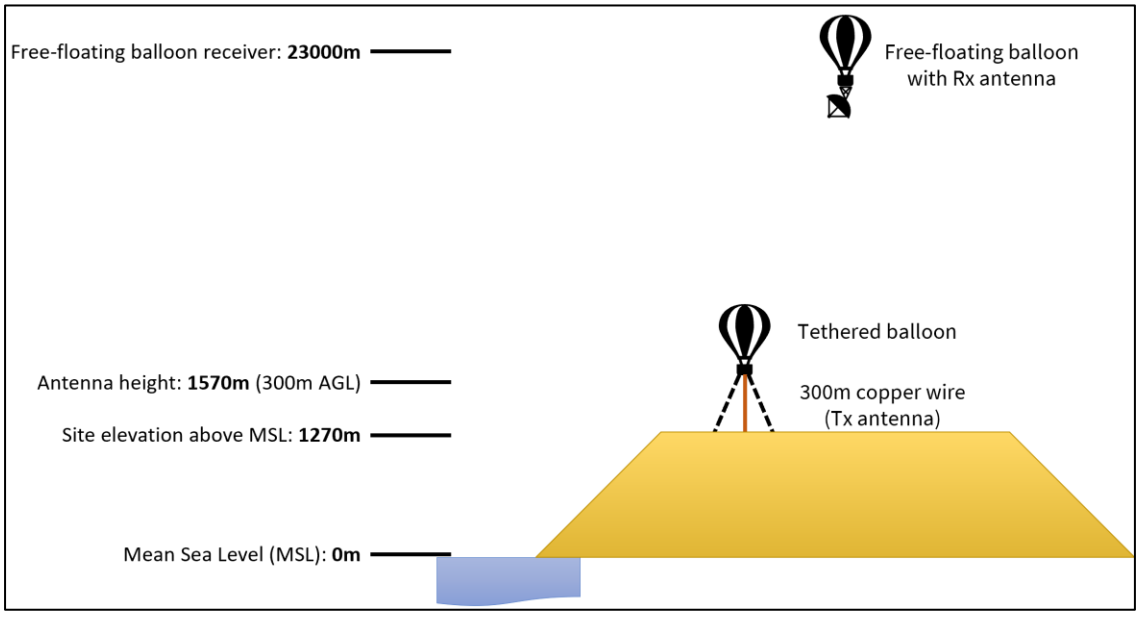
LUNASONDE

I. Experiment Overview

Lunasonde seeks authority to transmit using 99.385-100.615 kHz from one tethered balloon to sense subsurface Earth properties from February 1, 2023 to August 1, 2023.[1] Issuing the requested authority would permit Lunasonde to test a low frequency (LF) transceiver design before the technology is launched to orbit, where testing becomes more difficult given the space environment and additional financial resources required.

The proposed testing is necessary to increase the LF transceiver's technology readiness level (TRL). During a test mission, one uncrewed high-altitude balloon will carry one LF receiver system approximately 60,000-100,000 feet above ground level. Simultaneously, a stationary, tethered balloon will lift a 300-meter-long cable of 18AWG wire. This wire will be connected to one transmitter system at the base of the tethered balloon.[2] Signals from the transmitting tethered balloon system that reflect from the Earth's surface would be received by the free-floating balloon receiver system.



Testing would be limited. The test site is a five (5) mile radius centered at Willcox Playa, Arizona (32.148056, -109.839167). Only three experiments are expected (with no greater than ten tests during the requested period). Transmissions will only occur for up to six hours per experiment in coordination with the Federal Aviation Administration and local air traffic control.[3]

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[1] Lunasonde is developing LF transceiver technology for use in low-Earth orbit satellites to detect the Earth's subsurface properties, including water repositories and mineral deposits.

[2] In an abundance of caution, Lunasonde has noted the antenna is mobile in the attached Form 442. However, the antenna is tethered to the ground and is expected to sway only slightly due to atmospheric conditions.

[3] This experiment is conducted using a tethered (moored) balloon. Lunasonde will satisfy all Federal Aviation Administration requirements for moored balloons. *See generally* 14 C.F.R. Part 101 Subpart B.

II. Non-Interference, Non-Protected Basis

Lunasonde would operate on a non-interference, non-protected basis. In the 90-110 kHz band for which Lunasonde seeks authority, the FCC universal licensing system shows only nine active regular licenses for aeronautical radionavigation and coastal group operators. See Appendix for the survey results. The closest possible licensed deployment (northern California) is greater than 900 miles from Lunasonde's testing site (southeastern Arizona). Interference resolution is possible given the large geographic separation, limited test occurrences and duration, and Lunasonde's commitment to coordinate if necessary.

III. Stop Buzzer Contact

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APPENDIX

Active Regular Licenses in 90-110 kHz Band

Call Sign / Lease ID	Name	Radio Service	Expiration Date	Centerpoint	Area of Operation
KPH	Global HF Net LLC	MC	04/19/2031	38° 11' 54.7" N, 121° 48' 33.8" W 37° 54' 50.4" N, 122° 43' 21.5" W	1 fixed (6762 Flannery Road, Solano County, Rio Vista, CA) 1 fixed (451 Mesa Road, Marin County, Bolinas, CA)
WQOR529	The Boeing Company	AR	01/31/2024	29° 23' 50.0" N, 098° 34' 48.0" W	1 mobile (4.0 km radius around centerpoint in Bexar County, San Antonio, TX)
WQQK529	Lockheed Martin Corporation	AR	01/14/2023	33° 55' 00.4" N, 084° 30' 59.8" W 34° 45' 30.0" N, 082° 22' 35.1" W	1 fixed (Cobb County, Dobbins AFB Marietta, GA) 1 fixed (255 Terminal Road, Greenville County, Greenville, SC)
WQUG520	The Boeing Company	AR	07/01/2024	38° 45' 03.0" N, 090° 21' 24.0" W	1 mobile (24.2 km radius around centerpoint in St. Louis County, St. Louis, MO)
WQWW816	The Boeing Company	AR	12/11/2025	35° 23' 53.0" N, 097° 35' 08.0" W	1 mobile (2.0 km radius around centerpoint in Oklahoma County, Oklahoma City, OK)
WRFB816	Embraer Services & Support	AR	01/27/2030	36° 07' 48.8" N, 086° 41' 19.7" W 32° 41' 46.9" N, 083° 38' 30.0" W	1 mobile (1 km radius around centerpoint in Davidson County, Nashville, TN) 1 mobile (1.0 km radius around

Call Sign / Lease ID	Name	Radio Service	Expiration Date	Centerpoint	Area of Operation
					centerpoint in Bibb County, Macon, GA)
WRLT2031	The Boeing Company	AR	12/31/2022	47° 29’ 35” N. 122° 12’ 57” W	80 handheld units (at Renton Municipal Airport in Renton, WA)
WRLT2032	The Boeing Company	AR	05/31/2025	47° 54’ 23” N. 122° 16’ 54” W	21 mobile units (at Paine Field/Snohomish County Airport in Everett, WA)
WRLT4930	The Boeing Company	AR	04/22/2030	47° 32’ 11.2” N, 122° 18’ 46.2” W	1 mobile (2.0 km radius around centerpoint in King County, Seattle, WA)