 83)	80° 36' 37.9" W		
Ground Elevation (AMSL)	0.0 m / 0.0 ft		
Antenna Centerline (AGL)	3.66 m / 12.0 ft		
Antenna Model	Harris 2.4 Meter		
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	-18.7 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	55.32	-10.00	129.28
195	0.00	53.50	-10.00	129.28
200	0.00	51.13	-10.00	129.28
205	0.00	48.29	-10.00	129.28
210	0.00	45.09	-9.35	131.39
215	0.00	41.62	-8.48	134.34
220	0.00	38.23	-7.56	137.58
225	0.00	35.16	-6.65	140.90
230	0.00	32.50	-5.80	144.13
235	0.00	30.37	-5.06	147.00
240	0.00	28.88	-4.52	149.06
245	0.00	28.14	-4.23	150.20
250	0.00	28.21	-4.26	150.10
255	0.00	29.08	-4.59	148.76
260	0.00	30.68	-5.17	146.57
265	0.00	32.90	-5.93	143.62
270	0.00	35.63	-6.80	140.36
275	0.00	38.76	-7.71	137.04
280	0.00	42.20	-8.63	133.82
285	0.00	45.88	-9.54	130.78
290	0.00	49.74	-10.00	129.28
295	0.00	53.74	-10.00	129.28
300	0.00	57.85	-10.00	129.28
305	0.00	62.05	-10.00	129.28
310	0.00	66.31	-10.00	129.28
315	0.00	70.62	-10.00	129.28
320	0.00	74.97	-10.00	129.28
325	0.00	79.35	-10.00	129.28
330	0.00	83.75	-10.00	129.28
335	0.00	88.16	-10.00	129.28
340	0.00	92.57	-10.00	129.28
345	0.00	96.97	-10.00	129.28
350	0.00	101.37	-10.00	129.28
355	0.00	105.74	-10.00	129.28

## **EXHIBIT D**

### **§§ 25.221 & 25.222 Compliance Statements**

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#### ***§ 25.221 Compliance Statement***

As part of its application for special temporary authority (“STA”) to operate the ST5000-2.4 terminal in the C- and Ku-band for sea trials onboard a foreign-flagged ship, the Carnival Valor, Harris CapRock certifies in the following section and associated appendices that when the terminal is operating in the C-band, it will comply with the relevant requirements of Section 25.221 of the Commission’s Rules, 47 C.F.R. § 25.221:

(a)(1)(i)(A-C): Comply. (*See Exhibit A, Annex 1.*)

(a)(1)(ii): The ST5000-2.4 uses the same positioner technology and algorithms used by previously authorized SpaceTrack ESV terminals, and Harris CapRock certifies that the terminal will maintain a pointing error of less than or equal to 0.2° between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna. (*See Exhibit A, Annex 4.*)

(a)(1)(iii): In addition to the foregoing, the ST5000-2.4 uses the same automated antenna control and transmit mute functionalities used by previously authorized SpaceTrack ESV terminals, and Harris CapRock certifies that all emissions from the ESV will automatically cease within 100 ms if the angle between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna exceeds 0.5°, and transmission will not resume until such angle is less than or equal to 0.2. (*See Exhibit A, Annex 5.*)

(a)(2): Not applicable.

(a)(3): Not applicable.

(a)(4): Comply. The primary contact for Harris CapRock ESV operational issues is the Harris CapRock Network Control Center, which is available 24 hours a day, seven days a week:

Harris CapRock Network Control Center  
Managed Network Services 24x7 support  
4400 S. Sam Houston Pkwy, E.  
Houston, Texas 77046  
Office: (832) 668-2775  
Fax: (713) 987-2894  
Email Address: [hcc-hou-csc@harris.com](mailto:hcc-hou-csc@harris.com)

(a)(5): Comply. Harris CapRock has designed a system to record the vessel's location, transmit frequency, channel bandwidth and satellite. The system records this information every 20 minutes; this data will be stored locally and will be uploaded to Harris CapRock's Network Management System (NMS) on a regular basis. Harris CapRock can make this data available within 24 hours of a request by a coordinator, fixed system operator, fixed-satellite system operator, NTIA, or the Commission.

(a)(6): Comply. In the event Harris CapRock must communicate with vessels of foreign registry, it will maintain detailed information on each vessel as well as a point of contact for the relevant administration responsible for licensing the ESV.

(a)(7): Comply. The proposed ESV terminal operated by Harris CapRock will be controlled by various hub earth stations located in the United States and licensed to Harris CapRock.

(a)(8): Comply. Harris CapRock certifies that it will not seek to coordinate, in any geographic location, more than 36 MHz of uplink bandwidth on each of no more than two GSO FSS satellites when transmitting in the 5.925-6.425 GHz band.

(a)(9): Comply. Harris CapRock certifies it will not operate ESVs in the 5.925-6.425 GHz and 3.700-4.200 GHz bands on vessels smaller than 300 gross tons.

(a)(10): Not applicable. Harris CapRock does not seek receive protection for in-port C-band ESV terminal operations in this application.

(a)(11): Comply. When operating ESVs in motion, Harris CapRock will not claim protection from harmful interference from any authorized terrestrial stations or lawfully operating satellites to which frequencies are either already assigned, or may be assigned in the future in the 3.700-4.200 GHz band.

(a)(12): Comply. Harris CapRock has completed final coordination of C-band frequencies at Port Canaveral, Florida (*see* Exhibit C). Furthermore, Harris CapRock has completed preliminary route coordination with affected U.S.-licensed fixed service facilities in San Juan, Puerto Rico and Charlotte Amalie, St. Thomas, where transmission muting will be implemented to avoid potential interference (*see* Exhibit B). Harris CapRock will file the final coordination report, which will be identical in substance to the interim report, as soon as it becomes available.

(a)(13): Comply.

(b)(1)(i)(A-C): Comply. (*See* Exhibit A, Annex 1.)

(b)(1)(ii): Comply. Harris CapRock acknowledges that the ST5000-2.4 antenna does not meet the Commission's Section 25.209 gain pattern for Ku-band operations. Accordingly, pursuant to Section 25.132(b)(3) of the Commission's rules, Harris CapRock hereby submits range test plots of the antenna gain patterns in both C-band and Ku-band. (*See* Exhibit A, Annex 2.)

(b)(1)(iii): Harris CapRock certifies that the terminal will maintain a pointing error of less than or equal to  $0.2^{\circ}$  between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna and that that all emissions will automatically cease within 100 ms if the angle between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna exceeds  $0.5^{\circ}$ . (*See* Exhibit A, Annexes 4 & 5.)



(b)(2): Not Applicable.

(b)(3): Not Applicable.

(b)(4): Comply. (*See* Exhibit B – Area of Operations.)

(b)(5): Comply. (Also note discussion of 25.221(a)(4).)

(b)(6): Comply. (*See* Exhibit A, Annex 3.)

### **§ 25.222 Compliance Statement**

As part of its application for special temporary authority (“STA”) to operate the ST5000-2.4 terminal in the C- and Ku-band for sea trials onboard a foreign-flagged ship, the Carnival Valor, Harris CapRock certifies in the following section and associated appendices that when the terminal is operating in the Ku-band, it will comply with the relevant requirements of Section 25.222 of the Commission’s Rules, 47 C.F.R. § 25.222:

(a)(1)(i)(A-C): Comply. (*See* Exhibit A, Annex 1.)

(a)(1)(ii): The ST5000-2.4 uses the same positioner technology and algorithms used by previously authorized SpaceTrack ESV terminals, and Harris CapRock certifies that the terminal will maintain a pointing error of less than or equal to 0.2° between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna. (*See* Exhibit A, Annex 4.)

(a)(1)(iii): In addition to the foregoing, the ST5000-2.4 uses the same automated antenna control and transmit mute functionalities used by previously authorized SpaceTrack ESV terminals, and Harris CapRock certifies that all emissions from the ESV will automatically cease within 100 ms if the angle between the orbital location of the target

satellite and the axis of the main lobe of the ESV antenna exceeds 0.5°, and transmission will not resume until such angle is less than or equal to 0.2. (See Exhibit A, Annex 5.)

(a)(2): Not applicable.

(a)(3): Not applicable.

(a)(4): Comply. The primary contact for Harris CapRock ESV operational issues is the Harris CapRock Network Control Center, which is available 24 hours a day, seven days a week:

Harris CapRock Network Control Center  
Managed Network Services 24x7 support  
4400 S. Sam Houston Pkwy, E.  
Houston, Texas 77046  
Office: (832) 668-2775  
Fax: (713) 987-2894  
Email Address: [hcc-hou-csc@harris.com](mailto:hcc-hou-csc@harris.com)

(a)(5): Comply. Harris CapRock has designed a system to record the vessel's location, transmit frequency, channel bandwidth and satellite. The system records this information every 20 minutes; this data will be stored locally and will be uploaded to Harris CapRock's Network Management System (NMS) on a regular basis. Harris CapRock can make this data available within 24 hours of a request by a coordinator, fixed system operator, fixed-satellite system operator, NTIA, or the Commission.

(a)(6): Comply. In the event Harris CapRock must communicate with vessels of foreign registry, it will maintain detailed information on each vessel as well as a point of contact for the relevant administration responsible for licensing the ESV.

(a)(7): Comply. The proposed ESV terminal operated by Harris CapRock will be controlled by various hub earth stations located in the United States and licensed to Harris CapRock.

(a)(8): Comply. Harris CapRock certifies that not claim protection from interference from any authorized terrestrial stations to which frequencies are either already assigned, or may be assigned in the future in the 10.95-11.2 GHz (space-to-Earth) and 11.45-11.7 GHz (space-to-Earth) frequency bands.

(b)(1)(i)(A-C): Comply. (*See Exhibit A, Annex 1.*)

(b)(1)(ii): Comply. Harris CapRock acknowledges that the ST5000-2.4 antenna does not meet the Commission's Section 25.209 gain pattern for Ku-band operations. Accordingly, pursuant to Section 25.132(b)(3) of the Commission's rules, Harris CapRock hereby submits range test plots of the antenna gain patterns in both C-band and Ku-band. (*See Exhibit A, Annex 4.*)

(b)(1)(iii): Harris CapRock certifies that the terminal will maintain a pointing error of less than or equal to  $0.2^{\circ}$  between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna and that that all emissions will automatically cease within 100 ms if the angle between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna exceeds  $0.5^{\circ}$ . (*See Exhibit A, Annexes 4 & 5.*)

(b)(2): Not Applicable.

(b)(3): Not Applicable.

(b)(4): Comply. (*See Exhibit B – Area of Operations.*)

(b)(5) Comply. (Also note discussion of 25.222(a)(4).)

(b)(6): Comply. (*See Exhibit A, Annex 3.*)

(c): Harris CapRock certifies that its proposed operations will not be conducted in the 14.0-14.2 GHz band within: 125 km of the NASA TDRSS facilities on Guam (located at

latitude: 13°36'55" N, longitude 144°51'22" E) or White Sands, New Mexico (latitude: 32°20'59" N, longitude 106°36'31" W and latitude: 32°32'40" N, longitude 106°36'48" W). Furthermore, Harris CapRock certifies that it does not plan to conduct operations in the 14.0-14.2 GHz band within 125 km of the NASA TDRSS facilities in Blossom Point, MD (latitude: 38°25'44" N, longitude: 77°05'02" W).<sup>1</sup> Harris CapRock acknowledges that operations within the regions defined above are subject to coordination with relevant federal agencies and may pursue such coordination in the future.

(d): Harris CapRock certifies that it is proposed operations will not be conducted in the 14.47-14.5 GHz band within: (a) 45 km of the radio observatory on St. Croix, Virgin Islands (latitude 17°46' N, longitude 64°35' W); (b) 125 km of the radio observatory on Mauna Kea, Hawaii (at latitude 19°48' N, longitude 155°28' W); and (c) 90 km of the Arecibo Observatory on Puerto Rico (latitude 18°20'46" N, longitude 66°45'11" W). Harris CapRock acknowledges that operations within the regions defined above are subject to coordination with relevant federal agencies and may pursue such coordination in the future.

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<sup>1</sup> See Public Notice, DA 14-992 (July 11, 2014).