

Experimental STA Request

Harris CapRock Communications, Inc. (“Harris CapRock”), by the present application, respectfully requests experimental authority to operate a total of up to nine (9) earth station terminals at three (3) separate test locations (two in Melbourne, Florida and one in Houston, Texas). Harris CapRock is developing and testing new earth stations to communicate with the Ka-band non-geostationary satellite orbit (“NGSO”) fixed-satellite service (“FSS”) system operated by O3b Limited (“O3b”), which has been previously authorized by the FCC to communicate with earth stations located in the United States.¹ In this filing, Harris CapRock seeks an experimental STA for a period of six (6) months, commencing on May 1, 2015, to test and demonstrate terminal uplink transmissions in the 27.6-28.4 GHz and 28.6-29.1 GHz bands.

Harris CapRock will operate the 2.4m Ka-band terminals (Model ST5000-2.4) for noncommercial development, testing and demonstration purposes with the O3b system at three locations: Melbourne, Florida at 28°01’51” N, 80°35’56” W (“Melbourne 1”), Melbourne, Florida at 28°5’24” N, 80°38’20” W (“Melbourne 2”) and Houston, Texas at 29°35’54” N, 95°20’50” W (“Houston”). Harris CapRock was recently granted an experimental STA to test the subject terminals at the Melbourne 1 and Houston sites in the 28.6-29.1 GHz band, with three (3) antennas at each site.² Harris CapRock also has a pending application to test three (3) ST5000-2.4 terminals at the Melbourne 2 location in the 28.6-29.1 GHz band.³

In the present application, Harris CapRock is proposing to conduct identical experimental operations at all three locations using the existing developmental terminals and seeks to test in the 27.6-28.4 GHz and 28.6-29.1 bands. The Melbourne 1/Houston application, attached hereto

¹ For example, in September 2012, the Commission granted O3b a license to operate a gateway earth station in Haleiwa, Hawaii, to communicate with its NGSO FSS system (see File No. SES-LIC-20100723-00952, granted September 25, 2012). In June 2013, the Commission granted O3b a license to operate a second gateway in the United States, located in Vernon, Texas (see File No. SES-LIC-20130124-00089, granted June 20, 2013). In May 2014, the Commission granted O3b a blanket license to operate maritime earth stations (see File No. SES-LIC-20130528-00455, granted May 13, 2014).

² See File No. 1105-EX-ST-2014, in effect until July 1, 2015.

³ See File No. 0171-EX-PL-2015. Subject to consultations with the FCC staff, Harris CapRock plans to withdraw this application.

as Exhibit A, contains relevant information relating to the earth station technical parameters, antenna performance, link budgets, radiation hazard and general antenna specifications.

With the exception of operations in the 27.6-28.4 GHz band, Harris Caprock's proposed experimental earth station is consistent with ongoing earth station operations previously approved by the Commission at the Melbourne 1 and Houston locations. Furthermore, O3b has been granted an STA for nearly identical earth stations to communicate with the O3b system at the Melbourne 2 facility.⁴ Harris CapRock's proposed use of the 27.6-28.4 GHz band has already been coordinated for two of the three test locations, and coordination of the third location will be completed in due course. Grant of the requested authority will serve the public interest by allowing Harris CapRock to continue development of a new line of antennas that could greatly benefit government and commercial 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.

Proposed Site

As noted above, Harris CapRock has previously been authorized to operate the subject earth stations and communicate with the O3b system at the Melbourne 1 and Houston sites.⁵ In addition, as discussed in the following section, coordination with other co-frequency systems or services that may be affected has been completed for the Melbourne 1 and Houston sites.⁶ Given the experimental nature of the operations proposed herein, 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.

⁴ See File No. SES-STA-20130620-00515. O3b was granted an extension of its STA through December 30, 2014 (*see* File No. SES-STA-20140430-00326). O3b currently has a pending STA extension request that was accepted for filing on January 14, 2015, and is currently with the Commission for review (*see* File No. SES-STA-20141212-00889).

⁵ *See* File No. 1105-EX-ST-2014, in effect until July 1, 2015.

⁶ Harris CapRock has not yet completed coordination for the Melbourne 2 site. Harris CapRock will not commence operations in the 27.6-28.4 GHz band until coordination with affected terrestrial fixed service licensees has been completed.

The 2.4m antenna terminals will be mounted on a temporary fixed platform in a controlled test area where general public access is prohibited. Although the pointing angle of the antennas will change as O3b's in-orbit satellites are tracked, the platform will remain stationary during the demonstration. Only trained operators and technicians will be permitted to access the terminals, and specific instruction will be provided with respect to radiofrequency hazard characteristics of the antenna.

Proposed Spectrum Use

Harris CapRock's proposed earth station operations in shared bands are consistent with the Commission's rules and policies. Harris CapRock first notes that O3b has completed all necessary coordination with U.S. government satellite networks operating in the Ka-band, including GSO and NGSO networks, as well as their associated specific earth stations filed under 9.7A and 9.7B of the ITU Radio Regulations through other administrations. O3b has also completed coordination, according to U.S. footnote 334 of the FCC Table of Frequency Allocations, with the U.S. government, and this US334 coordination agreement specifically provides for additional earth stations in U.S. territory operating with O3b's satellites.

Harris CapRock will conduct limited terminal uplink transmission to the 27.6-28.4 GHz and 28.6-29.1 GHz bands for testing and demonstration purposes only. Under the Commission's Ka-band plan, this band may be used by NGSO FSS systems, albeit subject to coordination with terrestrial services in shared spectrum.⁷ Harris CapRock recognizes, however, that operations under the requested license will be on an unprotected, non-harmful interference basis. The coordination process and limited, intermittent nature of Harris CapRock's proposed experimental development operations will ensure that other allocated services will not be adversely affected.

The proposed operations will not cause any interference into or require protection from any co-frequency GSO satellites. As previously shown by O3b, there is an inherent angular

⁷ See *In the Matter of Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services*, 11 FCC Rcd. 19005, ¶¶ 59-62 and 79 (1996). See also *In the Matter of Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite-Service Use*, 15 FCC Rcd. 13430, ¶ 28 (2000).

separation between the O3b system orbit and the GSO arc from the perspective of earth stations located away from the equator.⁸ The subject facilities are located further north in latitude than the O3b Hawaii gateway, which results in an even greater angular separation between the O3b and geostationary orbits as viewed from the Earth. This means that the angular separation between the O3b satellites and GSO arc from these locations will be greater than the 7° separation accepted by the Commission when it approved O3b's Hawaii gateway. This ensures that GSO FSS systems will be adequately protected.

As noted above, Harris CapRock has completed coordination notices for all existing and proposed terrestrial licenses within the coordination contours of their proposed Ka-Band earth stations transmitting in the 27.6-28.4 GHz band for the Melbourne 1 and Houston sites (attached as Exhibits B and C, respectively). No objections were received from any of the incumbent licensees. Although coordination has not yet been completed for the Melbourne 2 site, Harris CapRock certifies that it will not commence operations in shared spectrum at that location until coordination with terrestrial licensees has been completed.

With respect to sharing with other Ka-band NGSO systems, Harris CapRock notes that there are no planned NGSO systems contemplated for deployment throughout the duration of the proposed operations. Moreover, the O3b system is capable of sharing with future NGSO networks operating in the same frequency bands and, therefore, will not preclude additional entry by future NGSO licensees. Thus, the proposed experimental operations can be authorized on an unprotected, non-interference basis under Part 5 of the Rules.

Expedited Processing

Finally, Harris CapRock respectfully requests expedited processing of this application. As discussed herein, similar earth stations have been previously reviewed and approved by the Commission to communicate with the O3b system at the Melbourne 1, Melbourne 2 and Houston locations. Furthermore, coordination of proposed operations in the 27.6-28.4 GHz band has been completed at the Melbourne 1 and Houston locations, and will be completed in due course at the Melbourne 2 location. Because the Commission has previously reviewed and approved operation of the terminals, and because it may condition authority to operate in the

⁸ See O3b Hawaii License Application, File No. SES-LIC-20100723-00952, Technical Attachment at A.10.1.

27.6-28.4 GHz band on completion of coordination at Melbourne 2, it may effectively review and approve the proposed operations in the 27.6-28.4 GHz (shared) and 28.6-29.1 GHz (unshared) bands on an expedited basis.

Conclusion

The requested experimental STA will allow Harris CapRock to continue development, testing and demonstration of its new 2.4m terminals with the O3b system, and 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 within the public interest. Harris CapRock respectfully requests that the experimental STA be granted for a six (6) month period commencing on May 1, 2015.