

Experimental STA Request

Harris CapRock Communications, Inc. (“Harris CapRock”) respectfully requests experimental special temporary authority (“STA”) to operate earth station onboard vessel (“ESV”) terminals (Model ST5000-2.4) in the C- and Ku-band for sea trials on a Bahamian-registered cruise ship, the Carnival Sunshine, currently based in Port Canaveral, Florida. Harris CapRock seeks an experimental STA for a period of up to six (6) months, commencing on or about August 1, 2015, to test terminal transmissions in the 5.925-6.425 GHz band and the 14.0-14.5 GHz band.

The requested authority enhances current experimental STAs granted to Harris CapRock to test the subject ESV terminal at specific inland locations¹ by enabling testing in real-world maritime conditions. Although it is not clear that the requested authority is required (due to some uncertainty as to whether the Commission may authorize experimental operations on a foreign-registered vessel under its Part 5 rules), Harris CapRock files this request for expanded testing of the ST5000-2.4 terminal on a Bahamian-registered ship out of an abundance of caution.

Discussion. Harris CapRock is developing and testing the new tri-band earth station terminals to communicate with certain C- and Ku-band geostationary satellite orbit (“GSO”) fixed-satellite service (“FSS”) satellites, and with the O3b non-geostationary satellite orbit (“NGSO”) Ka-band system. Harris CapRock was previously granted an STA to test the ST5000-2.4 to communicate with the O3b Ka-band NGSO FSS system at two Melbourne, Florida locations and a Houston, Texas location.² More recently, Harris CapRock was granted consolidated authority to test the subject ST5000-2.4 terminal in the C-, Ku- and Ka-band at additional fixed inland locations.³

Harris CapRock now seeks test authority for the ST5000-2.4 terminal at C- and Ku-band frequencies in real-world maritime conditions.⁴ Exhibit A contains relevant

¹ See File No. 0734-EX-ST-2015; *see also* File No. 0454-EX-ST-2015.

² See File No. 0454-EX-ST-2015.

³ See File No. 0734-EX-ST-2015.

⁴ Harris CapRock may seek authority to test the ST5000-2.4 terminal in Ka-band frequencies on a vessel in the future.

information relating to the earth station technical parameters, antenna performance, link budgets, radiation hazard and general antenna specifications. Grant of the requested authority will serve the public interest by allowing Harris CapRock to continue development of this new line of antennas that would greatly benefit government and commercial maritime customers. Moreover, the proposed experimental operations will be conducted on an unprotected non-interference basis and will otherwise comply with Part 5 of the FCC Rules.

Sea Trials. Harris CapRock seeks to test the new ESV terminals in the C- and Ku-band on the Carnival “Sunshine” cruise ship, which will be ported in Port Canaveral, Florida. During testing, the Sunshine cruise ship will serve routes in the Caribbean around Puerto Rico and the U.S. Virgin Islands, but will only sail to and dock in foreign territories. (See Exhibit B for Carnival Sunshine Port List). The ST5000-2.4 terminals will be added to the vessels satellite communications suite for purposes of test performance in C- and Ku-band frequencies in real-world conditions. Harris CapRock will test the terminals in Ku-band with the U.S.-licensed Telstar 11N satellite and in the C-band with the U.S.-licensed IS-701 and IS-23 satellites. The ST-5000 2.4m terminal has been previously authorized to communicate with the first two satellites,⁵ and will communicate with IS-23 in accordance with the authorized parameters of this FCC-licensed satellite.

Harris CapRock has completed coordination of C-band frequencies at Port Canaveral, Florida (see Annex 4) and is in the process of coordinating relevant routes and frequencies that could potentially affect U.S.-licensed fixed service operations. Harris CapRock will ensure that its proposed operations will avoid interference to other co-frequency systems and services, and will otherwise comply with Commission policies embodied in its C-band ESV rules.⁶

Harris CapRock’s coordination efforts will ensure that no interference will be caused by intermittent C-band test operations and the absence of co-frequency operations in relevant Ku-band frequencies will prevent interference from experimental operations

⁵ See File No. 0734-EX-ST-2015.

⁶ See, e.g., 47 C.F.R. §25.221-222.

of the ST5000-2.4 terminal in those bands. While Harris CapRock's commercial C-band and Ku-band ESV licenses impose operational restrictions to protect other co-frequency operations, it cannot yet add the ST5000-2.4 to these licenses because the terminal is still in development.

In both bands, consistent with the Commission's Part 5 rules, Harris CapRock agrees to accept all interference from other authorized spectrum users and will immediately suspend operations in the event of interference to other systems and services. In addition, Harris CapRock acknowledges and accepts the conditions of operation set forth in its prior C-band ESV experimental authority⁷ and similar Ku-band ESV authority.⁸

Finally, Harris CapRock notes that there is some uncertainty whether Commission authority under Part 5 of the rules is necessary to conduct the contemplated testing on the Bahamian-registered Carnival Sunshine. The Commission's *ESV Order* recognizes Section 306 of the Communications Act, providing that "the Commission does not have the authority to license radio stations, such as ESVs, on vessels registered by foreign administrations (foreign-registered vessels)."⁹ Although the *ESV Order* further suggests that ESV terminals on foreign-registered vessels communicating with U.S.-licensed ESV hubs are subject to the same rights and restrictions as U.S.-licensed ESVs,¹⁰ the discussion was in the context of requirements of the Commission's Part 25 rules and not the Part 5 rules. Regardless of whether the Commission can formally authorize experimental operations onboard foreign-registered vessels under its Part 5 rules, Harris CapRock requests the subject STA under the policies espoused in the *ESV Order* and will comply with applicable Part 5 rules and policies.

⁷ See File No. 0363-EX-ST-2011.

⁸ See File No. SES-MFS-20120801-00710 (Call Sign: E100015).

⁹ See Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz/3700-4200 MHz Bands and 14.0-14.5 GHz/11.7-12.2 GHz Bands, *Report and Order* (IB Docket No. 02-10, rel. Jan. 6, 2005) at ¶ 122 ("*ESV Order*").

¹⁰ See, *id.*, at ¶ 126.

Stop Buzzer Contact and Other Information. The Harris CapRock point of contact with the authority to suspend immediately the proposed ST5000-2.4 terminal operations is:

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Text: [3212584414@text.att.net](tel:3212584414)
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The secondary point of contact for the proposed experimental operations is:

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Managed Network Services 24x7 support
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Houston, Texas 77046
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Email Address: hcc-hou-csc@harris.com

The following annexes contain additional technical information relating to the proposed experimental operations:

- ST5000-2.4 Description and Technical Characteristics;
- Annex 1 – Antenna Performance Plots (demonstrating compliance with the off-axis EIRP spectral density mask, including co-pol and cross-pol);
- Annex 2 - Link Budgets (various forward and return link budgets for the ST5000-2.4 terminal); and
- Annex 3 - Radiation Hazard Studies (establishing near-field and far-field region distances). Harris CapRock will follow standard industry procedures to mitigate potential radiation hazards to personnel in controlled environments. (The terminals do not transmit in uncontrolled areas at Harris CapRock test facilities.)
- Annex 4 – C-band Coordination Report, Port Canaveral, Florida.

Expedited Processing. Harris CapRock respectfully requests expedited processing of this experimental STA request. Harris CapRock requests that the experimental STA be granted for an approximately six (6) month period commencing on or about August 1, 2015. As discussed, the identical earth stations have been previously reviewed and approved by the Commission for testing and demonstration in the C-band and Ku-band at

locations in Florida and Texas. Grant of STA authority subject to appropriate coordination in bands shared with the terrestrial fixed service will enable near-term grant of this request.

Conclusion. The requested experimental STA will allow Harris CapRock to continue development, testing and demonstration of its new ST5000-2.4 terminal. Moreover, grant of the requested authority will not result in harmful interference to or require protection from other authorized spectrum users. Accordingly, the proposed operations are consistent with Part 5 of the FCC's rules and would strongly serve the public interest.