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 5 Winegard WX1200 1.2 Meter Ku–band Antennas

1. Applicant

Name:	Marlink, Inc.	**Phone Number:**	713–910–3352
DBA Name:		**Fax Number:**	713–946–0403
Street:	3327 South Sam Houston Parkway East Suite 100	**E–Mail:**	Tom.Collins@marlink.com
City:	Houston	**State:**	TX
Country:	USA	**Zipcode:**	77047 –
Attention:	Tom Collins		

GRANTED
International Bureau

File # SES-STA-20190808-01018

Call Sign N/A Grant Date 8/9/2019
(or other identifier)

Term Dates
From 8/11/2019 To: 9/9/2019

Approved: Paul E Flood

File # SES - STA - 20190808 - 01018

GRANTED
International Bureau

Call Sign N/A Grant Date 8/9/2019
(or other identifier)

Term Dates
From 8/11/2019 To: 9/9/2019

Approved: Paul E Blaes

Applicant: Marlink, Inc-
File No.: SES-STA-20190808-01018
Call Sign: N/A
Special Temporary Authority

Marlink, Inc is granted special temporary authority for 30 days, beginning August, 11, 2019, to operate up to five 5 Winegard, Model WX 1200, 1.2 Meter Ku-band temporary fixed VSAT antennas terminals within the US&P with the Galaxy 23 satellite(S2592) at the 121 W.L. orbital locations and the Galaxy 19 satellite (S2592) in the 11.7-12.2 GHz (space-to Earth) and 14.0-14.5 GHz (Earth-to-space) frequency bands under the following conditions:

1. Operations will not exceed:

Frequency (MHz)	Polarization	Emission	Tx/Rx	Max EIRP /Carrier (dBW)	Max EIRP Density (dBW/4kHz)
11700-12000	H&V	565KG7W	R		
14000-14500	H&V	565KG7W	T	49.97	29.15

2. In the event of any harmful interference under this grant of special temporary authority, Marlink, Inc must cease operations immediately upon notification of such interference and must immediately inform the Commission in writing of such an event.

3. All operators of satellites must be provided with an emergency phone number where the licensee can be reached in the event that harmful interference occurs. Currently the 24x7 contact information for Intelsat satellite is Ph.: (703) -559-7701-East Coast Operations Center (primary) (310)525-5591-West Coast Operations Center (back-up). Request to speak with Harry Burnham or Kevin Bell. The Marlink Network Operating Center (MNOC) point of contact is available 24 hours a day, seven days a week is 203-346-0461.
4. Transmitters(s) must be turned off during antenna maintenance to ensure compliance with the FCC-specified safety guidelines for human exposure to radiofrequency radiation in the region between the antenna feed and the reflector. Appropriate measure must also be taken to restrict access to other regions in which the earth station's power flux density levels exceed the specified guidelines.
5. Any action taken, or expense incurred as a result of operations pursuant to this special temporary authority is solely at Marlink's risk.

6. Grant of this authorization is without prejudice to any determination that the Commission may make regarding pending or future Marlink applications.

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.

2. Contact

Name:	Marlink, Inc.	**Phone Number:**	281-809-9708
Company:		**Fax Number:**	713-946-0403
Street:	3327 South Sam Houston Parkway East Suite 100	E-Mail:	David.Atabala@marlink.com
City:	Houston	**State:**	TX
Country:	USA	**Zipcode:**	77047 -
Attention:		**Relationship:**	Engineer

(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 CGS - Fixed Satellite Small Transmit/Receive Earth Station

5. Type Request

◉ Use Prior to Grant ○ Change Station Location ○ Other

6. Requested Use Prior Date 08/11/2019	

7. City	8. Latitude (dd mm ss.s h) 0 0 0.0
9. State TX	10. Longitude (dd mm ss.s h) 0 0 0.0

11. Please supply any need attachments.

Attachment 1: STA Justification Attachment 2: RadHaz Report 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 to Operate 5 Winegard Model WX1200 1.2 Meter Temporary Fixed VSAT Antennas to Communicate With Intelsat 23 and Galaxy 19 Satellites

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 David Atabala	15. Title of Person Signing Technical Sales Support Engineer

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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Marlink, Inc.

Request for Special Temporary Authority to
Operate 5 Winegard Model WX 1200 1.2 Meter Temporary Fixed VSAT Antennas to
Communicate With Intelsat 23 and Galaxy 19 Satellites

Marlink, Inc. ("Marlink") respectfully requests a grant of Special Temporary Authority ("STA") effective August 11, 2019 to operate 5 Winegard Model WX 1200 ("WX 1200") 1.2 Meter Ku-band temporary fixed VSAT antennas to communicate with the U.S. licensed Intelsat 23 and Galaxy 19 satellites for a demonstration and testing project. The purpose of the project is to evaluate performance of Marlink's network in the monitoring of crude oil extraction points in desolate areas.

The antennas will be operated in CONUS in an area of West Texas bounded by 103.32W to the west, 100.32W to the east, 33.50N to the north and 30.12N to the south. The antennas will be operated by remote control via the Marlink Network Operations Center (MNOC) located in Eik, Norway which will control the remote antennas via uplink teleports located in the U.S. The MNOC operation of antennas located in the U.S. is in turn controlled by Marlink's U.S. FCC Point of Contact which has a business address of 3327 S. Sam Houston Parkway East, Suite 100, Houston, Texas, 77047 and is available 24 hours a day, seven days a week via 203-346-0461 which is the U.S. number for the MNOC.

The Technical Specifications published by Winegard for the WX 1200 antenna state that radiation pattern compliance is with FCC Part 25.209. No frequency coordination or coordination with another country is required for the operation of these antennas as they will only be transmitting within the U.S. on standard Ku-band frequencies. FAA notification is not required as the antennas will be located in areas with structures of equal or greater heights. A Radiation Hazard Report is included as an exhibit with the STA application.

As noted above, the Points of Communication for which authorization is requested are the U.S. licensed Intelsat 23 and Galaxy 19 satellites. The Transmit and Receive Gains for the WX 1200 antenna are 43 dBi @ 14.125 GHz and 41.5 dBi @ 11.950 GHz respectively. The STA is requested to operate the antennas utilizing a total input power to the antenna flange of 5.4 watts with a total EIRP for all carriers of 50.8 dBW. Authorization is requested to utilize the following Emission Designators -

Frequency (MHz)	**Polarization**	**Emission**	**Tx/Rx**	**Max EIRP /Carrier (dBW)**	**Max EIRP Density (dBW/4kHz)**
11700-12000	H&V	565KG7W	R		
14000-14500	H&V	565KG7W	T	49.97	29.15

Modulation & Services - DIGITAL TRAFFIC USING QPSK MODULATION

Grant of the STA is in the public interest because as noted above the antennas will be operated for the purpose of evaluating the performance of Marlink's network in the monitoring of crude oil extraction points in desolate areas. Crude oil extraction is an important element in meeting the nation's energy needs. It is therefore respectfully requested that STA as described above be granted for a period of 30 days, effective August 11, 2019.

Any questions with respect to this matter may be directed to David Atabala at 281-809-9708 or James G. Lovelace at 571-599-3643.

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
Subreflector Diameter	D_{sr}	Input	19.0	cm
Area of Subreflector	A_{sr}	$\pi D_{sr}^2/4$	283.53	cm^2
Frequency	F	Input	14125	MHz
Wavelength	λ	300 / F	0.021239	m
Transmit Power	P	Input	6.00	W
Antenna Gain (dBi)	G_{es}	Input	43.0	dBi
Antenna Gain (factor)	G	$10^{Ges/10}$	19952.6	n/a
Pi	π	Constant	3.1415927	n/a
Antenna Efficiency	η	$G\lambda^2/(\pi^2D^2)$	0.63	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

$$R_{ff} = 0.60\ D^2 / \lambda \quad (1)$$
$$= 40.7\ m$$

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

$$S_{ff} = G\ P / (4\ \pi\ R_{ff}^2) \quad (2)$$
$$= 5.757\ W/m^2$$
$$= 0.576\ mW/cm^2$$

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

$$R_{nf} = D^2 / (4\ \lambda) \quad (3)$$
$$= 17.0\ m$$

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

Near Field Power Density

$$S_{nf} = 16.0\ \eta\ P / (\pi\ D^2) \quad (4)$$
$$= 13.439\ W/m^2$$
$$= 1.344\ mW/cm^2$$

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

$$S_t = S_{nf}\ R_{nf} / R_t \quad (5)$$
$$= 1.344\ mW/cm^2$$

4. Region between the Main Reflector and the Subreflector

Transmissions from the feed assembly are directed toward the subreflector surface, and are reflected back toward the main reflector. The most common feed assemblies are waveguide flanges, horns or subreflectors. The energy between the subreflector and the reflector surfaces can be calculated by determining the power density at the subreflector surface. This can be determined from the following equation:

Power Density at the Subreflector

$$S_{sr} = 4000\ P / A_{sr} = 84.648\ mW/cm^2 \quad (6)$$

5. Main Reflector Region

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

Power Density at the Main Reflector Surface

$$S_{surface} = 4\ P / A_{surface} = 21.221\ W/m^2 = 2.122\ mW/cm^2 \quad (7)$$

6. Region between the Main 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

$$S_g = P / A_{surface} = 5.305\ W/m^2 = 0.531\ mW/cm^2 \quad (8)$$

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} = 40.7 m)	S_{ff}	0.576	Satisfies FCC MPE
2. Near Field (R_{nf} = 17.0 m)	S_{nf}	1.344	Potential Hazard
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	1.344	Potential Hazard
4. Between Main Reflector and Subreflector	S_{sr}	84.648	Potential Hazard
5. Main Reflector	$S_{surface}$	2.122	Potential Hazard
6. Between Main Reflector and Ground	S_g	0.531	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} = 40.7 m)	S_{ff}	0.576	Satisfies FCC MPE
2. Near Field (R_{nf} = 17.0 m)	S_{nf}	1.344	Satisfies FCC MPE
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	1.344	Satisfies FCC MPE
4. Between Main Reflector and Subreflector	S_{sr}	84.648	Potential Hazard
5. Main Reflector	$S_{surface}$	2.122	Satisfies FCC MPE
6. Between Main Reflector and Ground	S_g	0.531	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 the FCC MPE guidelines have been exceeded (or met) in the regions of Table 4 and 5. The applicant proposes to comply with the MPE limits by one or more of the following methods.

Radiation hazard signs will be posted while this earth station is in operation.

Due to the secure location of the proposed earth station antenna, the area of operation around the antenna will be limited to those that have knowledge of the potential for radiation exposure. The applicant will ensure that no buildings or other obstacles will be in the areas that exceed the MPE levels.

Radiation Hazard Report

Means of Compliance Controlled Areas

The earth station's operational staff will not have access to the areas that exceed the MPE levels while the earth station is in operation.

The transmitters will be turned off during antenna maintenance

The applicant agrees to abide by the conditions specified in Condition 5208 provided below:

> *Condition 5208 - The licensee shall take all necessary measures to ensure that the antenna does not create potential exposure of humans to radiofrequency radiation in excess of the FCC exposure limits defined in 47 CFR 1.1307(b) and 1.1310 wherever such exposures might occur. Measures must be taken to ensure compliance with limits for both occupational/controlled exposure and for general population/uncontrolled exposure, as defined in these rule sections. Compliance can be accomplished in most cases by appropriate restrictions such as fencing. Requirements for restrictions can be determined by predictions based on calculations, modeling or by field measurements. The FCC's OET Bulletin 65 (available on-line at www.fcc.gov/oet/rfsafety) provides information on predicting exposure levels and on methods for ensuring compliance, including the use of warning and alerting signs and protective equipment for worker.*

I HEREBY CERTIFY THAT I AM THE TECHNICALLY QUALIFIED PERSON RESPONSIBLE FOR THE PREPARATION OF THE RADIATION HAZARD REPORT, AND THAT IT IS COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: _

Gary K. Edwards
Senior Manager
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: July 31, 2019