EXHIBIT A – NARRATIVE DISCUSSION

Loon LLC ("Loon," an Alphabet Inc. subsidiary and formerly known as Project Loon), submits this statement pursuant to Section 5.63(c)(1) of the Commission's Rules in support of its application for an Experimental Radio Service License ("Experimental License") to conduct a market trial. As defined in Sections 5.5 and 5.602 of the Commission's Rules, Loon seeks authority to transmit in the 71-76 GHz and 81-86 GHz ("E-band") from fixed base stations in Puerto Rico that will utilize High Altitude Platform Stations ("HAPS") as relay transmission points to deliver broadband service to maritime vessels operating in line-of-sight.

Loon Background

Loon is working to bring HAPS-powered Internet access to unserved and underserved communities around the world. Loon's unmanned HAPS balloons are capable of months-long flight at altitudes of approximately 20 kilometers.[1] Depending on the application and configuration, Loon's balloons may be equipped with an energy-efficient communications payload that employs standard LTE frequencies for the user access links, or, alternatively, they may be equipped with E-band payloads for feeder link service. When configured for feeder link service, the balloons backhaul aggregated end user traffic to the Internet from local area networks employing LTE or WiFi for last mile connectivity. Loon HAPS balloons serving end users directly can provide service over 5000 square kilometers using standard LTE frequencies to communicate with terrestrial User Equipment ("UE"). Loon HAPS balloons employing E-band frequencies can establish point-to-point links exceeding 1000 kilometers by interconnecting multiple HAPS balloons.[2] Given Loon's ability to expeditiously launch HAPS balloons that cover a large geographic footprint for end user or backhaul communications, our technology has already demonstrated itself as a valuable transmission medium to restore mission critical communications after natural disasters.[3]

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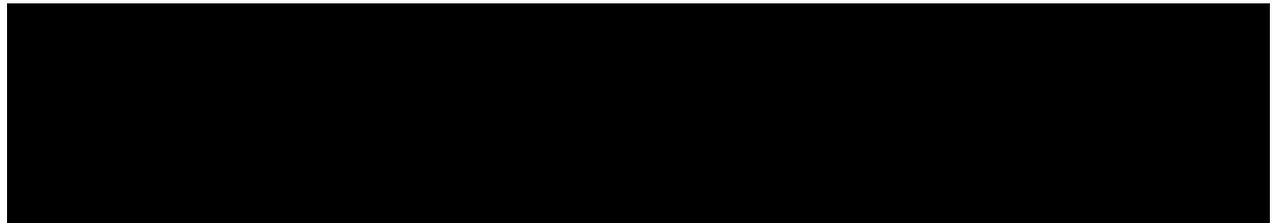
[1] While the current generation of Loon HAPS balloons do not involve active propulsion, stationkeeping occurs through adjustments in balloon altitude that permit Loon to take advantage of different directional air currents.

[2] *See* https://medium.com/loon-for-all/1-connection-7-balloons-1-000-kilometers-74da60b9e283 (last visited October 16, 2019).

[3] Loon delivered Internet connectivity to over 100,000 Puerto Ricans in the immediate aftermath of Hurricane Maria. See https://www.engadget.com/2017/11/09/project-loon-delivers-internet-100-000-people-puerto-rico/ (last visited January 30, 2019).
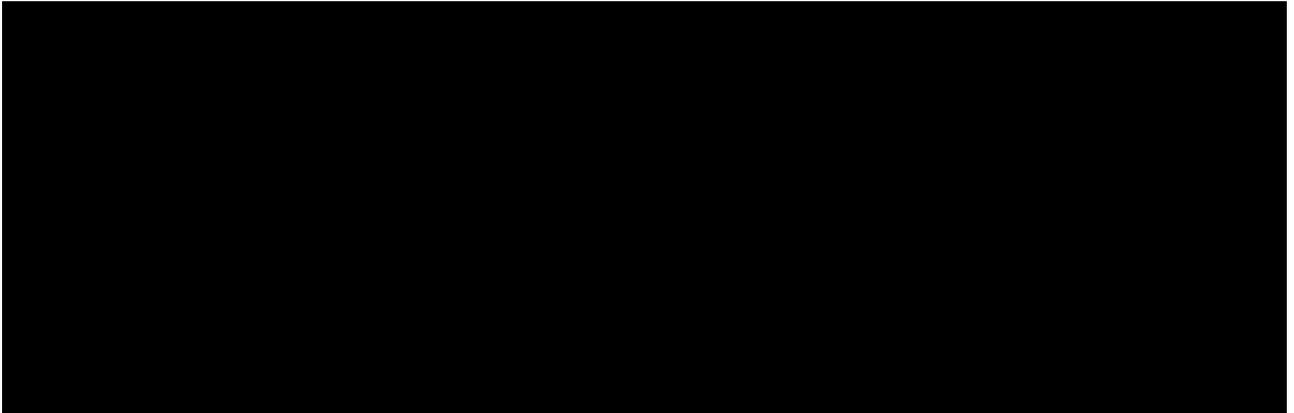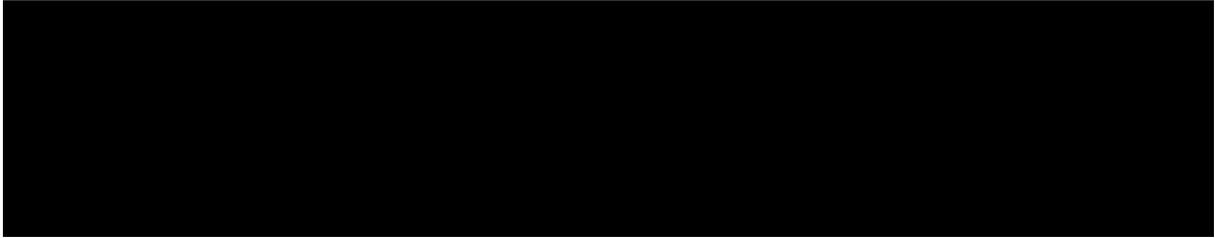
Notice to Consumers and Termination

As required by Section 5.602(e), all trial participants will be advised at the commencement of the trial that service is being provided on a trial basis. In particular, all trial participants will be notified that the service they will receive is provided in part or in whole under experimental authority, and that as a condition of the experimental license, Loon may be required at any time, without prior notice, to cease operations in the E-band.

Loon will maintain locational awareness and have the ability to terminate transmissions to and from HAPS balloons. First, the platforms will contain a GPS receiver. If the receiver detects that the platform has exited its desired operational range, it will automatically mute transmissions over the test frequencies. Second, connections to the ground infrastructure can be

used to manually disable transmissions. Third, the airborne radios will automatically mute transmissions if the connection to the ground infrastructure is lost for a defined period of time.

The proposed experimental operations accordingly will be conducted without harmful interference to other authorized users. Should any interference be reported, the proposed tests will cease immediately unless and until the interference is resolved to the satisfaction of the complainant. Protected users should report possible interference to Ben Wojtowicz of Loon (email: loonfcc@google.com; telephone: (847) 767 0554)

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