

APPLICATION FOR EARTH STATION SPECIAL TEMPORARY AUTHORITY

APPLICANT INFORMATION Enter a description of this application to identify it on the main menu:  
Request for STA/Testing Authority

1. Applicant

<b>Name:</b>	SATCOM Digital Networks, LLC	<b>Phone Number:</b>	724-898-3272
<b>DBA Name:</b>		<b>Fax Number:</b>	
<b>Street:</b>	20 Leonberg Rd. Suite E	<b>E-Mail:</b>	dave@satcomsystems.com
<b>City:</b>	Cranberry Township	<b>State:</b>	PA
<b>Country:</b>	USA	<b>Zipcode:</b>	16066 -
<b>Attention:</b>	David C. Chisholm		



GRANTED

SES-STA-20120731-00706  
E120144 Grant Date 9-27-12  
Call Sign (or other identifier) From 9-28-12 To 11-27-12  
Term Dates  
Approved by / Sing Liu  
with conditions

Applicant: SATCOM Digital Networks, LLC  
Call Sign: E120144  
File No.: SES-STA-20120731-00706  
Special Temporary Authority (STA)

SATCOM Digital Networks, LLC is granted STA, under the following conditions, from September 28, 2012 through November 27, 2012 to conduct on-site testing at Cranberry Township, Pennsylvania in the extended Ku-band frequencies 13.75-13.77 GHz and 13.78-14.00 GHz to communicate with AMAZONAS-1 satellite orbital location 61.0 degrees W.L.

1. Uplink to satellite on 13.75 – 14.0 GHz within coordinated emission and power limits.
2. Downlink from satellite on 11.7-12.2 GHz.
3. All operations shall be on an unprotected and non-harmful interference basis, SATCOM Digital Networks, LLC, E120144, 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.

*SES-STA-20120731-00706*

Call Sign	<i>E120144</i>	Grant Date	<i>9-27-12</i>
(or other identifier)		Term Expires	<i>11-27-12</i>
From	<i>9-28-12</i>	To	<i>11-27-12</i>
Area	<i>1 hrms bin</i>		

GRANTED

<b>2. Contact</b>			
<b>Name:</b>	FRANK R. JAZZO, ESQ.	<b>Phone Number:</b>	703-812-0470
<b>Company:</b>	FLETCHER, HEALD & HILDRETH, P.L.C.	<b>Fax Number:</b>	703-812-0486
<b>Street:</b>	1300 NORTH 17TH STREET 11TH FLOOR	<b>E-Mail:</b>	jazzo@fhhlaw.com
<b>City:</b>	ARLINGTON	<b>State:</b>	VA
<b>Country:</b>	USA	<b>Zipcode:</b>	22209 -
<b>Attention:</b>		<b>Relationship:</b>	Legal Counsel
(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 or Submission ID IB2012001749			
4a. Is a fee submitted with this application?			
<input checked="" type="radio"/> If Yes, complete and attach FCC Form 159. If No, indicate reason for fee exemption (see 47 C.F.R. Section 1.1114).			
<input type="radio"/> Governmental Entity <input type="radio"/> Noncommercial educational licensee			
<input type="radio"/> Other (please explain):			
4b. Fee Classification CGS – Fixed Satellite Small Transmit/Receive Earth Station			
5. Type Request			
<input checked="" type="radio"/> Use Prior to Grant <input type="radio"/> Change Station Location <input type="radio"/> Other			
6. Requested Use Prior Date			
08/10/2012			

7. CityCranberry	8. Latitude (dd mm ss.s h) 40 42 25.0 N
9. State PA	10. Longitude (dd mm ss.s h) 80 5 44.0 W
11. Please supply any need attachments. Attachment 1: STA Request                      Attachment 2:                      Attachment 3:	
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.) <div style="border: 1px solid black; padding: 5px; margin: 10px 0;">SATCOM Digital Networks, LLC requests a 60-day STA to conduct on-site testing in the extended Ku-Band in preparation of operations using Amazonas-1.</div>	
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"; for these purposes. <input checked="" type="radio"/> Yes <input type="radio"/> No	
14. Name of Person Signing David Chisholm	15. Title of Person Signing President
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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**THE FOREGOING NOTICE IS REQUIRED BY THE PAPERWORK REDUCTION ACT OF 1995, PUBLIC LAW 104-13, OCTOBER 1, 1995, 44 U.S.C. SECTION 3507.**

### **Request for Special Temporary Authority**

SATCOM Digital Networks, LLC (“SATCOM”) requests special temporary authority (“STA”) for 60 days beginning August 10, 2012 to conduct on-site testing in the extended Ku-Band (13.75- 13.77 GHz and 13.78-14.00 GHz) in preparation of operation using Amazonas-1 commencing September 1, 2012. The FCC may grant an STA for a period not to exceed 60 days where the STA request has not been placed on public notice and the applicant plans to file a request for regular authority for the service. An application for license for this operation has been filed with the Commission, (File Number SES-LIC-20120724-00688, filed July 24, 2012 and assigned call sign E120144).

SATCOM seeks use of AMAZONAS-1 in the extended Ku-Band to provide domestic service in the U.S. because it has the only available 36 MHz channel capacity. Details of the proposed operation are attached.

This system will provide U.S. domestic video services to institutional facilities, such as retirement housing and prisons. The requested STA serves the public interest by allowing SATCOM to perform necessary testing and to resolve any issues in preparation for operation. SATCOM’s service will meet niche market needs currently underserved or unserved in the marketplace.

**Exhibit For**  
**SATCOM Digital Networks**  
**Cranberry Township, Pennsylvania**  
**RSI Satcom 6.4 Meter Earth Station**

**Compliance with FCC Report & Order (FCC96-377) for the 13.75 - 14.0 GHz Band**  
**Analysis and Calculations**

**1. Background**

This Exhibit is presented to demonstrate the extent to which the proposed SATCOM Digital Network's satellite earth station, to be located in Cranberry Township, Pennsylvania, is in compliance with FCC REPORT & ORDER 96-377. The potential interference from the earth station to US Navy shipboard radiolocation operations (RADAR) and the NASA space research activities in the 13.75 - 14.0 GHz Band is addressed in this exhibit. The parameters for the earth station are:

**Table 1. Earth Station Characteristics**

- Coordinates (NAD83): 40° 42' 25.0" N, 80° 05' 44.0" W
- Satellite Location for Earth Station: Amazonas 1 and 2 at 61.0° WL
- Frequency Band: 13.75-14.0 GHz for uplink
- Polarizations: Circular and Linear
- Emissions: 23M0G7W
- Modulation: Digital
- Maximum Aggregate Uplink EIRP: 80.92 dBW for all Carriers
- Transmit Antenna Characteristics
  - Antenna Size: 6.4 meters in Diameter
  - Antenna Type/Model: RSI Satcom
  - Gain: 57.4 dBi
- RF power into Antenna Flange: 23.52 dBW or 9.9 dBW/MHz  
or -14.1 dBW/4 KHz (Maximum)
- Minimum Elevation Angle: 39.0° @ 152.0° Az. (Amazonas 1 & 2) at 61.0° W  
Cranberry Twp, Pa.

- Side Lobe Antenna Gain:  $32 - 25 * \log(\theta)$

Because the above uplink spectrum is shared with the Federal Government, coordination in this band requires resolution data pertaining to potential interference between the earth station and both Navy Department and NASA systems. Potential interference from the earth station could impact with the Navy and/or NASA systems in two areas. These areas are noted in FCC Report and Order 96-377 dated September 1996, and consist of (1) Radiolocation and radio navigation, (2) Data Relay Satellites.

Summary of Coordination Issues:

- 1) Potential Impact to Government Radiolocation (Shipboard Radar)
- 2) Potential Impact to NASA Data Relay Satellite Systems (TDRSS)

**2. Potential Impact to Government Radiolocation (Shipboard Radar)**

Radiolocation operations (RADAR) may occur anywhere in the 13.4 - 14 GHz frequency band aboard ocean going United States Navy ships. The Federal Communication Commission (FCC) order 96-377 allocates the top 250 MHz of this 600 MHz band to the Fixed Satellite Service (FSS) on a co-primary basis with the radiolocation operations and provides for an interference protection level of  $-167 \text{ dBW/m}^2/4 \text{ KHz}$ .

The closest distance to the shoreline from the Cranberry Township earth station is approximately 341 km Southeast toward the Chesapeake Bay. The calculation of the power spectral density at this distance is given by:

1. Clear Sky EIRP: 80.92 dBW
2. Carrier Bandwidth: 23.0 MHz
3. PD at antenna input:  $-14.1 \text{ dBW}/4 \text{ KHz}$
4. Transmit Antenna Gain: 57.4 dBi
5. Antenna Gain Horizon: FCC Reference Pattern
6. Antenna Elevation Angle:  $39.0^\circ$

The proposed earth station will radiate interference toward the Chesapeake Bay according to its off-axis side-lobe performance. A conservative analysis, using FCC standard reference pattern, results in off-axis antenna gains of  $-9.9 \text{ dBi}$  towards the Chesapeake Bay.

The signal density at the shoreline, through free space is:

$$\begin{aligned} \text{PFD} &= \text{Antenna Feed Power density (dBW/4 KHz)} + \text{Antenna Off-Axis Gain (dBi)} - \text{Spread Loss (dBw-m}^2\text{)} \\ &= -14.1 \text{ dBW}/4 \text{ KHz} + (-9.9 \text{ dBi}) - 10 * \log[4\pi * (341000\text{m})^2] \\ &= -145.6 \text{ dBW/m}^2/4 \text{ KHz} + \text{Additional Path Losses (}\sim 85.0 \text{ dB)} \\ &= -230.6 \text{ dBW/m}^2/4 \text{ KHz} \end{aligned}$$



Our calculations indicate additional path loss of approximately 85.0 dB including absorption loss and earth diffraction loss for the actual path profiles from the proposed earth station to the nearest shoreline.

The calculated PFD including additional path losses to the closest shoreline location is  $-230.6 \text{ dBW/m}^2/4 \text{ kHz}$ . This is 63.6 dB below the  $-167 \text{ dBW/m}^2/4 \text{ kHz}$  interference criteria of R&O 96-377. Therefore, there should be no interference to the US Navy RADAR from the Cranberry Township earth station due to the distance and the terrain blockage between the site and the shore.

### **3. Potential Impact to NASA's Data Relay Satellite System (TDRSS)**

The geographic location of the SATCOM Digital Networks' earth station in Cranberry Township, Pennsylvania is outside the 390 km radius coordination contour surrounding NASA's White Sands, New Mexico ground station complex. Therefore, the TDRSS space-to-earth link will not be impacted by the SATCOM Digital Networks earth station in Cranberry Township.

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 less than 71 dBW/6 MHz in this band. The 6.4 meter earth station antenna will have an EIRP greater than 71 dBW/6 MHz in this band. The total EIRP for all carriers is 80.92 dBW, and the equivalent EIRP per 6 MHz segment will be 77.09 dBW/6 MHz. Therefore, there could be interference to the TDRSS space-to-space link (Table 1).

In order to meet the 71 dBW/6 MHz interference criteria, the earth station would have to be limited to an RF power density 6.1 dB lower than the maximum of  $-14.1 \text{ dBW/4kHz}$  or  $-20.2 \text{ dBW/4kHz}$  for an EIRP of 74.82 dBW. If this operational condition cannot be met, then the Cranberry Township, Pennsylvania earth station may not be tuned to operate at the frequencies in the 13.770 to 13.780 GHz Band.

### **4. Coordination Issue Result Summary and Conclusions**

The results of the analysis and calculations performed in this exhibit indicate that compatible operation between the earth station at the Cranberry Township facility and the US Navy and NASA systems space-to-earth link are possible. This analysis has been based on the assumption of 23 MHz bandwidth carriers.

Operations in NASA systems space-to-space link (13770.0 to 13780.0 MHz) will not be permitted.

**Table 1**

**Excluded Frequency Range for SATCOM Digital Networks Earth Station**

<b>System</b>	<b>Frequency Restriction</b>
TDRSS	13.770-13.780 GHz (see Note 1)

**Note 1:** In order to meet the 71 dBW/6 MHz interference criteria, the earth station would have to be limited to a maximum total EIRP of 74.82 dBW.

No interference to US Navy RADAR operations from the Cranberry Township, Pennsylvania earth station will occur.