**Task 3-5: Robust Conformal Antennas for UAS Communication**

***Technical Accomplishments***

Setup

*Brief discussion of setup used, if any, including vehicles, sensors, ground systems, etc.*

An Ascending Technologies Hummingbird with Ascending Technologies Firefly landing gear was used with an Odroid XU4 mounted beneath the vehicle and an additional XBee Pro attached to the Odroid. A Futaba 7C was used as controller. Software used included VMWare workstation 12, Ubuntu 14.04, ROS Jade, and mit\_asctec.

Operations

*Operational results including number of flights, hours, personnel, etc.*

The vehicle with FAA certificate number: FA3RRRYXHF also known as Jenny performed 22 takeoffs, 3 takeoffs on Tuesday 28 June, 2016 and 19 takeoffs on Thursday 30 June, 2016. The vehicle had a total flight time of 0.75 hours or 45 minutes. W. Willie Wells coordinated flights while Ajay Shankar piloted the vehicle in GPS enabled manual mode.

Data

*Data acquired from both technical and operational aspects of exercise – does not need to include interpretations (at this time) but can if analysis is available.*

Data collected included Received Signal Strength Indication for different distances.

Discussions

*Summary of campaign related technical/scientific objectives from proposal and progress achieved.*

The XBee Pros used exhibited short range in both the horizontal and vertical directions. Investigation into the cause of this anomalous data is in process. Interference from neighboring vehicles, ambient temperature, as well as the XBee Pros used being inferior when compared to the XBee Pros used by Ascending Technologies may be possible contributing factors to the short range achieved. Further experiments revealed that the XBee Pro connected to the base station was not working properly. When this XBee Pro was replaced expected signal range was observed.

***Connections***

*What connections were made during the campaign? Include relevant faculty and student interactions, whether they made lead to collaborations or not.*

It may have been beneficial to meet the lead on this task. Discussing problems encountered when using custom software in concert with the Mavlink protocol with Dr. Hoagg and B. J. Wellman was beneficial.

***Goals for Next Year***

*Ideas and concepts for next flight campaign. Discuss both intellectual merit and broader impacts of the goals as related to the specific task and overall proposal objectives. List specific multi-university/cross-jurisdictional collaborations.*