From: Nick Denniston

To: Hung Le
Date: February 04, 2020

Subject: Request for Info - File # 0027-EX-CN-2020

Message:

Hello,

The balloon flight plan changes based on customer program, time of year, and prevailing wind directions; this is why we were seeking a more general experimental license as opposed to a flight-by-flight STA. The 800km was copied from a previously approved STA application; I am modifying that distance to 400km (approximately 200nm), which is the maximum ground-to-air distance we are attempting to achieve reliable communications over.

I am adding additional antenna details to the Exhibit. I've copied the text below.

Purpose of Submission: Conduct High-Altitude Balloon testing using Mobile Networked MIMO (MN-MIMO) radios in support of DoD programs. Testing supports the development of a persistent surveillance platform to combat homeland security threats, deter narcotics trafficking, and provide other national defense support. Ground station is a temporary fixed platform in place for the duration of the balloon flight only and will be used to downlink high-rate payload data from the balloon. Balloons may also relay data to other balloons in a mesh network, but at a much lower EIRP.

Three types of temporary fixed tracking antenna platforms will be used:

Config 1
Dual 2-channel dish, 2x AirFiberX AF-2G24-S45, 13.4°, 24dBi

Config 2
Dual 2-channel MIMO patch, ITELITE PAT2319DPX2, 20°, 19dBi

Config 3
2-channel dish, AirFiberX AF-2G24-S45, 13.4°, 24dBi

The antennas are mounted on a tracking system that points towards the balloon based on its GPS location. Typically, the antenna vertical orientation is at max (60°) shortly after launch during balloon climbout; angle decreases beneath 30° at a ground distance of about 5nm, beneath 20° at a ground distance of about 25nm, and beneath 10° at a ground distance of about 50nm.

The horizontal orientation depends on the direction of flight for that day, which varies based on customer program, time of year, and direction of winds. The max expected ground-to-airborne distance is approximately 200nm.