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Callsign/Satellite ID:

# APPLICATION FOR EARTH STATION AUTHORIZATIONS FCC 312 MAIN FORM FOR OFFICIAL USE ONLY FCC Use Only

## APPLICANT INFORMATION

Enter a description of this application to identify it on the main menu: Swarm Puerto Rico Gateway Earth Station Application

1_8	Legal Na	ame of	Anı	nlicant
11-0.	Legai IN	mic or	AVI	uncam

Name: Swarm Technologies, Inc. **Phone Number:** 608–225–3173

**DBA Fax Number:** 608–225–3173

Name:

Street: 845 Madonna Way E–Mail: sara@swarm–technologies.com

City: Los Altos State: CA

Country: USA Zipcode: 94024 -

**Attention:** Dr Sara Spangelo

9–16. Name of Contact Representative

Name: Kyle Wesson Phone Number: 650–396–9184

Company: Swarm Technologies, Inc. Fax Number:

Street: 435 N Whisman Rd E–Mail: kyle@swarm.space

Ste 100

City: Mountain View State: CA

Country: USA Zipcode: 94043-

**Attention:** Kyle Wesson **Relationship:** Same

# **CLASSIFICATION OF FILING**

17. Choose the button next to the	b.
classification that applies to this filing for	b1. Application for License of New Station
both questions a. and b. Choose only one	b2. Application for Registration of New Domestic Receive–Only Station
for 17a and only one for 17b.	
	(N/A) b3. Amendment to a Pending Application (N/A) b4. Modification of License or Registration
a.	(N/A) b5. Assignment of License or Registration
a1. Earth Station	(N/A) b6. Transfer of Control of License or Registration
(N/A) a2. Space Station	(N/A) b7. Notification of Minor Modification
	(N/A) b8. Application for License of New Receive-Only Station Using Non-U.S. Licensed
	Satellite
	(N/A) b9. Letter of Intent to Use Non–U.S. Licensed Satellite to Provide Service in the United
	States  h 10. Other (Please specify)
	o b10. Other (Please specify)
	▶ b11. Application for Earth Station to Access a Non–U.S.satellite Not Currently Authorized to
	Provide the Proposed Service in the Proposed Frequencies in the United States.
	(N/A) b13. Amendment to a Pending Database Entry Application
	(N/A) b14. Modifiction of Database Entry
17c. Is a fee submitted with this applicati	on?
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 Noncomme	ercial educational licensee
Other(please explain):	
17d.	
Fee Classification BAX – Fixed Satellite T	ransmit/Receive Earth
Station	

<ul><li>18. If this filing is in reference to an existing station, enter:</li><li>(a) Call sign of station:</li><li>Not Applicable</li></ul>	19. If this filing is an amen (a) Date pending application. Not Applicable	1	application enter:  (b) File number of pending application  Not Applicable	ation:
TYPE OF SERVICE				
20. NATURE OF SERVICE: This filing is	for an authorization to provid	le or use the followir	ng type(s) of service(s): Select all that	apply:
□ a. Fixed Satellite □ b. Mobile Satellite □ c. Radiodetermination Satellite □ d. Earth Exploration Satellite □ e. Direct to Home Fixed Satellite □ f. Digital Audio Radio Service □ g. Other (please specify)				
21. STATUS: Choose the button next to the only one.	e applicable status. Choose		applicant, check all that apply. ensed satellites	
Common Carrier Non-Comm	non Carrier	I	S. licensed satellites	

23. If applicant is providing INTERNATIONAL COMMON CARRIER service, see instructions regarding Sec. 214 filings. Choose one. Are these

O Connected to a Public Switched Network Not connected to a Public Switched Network N/A

facilities:

24. FREQUENCY BAND(S): Place an "X" in the box(es) next to all applicable frequency band(s).				
a. C–Band (4/6 GHz) b. Ku–Band (12/14 GHz)				
c.Other (Please specify upper and lower frequencies in MHz.)				
Frequency Lower: 137.00 Frequency Upper: 149.95				
TYPE OF STATION				
25. CLASS OF STATION: Choose the button next to the class of station that applies. Choose only one.				
a. Fixed Earth Station				
b. Temporary–Fixed Earth Station				
c. 12/14 GHz VSAT Network				
d. Mobile Earth Station				
(N/A) e. Geostationary Space Station				
(N/A) f. Non–Geostationary Space Station				
og. Other (please specify)				
26. TYPE OF EARTH STATION FACILITY: Choose only one.				
Transmit/Receive Transmit-Only Receive-Only N/A				
PURPOSE OF MODIFICATION				
27. The purpose of this proposed modification is to: (Place an 'X' in the box(es) next to all that apply.)				
Not Applicable				

### **ENVIRONMENTAL POLICY**

28. Would a Commission grant of any proposal in this application or amendment

environmental impact as defined by 47 CFR 1.1307? If YES, submit the

1.1308 and 1.1311 of the Commission's rules, 47 C.F.R. §§ 1.1308 and 1.1311, as an exhibit to this application. A Radiation Hazard Study must accompany all applications for new transmitting facilities, major modifications, or major amendments.	Radiation Report
ALIEN OWNERSHIP Earth station applicants not proposing to provide broadcast, common carrier, aerona aeronautical fixed radio station services are not required to respond to Items 30–34.	nutical en route or
29. Is the applicant a foreign government or the representative of any foreign government?	O Yes O No
30. Is the applicant an alien or the representative of an alien?	O Yes O No ⊗ N/A
31. Is the applicant a corporation organized under the laws of any foreign government?	O Yes O No ● N/A
32. Is the applicant a corporation of which more than one–fifth of the capital stock is owned of record or voted by aliens or their representatives or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country?	O Yes O No ● N/A

have a significant

statement as required by Sections

O Yes

No

33. Is the applicant a corporation directly or indirectly controlled by any other corporation of which more than one–fourth of the capital stock is owned of record or voted by aliens, their representatives, or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country?	O Yes O No ⊗ N/A
34. If any answer to questions 29, 30, 31, 32 and/or 33 is Yes, attach as an exhibit an identification of the aliens or foreign entities, their nationality, their relationship to the applicant, and the percentage of stock they own or vote.	
BASIC QUALIFICATIONS	
35. Does the Applicant request any waivers or exemptions from any of the Commission's Rules? If Yes, attach as an exhibit, copies of the requests for waivers or exceptions with supporting documents.	O Yes O No
36. Has the applicant or any party to this application or amendment had any FCC station authorization or license revoked or had any application for an initial, modification or renewal of FCC station authorization, license, or construction permit denied by the Commission? If Yes, attach as an exhibit, an explination of circumstances.	Yes No
	Response to Q 36

37. Has the applicant, or any party to this application or amendment, or any party directly or indirectly controlling the applicant ever been convicted of a felony by any state or federal court? If Yes, attach as an exhibit, an explination of circumstances.	O Yes	<b>⊚</b> No
38. Has any court finally adjudged the applicant, or any person directly or indirectly controlling the applicant, guilty of unlawfully monopolizing or attempting unlawfully to monopolize radio communication, directly or indirectly, through control of manufacture or sale of radio apparatus, exclusive traffic arrangement or any other means or unfair methods of competition? If Yes, attach as an exhibit, an explanation of circumstances	O Yes	<b>⊚</b> No
39. Is the applicant, or any person directly or indirectly controlling the applicant, currently a party in any pending matter referred to in the preceding two items? If yes, attach as an exhinit, an explanation of the circumstances.	O Yes	<b>⊘</b> No
40. If the applicant is a corporation and is applying for a space station license, attach as an exhibit the names, address, and citizenship of those stockholders owning a record and/or voting 10 percent or more of the Filer's voting stock and the percentages so held. In the case of fiduciary control, indicate the beneficiary(ies) or class of beneficiaries. Also list the names and addresses of the officers and directors of the Filer.		

41. 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	O No
42a. Does the applicant intend to use a non–U.S. licensed satellite to provide service in the United States? If Yes, answer 42b and attach an exhibit providing the information specified in 47 C.F.R. 25.137, as appropriate. If No, proceed to question 43.	• Yes	No
42b. What administration has licensed or is in the process of licensing the space station? If no license will be issued, vectorial coordinated or is in the process of coordinating the space station?	what administr	ration has
43. Description. (Summarize the nature of the application and the services to be provided). (If the not appear in this box, please go to the end of the form to view it in its entirety.)	complete desc	ription does
Swarm seeks authority for a new gateway earth station located in Puerto Riccommunicate with its non-geostationary, non-voice mobile-satellite service		
Narrative		

43a. Geographic Service Rule Certification By selecting A, the undersigned certifies that the applicant is not subject to the geographic service or geographic coverage requirements specified in 47 C.F.R. Part 25.	<b>●</b> A
By selecting B, the undersigned certifies that the applicant is subject to the geographic service or geographic coverage requirements specified in 47 C.F.R. Part 25 and will comply with such requirements.	O B
By selecting C, the undersigned certifies that the applicant is subject to the geographic service or geographic coverage requirements specified in 47 C.F.R. Part 25 and will not comply with such requirements because it is not feasible as a technical matter to do so, or that, while technically feasible, such services would require so many compromises in satellite design and operation as to make it economically unreasonable. A narrative description and technical analysis demonstrating this claim are attached.	<b>o</b> c

#### **CERTIFICATION**

The Applicant waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests an authorization in accordance with this application. The applicant certifies that grant of this application would not cause the applicant to be in violation of the spectrum aggregation limit in 47 CFR Part 20. All statements made in exhibits are a material part hereof and are incorporated herein as if set out in full in this application. The undersigned, individually and for the applicant, hereby certifies that all statements made in this application and in all attached exhibits are true, complete and correct to the best of his or her knowledge and belief, and are made in good faith.

O Individual						
<ul> <li>Unincorporated Association</li> </ul>						
Partnership						
Corporation	¥					
Governmental Entity						
Other (please specify)						
45. Name of Person Signing Dr. Sara Spangelo		46. Title of Po	erson Signing			
47. Please supply any need attachr	 ments.					
Attachment 1:	Attachment 2:		Attachment 3:			

## SATELLITE EARTH STATION AUTHORIZATIONS FCC Form 312 – Schedule B:(Technical and Operational Description) FOR OFFICIAL USE ONLY

Location of Earth Station Site

E1: Site Identifier: Puerto Rico E5. Call Sign:

Gateway

E2: Contact Name Benjamin E6. Phone 608–225–3173

Longmier Number:

E3. Street: PR-303, Las E7. City: Cabo Rojo

Palmas

E8. County: Puerto Rico

E4. State PR E9. Zip Code 00623

E10. Area of Operation: Cabo Rojo, Puerto Rico

E11. Latitude: 17 °58 '38.64 "N

E12. Longitude: 67 °8 '11.4 "W

E13. Lat/Lon Coordinates are: NAD-27 NAD-83 NAD-83

E14. Site Elevation (AMSL): 58.0 meters

E15. If the proposed antenna(s) operate in the Fixed Satellite Service (FSS) with geostationary satellites, do(es) the proposed antenna(s) comply with the antenna gain patterns specified in Section 25.209(a) and (b) as demonstrated by the manufacturer's qualification measurement? If NO, provide as a technical analysis showing compliance with two–degree spacing policy.	O Yes	O No	● N/A
E16. If the proposed antenna(s) do not operate in the Fixed Satellite Service (FSS), or if they operate in the Fixed Satellite Service (FSS) with non–geostationary satellites, do(es) the proposed antenna(s) comply with the antenna gain patterns specified in Section 25.209(a2) and (b) as demonstrated by the manufacturer's qualification measurements?	<b>O</b> Yes	O No	<b>⊚</b> N/A
E17. Is the facility operated by remote control? If YES, provide the location and telephone number of the control point.	● Yes	٥	No
E18. Is frequency coordination required? If YES, attach a frequency coordination report as	O Yes	•	No
E19. Is coordination with another country required? If YES, attach the name of the country(ies) and plot of coordination contours as	O Yes	•	No
E20. FAA Notification – (See 47 CFR Part 17 and 47 CFR part 25.113(c)) Where FAA notification is required, have you attached a copy of a completed FCC Form 854 and or the FAA's study regarding the potential hazard of the structure to aviation?  FAILURE TO COMPLY WITH 47 CFR PARTS 17 AND 25 WILL RESULT IN THE RETURN OF THIS APPLICATION.	O Yes	•	No
POINTS OF COMMUNICATION	1		
Satellite Name:OTHER   OTHER   If you selected OTHER, please enter the following:			

E21. Common Name: Swarm 1	E22. ITU Name: USASAT–NGSO–7
E23. Orbit Location: NGSO	E24. Country: USA

# POINTS OF COMMUNICATION (Destination Points)

E25. Site Identifier: Puerto Rico Gateway	
E26. Common Name:	E27. Country: USA

# ANTENNA

Site ID	E28. Antenna Id	E29. Quantity	E30. Manufacturer	E31. Model	E32. Antenna Size <meters></meters>	E41/42. Antenna GainTransmint and/or Recieve (dBi atGHz)
Puerto Rico Gateway	W1/2	1	Swarm	001	1.1	2.0 dBi at 0.138
						2.0 dBi at 0.148
	COLINEAR			002	3.0	5.5 dBi at 0.138
						5.5 dBi at 0.148
	QFH			003	1.6	0.0 dBi at 0.138
						0.0 dBi at 0.148
	YAGI			004	1.7	11.0 dBi at 0.138
						11.0 dBi at 0.148
	W1/4			005	0.55	2.0 dBi at 0.138
						2.0 dBi at 0.148

E28. Antenna Id	E33/34. Diameter Minor/Major (meters)	E35. Above Ground Level  (meters)	E36. Above Sea Level  (meters)	E37. Building Height Above Ground Level  (meters)	E38. Total Input Power at antenna flange (Watts)	E39. Maximum Antenna Height Above Rooftop (meters)	E40. Total EIRP for al carriers  (dBW)
W1/2	0.0/0.0	11.1	69.1	10.0	10.0	1.1	12.0
COLINEAR	0.0/0.0	13.0	71.0	10.0	10.0	3.0	15.5
QFH	0.0/0.0	11.6	69.6	10.0	10.0	1.6	10.0
YAGI	0.0/0.0	11.7	69.7	10.0	10.0	1.7	21.0
W1/4	0.0/0.0	6.6	64.6	10.0	10.0	0.6	12.0

# FREQUENCY

	E43/44. Frequency Bands (MHz)	E45. T/R Mode			E48. Maximum EIRP per Carrier (dBW)	E49. Maximum ERIP Density per Carrier (dBW/4kHz)
W1/2	137 138	R	Vertical	125KF1D	0.0	0.0

E50. Modulation and Services (If the complete description does not appear in this box, please go to the end of the form to view it in its entirety.)

FSK / data (non-voice)

W1/2	137	138	R	Vertical	7K80F1D	0.0	0.0

E50. Modulation entirety.)	and Services	(If th	e complete description	on does not appear in	this box, please go to	o the end of the form	to view it in its
FSK / data	(non-voi	ce)					
W1/2	148	149.95	Т	Vertical	250KF1D	12.0	-6.0
E50. Modulation entirety.)  FSK / data			e complete description	on does not appear in	this box, please go to	o the end of the form	to view it in its
W1/2	148	149.95	Т	Vertical	7K80F1D	12.0	9.1
E50. Modulation entirety.)  FSK / data			e complete description	on does not appear in	this box, please go to	o the end of the form	to view it in its
COLINEAR	137	138	R	Vertical	125KF1D	0.0	0.0

E50. Modulation	and Services (If t	he complete description	on does not appear in	this box, please go to	o the end of the form	to view it in its
entirety.)  FSK / data	(non-voice)					
COLINEAR	137 138	R	Vertical	7K80F1D	0.0	0.0
entirety.)  FSK / data	(non-voice)					
COLINEAR	148 149.95	Т	Vertical	250KF1D	15.5	-2.5
	(non-voice)	he complete description				
COLINEAR	148 149.95	Т	Vertical	7K80F1D	15.5	12.6

E50. Modulation entirety.)	and Services	s (If th	ne complete description	on does not appear in	this box, please go to	o the end of the form	to view it in its
FSK / data	(non-vo	ice)					
QFH	137	138	R	Left Hand Circular	125KF1D	0.0	0.0
entirety.)  FSK / data	(non-vo	ice)					
QFH	137	138	R	Left Hand Circular	7K80F1D	0.0	0.0
E50. Modulation entirety.)  FSK / data			ne complete description	on does not appear in	this box, please go to	o the end of the form	to view it in its
QFH	148	149.95	Т	Left Hand Circular	250KF1D	10.0	-8.0

E50. Modulation entirety.)	and Services	(If th	e complete description	on does not appear in	this box, please go to	o the end of the form	to view it in its
FSK / data	(non-voi	ce)					
QFH	148	149.95	Т	Left Hand Circular	7K80F1D	10.0	7.1
E50. Modulation entirety.)  FSK / data			e complete description	on does not appear in	this box, please go to	o the end of the form	to view it in its
YAGI	137	138	R	Vertical	125KF1D	0.0	0.0
E50. Modulation entirety.)  FSK / data			ne complete description	on does not appear in	this box, please go to	o the end of the form	to view it in its
YAGI	137	138	R	Vertical	7K80F1D	0.0	0.0

E50. Modulation entirety.)	and Service	s (If th	ne complete description	on does not appear in	this box, please go to	o the end of the form	to view it in its
FSK / data	(non-vo	ice)					
YAGI	148	149.95	Т	Vertical	250KF1D	21.0	3.0
entirety.)  FSK / data	(non-vo	ice)					
YAGI	148	149.95	Т	Vertical	7K80F1D	21.0	18.1
E50. Modulation entirety.)  FSK / data			ne complete description	on does not appear in	this box, please go to	o the end of the form	to view it in its
W1/4	137	138	R	Vertical	125KF1D	0.0	0.0

E50. Modulation entirety.)	and Services	s (If th	ne complete description	on does not appear in	this box, please go to	o the end of the form	to view it in its
FSK / data	(non-vo	ice)					
W1/4	137	138	R	Vertical	7K80F1D	0.0	0.0
E50. Modulation entirety.)  FSK / data						o the end of the form	
W1/4	148	149.95	Т	Vertical	250KF1D	12.0	-6.0
E50. Modulation entirety.)  FSK / data			ne complete description	on does not appear in	this box, please go to	o the end of the form	to view it in its
W1/4	148	149.95	Т	Vertical	7K80F1D	12.0	9.1

E50. Modulation and Services (If the complete description does not appear in this box, please go to the end of the form to view it in its entirety.)

FSK / data (non-voice)

# FREQUENCY COORDINATION

E28. Antenna Id	E51. Satellite Orbit Type	E52/53. Frequency Limits(MHz)	E54/55. Range of Satellite Arc E/W Limit	E56. Earth Station Azimuth Angle Eastern Limit	E57. Antenna Elevation Angle Eastern Limit	E58. Earth Station Azimuth Angle Western Limit	E59. Antenna Elevation Angle Western Limit	E60. Maximum EIRP Density toward the Horizon (dBW/4kHz)
W1/2	Non– Geostationary	137 138	0.0/ 0.0	0.0	5.0	0.0	5.0	0.0
	Non– Geostationary	148 149.95	0.0/ 0.0	0.0	5.0	0.0	5.0	-39.9
COLINEAR	Non– Geostationary	137 138	0.0/ 0.0	0.0	5.0	0.0	5.0	0.0
	Non– Geostationary	148 149.95	0.0/ 0.0	0.0	5.0	0.0	5.0	-44.9
QFH	Non– Geostationary	137 138	0.0/ 0.0	0.0	5.0	0.0	5.0	0.0

	Non– Geostationary	148 149.95	0.0/ 0.0	0.0	5.0	0.0	5.0	-35.9
YAGI	Non– Geostationary	137 138	0.0/ 0.0	0.0	5.0	0.0	5.0	0.0
	Non– Geostationary	148 149.95	0.0/ 0.0	0.0	5.0	0.0	5.0	-47.9
W1/4	Non- Geostationary	137 138	0.0/ 0.0	0.0	5.0	0.0	5.0	0.0
	Non– Geostationary	148 149.95	0.0/ 0.0	0.0	5.0	0.0	5.0	-39.9

# REMOTE CONTROL POINT LOCATION

E61. Call Sign E190610 NOTE: Please enter the callsign of the contro callsign for which this application is being filed.		E65. Phone Number 608–225–3173				
E62. Street Address 435 N Whisman Road Ste. 100						
E63. City Mountain View	E67. County Santa Clara		E64/68. State/Country CA/ USA	E66. Zip Code 94043		

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