Approved by OMB
3060–0678

# APPLICATION FOR EARTH STATION SPECIAL TEMPORARY AUTHORITY

APPLICANT INFORMATIONEnter a description of this application to identify it on the main menu:
STA to Operate 1.2–meter antenna in Extended Ku–Band Downlink

**1. Applicant**

| | | | |
|---|---|---|---|
| **Name:** | Global Eagle Telecom Licensing Subsidiary LLC | **Phone Number:** | 310–740–8600 |
| **DBA Name:** | | **Fax Number:** | |
| **Street:** | 6080 Center Drive | **E–Mail:** | Julia.Waldron@globaleagle.com |
| | Suite 1200 | | |
| City: | Los Angeles | **State:** | CA |
| **Country:** | USA | **Zipcode:** | 90045 – |
| **Attention:** | Ms Julia Waldron | | |

FEDERAL COMMUNICATIONS COMMISSION
GRANTED
International Bureau

File # SES-STA-20200114-00029
Call Sign N/A Grant Date 1/16/2020
(or other identifier)
Term Dates
From 1/20/2020 To: 2/19/2020
Approved: Paul E Blais

**2. Contact**

| | | | |
|---|---|---|---|
| **Name:** | David S. Keir | **Phone Number:** | 202-429-8970 |
| **Company:** | Lerman Senter PLLC | **Fax Number:** | 202-293-7783 |
| **Street:** | 2001 L Street, N.W. | E-Mail: | dkeir@lermansenter.com |
| | Suite 400 | | |
| **City:** | Washington | **State:** | DC |
| **Country:** | USA | **Zipcode:** | 20036 - |
| **Attention:** | | **Relationship:** | 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

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<br>01/20/2020 | |
| 7. CityDallas | 8. Latitude<br>(dd mm ss.s h) 32 50 51.0 N |

| 9. State TX | 10. Longitude<br>(dd mm ss.s h) 96 51 52.6 W |
|---|---|

11. Please supply any need attachments.

Attachment 1: Explanatory Stmt  Attachment 2: 1,2 meter RadHaz  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.)

Request for Special Temporary Authority for a period of 30 days commencing January 20, 2020 to conduct antenna tests including reception of signals initiated at Holmdel, NJ in the 11450-12200 MHz band. A waiver of U.S. footnote NG52 is requested for the 11.45-11.7 GHz portion of the 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" for these purposes.

(●) Yes ( ) No

| 14. Name of Person Signing<br>John Hudak | 15. Title of Person Signing<br>Dir. of Teleport Operations, Western Hemisphere |
|---|---|

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.**

Applicant: Global Eagle Telecom Licensing
Call Sign: None
File No.: SES-STA-20200114-00029
Special Temporary Authority (STA)

Global Eagle Telecom Licensing is granted special temporary authority for 30 days, beginning January 20, 2020, to conduct antenna tests on a 1.2 meter, Skyware Global, Type 123, Class II, Ku band ESAA antenna via the AMC-6 (S2347) satellite at the 83° W.L. orbital location in the 11.45-11.7 GHz (space-to Earth) frequency band. Waiver of NG52 to allow reception of transmissions originating from transmission Holmdel, NJ is granted without prejudice to the conditions in the market access grant for the AMC-6 (S2347) satellite, and in respect to footnote NG527A of the table of allocations in that ESAA terminals fall under the ESIM classification. The grant of this waiver is limited to the duration of this authorization, under the following conditions:

1. All operations under this grant of STA shall be on an unprotected and non-harmful interference basis. Global Eagle Telecom Licensing's testing shall not cause harmful interference to and shall not claim protection from interference caused to it by any other lawfully operating radio communication system.

2. In the event of any harmful interference as a result of operations under this grant of special temporary authority, Global Eagle Telecom Licensing shall cease operations immediately upon notification of such interference and shall immediately inform the Commission, in writing, of such an event.

3. Grant of this STA is without prejudice to any determination that the Commission may make regarding pending or future Global Eagle Telecom Licensing applications.

4. Any action taken or expense incurred as a result of operations pursuant to this STA is solely at Global Eagle Telecom Licensing's risk.

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

FEDERAL COMMUNICATIONS COMMISSION

GRANTED
International Bureau

File # SES-STA-20200114-00029

Call Sign N/A Grant Date 1/16/2020
(or other identifier)

Term Dates
From 1/20/2020 To: 2/19/2020

Approved: Paul E Black

**Explanatory Statement**

Global Eagle Telecom Licensing Subsidiary, LLC ("Global Eagle") seeks special temporary authority for a period of thirty (30) days to conduct limited antenna testing using a single 1.2-meter Ku-band antenna at Dallas, Texas. Global Eagle anticipates requiring renewal of the requested STA for additional periods not exceeding a total operational 175 days. The purpose of the testing is to evaluate new equipment for possible future use with Global Eagle's existing ESAA network (Call Sign E080100), including assessment of approaches to achieve improved data throughput. Technical parameters for the test are provided on the following page.

Request for Waiver of U.S. Footnote NG52

In order to permit these operations, Global Eagle respectfully requests a waiver of Footnote NG52 of the U.S. Table of Allocations[1] to permit the earth station to receive signals in the extended Ku-band at 11.45-11.7 GHz that originate from a U.S. domestic earth station located at Holmdel, New Jersey (Call Sign E070218). A waiver is necessary because Footnote NG52 expressly limits "use of the bands 10.7-11.7 GHz (space-to-Earth) ... by geostationary satellites in the fixed-satellite service (FSS) ... to international systems, i.e., other than domestic systems."[2] As the planned test involves downlink transmissions from the AMC-6 satellite located at 83° West longitude in the U.S. domestic geostationary arc, and that space station does not have permission to transmit signals between domestic earth stations under its FCC license (S2347, FCC File No. SAT-MOD-20170628-00102), Global Eagle requires a narrow waiver of the rule to permit the planned operations.

The requested waiver is in the public interest because it will facilitate the gathering of antenna performance information that is expected to permit enhancement of both international and domestic satellite services offered to small user terminals. Moreover, grant of the requested waiver will not undermine the purpose of the limitation to international operations, which is intended to avoid over-use of the extended Ku-band downlink by excluding domestic-only transmissions. The requested authority is consistent with this objective in that (1) AMC-6 is already authorized to use the requested frequencies for international operations, and therefore has existing transmit operations in the band to U.S. locations, (2) the use is limited to a single antenna location, and (3) the use is of limited duration. Accordingly, Global Eagle requests that STA be granted expeditiously for a period commencing January 20, 2020 and initially extending until February 19, 2020.

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[1] *See* 47 C.F.R. §2.106, footnote NG52.

[2] *Id.*

# Antenna Test Technical Parameters

## Antenna Specifications

| Manufacturer | Model | Size | Antenna Gain |
|---|---|---|---|
| Skyware Global | Type 123, Class II, Ku-Band Tx/Rx Antenna | 1.2 meters | Rx: 41.8 dBi @ 12.0 GHz, Tx: 43.2 dBi @ 14.3 GHz |

## Antenna Location

| Geographic Coordinates | AGL (meters) | AMSL (meters) | Building Height | Height Above Rooftop |
|---|---|---|---|---|
| 32°50'51.4"N 96°51'56.2"W | 32.9 | 145.0 | 31.7 | 3 meters |

## Frequency Use

| Band (GHz) | Mode | Polarization | Emission | Max EIRP per carrier | Max EIRP Density Per Carrier |
|---|---|---|---|---|---|
| 11.45 – 12.2 | Receive | Vertical linear | 72M0G7W | -- | -- |
| 14.00– 14.5 | Transmit | Horizontal linear | 36M0G7W | 55.90 | -12.78 |

## Point of Communication Data

| Satellite | Orbital Location | Azimuth (°) | Elevation (°) |
|---|---|---|---|
| AMC-6 | 83°W.L. | 155.6 | 48.9 |

# Analysis of Non-Ionizing Radiation for a 1.2-Meter Earth Station System

This report analyzes the non-ionizing radiation levels for a 1.2-meter earth station system. The analysis and calculations performed in this report comply with the methods described in the FCC Office of Engineering and Technology Bulletin, No. 65 first published in 1985 and revised in 1997 in Edition 97-01. The radiation safety limits used in the analysis are in conformance with the FCC R&O 96-326. Bulletin No. 65 and the FCC R&O specifies that there are two separate tiers of exposure limits that are dependant on the situation in which the exposure takes place and/or the status of the individuals who are subject to the exposure. The Maximum Permissible Exposure (MPE) limits for persons in a General Population/Uncontrolled environment are shown in Table 1. The General Population/Uncontrolled MPE is a function of transmit frequency and is for an exposure period of thirty minutes or less. The MPE limits for persons in an Occupational/Controlled environment are shown in Table 2. The Occupational MPE is a function of transmit frequency and is for an exposure period of six minutes or less. The purpose of the analysis described in this report is to determine the power flux density levels of the earth station in the far-field, near-field, transition region, between the subreflector or feed and main reflector surface, at the main reflector surface, and between the antenna edge and the ground and to compare these levels to the specified MPEs.

Table 1. Limits for General Population/Uncontrolled Exposure (MPE)

| Frequency Range (MHz) | Power Density ($mW/cm^2$) |
|---|---|
| 30-300 | 0.2 |
| 300-1500 | Frequency (MHz)*(0.8/1200) |
| 1500-100,000 | 1.0 |

Table 2. Limits for Occupational/Controlled Exposure (MPE)

| Frequency Range (MHz) | Power Density ($mW/cm^2$) |
|---|---|
| 30-300 | 1.0 |
| 300-1500 | Frequency (MHz)*(4.0/1200) |
| 1500-100,000 | 5.0 |

Table 3. Formulas and Parameters Used for Determining Power Flux Densities

| Parameter | Symbol | Formula | Value | Units |
|---|---|---|---|---|
| Antenna Diameter | D | Input | 1.2 | m |
| Antenna Surface Area | $A_{surface}$ | $\pi D^2 / 4$ | 1.13 | $m^2$ |
| Feed Flange Diameter | $D_{fa}$ | Input | 9.0 | cm |
| Area of Feed Flange | $A_{fa}$ | $\pi D_{fa}{}^2/4$ | 63.62 | $cm^2$ |
| Frequency | F | Input | 14250 | MHz |
| Wavelength | $\lambda$ | 300 / F | 0.021053 | m |
| Transmit Power | P | Input | 2.50 | W |
| Antenna Gain (dBi) | $G_{es}$ | Input | 43.2 | dBi |
| Antenna Gain (factor) | G | $10^{Ges/10}$ | 20893.0 | n/a |
| Pi | $\pi$ | Constant | 3.1415927 | n/a |
| Antenna Efficiency | $\eta$ | $G\lambda^2/(\pi^2D^2)$ | 0.65 | n/a |

## 1. Far Field Distance Calculation

The distance to the beginning of the far field can be determined from the following equation:

Distance to the Far Field Region

$$R_{ff} = 0.60\ D^2 / \lambda = 41.0\ m \quad (1)$$

The maximum main beam power density in the far field can be determined from the following equation:

On-Axis Power Density in the Far Field

$$S_{ff} = G\ P / (4\ \pi\ R_{ff}^2) = 2.468\ W/m^2 = 0.247\ mW/cm^2 \quad (2)$$

## 2. Near Field Calculation

Power flux density is considered to be at a maximum value throughout the entire length of the defined Near Field region. The region is contained within a cylindrical volume having the same diameter as the antenna. Past the boundary of the Near Field region, the power density from the antenna decreases linearly with respect to increasing distance.

The distance to the end of the Near Field can be determined from the following equation:

Extent of the Near Field

$$R_{nf} = D^2 / (4\ \lambda) = 17.1\ m \quad (3)$$

The maximum power density in the Near Field can be determined from the following equation:

Near Field Power Density

$$S_{nf} = 16.0\ \eta\ P / (\pi\ D^2) = 5.761\ W/m^2 = 0.576\ mW/cm^2 \quad (4)$$

## 3. Transition Region Calculation

The Transition region is located between the Near and Far Field regions. The power density begins to decrease linearly with increasing distance in the Transition region. While the power density decreases inversely with distance in the Transition region, the power density decreases inversely with the square of the distance in the Far Field region. The maximum power density in the Transition region will not exceed that calculated for the Near Field region. The power density calculated in Section 1 is the highest power density the antenna can produce in any of the regions away from the antenna. The power density at a distance $R_t$ can be determined from the following equation:

Transition Region Power Density

$$S_t = S_{nf}\ R_{nf} / R_t = 0.576\ mW/cm^2 \quad (5)$$

## 4. Region between the Feed Assembly and the Antenna Reflector

Transmissions from the feed assembly are directed toward the antenna reflector surface, and are confined within a conical shape defined by the type of feed assembly. The most common feed assemblies are waveguide flanges, horns or subreflectors. The energy between the feed assembly and reflector surface can be calculated by determining the power density at the feed assembly surface. This can be determined from the following equation:

Power Density at the Feed Flange

$$S_{fa} = 4000\ P / A_{fa} = 157.190\ mW/cm^2 \quad (6)$$

## 5. Main Reflector Region

The power density in the main reflector is determined in the same manner as the power density at the feed assembly. The area is now the area of the reflector aperture and can be determined from the following equation:

Power Density at the Reflector Surface

$$S_{surface} = 4\ P / A_{surface} = 8.842\ W/m^2 = 0.884\ mW/cm^2 \quad (7)$$

## 6. Region between the Reflector and the Ground

Assuming uniform illumination of the reflector surface, the power density between the antenna and the ground can be determined from the following equation:

Power Density between Reflector and Ground

$$S_g = P / A_{surface} = 2.210\ W/m^2 = 0.221\ mW/cm^2 \quad (8)$$

## 7. Summary of Calculations

Table 4. Summary of Expected Radiation levels for Uncontrolled Environment

| Region | | Calculated Maximum Radiation Power Density Level ($mW/cm^2$) | Hazard Assessment |
|---|---|---|---|
| 1. Far Field ($R_{ff}$ = 41.0 m) | $S_{ff}$ | 0.247 | Satisfies FCC MPE |
| 2. Near Field ($R_{nf}$ = 17.1 m) | $S_{nf}$ | 0.576 | Satisfies FCC MPE |
| 3. Transition Region ($R_{nf} < R_t < R_{ff}$) | $S_t$ | 0.576 | Satisfies FCC MPE |
| 4. Between Feed Assembly and Antenna Reflector | $S_{fa}$ | 157.190 | Potential Hazard |
| 5. Main Reflector | $S_{surface}$ | 0.884 | Satisfies FCC MPE |
| 6. Between Reflector and Ground | $S_g$ | 0.221 | Satisfies FCC MPE |

Table 5. Summary of Expected Radiation levels for Controlled Environment

| Region | | Calculated Maximum Radiation Power Density Level ($mW/cm^2$) | Hazard Assessment |
|---|---|---|---|
| 1. Far Field ($R_{ff}$ = 41.0 m) | $S_{ff}$ | 0.247 | Satisfies FCC MPE |
| 2. Near Field ($R_{nf}$ = 17.1 m) | $S_{nf}$ | 0.576 | Satisfies FCC MPE |
| 3. Transition Region ($R_{nf} < R_t < R_{ff}$) | $S_t$ | 0.576 | Satisfies FCC MPE |
| 4. Between Feed Assembly and Antenna Reflector | $S_{fa}$ | 157.190 | Potential Hazard |
| 5. Main Reflector | $S_{surface}$ | 0.884 | Satisfies FCC MPE |
| 6. Between Reflector and Ground | $S_g$ | 0.221 | Satisfies FCC MPE |

It is the applicant's responsibility to ensure that the public and operational personnel are not exposed to harmful levels of radiation.

## 8. Conclusions

Based on the above analysis it is concluded that harmful levels of radiation will not exist in regions normally occupied by the public or the earth station's operating personnel. The transmitter will be turned off during antenna maintenance so that the FCC MPE of 5.0 mW/cm2 will be complied with for those regions with close proximity to the reflector that exceed acceptable levels.