

MicroCart (Microprocessor Controlled Aerial Robotics Team) sdmay19-20

February 25 — March 10

Client/Advisor: Dr. Phillip Jones

Team Members

James Talbert — *Hardware*

Sarah Koch — *Controls*

Anthony Bertucci — *Ground Station*

Summary of Progress this Report

- **James**
 - Determined and resolved the cause of flight instabilities on the quad recently
 - A motor had been slowly wearing out.
 - With a new motor, the quad flies acceptably in manual mode
 - Determined bias values for the MPU-9250 IMU as mounted on the PCB
 - Performed successful flight tests with the PCB
 - **Sarah**
 - Added step response testing to the overall controller testing procedure, based off of feedback from Dr. Jones
 - Edited the Simulink simulator to make it easier to alter the controller and simulation inputs for autonomous mode
 - Researched testing rig designs as we currently have a rig for testing yaw only
 - **Tony**
 - Determined an issue with code in quad software side of real time data logging feature
 - Began debugging the many problems present in the above software
 - Determined and began debugging an issue involving an unused bluetooth dependency that was preventing the creation of new groundstation builds
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Pending Issues

- **James**
 - The new MPU-9250 IMU provides less smooth flight. It's difficult to quantify without full log data
 - I am unable to connect over a TCP port to the WiFi<->UART bridge on quad 1, which prevents me from extracting log data
 - With the ground station unable to communicate with the local network, my ability to gather log

data for analysis is limited

- **Sarah**
 - Difficulties with the IMU on the quad have delayed controls testing
 - Problems with the Ground Station prevent controls testing for autonomous mode
 - The Simulink simulator assumes the flight is autonomous and uses setpoints as inputs. In order to perform testing in manual mode I will need to alter the simulator to also accept manual mode inputs.
 - **Tony**
 - Due to the difficulty in determining the exact files necessary to satisfy the bluetooth dependency, it may be more beneficial for the time being to remove/comment out references to bluetooth within the code (as it is not used) to allow progress to continue
 - After the ground station computer was rebuilt by ETG, it suffers from significant hangs whenever the LAN cable is plugged in
 - This will be an incredibly significant issue when we wish to use the camera system to test
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Plans for Upcoming Reporting Period

- **James**
 - Assist Tony and Sarah with their tasks that require a functioning quad (now that we more or less have one)
 - Assist tony in diagnosing issues with the ground station's system setup after it was rebuilt
 - **Sarah**
 - Alter new controller testing procedure to include an option for manual mode testing
 - Alter the Simulink simulator so that there is an option for manual mode inputs
 - **Tony**
 - Continue debugging the quad software side of RT data analysis for functionality
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Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
James Talbert	<ul style="list-style-type: none">● Diagnosed and repaired system failures on the quad	5,7	139
Sarah Koch	<ul style="list-style-type: none">● Developing safe testing procedure for new quad controllers	5,3	105
Anthony Bertucci	<ul style="list-style-type: none">● Determined issues with build process as well as quad software created by another team member● Began debugging these issues to allow for a new stable build of the quad to be	5, 5	106

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Gitlab Activity Summary

Action: pushed to, Mon Mar 04 2019

Author: bertucci

Title: begining to make necessary fixes to Tina's addition to allow build...
