

Description of Application

Spire Global, Inc. (“Spire”) hereby requests authority to operate the earth stations identified in Attachment 1 to this exhibit¹ as part of the ground segment for the LEMUR satellite system.² The LEMUR system will provide maritime monitoring, meteorological monitoring, and earth imaging services.³ Spire requests authority to use the 402-403 MHz band for uplink and telemetry, tracking, and command (“TT&C”) and to use the 2020-2025 MHz band for downlink.⁴ Spire has requested additional frequencies for its Phase II LEMUR satellites.⁵ However, because those satellites will not be deployed in the immediate future and coordination of the S-band uplink may require additional time, Spire does not seek authority to use those frequencies with the proposed earth stations at this time.⁶

¹ Spire is contemporaneously submitting separate applications for each earth station. Except for location-specific information, including the number and height of the antennas, the applications are materially the same. *See* Attachment 1.

² *See* Application of Spire Global, Inc., File No. SAT-LOA-20151123-00078 (filed Nov. 23, 2015) (“LEMUR Application”). Spire also plans to deploy unlicensed receive-only facilities—on a non-harmful interference and unprotected basis—as part of its ground system. *See* 47 C.F.R. 25.131; *Regulation of Domestic Receive-Only Satellite Earth Stations*, First Report and Order, 74 FCC 2d 205 ¶ 31 (1979); *see also* *Amendment of Part 25 of the Commission's Rules and Regulations to Reduce Alien Carrier Interference Between Fixed-Satellites at Reduced Orbital Spacings and to Revise Application Processing Procedures for Satellite Communications Services*, First Report and Order, 6 FCC Rcd 2806 (1991).

³ *See* LEMUR Application, Exhibit A at 7.

⁴ The 402-403 MHz band will also be used for backup downlink. *See id.* at 1.

⁵ The Phase II satellites will use the 8025-8400 MHz band for downlink, including TT&C, and the 2025-2110 MHz band for uplink, including TT&C. *See id.* at 1-2.

⁶ Spire will modify its licenses accordingly prior to the deployment of the Phase II satellites.

Consistent with the LEMUR Application and to the extent necessary,⁷ Spire requests waiver of the rules listed below and submits that good cause exists for grant of the requested waivers.⁸

Spire requests waiver of the U.S. Table of Frequency Allocations to use the 402-403 MHz band on a non-conforming, non-harmful interference basis.⁹ The 402-403 MHz band is allocated to a number of satellite services, including earth exploration-satellite service (“EESS”) (Earth-to-space), meteorological-satellite service (“METS”) (Earth-to-space), and Meteorological Aids Service (radiosonde).¹⁰ Spire’s use of the band for its LEMUR satellites will be of limited duration.¹¹ The wide beamwidth of the low-band frequencies can greatly facilitate the reestablishment of a lost communications link. In any event, there is unlikely to be harmful interference because of the infrequent nature and type of transmissions from the satellite system.¹² Additionally, to the extent possible, Spire will coordinate with other operators in this band to ensure there is no harmful interference.

⁷ See LEMUR Application, Exhibit A at 23-24.

⁸ See 47 C.F.R. § 1.3; see also *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969), *cert. denied* 409 U.S. 1027 (1972); *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1166 (D.C. Cir. 1990).

⁹ See LEMUR Application, Exhibit A at 23.

¹⁰ See 47 C.F.R. § 2.106; see also *id.* at notes US64(a), US70, US384. The mobile service, excluding aeronautical mobile, is allocated to the Medical Device Radiocommunication Service operations on a secondary basis. *Id.* at note US64(a). The Meteorological Aids Service can operate associated ground transmitters. *Id.* at note US70. Finally, non-Federal EESS (Earth-to-Space) and METS (Earth-to-Space) are permitted to transmit only to Federal space stations. *Id.* at note US384.

¹¹ See LEMUR Application, Exhibit A at 9-10. The antenna will transmit only on one carrier frequency at a time.

¹² See *id.* at 23.

Spire also requests waiver of the U.S. Table of Frequency Allocations to use the 2020-2025 MHz band (space-to-Earth) on a non-conforming, non-harmful interference basis.¹³

Although there is a co-primary mobile-satellite service allocation in the 2020-2025 MHz band for ITU Region 2, the frequency band is allocated only for fixed and mobile service in the United States.¹⁴ However, the spectrum is currently fallow and unlikely to be used until well after June 2016, the deadline for the adjacent band licensee to determine whether the 2000-2020 MHz band will be used for terrestrial uplinks or downlinks.¹⁵ Accordingly, Spire's temporary use of this band, as a downlink for its LEMUR satellites, will not likely cause harmful interference to any authorized operator.¹⁶

¹³ *See id.* at 24.

¹⁴ *See Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, Report and Order, 29 FCC Rcd 4610 ¶ 59 (2014).

¹⁵ *See id.*

¹⁶ *See* LEMUR Application, Exhibit A at 9-10.

Attachment 1
Earth Station Sites Characteristics

Site Address	Latitude	Longitude	Antenna(s) at Location
2347 Azurite Court Anchorage, AL	61° 8' 46.74" N	149° 50' 16.31" W	M2 Antenna Systems 401CP14 ("UHF-1")
4680 Conference Way S #150 Boca Raton, FL	26° 23' 21.30" N	80° 6' 32.46" W	UHF-1
3060 Flying View Ellicott, CO	38° 52' 25.58" N	104° 24' 26.10" W	UHF-1; ARA – Seavey C1502-800 ("SBAND-1")
155 Locust Street Hartford, CT	41° 44' 42.27" N	72° 39' 54.66" W	UHF-1
93-1704 South Point Road Naalehu, HI	19° 0' 50.90" N	155° 39' 46.78" W	UHF-1; SBAND-1
N/A Juneau, AK	58° 21' 50.65" N	134° 36' 21.52" W	UHF-1
312 Route 2A Shell Fuel Farm Road Piti, Guam	13° 24' 56.30" N	144° 41' 15.10" E	UHF-1; SBAND-1
904 Quality Way Richardson, TX	32° 57' 58.38" N	96° 42' 41.58" W	UHF-1; SBAND-1
23 Estate Northside Saint Croix, Virgin Islands	17° 45' 43.12" N	64° 53' 6.01" W	UHF-1; SBAND-1
466 8th Street San Francisco, CA	37° 46' 22.15" N	122° 24' 27.80" W	UHF-1; SBAND-1

Site Address	Latitude	Longitude	Antenna(s) at Location
33 Norfolk Street San Francisco, CA	37° 46' 16.20" N	122° 24' 50.42" W	UHF-1; SBAND-1
3433 S 120th Place Tukwila, WA	47° 29' 39.15" N	122° 17' 18.55" W	UHF-1; SBAND-1
7202 S. Campus View Drive West Jordan, UT	40° 37' 12.47" N	111° 59' 9.98" W	UHF-1; SBAND-1

No Federal Aviation Administration notification is required for any of the proposed ground stations. 47 C.F.R. § 17.7(e).

Attachment 2
Additional Antenna Information

Due to the limitations of the Commission’s Form 312 Schedule B form, Spire clarifies in this attachment some of its responses in that form. Spire will use a Yagi antenna for its transmissions in the 402-403 MHz band (the “UHF-1” antenna). As identified in Attachment 1, some of the earth stations also will have a Dual Circular Dish antenna for reception of downlink transmissions in the 2020-2025 MHz band (the “SBAND-1” antenna). The characteristics of both antennas are provided below.

Table 1: UHF-1 Yagi Antenna Characteristics

Manufacturer & Model	Antenna Length (m)	3dB Beamwidth (deg)	Polarization
M2 Antenna Systems 401CP14	1.85 x 0.38 x 0.38	60	RHCP

Table 2: SBAND-1 Dual Circular Dish Antenna Characteristics

Manufacturer & Model	Antenna Diameter (m)	3dB Beamwidth (deg)	Polarization
ARA – Seavey C1502-800	1.2	6.5	RHCP