



# Equinox Innovative Systems

## Tethered Drone LTE Testing & Product Demonstrations

STA Confirmation Number: EL352630  
STA File Number: 0870-EX-ST-2018  
Date of Submission: May 11, 2018

DOCUMENT NUMBER: EIS20180507-2

*Prepared May 7, 2018*



**May 7, 2018**

**Federal Communications Commission - ELB**

445 12th Street, SW  
Washington, DC 20554  
e-mail: ELB@FCC.gov

**Subject: Equinox Innovative Systems Experimental Special Temporary License (STA)  
Application Statement**

Dear FCC ELB,

Equinox Innovative Systems (EIS) appreciates the opportunity to provide this proposed activity description in hopes of securing an experimental STA for LTE experimentation and product testing on tethered drones that can be used in lieu of temporary towers supporting disaster recovery efforts similar to those conducted by AT&T and Loon. The STA would support our RF engineering effort to optimize frequency, antenna, and amplifier selection aboard existing tethered multi-rotor drones.

If you have any questions regarding the information enclosed, please let me know. You can reach me at email at [rmorser@equinoxcomms.com](mailto:rmorser@equinoxcomms.com). On behalf of our team, we look forward to working with you!

Sincerely,

Randal Morser  
Chief Executive Officer  
Equinox Innovative Systems, LLC

## Equinox Executive Summary

[Equinox Innovative Systems](#) is an innovator in communications and multi-rotor drone technology integration. The EIS core team offers expertise in RF engineering, electro-mechanical airframe integration, and systems engineering. EIS products optimize the balance between flight time, power, bandwidth, and payload capacity to deliver consistently high-performing reliable solutions. Equinox services offerings take full advantage of organic technical expertise in order to maximize the customer value in the services we provide.

## Activity Description Overview

Equinox intends to integrate LTE communications system operating in licensed bands into multi-rotor unmanned aerial vehicles that receive their electrical power and network connectivity through a cable that is connected to both a generator and a BTS or laptop. These systems will be used as temporary towers, flying up to 120 meter for periods of several hours at a time. The drones will carry a range of antennas, amplifiers, complete small cell products, and fiber-fed remote radio heads. Experiments will focus on range, signal quality, and data throughput performance. Ground activities will utilize user equipment handsets to communicate over private networks with locally hosted or cloud-hosted network cores.

Purpose: Research and Development and technology demonstrations supporting disaster recovery cellular communications restoration by flying LTE pico cells and small cells as well as fiber-fed remote radio heads on tethered drones in lieu of temporary towers.

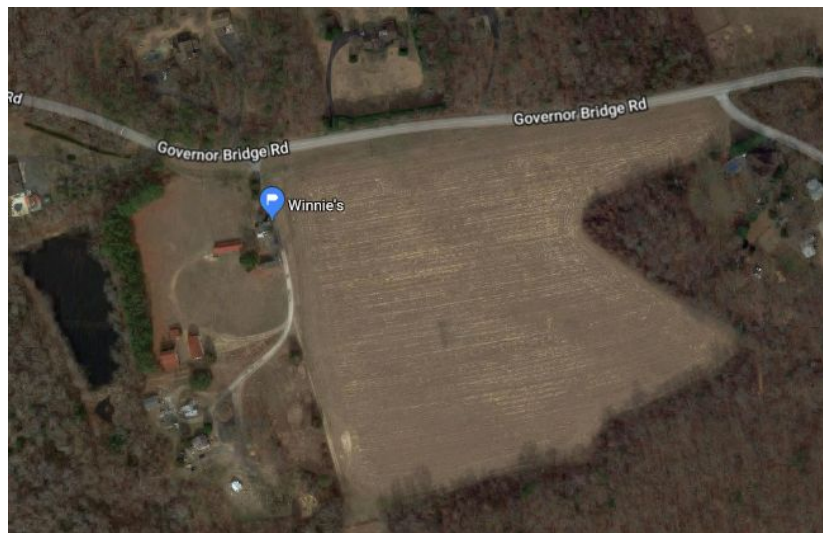
Duration: May 15, 2018 to May 14, 2019.

Locations: Equinox requests permission to conduct experiments and product demonstrations at following location:

### **1700-1794 Governor Bridge Rd**

Davidsonville, MD 21035

[38.952654, -76.688075](#)



Equinox Innovative Systems, LLC | 613 Yorktown Manor Ct | Annapolis, MD 21045

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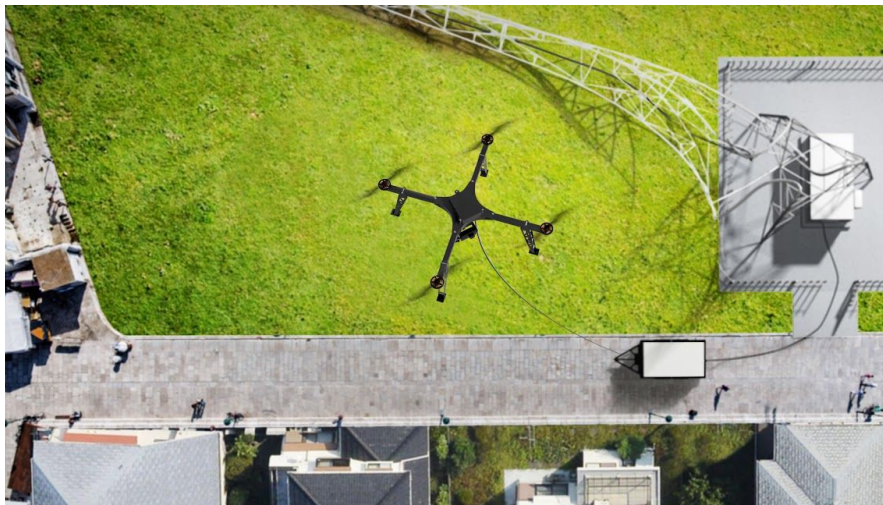
Frequencies: Equinox requests STAs to use LTE bands 5, 12, 13, 14, and 17.

Antennas: Equinox will use a variety of commercially available indoor omni-directional ceiling mount antennas. The drone systems are equipped with safety batteries and automated safe-landing capabilities in the event of a power failure.

Transmit Power: Experiments will range in transmit output power from 6 dBm to 39 dBm.

Activities observers will at times include US Government, Telecom, and Public Safety personnel. All drone flight activities will be conducted with the proper permits and authorizations by licensed commercial drone pilots and in accordance with FAA regulations and all Federal, State, and Local laws.

Antenna deployment examples:



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