



UNITED STATES OF AMERICA
FEDERAL COMMUNICATIONS COMMISSION
RADIO STATION AUTHORIZATION
Current Authorization : FCC WEB Reproduction
 Unofficial Copy

Name: SWARM TECHNOLOGIES, INC.

Call Sign: E191406
File Number: SES-LIC-20191206-01665

Authorization Type: License
 Non Common Carrier **Grant Date:** 08/12/2020 **Expiration Date:** 08/12/2035

Nature of Service: Mobile Satellite Service

Class of Station: Fixed Earth Stations

A) Site Location(s)

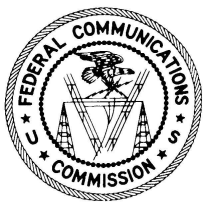
#	Site ID	Address	Latitude	Longitude	Elevation (Meters)	NAD	Special Provisions (Refer to Section H)
1)	1	312 RT 2A SHELL FUEL FARM RD Piti, Guam, GU, 96925	13° 24' 56.2" N	144° 41' 16.3" E	45.0	83	

Subject to the provisions of the Communications Act of 1934, The Communications Satellite Act of 1962, subsequent acts and treaties, and all present and future regulations made by this Commission, and further subject to the conditions and requirements set forth in this license, the grantee is authorized to construct, use and operate the radio facilities described below for radio communications for the term beginning Wednesday, August 12, 2020 (3 AM Eastern Standard Time) and ending Sunday, August 12, 2035 (3 AM Eastern Standard Time). The required date of completion of construction and commencement of operation is Thursday, August 12, 2021 (3 AM Eastern Standard Time). Grantee must file with the Commission a certification upon completion of construction and commencement of operation.

B) Particulars of Operations

The General Provision 1010 applies to all receiving frequency bands.
 The General Provision 1900 applies to all transmitting frequency bands.
 For the text of these provisions, refer to Section H.

#	Frequency	Polarization	Emission	Tx/Rx Mode	Max EIRP /Carrier	Max EIRP Density	Associated Antenna	Special Provisions (Refer to Section H)	Modulation/ Services
1)	148.2500 - 149.9500	V	7K80F1D	T	12.00	9.10	1	FSK / data (non-voice)	
2)	148.2500 - 148.5850	V	250KF1D	T	12.00	-6.00	1	FSK / data (non-voice)	
3)	137.8125 - 138.0000	V	125KF1D	R	0.00	0.00	1	FSK / data (non-voice)	
4)	137.0250 - 138.0000	V	7K80F1D	R	0.00	0.00	1	FSK / data (non-voice)	
5)	148.2500 - 149.9500	V	7K80F1D	T	15.50	12.60	2	FSK / data (non-voice)	
6)	148.2500 - 148.5850	V	250KF1D	T	15.50	-2.50	2	FSK / data (non-voice)	
7)	137.8125 - 138.0000	V	125KF1D	R	0.00	0.00	2	FSK / data (non-voice)	
8)	137.0250 - 138.0000	V	7K80F1D	R	0.00	0.00	2	FSK / data (non-voice)	
9)	148.2500 - 149.9500	L	7K80F1D	T	10.00	7.10	3	FSK / data (non-voice)	
10)	148.2500 - 148.5850	L	250KF1D	T	10.00	-8.00	3	FSK / data (non-voice)	
11)	137.8125 - 138.0000	L	125KF1D	R	0.00	0.00	3	FSK / data (non-voice)	
12)	137.0250 - 138.0000	L	7K80F1D	R	0.00	0.00	3	FSK / data (non-voice)	
13)	148.2500 - 149.9500	V	7K80F1D	T	21.00	18.10	4	FSK / data (non-voice)	
14)	148.2500 - 148.5850	V	250KF1D	T	12.00	-6.00	4	FSK / data (non-voice)	
15)	148.2500 - 148.5850	V	250KF1D	T	21.00	3.00	4	FSK / data (non-voice)	
16)	137.8125 - 138.0000	V	125KF1D	R	0.00	0.00	4	FSK / data (non-voice)	



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17) 137.0250 - 138.0000	V 7K80F1D R	0.00	0.00 4
18) 148.2500 - 149.9500	V 7K80F1D T	12.00	9.10 5
19) 137.8125 - 138.0000	V 125KF1D R	0.00	0.00 5
20) 137.0250 - 138.0000	V 7K80F1D R	0.00	0.00 5

C) Frequency Coordination

#	Frequency Limits(MHz)	Satellite Arc (Deg. Long.)		Elevation (Degrees)		Azimuth (Degrees)		Max EIRP Density toward Horizon (dBW/4kHz)	Associated Antenna(s)
		East Limit	West Limit	East Limit	West Limit	East Limit	West Limit		
1)	148.2500 - 149.9500	NGSO		5.0	5.0	0.0	0.0	-39.9	1
2)	137.0250 - 138.0000	NGSO		5.0	5.0	0.0	0.0	0.0	1
3)	148.2500 - 149.9500	NGSO		5.0	5.0	0.0	0.0	-44.9	2
4)	137.0250 - 138.0000	NGSO		5.0	5.0	0.0	0.0	0.0	2
5)	137.0250 - 138.0000	NGSO		5.0	5.0	0.0	0.0	0.0	3
6)	148.2500 - 149.9500	NGSO		5.0	5.0	0.0	0.0	-35.9	3
7)	148.2500 - 149.9500	NGSO		5.0	5.0	0.0	0.0	-47.9	4
8)	137.0250 - 138.0000	NGSO		5.0	5.0	0.0	0.0	0.0	4
9)	148.2500 - 149.9500	NGSO		5.0	5.0	0.0	0.0	-39.9	5
10)	137.0250 - 138.0000	NGSO		5.0	5.0	0.0	0.0	0.0	5

D) Point of Communications

The following stations located in the Satellite orbits consistent with Sections B and C of this Entry:

- 1) 1 to Swarm Constellation (S3041) satellites [300 to 500 km circular orbit @ 45°, 10° & 97° Incl, in 9 orbital planes]

E) Antenna Facilities

Site ID	Antenna ID	Units	Diameter (Meters)	Manufacturer	Model Number	Site Elevation	Max Antenna Height (Meters)	Special Provisions (Refer to Section H)
1	1	1	1.1	Swarm	001	45.0	7.1 AGL/ 52.1 AMSL	

Max Gains(s):2.0 dBi @ 0.1380 GHz 2.0 dBi @ 0.1483 GHz

Maximum total input power at antenna flange (Watts) = 10.0

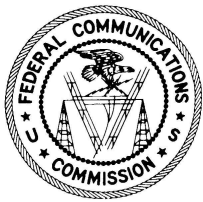
Maximum aggregate output EIRP for all carriers (dBW)12.0

1	2	1	3.0	Swarm	002	45.0	9.0 AGL/ 54.0 AMSL	
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Max Gains(s):5.5 dBi @ 0.1380 GHz 5.5 dBi @ 0.1483 GHz

Maximum total input power at antenna flange (Watts) = 10.0

Maximum aggregate output EIRP for all carriers (dBW)15.5



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1	3	1	1.6 Swarm 003 45.0 7.6 AGL/ 52.6 AMSL
Max Gains(s):0.0 dBi @ 0.1380 GHz 0.0 dBi @ 0.1483 GHz			
Maximum total input power at antenna flange (Watts) = 10.0			
Maximum aggregate output EIRP for all carriers (dBW)10.0			
1	4	1	1.7 Swarm 004 45.0 7.7 AGL/ 52.7 AMSL
Max Gains(s):11.0 dBi @ 0.1380 GHz 11.0 dBi @ 0.1483 GHz			
Maximum total input power at antenna flange (Watts) = 10.0			
Maximum aggregate output EIRP for all carriers (dBW)21.0			
1	5	1	0.55 Swarm 005 45.0 6.6 AGL/ 51.6 AMSL
Max Gains(s):2.0 dBi @ 0.1380 GHz 2.0 dBi @ 0.1483 GHz			
Maximum total input power at antenna flange (Watts) = 10.0			
Maximum aggregate output EIRP for all carriers (dBW)12.0			

F) Remote Control

1	435 N Whisman Road Ste. 100 Mountain View, Santa Clara, CA, 94043 608-225-3173	Call Sign:	E190610
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G) Antenna Structure marking and lighting requirements:

None unless otherwise specified under Special and General Provisions

H) Special and General Provisions

A) This RADIO STATION AUTHORIZATION is granted subject to the following special provisions and general conditions:

- 4 Licensee must ensure that a current listing of the name, title, mailing address, email address, and telephone number of the responsible point of contact are on file at the FCC. Any changes must be filed electronically in the International Bureau Filing System (MyIBFS) using the "Pleadings and Comments" link on the MyIBFS homepage within 10 days of the change.
- 6 Licensee must comply with the license modification and notification requirements of 47 CFR § 25.118 to change the coordinates of its authorized earth station.
- 8 Licensee must notify the Commission when all earth stations operating under this authorization are no longer operational or when they have not been used to provide any service during any 6-month operation.
- 90398 Changes to previously authorized transmitting facilities, operations and devices regulated by the Commission that may have significant environmental impact, and are not excluded by §1.1306, require the preparation of an Environmental Assessment (EA) by the licensee. (See 47 C.F.R. §§1.1307, 1.1308 and 1.1311)
- 90399 The licensee shall, at all times, take all necessary measures to ensure that operation of this (these) authorized earth station(s) 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. Physical 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 workers.



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H) Special and General Provisions

- 90551 Swarm Technologies' earth stations are subject to the requirements of Footnote US323 of the U.S. Table of Frequency Allocations, 47 CFR § 2.106, Footnote US323.
- 900438 Waiver of the Frequency Allocations Table Footnote 5.218 is granted. Operations of emissions up to 250 KHz for any individual transmission in the frequency band 148.0-149.9 MHz is approved under the condition that the effective isotropic radiated power ("EIRP") density would be equal to or less than the EIRP density for emissions emission operating up to 25 KHz in bandwidth.



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H) Special and General Provisions

B) This RADIO STATION AUTHORIZATION is granted subject to the additional conditions specified below:

This authorization is issued on the grantee's representation that the statements contained in the application are true and that the undertakings described will be carried out in good faith.

This authorization shall not be construed in any manner as a finding by the Commission on the question of marking or lighting of the antenna system should future conditions require. The grantee expressly agrees to install such marking or lighting as the Commission may require under the provisions of Section 303(q) of the Communications Act. 47 U.S.C. § 303(q).

Neither this authorization nor the right granted by this authorization shall be assigned or otherwise transferred to any person, firm, company or corporation without the written consent of the Commission. This authorization is subject to the right of use or control by the government of the United States conferred by Section 706 of the Communications Act. 47 U.S.C. § 706. Operation of this station is governed by Part 25 of the Commission's Rules. 47 C.F.R. Part 25.

This authorization shall not vest in the licensee any right to operate this station nor any right in the use of the designated frequencies beyond the term of this license, nor in any other manner than authorized herein.

This authorization is issued on the grantee's representation that the station is in compliance with environmental requirements set forth in Section 1.1307 of the Commission's Rules. 47 C.F.R. § 1.1307.

This authorization is issued on the grantee's representation that the station is in compliance with the Federal Aviation Administration (FAA) requirements as set forth in Section 17.4 of the Commission's Rules. 47 C.F.R. § 17.4.

The following condition applies when this authorization permits construction of or modifies the construction permit of a radio station.

This authorization shall be automatically forfeited if the station does not meet each required construction deadline by the required date of completion unless, before such date(s), a specific application is timely filed to request an extension of the construction deadline(s), supported with good cause why that failure to construct by the required date was due to factors not under control of the grantee.

Licensees are required to pay annual regulatory fees related to this authorization. The requirement to collect annual regulatory fees from regulates is contained in Public Law 103-66, "The Omnibus Budget Reconciliation Act of 1993". These regulatory fees, which are likely to change each fiscal year, are used to offset costs associated with the Commission's enforcement, public service, international and policy and rulemaking activities. The Commission issues a Report and Order each year, setting the new regulatory fee rates. Receive only earth stations are exempt from payment of regulatory fees.