

NARRATIVE EXPLANATION OF PROPOSED OPERATION

Equinox Innovative Systems has developed wide bandwidth tethered drone (UAS) communications systems for military and civilian telecommunications service deployment. The goal of the experiments proposed herein in a variety of RF environments is to integrate an 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 meters above ground level 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 in both rural and urbanized environments. Ground activities will utilize user equipment handsets to communicate over private networks with locally hosted or cloud-hosted network cores. 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.

The equipment under test is as follows:

Manufacturer	Model Number
DeltaNode	DDR200
Shireen	diplexer/amplifier
Yate	LTE lab kit

Test locations are as follows:

Latitude	Longitude	Address	City	State	Zip Code
39°1'24.6"N	76°25'21.4"W	613 Yorktown Manor Court	Annapolis	MD	21409
38°58'53.9"N	76°29'10.4"W	121 Blake Road	Annapolis	MD	21402
38°22'38.9"N	76°41'57.7"W	25135 Vista Road	Hollywood	MD	20636
38°21'11.3"N	76°31'15.9"W	24955 Garden Point Lane	Hollywood	MD	20636
39°10'2.1"N	76°42'0"W	7940 Airpark Drive	Gaithersburg	MD	20879
39°5'16.6"N	76°47'60"W	7515 General Aviation Drive	Fort Meade	MD	20755
38°56'23.9"N	76°35'60"W	3094 Solomons Island Road	Edgewater	MD	21037

39°1'0.3"N	76°47'60"W	14000 Jericho Park Road	Bowie	MD	20715
38°57'7.9N	76°41'16.4W	1759 Governor Bridge Road	Davidsonville	MD	21035
38°45'32.9"N	76°47'60"W	9500 Croom Road	Upper Marlboro	MD	20772
42°21'40.1"N	71°3'25.5" W	40 New Sudbury Street	Boston	MA	2114
38°31'32" N	76°55'18" W	44181 Airport Road	California	MD	20619
18°27'23" N	66°6'8" W	Calle Lindbergh #64	San Juan	PR	907

The antenna on the tethered drone will be a 6 dB clover antenna pointed at the ground with a 160-degree beamwidth. The power level will be 5 watts TPO from the amplifier and an ERP of 12 watts.

Equinox will avoid any interference to commercial wireless communications in and around the test areas through the employment of directional antennas and the careful management of antenna orientation so as to focus RF energy in a downward direction on the test area. Carrier tower locations will be noted and the azimuths from the test location to those towers will be avoided, as will residential areas and the carrier's subscribers who live there. Nevertheless, Equinox will cease any and all operation in the event of an interference complaint from an authorized user and will not resume any test operations unless and until the interference complaint is addressed to the satisfaction of the complainant.

The “stop buzzer” contact for all locations will be Mr. Randal Morser, whose mobile telephone number is 443-822-0952.