

**\*\* GRANT-IN-PART/DEFER-IN-PART \*\***



File # SAT-MOD-20200603-00065

Call Sign S2946 Grant Date 10/30/2020  
(or other identifier)

Approved by OMB  
3060-0678

Term Dates  
From 10/30/2020 To: see conditions

Approved: Merissa L. Velez  
Merissa L. Velez  
Chief, Satellite Policy Branch

Date & Time Filed: Jun 3 2020 1:26:48:946PM  
File Number: SAT-MOD-20200603-00065

**\*with conditions\***

FCC APPLICATION FOR SPACE AND EARTH STATION:MOD OR AMD – MAIN FORM	FCC Use Only
FCC 312 MAIN FORM FOR OFFICIAL USE ONLY	

**APPLICANT INFORMATION**

Enter a description of this application to identify it on the main menu:  
Modification 5/26/2020


**1-8. Legal Name of Applicant**

<b>Name:</b>	Spire Global, Inc.	<b>Phone Number:</b>	202-734-6883
<b>DBA Name:</b>		<b>Fax Number:</b>	
<b>Street:</b>	251 Rhode Island Street Suite 150	<b>E-Mail:</b>	michelle.mcclure@spire.com
<b>City:</b>	San Francisco	<b>State:</b>	CA
<b>Country:</b>	USA	<b>Zipcode:</b>	94103 -
<b>Attention:</b>			

# ATTACHMENT TO GRANT

Spire Global, Inc.

IBFS File No. SAT-LOA-20151123-00078 & SAT-MOD-20200603-00065

<b>IBFS File No(s):</b>	SAT-LOA-20151123-00078 SAT-MOD-20200603-00065 <sup>1</sup>	<b>GRANT IN PART / DEFER IN PART – With Conditions</b>    <b>International Bureau Satellite Division</b>
<b>Licensee/Grantee:</b>	Spire Global, Inc.	
<b>Call Sign:</b>	S2946	
<b>Satellite Name:</b>	LEMUR constellation	
<b>Orbital Location: (required station- keeping tolerance)</b>	NGSO at altitudes up to 650 km ( <i>see</i> scope of grant below)	
<b>Administration:</b>	United States of America	
<b>Nature of Service:</b>	Earth Exploration Satellite Service (EESS)	
<b>Scope of Grant:</b>	Modification of license to: (1) extend the deadline for cessation of operations in the 402-403 MHz frequency band, <i>see</i> conditions 15 and 17; (2) authorize deployment of 18 additional satellites <sup>2</sup> deployed to circular orbits at an altitude of no greater than 550 km, prior to completion of the Commission’s review of the supplemented orbital debris mitigation plan, <i>see</i> condition 4, <sup>3</sup> including authority to operate only with earth stations in the United States in the 2020-2025 MHz (space-to-Earth) frequency band.	
<b>Previous Grant(s)</b>	Authority to construct, deploy and operate 28 technically identical satellites for what the applicant describes as “Phase IA” deployment, initially deployed to orbital altitudes of no greater than 650 km. <sup>4</sup>  Authority to construct, deploy, and operate up to 4 technically identical Phase IB satellites, initially deployed to circular orbits of no greater than 500 km in altitude. <sup>5</sup>  Authority to construct, deploy, and operate up to 24 technically identical Phase IB satellites, initially deployed to circular orbits of no greater than 600 km in altitude. <sup>6</sup>	

<sup>1</sup> *See Policy Branch Information, Applications Accepted for Filing*, Public Notice, Report No. SAT-01491 (IBFS File No. SAT-MOD-20200603-00065) (Aug. 21, 2020). This action does not address certain additional requests, which are either inapplicable to the 18 satellites addressed by this grant, or are deferred for later consideration. *See* Letter from Michelle A. McClure, Regulatory and Legislative Affairs Counsel, Spire, Inc. to Marlene H. Dortch, Secretary, FCC (October 8, 2020) (requesting expedited consideration of portions of the pending modification application); Letter from Michelle A. McClure, Regulatory and Legislative Affairs Counsel, Spire Global, Inc., to Marlene H. Dortch, Secretary, FCC (October 15, 2020) (clarifying that the satellites covered by the request for expedited consideration will not include an inter-satellite link capability).

<sup>2</sup> If any of these 18 satellites are not U.S.-licensed LEMUR satellites covered by this license, Spire must notify the Commission in writing in advance of launch, consistent with the terms of condition 6. *See also* Letter from Michelle A. McClure, Regulatory and Legislative Affairs Counsel, Spire Global, Inc. to Marlene H. Dortch, Secretary, FCC (filed Oct. 30, 2020) (specifying anticipated launch vehicles for launch of these 18 satellites during 2020 and 2021, and noting that all satellites are currently intended to be LEMUR satellites launched under Spire's U.S. license).

<sup>3</sup> We also make minor editorial revisions to other conditions.

<sup>4</sup> IBFS File No. SAT-LOA-20151123-00078 (granted in part Mar. 18, 2016); IBFS File No. SAT-LOA-20151123-00078 (granted in part June 16, 2016); IBFS File No. SAT-LOA-20151123-00078 (granted in part Oct. 14, 2016). Spire has deployed all 28 of its Phase IA satellites.

<sup>5</sup> IBFS File No. SAT-AMD-20161114-00107 (granted in part Apr. 7, 2017).

<sup>6</sup> IBFS File No. SAT-AMD-20161114-00107 (granted in part May 18, 2017).

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	<p>Authority to construct, deploy, and operate up to 72 Phase IC satellites, initially deployed to circular orbits of no greater than 600 km in altitude.<sup>7</sup></p> <p>Authority to construct, deploy, and operate up to 872 LEMUR Phase II satellites, initially deployed to altitudes from 385 to 650 km with inclinations ranging from equatorial to polar sun-synchronous (98 degrees).<sup>8</sup></p> <p>Modification of license to authorize one of the LEMUR satellites to operate with an additional radio in the 8025-8325 MHz (space-to-Earth) and 9200-10550 MHz (Earth-to-space) frequency bands, on an un-allocated basis, deployed at an altitude of approximately 500 km, inclination of 98 degrees.<sup>9</sup></p>
<b>Service Area(s):</b>	Global. See Schedule S Tech Report at Item S6
<b>Frequencies:</b>	<p>8025-8400 MHz (space-to-Earth) (main data downlink)</p> <p>2020-2025 MHz (space-to-Earth) (data downlink) (U.S. earth stations only)</p> <p>2025-2110 MHz (Earth-to-space) (main data uplink)</p> <p>2200-2290 MHz (space-to-Earth) (data downlink) (Phase IB and 1C and Phase II only)</p> <p>402-403 MHz (Earth-to-space) (space-to-Earth (data back up only))</p> <p>9200-10550 MHz (Earth-to-space) (1 satellite)</p> <p><u>Telemetry, Tracking, and Command:</u></p> <p>401-402 MHz (space-to-Earth)</p> <p>402-403 MHz (Earth-to-space and space-to-Earth)</p> <p>449.75-450.25 MHz (Earth-to-space) (Phase IC and Phase II only)</p> <p>2025-2110 MHz (Earth-to-space)</p> <p><u>Receive Frequencies:</u></p> <p>156.7625-156.7875 MHz (Automatic Identification System (AIS) (AIS 3)) (Phase IB and IC and Phase II only)</p> <p>156.8125-156.8375 MHz (AIS 4) (Phase IB and IC and Phase II only)</p> <p>161.9625-161.9875 MHz (AIS 1)</p> <p>162.0125-162.0375 MHz (AIS 2)</p> <p>161.9375-161.9625 MHz (Application Specific Messages (ASM) (ASM 1)) (Phase IB and IC and Phase II only)</p> <p>161.9875-162.0125 MHz (ASM 2) (Phase IB and IC and Phase II only)</p> <p>1087.7-1092.3 MHz ((Earth-to-space) Automatic Dependent Surveillance-Broadcast (ADS-B)) (Phase IC and Phase II only)</p>

<sup>7</sup> See *Policy Branch Information, Satellite Space Applications Actions Taken*, Public Notice, DA 17-673, Report No. SAT-01253 (IBFS File Nos. SAT-AMD-20161114-00107).

<sup>8</sup> See *Policy Branch Information, Satellite Space Applications Actions Taken*, Public Notice, DA 18-1235, Report No. SAT-01363 (IBFS File No. SAT-AMD-20180102-00001). We deferred action on the remainder of Spire's application, as amended, to add Phase II satellites and to operate in additional frequency bands. Specifically, we deferred action on Spire's request to construct, deploy, and operate satellites in the 399.9-400.05 MHz (Earth-to-space) frequency band. In addition, although Spire noted its plans to include additional transmitters, sensors and other equipment on its satellites for educational, government, and commercial customers, Amendment at 9-10, at the time, Spire did not seek authorization for or provide supporting factual details concerning such satellites and no authority was granted.

<sup>9</sup> See *Policy Branch Information, Satellite Space Applications Actions Taken*, Public Notice, DA 20-1028, Report No. SAT-01496 (IBFS File No. SAT-MOD-20200603-00065). The grant-in-part that included this modification was originally issued on August 31, 2020, and was reissued with the modified orbital parameters specified here based on a change in planned deployment reported by the applicant on September 3, 2020. See Letter from Michelle A. McClure, Regulatory and Legislative Affairs Counsel, Spire, Inc., to Marlene H. Dortch, Secretary, FCC (September 3, 2020).

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	1575.42 MHz and 1227.60 MHz (center frequencies, GPS reception) 1559-1591 MHz (Galileo E1 signal) (Phase IB and IC and Phase II only) 1164-1219 MHz (Galileo E5 signal) (Phase IB and IC and Phase II only)
<p><b>Unless otherwise specified herein, operations under this grant must comport with the legal and technical specifications set forth by the applicant or petitioner and with Federal Communication Commission's rules not waived herein. This grant is also subject to the following conditions:</b></p> <p>1. Spire must prepare the necessary information, as may be required, for submission to the International Telecommunication Union (ITU) to initiate and complete the advance publication, coordination, due diligence, and notification process for these space stations, in accordance with the ITU Radio Regulations. Spire will be held responsible for all cost-recovery fees associated with ITU filings. No protection from interference caused by radio stations authorized by other administrations is guaranteed unless coordination and notification procedures are timely completed or, with respect to individual administrations, by successfully completing coordination agreements. Any radio station authorization for which coordination has not been completed may be subject to additional terms and conditions as required to effect coordination of the frequency assignments of other administrations. <i>See</i> 47 CFR § 25.111(b).</p> <p>2. Upon receipt of a conjunction warning from the Joint Space Operation Center or other source, Spire must review the warning and take all possible steps to assess and, if necessary, to mitigate collision risk, including, but not limited to: contacting the operator of any active spacecraft involved in such warning; sharing ephemeris data and other appropriate operational information with any such operator; modifying spacecraft attitude and/or operations.</p> <p>3. The number of simultaneously operational satellites must not exceed 175.<sup>10</sup></p> <p>4. The information provided by Spire supports a finding that some portion of the requested number of satellites is in the public interest, but it does not resolve all material questions of fact concerning whether deployment of the full constellation over the 15-year license term would involve debris mitigation plans sufficient to support a finding that the full deployment is in the public interest. Accordingly, prior to deploying Phase II satellites in excess of 118 satellites,<sup>11</sup> Spire must supplement the information provided in its orbital debris mitigation plan and must obtain FCC approval of the supplemented orbital debris mitigation plan. In particular, the supplement should clarify and expand the information provided regarding the aggregate collision risk for its proposed system at all altitudes requested, based on launches completed and planned.</p> <p>5. Spire must comply with any new rules adopted by the Commission as a result of the rulemaking in IB Docket No. 18-313.<sup>12</sup></p> <p>6. Spire must notify the Commission in writing at least 30 days prior to launch of a satellite that will operate with and be substantially technically identical to satellites in the LEMUR constellation and that is licensed by an Administration other than the United States. This notification must include the name of the</p>	

<sup>10</sup> We note that the total number of simultaneously operational satellites refers specifically to those satellites operating in frequencies other than TT&C frequencies and does not include non-operational satellites that continue to operate in TT&C frequency bands as part of approved post-mission disposal plans.

<sup>11</sup> We increase the number of Phase II satellites specified in this condition from 100 to 118, based on a finding that the addition of 18 satellites is a sufficiently small increase in the number of deployed satellites to warrant authorization pending the Commission's review of the supplemental orbital debris information submitted by Spire. *See* Spire Global Inc., Exhibit B – Orbital Debris Risk Mitigation Plan (filed July 22, 2020); Spire Global, Inc., Exhibit C – ODAR (filed July 22, 2020). This does not constitute a finding with respect to the adequacy of Spire's supplemental orbital debris mitigation plan or a finding that the full deployment is in the public interest.

<sup>12</sup> *See Mitigation of Orbital Debris in the New Space Age*, Notice of Proposed Rulemaking, FCC 18-159, 33 FCC Rcd 11352 (2018); *Mitigation of Orbital Debris in the New Space Age*, Report and Order and Further Notice of Proposed Rulemaking, FCC 20-54, 35 FCC Rcd 4156 (2020).

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Administration that has licensed the satellite, the anticipated launch date and launch vehicle, as well as the apogee, perigee, and inclination of the satellite, as intended to be deployed and intended to be operated. Any such satellite will count towards the number of satellites authorized under this grant and such satellites licensed by other Administrations will count towards the maximum number of simultaneously operational satellites allowed under Condition 3 of this grant and towards the maximum number of satellites that may be deployed prior to the additional approval specified in condition 4 of this grant.

7. Deployment into an orbit with an inclination of 51.6 degrees, plus or minus 0.1 degree, other than directly from the ISS, is only authorized for satellites to be launched on Cygnus re-supply missions and is subject to the following:

- a. Deployment shall be into an orbit that, if from below the ISS altitude, is not closer than 15 km below and 15 km in front of ISS and, if above the ISS altitude, is to an orbit acceptable to NASA, which is currently defined as a co-elliptic orbit above the ISS semi-major axis with a relative perigee greater than 45 km. If deployment is planned from an altitude above the ISS, not later than 10 business days prior to launch of the resupply mission, Spire shall provide documentation from NASA confirming that deployment from the Cygnus capsule is acceptable to NASA.
- b. Deployment above the ISS altitude may proceed only if it is confirmed in a manner acceptable to NASA that, following launch and docking operations, there is sufficient fuel on Cygnus to execute both the planned satellite deployment and planned Cygnus disposal operations.

8. Spire's request for waiver of the U.S. Table of Frequency Allocations, Section 2.106, to receive ASM transmissions in the 161.9375-161.9625 MHz (ASM 1), and 161.9875-162.0125 MHz (ASM 2), frequency bands, on a non-conforming, non-harmful interference basis, IS GRANTED. We note that all reception in this band must comport with the requirements on unauthorized publication or use of communications in Section 705 of the Communications Act of 1934, as amended.<sup>13</sup>

9. Spire may claim protection for reception in the 156.7625-162.0375 MHz or 1087.7-1092.3 MHz bands only to the extent permitted under the U.S. Table of Frequency Allocations for domestic operations or the ITU Radio Regulations for international operations, as of the time of operation. Operations in the 156.7625-162.0375 MHz and 1087.7-1092.3 MHz bands must be in accordance with any Commission rulemakings subsequent to the release of this license that implement any new domestic allocations or service rules for these bands.<sup>14</sup>

10. Spire may not claim any harmful interference protection rights for receiver operations with the Galileo E1 signal beyond that already afforded to non-Federal receivers that operate with the GPS L1 signal.<sup>15</sup>

11. We find it is in the public interest to grant a waiver of the U.S. Table of Frequency Allocations for Spire's receiver operations with the Galileo E5 signal in the 1215-1219 GHz frequency band (space-to-space), where such operations would be on a non-conforming basis and Spire's Galileo E5 receivers must accept harmful interference from authorized services in the 1215-1240 MHz band.<sup>16</sup>

12. Spire's request for a waiver of the United States Table of Frequency Allocations, 47 CFR § 2.106, is GRANTED to permit operations in the 402-403 MHz (Earth-to-space and space-to-Earth (TT&C and

<sup>13</sup> 47 U.S.C. § 605.

<sup>14</sup> *Iridium Order and Authorization*, 31 FCC Rcd at 8689, para. 50.

<sup>15</sup> *See Waiver of Part 25 Licensing Requirements for Receive-Only Earth Stations Operating with the Galileo Radionavigation-Satellite Service*, IB Docket No. 17-16, Order, FCC 18-158, para. 31, fn. 121 (Nov. 16, 2018).

<sup>16</sup> To the extent that Spire receivers have a front end that receives transmissions outside of the bands allocated for the Radionavigation-Satellite Service (RNSS) in the U.S. Table of Frequency Allocations (in bands between 1240 MHz and 1559 MHz), such receivers will not be afforded any harmful interference protection rights with respect to the signals received outside of these RNSS bands. *Id.* at para. 41, fn. 161.

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data back up only)) and 2020-2025 MHz (space-to-Earth) frequency bands subject to the condition that it may not cause harmful interference to and must accept interference from authorized users. Spire must immediately terminate non-conforming operations upon notification of harmful interference.

13. Operations in the 449.75-450.25 MHz band may be used for space telecommand (Earth-to-space) at specific locations, subject to conditions as may be applied on a case-by-case basis, pursuant to US87 of the U.S. Table of Frequency Allocations, 47 CFR § 2.106. Spire must take all practical steps to keep the carrier frequency between 450.15 and 450.25 MHz.

14. Spire must maintain a U.S. point of contact available by telephone 24 hours per day, seven days per week, with the authority and ability to terminate operations authorized herein. The telephone number for this U.S. point of contact must be provided to NTIA ([ravery@ntia.gov](mailto:ravery@ntia.gov)) and DOC/NOAA ([david.franc@noaa.gov](mailto:david.franc@noaa.gov)).

15. Operations in the 402.6-402.8 MHz frequency band must not exceed the long-term interference criteria specified in Table 2 (Type C) of Recommendation ITU-R RS.1263-2 in order to protect DOC/NOAA radiosondes operations in the United States. Operations in the 402.6-402.8 MHz frequency band shall be limited to a single center frequency of 402.79 MHz with a single emission bandwidth of 15 kilohertz by October 31, 2022. Spire must transition all operations out of the 402.6-402.8 MHz band by October 31, 2025.<sup>17</sup>

16. Operations pursuant to this authorization must not cause harmful interference to stations operating in the 2025-2110 MHz band in accordance with the U.S. Table of Frequency Allocations. *See* 47 CFR § 2.106, footnote US347.

17. Spire's request for a waiver of the U.S. Table of Frequency Allocations, 47 CFR § 2.106, to permit United States and Possessions (US&P) operations in the 2200-2290 MHz (space-to-Earth) frequency band is DEFERRED. Operations in the 2200-2290 MHz frequency band are permitted for use only outside of the US&P. Spire is required to successfully coordinate with NTIA prior to submitting any ITU filing involving any ground stations outside of the US&P that operate in the frequency band 2200-2290 MHz. NTIA will consider the request by Spire for access to the 2200-2290 MHz for ground stations located outside of US&P on a case-by-case coordinated basis with appropriate EMC analysis to NTIA ([ravery@ntia.gov](mailto:ravery@ntia.gov)), AFSMO ([jimmy.nguyen@us.af.mil](mailto:jimmy.nguyen@us.af.mil)), NASA ([john.e.zuzek@nasa.gov](mailto:john.e.zuzek@nasa.gov)) and DOC ([david.franc@noaa.gov](mailto:david.franc@noaa.gov)) to ensure compatibility of operations with the Federal government. Transmissions in the 2200-2290 MHz band to any single earth station must have a bandwidth no greater than one megahertz.

18. Transmissions in the 8025-8400 MHz frequency band to earth stations coordinated with the National Aeronautics and Space Administration (NASA), Air Force Spectrum Management Office, and DOC/NOAA. Spire shall provide the FCC with an updated list of coordinated earth stations within ten business days following any changes to this list.

19. Power flux-density limits for operation in the 8025-8400 MHz band must not exceed the limits in No. 22.5 and Table 21-4 of the International Telecommunication Union's Radio Regulations, must meet the limits/protection criteria in Recommendation ITU-R SA.1157-1, and must follow the guidelines in Recommendation ITU-R SA.1810.

20. Spire's request for a waiver of the U.S. Table of Frequency Allocations, 47 CFR § 2.106, to permit operations in the 8025-8325 MHz (space-to-Earth) and 9200-10550 MHz (Earth-to-space) band, by a single satellite with a single earth station, located at Tucson, Arizona,<sup>18</sup> IS GRANTED. Operations in this frequency band are on a non-interference basis, i.e., Spire shall not cause interference to any authorized service,

<sup>17</sup> For some satellites deployed under this license, the center frequency may not comport with this condition following a software re-set. These satellites, to the extent they remain in operation, are required to operate within the 402.6-402.8 MHz band, except as necessary for a satellite software reset, resulting in satellite transmissions returning to default transmission channels that does not comply with this condition, to allow for the retuning of transmissions to a compliant frequency, or unless otherwise agreed in a Memorandum of Agreement with DOC/NOAA.

<sup>18</sup> For the earth station authorization, *See* Experimental Licensing System File No. 1403-EX-ST-2019.

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and cannot claim protection from interference from any authorized service, operating in conformance with the Table of Allocations. Spire shall avoid direct illumination of the Kitt Peak VLBI station. Prior to operations, Spire or the earth station operator shall:

- a. Provide a testing schedule and stop buzzer POC to the DoD AFC AZ office at 520-538-6423 or 520-538-6424.
- b. Coordinate operations with the VLBI Point-of-Contact: Dan "Mert" Mertely nrao-rfi@nrao.edu phone: (575) 835-7128.
- c. Provide notification to any station shown in ULS and licensed for operations in the 9200-10400 MHz band within 50 miles of the Tucson, AZ earth station. (As of the date of grant, the stations are WQDM685 & WRAI595).

21. This authorization will become null and void if, at any time during the license term, there are no Spire satellites operating.

22. Spire is subject to milestone and bond obligations imposed as conditions to a previous grant of authority to operate up to nine NGSO satellites in the 2020-2025 MHz frequency band. *See supra*, note 4. We find that, following the discharge of the bond requirement associated with this previous grant, warehousing concerns are addressed in this situation through the imposition of condition 21 above.

23. Within 30 days after deployment of each satellite pursuant to this authorization, Spire must file a notification with the Commission specifying its apogee and perigee altitudes and orbital inclination.

24. The license term is 15 years, which commenced upon Spire's notification of the deployment of the first four Spire satellites on May 23, 2016.<sup>19</sup>

25. Spire's request for a waiver of Section 25.114(c) of the Commission's rules, 47 CFR § 25.114(c), to the extent described in its application with respect to certain information to be provided in the Schedule S, IS GRANTED. We find that a waiver is warranted for the requirement for orbital information on the Schedule S for each satellite because the information Spire provided in its Narrative is sufficient to fulfill the relevant informational requirements.

26. Spire's request for processing of its amendment on a first-come, first-serve basis pursuant to Section 25.158 of the Commission's rules, is GRANTED. Spire's request for waiver of Sections 25.156 and 25.157 of the Commission's rules, IS MOOT.

27. Spire's request for waiver of the Default Service Rules in 47 CFR § 25.217(b), IS GRANTED.

Licensee/grantee is afforded thirty (30) days from the date of release of this action to decline the grant as conditioned. Failure to respond within this period will constitute formal acceptance of the grant as conditioned.

This action is taken pursuant to Section 0.261 of the Commission's rules on delegated authority, 47 CFR § 0.261, and is effective upon release.

Station licenses are subject to the conditions specified in Section 309(h) of the Communications Act of 1934, as amended, 47 U.S.C. § 309(h).


<b>Action Date:</b>	October 30, 2020
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<sup>19</sup> Letter from Trey Hanbury, Counsel to Spire Global, Inc., to Marlene H. Dortch, Secretary, FCC, IBFS File No. SAT-LOA-20151123-00078 (filed May 23, 2016).

**ATTACHMENT TO GRANT**

Spire Global, Inc.

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<b>Term Dates</b>	<b>From:</b> October 30, 2020	<b>To:</b> See conditions
<b>Approved:</b>  Merissa L. Velez Chief, Satellite Policy Branch		



9-16. Name of Contact Representative

<b>Name:</b>	Michelle A. McClure	<b>Phone Number:</b>	202-734-6883
<b>Company:</b>	Spire Global, Inc.	<b>Fax Number:</b>	
<b>Street:</b>	8000 Towers Crescent Drive Suite 1225	<b>E-Mail:</b>	michelle.mcclure@spire.com
<b>City:</b>	Vienna	<b>State:</b>	VA
<b>Country:</b>	USA	<b>Zipcode:</b>	22182-
<b>Attention:</b>	Michelle A. McClure	<b>Relationship:</b>	Legal Counsel

CLASSIFICATION OF FILING

17. Choose the button next to the classification that applies to this filing for both questions a. and b. Choose only one for 17a and only one for 17b.

- ☐ a1. Earth Station
- ☒ a2. Space Station

- (N/A) b1. Application for License of New Station
- (N/A) b2. Application for Registration of New Domestic Receive-Only Station
- ☐ b3. Amendment to a Pending Application
- ☒ b4. Modification of License or Registration
- b5. Assignment of License or Registration
- b6. Transfer of Control of License or Registration
- ☐ 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
- (N/A) b10. Other (Please specify)
- (N/A) 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) b12. Application for Database Entry
- ☐ b13. Amendment to a Pending Database Entry Application
- ☐ b14. Modification of Database Entry

<p>17c. Is a fee submitted with this application?</p> <p><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).</p> <p><input type="radio"/> Governmental Entity    <input type="radio"/> Noncommercial educational licensee</p> <p><input type="radio"/> Other(please explain):</p>	
<p>17d.</p> <p>Fee Classification CGW – Space Station Modification(Non–Geostationary)</p>	
<p>18. If this filing is in reference to an existing station, enter:</p> <p>(a) Call sign of station: S2946</p>	<p>19. If this filing is an amendment to a pending application enter both fields, if this filing is a modification please enter only the file number:</p> <p>(a) Date pending application was filed:                      (b) File number:</p> <p style="text-align: right;">SATLOA2015112300078</p>

## TYPE OF SERVICE

<p>20. NATURE OF SERVICE: This filing is for an authorization to provide or use the following type(s) of service(s): Select all that apply:</p> <p> <input type="checkbox"/> a. Fixed Satellite  <input checked="" type="checkbox"/> b. Mobile Satellite  <input type="checkbox"/> c. Radiodetermination Satellite  <input checked="" type="checkbox"/> d. Earth Exploration Satellite  <input type="checkbox"/> e. Direct to Home Fixed Satellite  <input type="checkbox"/> f. Digital Audio Radio Service  <input checked="" type="checkbox"/> g. Other (please specify)      METS, Space Ops, and ISLs         </p>		
<p>21. STATUS: Choose the button next to the applicable status. Choose only one.</p> <p> <input type="radio"/> Common Carrier      <input checked="" type="radio"/> Non-Common Carrier         </p>	<p>22. If earth station applicant, check all that apply.</p> <p> <input checked="" type="checkbox"/> Using U.S. licensed satellites  <input type="checkbox"/> Using Non-U.S. licensed satellites         </p>	
<p>23. If applicant is providing INTERNATIONAL COMMON CARRIER service, see instructions regarding Sec. 214 filings. Choose one. Are these facilities:</p> <p> <input type="radio"/> Connected to a Public Switched Network      <input type="radio"/> Not connected to a Public Switched Network      <input checked="" type="radio"/> N/A         </p>		
<p>24. FREQUENCY BAND(S): Place an 'X' in the box(es) next to all applicable frequency band(s).</p> <p> <input type="checkbox"/> a. C-Band (4/6 GHz)      <input type="checkbox"/> b. Ku-Band (12/14 GHz)  <input checked="" type="checkbox"/> c. Other (Please specify upper and lower frequencies in MHz.)  <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>Frequency Lower: 399.9</span> <span>Frequency Upper: 10550</span> <span>(Please specify additional frequencies in an attachment)</span> </div> </p>		

## 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
- ☐ e. Geostationary Space Station
- ☒ f. Non–Geostationary Space Station
- ☐ g. Other (please specify)

26. TYPE OF EARTH STATION FACILITY:

- ☐ Transmit/Receive    ☐ Transmit–Only    ☐ Receive–Only    ☒ N/A

"For Space Station applications, select 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.)

- ☐ a --- authorization to add new emission designator and related service
- ☐ b --- authorization to change emission designator and related service
- ☐ c --- authorization to increase EIRP and EIRP density
- ☐ d --- authorization to replace antenna
- ☐ e --- authorization to add antenna
- ☐ f --- authorization to relocate fixed station
- ☐ g --- authorization to change frequency(ies)
- ☒ h --- authorization to add frequency
- ☐ i --- authorization to add Points of Communication (satellites & countries)
- ☐ j --- authorization to change Points of Communication (satellites & countries)
- ☐ k --- authorization for facilities for which environmental assessment and radiation hazard reporting is required
- ☐ l --- authorization to change orbit location
- ☐ m --- authorization to perform fleet management
- ☐ n --- authorization to extend milestones
- ☒ o --- Other (Please specify)

## ENVIRONMENTAL POLICY

28. Would a Commission grant of any proposal in this application or amendment have a significant environmental impact as defined by 47 CFR 1.1307? If YES, submit the statement as required by Sections 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.

☐ Yes ☒ No

Exhibit A

**ALIEN OWNERSHIP** Earth station applicants not proposing to provide broadcast, common carrier, aeronautical en route or aeronautical fixed radio station services are not required to respond to Items 30–34.

29. Is the applicant a foreign government or the representative of any foreign government?

☐ Yes ☒ No

30. Is the applicant an alien or the representative of an alien?

☐ Yes ☐ No ☒ N/A

31. Is the applicant a corporation organized under the laws of any foreign government?

☐ Yes ☐ 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?

☐ Yes ☐ No ☒ N/A

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?

☐ Yes ☐ 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.

☒ Yes ☐ 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 explanation of circumstances.

☐ Yes ☒ No

<p>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 explanation of circumstances.</p>	<p><input type="radio"/> Yes    <input checked="" type="radio"/> No</p>
<p>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</p>	<p><input type="radio"/> Yes    <input checked="" type="radio"/> No</p>
<p>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 exhibit, an explanation of the circumstances.</p>	<p><input type="radio"/> Yes    <input checked="" type="radio"/> No</p>
<p>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.</p>	



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 ☐ 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, what administration has coordinated or is in the process of coordinating the space station?N/A

43. Description. (Summarize the nature of the application and the services to be provided). (If the complete description does not appear in this box, please go to the end of the form to view it in its entirety.)

Applicant requests authority to (i) amend market access grant condition 4 and the license for 2020-2025 MHz use among all satellites; (ii) amend license condition 15 and the market access grant to allow 402-403 MHz use until Nov. 22, 2029; (iii) grant authority to employ inter-satellite links in 2025-2110 MHz and 2200-2290 MHz; (iv) approve the passive

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.

☒ 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.

☐ 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.

☐ 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.

44. Applicant is a (an): (Choose the button next to applicable response.)

- ☐ Individual
- ☐ Unincorporated Association
- ☐ Partnership
- ☒ Corporation
- ☐ Governmental Entity
- ☐ Other (please specify)

45. Name of Person Signing  
Ananda Martin

46. Title of Person Signing  
General Counsel

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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.**

**43. Description. (Summarize the nature of the application and the services to be provided).**

Applicant requests authority to (i) amend market access grant condition 4 and the license for 2020-2025 MHz use among all satellites; (ii) amend license condition 15 and the market access grant to allow 402-403 MHz use until Nov. 22, 2029; (iii) grant authority to employ inter-satellite links in 2025-2110 MHz and 2200-2290 MHz; (iv) approve the passive measurement of foreign GNSS signals for meteorological monitoring; (v) permit 6 kg (and not 4.5 kg) satellites; and (vi) license a hosted payload operating in the 8025-8325 MHz (space-to-Earth) and 9200-10550 MHz (Earth-to-space) bands.