

APPLICATION FOR EARTH STATION SPECIAL TEMPORARY AUTHORITY

APPLICANT INFORMATION Enter a description of this application to identify it on the main menu:
60-day STA request for fixed earth station extended band operations

1. Applicant

Name: Harris CapRock Communications, Inc. 832-668-2753
DBA Name: 832-668-2780
Street: 4400 S. Sam Houston Parkway Ea E-Mail: ellenann.sands@harris.com
City: Houston **State:** TX
Country: USA **Zipcode:** 77048
Attention: Ms. EllenAnn Sands



File # SES-STA-20160214-00135
2030253
Call Sign Grant Date 2-23-16
(or other identifier)
Term Dates
From: 2-23-16 To: 4-25-16
Approved: *Paul E. Black*

Applicant: Harris CapRock Communications, Inc
Call Sign: E030253
File Number: SES-STA-20160214-00135
Special Temporary Authority

Harris CapRock Communications, Inc (Harris CapRock) is granted special temporary authority for 60 days, beginning February 24, 2016, to operate its fixed earth station in Houston TX, with the Telstar 14R satellite at the 63° W.L. orbital location in the 13.8-14.0 GHz (Earth-to-space) and 11.45-11.7 GHz (space-to-Earth) frequency bands under the following conditions:

1. Operations, shall not cause harmful interference to, and shall not claim protection from interference caused to it by any other lawfully operating station and it shall cease transmission(s) immediately upon notice of such interference and notify the FCC in writing.
2. This action is taken without prejudice to the Commission's decisions and disposition of current or future pending applications for U.S. market access to Intelsat 14R satellite at the 63° W.L. orbital location.
3. Operations must comply with the EIRP density limits specified in US356, US357.
4. Operations in the 13.75-13.8 GHz are not authorized.
5. Any action taken or expense incurred as a result of operations pursuant to this STA is solely at Harris CapRock's risk.

This action is issued pursuant to Section 0.261 of the Commission's rules on delegated authority, 47 C.F.R. § 0.261, and is effective immediately.



File # SES-STA-20160214-00135
Call Sign E030253 Grant Date 2-23-16
(or other identifier)
Term Dates
From: 2-24-16 To: 4-25-16
Approved: Paul E. Kelly

2. Contact

Name: Carlos M. Nalda **Phone Number:** 5713325626
Company: LMI Advisors **Fax Number:**
Street: 8601 James Creek Drive **E-Mail:** cnalda@lmiadvisors.com
City: Springfield **State:** VA
Country: USA **Zipcode:** 22152 -
Attention: **Relationship:**

(If your application is related to an application filed with the Commission, enter either the file number or the IB Submission ID of the related application. Please enter only one.)

3. Reference File Number SEMF2016021400134 or Submission ID

4a. Is a fee submitted with this application?

If Yes, complete and attach FCC Form 159. If No, indicate reason for fee exemption (see 47 C.F.R. Section 1.1114).

Governmental Entity Noncommercial educational licensee

Other (please explain):

4b. Fee Classification CGX – Fixed Satellite Transmit/Receive Earth Station

5. Type Request

Use Prior to Grant Change Station Location Other

6. Requested Use Prior Date
02/22/2016

7. City Houston 8. Latitude
(dd mm ss.s h) 29 35 54.0 N

9. State TX	10. Longitude (dd mm ss.s h) 95 20 50.0 W
11. Please supply any need attachments. Attachment 1: FCC 96-377 Compliance Attachment 2: Narrative Statement Attachment 3: Modification App	
12. Description. (If the complete description does not appear in this box, please go to the end of the form to view it in its entirety.) Harris CapRock seeks a STA to operate its previously licensed 6.3m Model VertexRSI Ku-band gateway earth station in the extended Ku-band.	
13. By checking Yes, the undersigned certifies that neither applicant nor any other party to the application is subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Act of 1988, 21 U.S.C. Section 862, because of a conviction for possession or distribution of a controlled substance. See 47 CFR 1.2002(b) for the meaning of "party to the application"; party to the application; for these purposes. Yes <input checked="" type="radio"/> No <input type="radio"/>	
14. Name of Person Signing EllenAnn Sands	15. Title of Person Signing Legal Counsel
WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND / OR IMPRISONMENT (U.S. Code, Title 18, Section 1001), AND/OR REVOCATION OF ANY STATION AUTHORIZATION (U.S. Code, Title 47, Section 312(a)(1)), AND/OR FORFEITURE (U.S. Code, Title 47, Section 503).	

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**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of

Application of Harris CapRock)	
Communications, Inc. for a Special)	File No:
Temporary Authorization to Operate a Fixed)	
Earth Station in the 11.45-11.7 (space-to-)	Call Sign: E030253
Earth) and 13.75-14.0 GHz (Earth-to-space))	
Frequency Bands)	

Application for Special Temporary Authorization

Pursuant to Section 25.120 of the Rules and Regulations of the Federal Communications Commission (the "Commission Rules"), 47 C.F.R. § 25.120, Harris CapRock Communications, Inc. ("Harris CapRock") seeks a special temporary authorization ("STA") to operate its previously licensed 6.3m Model VertexRSI Ku-band gateway earth station ("Vertex 6.3m") in the 11.45-11.7 GHz (space-to-Earth) band and the 13.75-14.50 GHz (Earth-to-space) band (collectively, the "extended Ku-band") while communicating with the Telstar 14R satellite. The gateway earth station is located at a facility in Houston, Texas and is used to support U.S. and international earth station on board vessel ("ESV") and remote fixed station operations. The requested STA will afford Harris CapRock additional operational flexibility and enhance its satellite communication network supporting critical maritime and offshore commercial operations.

The requested STA will afford Harris CapRock short-term operating authority during the pendency of its concurrently filed modification application¹ to operate the Vertex 6.3m earth station in the 11.45-11.7 GHz and 13.75-14.0 GHz band. Grant of the requested STA is essential to ensure that there is no lapse in essential satellite-based services in the context of an upcoming change in serving satellite capacity. Harris

¹ See Application of Harris CapRock Communications, Inc. for Modification to Operate a Fixed Earth Station in the 11.45-11.7 (space-to-Earth) and 13.75-14.0 GHz (Earth-to-space) Frequency Bands ("*Modification Application*").

CapRock seeks an STA for a period of up to 60 days, commencing no later than February 22nd, 2016.

I. Background

Presently under the license, the Vertex 6.3m is authorized to communicate with satellites on the Commission's Permitted Space Station List ("Permitted List") in the 11.7-12.2 GHz and 14.0-14.5 GHz bands. Telstar 14R, a Brazilian-licensed satellite operated by Telesat Brasil located at the 63° W.L. orbital location, has previously been granted U.S. market access and is included on the Commission's Permitted Space Station List ("Permitted List").² Accordingly, the Vertex 6.3m can presently communicate with Telstar 14R as a point of communication in the conventional Ku-band pursuant to its Permitted List authority in the license. Harris CapRock now seeks a STA permit the Vertex 6.3m gateway to communicate with Telstar 14R in the extended Ku-band.

Harris CapRock provides the attached modification application FCC Form 312 and Schedule B and associated exhibits for relevant information relating to the gateway earth station's operational characteristics in the 11.45-11.7 GHz and 13.75-14.0 GHz bands. The remaining technical information in Harris CapRock's earth station license and associated application remains unchanged.³ Furthermore, as discussed below, Harris CapRock will comply with the Commission's rules and policies governing spectrum use of extended Ku-band frequencies for geostationary satellite orbit ("GSO") fixed-satellite service ("FSS") operations.

II. Discussion

The United States Table of Frequency Allocations ("Table of Allocations"), Section 2.106 of the Commission's Rules, 47 C.F.R. § 2.106, identifies conditions for spectrum use by FSS in the extended Ku-band. In the 11.45-11.7 GHz downlink band, GSO FSS operations are limited to international systems, *i.e.*, other than U.S. domestic services. In the 13.75-14.0 GHz uplink band, GSO FSS operations are co-primary with U.S.

² See Telesat Brasil, Grant of U.S. Market Access, File. No. SAT-PPL-20110112-00012 (Call Sign S2821) (granted on January 12, 2011). Telstar 14R is located at the 63° W.L. orbital location.

³ *Id.*

government shipboard radar radiolocation and National Aeronautics and Space Administration (“NASA”) Tracking and Data Relay Satellite Systems (“TDRSS”) operations. As discussed below, Harris CapRock will operate the Vertex 6.3m consistent with the Table of Allocations and the Commission’s policies governing use of the extended Ku-band.

a. 11.45-11.7 GHz Downlink Band

In the 11.45-11.7 GHz band, operations are co-primary with terrestrial FS and Harris CapRock’s operations and use of this band by GSO FSS systems is limited to international systems. Harris CapRock is currently authorized to operate a gateway earth station at the same location in the extended band.⁴

Harris CapRock’s proposed operations in the 11.45-11.7 GHz band are consistent with the Table of Allocations and similarly approved gateway earth station operations.⁵ Harris CapRock acknowledges that this downlink frequency band is shared co-equally with terrestrial systems and coordination with fixed service (“FS”) licensees is required. The 11.45-11.7 GHz band was previously coordinated at this facility by Comsearch for a similar Vertex 9.3m gateway earth station and the Comsearch database already includes full arc (21° W.L. to 143 W.L.), full extended band (11.45 GHz-12.2 GHz) coordination for this site.

No FS operations that might be potentially affected by the proposed operations with T-14R could be authorized without first coordinating with Harris CapRock’s licensed extended band operations. No such coordination requests have been received. Because the proposed operations of the Vertex 6.3m will be within the site’s presently coordinated parameters, the Commission may grant the requested modification application without “re-coordination” of extended downlink band operations of the Vertex 6.3m.

In addition, there is no potential for the proposed operations to cause interference to other spectrum users because they are earth station receive operations and would be the

⁴ See Harris CapRock, File No. SES-LIC-20031028-01500 (Call Sign E030253) (granted on January 13th, 2004).

⁵ See, e.g., Intelsat License LLC, File No. SES-LIC-20120106-00020, Call Sign E120009 (FCC granted Intelsat authority to operate a fixed gateway earth station in the 11.45-11.7 GHz band in Riverside, California).

victim of interference from terrestrial transmit operations. Harris CapRock expressly accepts the potential risk of relying on the prior coordination report and future coordination with its co-located Vertex 9.3m gateway to “protect” the proposed Vertex 6.3m receive operations in this band.

Finally, Harris CapRock notes that footnote NG52 in the U.S. Table of Allocations provides that use of the 11.45-11.7 GHz band “by geostationary satellites in the fixed-satellite service (FSS) shall be limited to international systems, *i.e.*, other than domestic systems.”⁶ The proposed operations, which are limited to supporting gateway links for ESV terminals on foreign-flagged vessels transiting U.S. and international waters and offshore oil rigs, are consistent with the policies underlying this provision. Indeed, previously granted authority to operate at this site in this frequency band strongly supports this conclusion.

To the extent necessary, Harris CapRock requests a waiver of footnote NG52 to grant this STA request. The policies underlying the rule would not be undermined because extended Ku-band receive operations are already conducted at this site, so there would be no expansion of such operations into new areas. Furthermore, the public interest would be served by granting such a waiver, which would enable Harris CapRock to conduct limited but important gateway operations with T-14R to support the maritime and oil and gas industries.

b. 13.75-14.0 GHz Uplink Band

Harris CapRock accepts that the 13.75-14.0 GHz band is allocated to FSS Earth-to-space uplink transmissions on a co-primary basis with U.S. government shipboard radiolocation services and NASA TDRSS operations. As demonstrated in Exhibit A, Harris CapRock will operate the Vertex 6.3m earth station in the 13.75-14.0 GHz band in accordance with the Table of Allocations and FCC Report and Order 96-377⁷ in order to protect U.S. government operations from harmful interference. The Commission has previously granted authority for fixed earth stations to operate in the extended 13.75-14.0

⁶ See United States Table of Allocations, 47 C.F.R. § 2.106, footnote NG52.

⁷ See *Amendment of Parts 2, 25 and 90 of the Commission's Rules to Allocate 13.75-14.0 GHz Band to the Fixed-Satellite Service*, Report and Order, FCC 96-377 (Rel. September 26, 1996).

GHz transmit Ku-band and Harris CapRock proposed use of the Vertex 6.3m will be consistent with similarly approved operations.⁸ Finally, Harris CapRock certifies that its proposed operations of the Vertex 6.3m are consistent with antenna size and power level requirements in footnote US356 of the Table of Allocations.⁹

Grant of the requested authority will serve the public interest by allowing the near-term use of the extended Ku-band band and ensure uninterrupted satellite communication services, thereby improving the critical services its provides to a wide array of users in the maritime, oil and gas industries.

III. Expedited Consideration

Harris CapRock respectfully requests expedited processing of this STA request under Section 25.120. Section 25.120(a) provides that STA requests should be filed at least three working days prior to the date of commencement of the proposed operations. Here, Harris CapRock seeks to commence operations on February 22nd, 2016.

Pursuant to Section 25.120(b)(3), Harris CapRock is filing for 60-day STA to ensure proper short-term authorizations during the pendency of its earth station modification application. Section 25.120(b)(3) provides that the Commission may grant STA for a period not to exceed 60 days if it has not placed the STA request on public notice and the applicant plans to file a request for regular authority for the service. Here, Harris CapRock has concurrently filed a request to modify its license to operate the Vertex 6.3m earth station in the 11.45-11.7 GHz and 13.75-14.0 GHz bands.¹⁰

Due to a change in satellite capacity, Harris CapRock requires near-term use of the 11.45-11.7 GHz and 13.75-14.0 GHz bands to accommodate the capacity adjustment and ensure there is no lapse in vital satellite communication services. Given the near-term commencement of the proposed operations and that they can operate consistent with the Table of Allocations and FCC Report & Order 96-377, expedited processing of this STA request is warranted and will ensure properly authorized temporary operations while

⁸ See Intelsat License LLC, File No. SES-MFS-20131111-00952 (Call Sign E000063); Globecom License Sub LLC, File No. SES-MOD-20101014-01388 (Call Sign E020288).

⁹ See United States Table of Allocations, 47 C.F.R. § 2.106, footnote US356.

¹⁰ See *Modification Application*.

the Commission reviews Harris CapRock's modification application.

Grant of the requested authority will serve the public interest by allowing the near-term use of the 11.45-11.7 GHz and 13.75-14.0 GHz bands and ensure uninterrupted satellite communication services, thereby improving the critical services its provides to a wide array of users in the maritime, oil and gas industries. Accordingly, Harris CapRock respectfully submits that the public interest will be served by grant of the requested STA no later than February 22nd, 2016.

VI. Conclusion

In view of the foregoing, Harris CapRock respectfully requests that the Commission grant its 60-day STA request to allow the Vertex 6.3m earth station to operate in the 11.45-11.7 GHz (space-to-Earth) band and the 13.75-14.50 GHz (Earth-to-space) band no later than February 22nd, 2016.

Harris CapRock Communications, Inc.

Call Sign: E030253

File No.: SES-MOD-20140606-00440

Earth Station: General Dynamics SATCOM (formerly VertexRSI) Model 6.3m Cassegrain Antenna

Compliance with FCC Report & Order (FCC 96-377) for the 13.75 - 14.0 GHz Band

Pursuant to FCC Report and Order 96-377 ("FCC 96-377"), the 13.75-14.0 GHz band is allocated to the fixed satellite service ("FSS") on a co-primary basis with U.S. government shipboard radar radiolocation operations and National Aeronautics and Space Administration ("NASA") Tracking and Data Relay Satellite Systems ("TDRSS") operations. As demonstrated in this exhibit, Harris CapRock Communications, Inc.'s ("Harris CapRock") 6.3m gateway earth station (the "Vertex 6.3m") in Houston, Texas complies with FCC 96-377 and will operate in the 13.75-14.0 GHz band within the parameters designed to protect U.S. Navy radiolocation and NASA TDRSS operations and will not cause harmful interference. The parameters for the earth station are:

Table 1. Earth Station Characteristics

- Coordinates (NAD-83): 29°35' 54.0" N, 95°20'50.0" W
- Satellite Location: Telstar 14R (formerly Estrela do Sul 2) at 63° W.L.
- Frequency Band: 13.75-14.5 GHz for uplink
- Polarizations: Horizontal/Vertical
- Emissions: 18M0G7W & 9M00G7W
- Modulation: Digital
- Maximum Uplink EIRP: 18M0G7W: 65.4 dBW / 9M00G7W: 62.4 dBW
- Transmit Antenna Characteristics:
 - Antenna Size: 6.3m
 - Antenna Type/Model: General Dynamic SATCOM (formerly VertexRSI) 6.3m Cassegrain Antenna
 - Gain: 57.3 dBi @ 13.875 GHz

18M0G7W

- RF power into Antenna Flange: 8.1 dBW or -28.4 dBW/4 kHz.

- Minimum Elevation Angle: Houston, Texas (40.7° @ 128.0° Azimuth) at 63° W.L. (Telstar 14R).
- Side Lobe Antenna Gain: $32 - 25 \cdot \log(\theta) = -8.2$ dBi for $\theta = 40.7^\circ$

9M00G7W

- RF power into Antenna Flange: 5.1 dBW or -28.4 dBW/4 kHz.
- Minimum Elevation Angle: Houston, Texas (40.7° @ 128.0° Azimuth) at 63° W.L. (Telstar 14R).
- Side Lobe Antenna Gain: $32 - 25 \cdot \log(\theta) = -8.2$ dBi for $\theta = 40.7^\circ$

Because the 13.75-14.0 GHz band is shared with the U.S. government, coordination in this band requires resolution data pertaining to potential interference between the subject earth station and U.S. Navy radiolocation and NASA TDRSS services.

1. Potential Impact to Government Radiolocation (Shipboard Radar)

U.S. Navy shipboard radiolocation operations may occur anywhere in the 13.4-14.0 GHz frequency band. FCC Order 96-377 allocates the top 250 MHz of this 600 MHz band to FSS on a co-primary basis with radiolocation operations and provides that FSS earth stations must have a power flux density ("PFD") value of -167 dB(W/m²/4 kHz) to prevent harmful interference to government radiolocation services. The closest distance to the shoreline from the Houston, Texas earth station is approximately 34 km west toward Trinity Bay. The calculation of the power spectral density at this distance is given by:

- Clear Sky EIRP: 65.4 dBW for 18M0G7W; 62.4 for 9M00G7W
- Carrier Bandwidth: 18 MHz for 18M0G7W; 9 MHz for 9M00G7W
- PD at antenna input: -28.4 dBW/4kHz for 18M0G7W and 9M007GW.
- Transmit Antenna Gain: 57.3 dBi @ 13.875 GHz
- Antenna Gain Horizon: FCC Reference Pattern
- Antenna Elevation Angle: 40.7°

The earth station will radiate interference toward the ocean according to its off-axis side-lobe performance. A conservative analysis, using the FCC standard reference pattern, results in off-axis antenna gains of -8.2 dBi towards Trinity Bay.

- The signal density at the shoreline, through free space is:
 - $\text{PFD} = \text{Antenna Feed Power density (dBW/4kHz)} + \text{Antenna Off-Axis Gain (dBi)} - \text{Spread Loss (dBW-m}^2\text{)}$

$$\begin{aligned}
 \text{PFD} &= -28.4 \text{ dBW/4kHz} + (-8.2) \text{ dBi} - 10 * \log[4\pi * (34000\text{m})^2] \\
 &= -138.2 \text{ dBW/m}^2/4 \text{ kHz} - \text{Additional Path Losses (61.1 dB)} \\
 &= -199.3 \text{ dB(W/m}^2/4 \text{ kHz)}
 \end{aligned}$$

Our calculations indicate additional path loss of approximately 61.1 dB including absorption loss and earth diffraction loss from the earth station to the nearest shoreline. The calculated PFD for both emission designators, including additional path losses to the closest shoreline, is -199.3 dB(W/m²/4 kHz). This is 32.3 dB below the -167.0 d(BW/m²/4 kHz) interference criteria of the R&O 96-377. Therefore, there should be no interference to the U.S. Navy radiolocation operations from the Houston, Texas earth station due to the distance and the terrain blockage between the site and the shore.

2. Potential Impact to NASA's Tracking and Data Relay Satellite System

Pursuant to FCC 96-377, FSS earth stations proposing to operate in the 13.75-14.0 GHz band must be coordinated with TDRSS forward link-to-LEO (US337) and with TDRSS earth stations located at NASA's White Sands Complex in New Mexico. Because the geographic location of the Harris CapRock earth station in Houston, Texas is outside of the 390 km coordination radius of the White Sands, New Mexico ground station complex. Therefore, the TDRSS space-to-earth link will not be impacted by Harris CaprRock's earth station operations in Houston, Texas.

The TDRSS space-to-space link in the 13.772 to 13.778 GHz band is assumed to be protected if an earth station produces an EIRP of less than 71 dBW/6 MHz in this band. The subject 6.3 m gateway earth station will not transmit in this band. Therefore, there will be no potential interference to the TDRSS space-to-space link.

3. Coordination Result Summary and Conclusion

The results of the analysis and calculations performed in this exhibit indicate that Harris CapRock may operate its gateway earth station at the Houston, Texas facility without causing interference to the U.S. Navy radiolocation and NASA TDRSS space-to-earth and space-to-space operations. Accordingly, Harris CapRock may operate on a co-primary basis to U.S. government services in the 13.75-14.0 GHz band.