

sdmay18-17 MicroCART (Microprocessor Controlled Aerial Robotics Team)

Week 18 Report

Reporting Period: 2/19/18 - 2/25/18

Team Members

Blake Pries -- Communications Lead

Dane Larson -- Ground Station Lead

Matthew Kelly -- Documentation Lead and Webmaster

Tyler Imboden -- Quad Software Lead

Jakub Hladik -- Test Lead

Kyle Trost -- Team Lead

Peter Thedens -- Repository Lead

Austin Rohlfing -- Controls Lead

Summary of Progress this Report

Generals Tasks for entire team:

- Keep building second quadcopter.

Quad Software - Tyler and Kyle:

Summary for progress this report:

- Further tested the updated quad hardware
- Found out that our pwm module takes 2 inputs(width and period) confirmed working on new hardware
- Implemented more hardware tests which match the old hardware

Pending Issues:

- Hardware still not working(PWM output not accepted by motors)
- No idea where the problem above is happening (further debugging required)

Plans for upcoming reporting period:

- Get hardware working
 - Expand hardware tests to start supporting motors and controller input
 - Start looking at different properties such as clock cycle
 - Start looking through software to determine incompatibilities

Controls - Austin and Blake:

Summary for progress this report:

- Implemented Matt Rich's "Improved LQR" controller in the existing Simulink setup
- Began working on manual assist flight with the help of Matt K. and Jakub.

Pending Issues:

- LQR in simulink runs, but is super unstable when all input channels enabled (see *Figure 1* on last page)
- Velocity not currently a factor of simulink sensors

Plans for upcoming reporting period:

- Update LQR for modern or generic parameters

Testing - Peter and Jakub:

Summary for progress this report:

- Opened merge request for Makefile readme (Peter)

Pending Issues:

- Still dealing with the control graph customization (Jake)

Plans for upcoming reporting period:

- Examine Data Analysis Tool files (Peter)
- Work with Jake on interfacing with control graph (Peter)

Ground Station - Matt and Dane:

Summary for progress this report:

- Presented technical challenges in senior design class. (Matt)
- Started merge request for issue 44. (Matt)
- Recalibrated camera system. (Matt)

- Issue 43 working (Dane and Matt)
- Adapter working (Dane)

Pending Issues:

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Plans for upcoming reporting period:

- Clean up backend and backend files. (Matt)
- Work on GUI. (Matt)
- Clean up 43 and merge with 44 (Dane)
- Get in touch with blake to help with assisted manual mode (Dane)
- Move to next goal (Dane)

Name	Role	Contribution	Hours worked	Total
Peter Thedens	Repository Lead	Open merge request for Makefile readme	3	97
Austin Rohlfing	Controls Lead	Implemented Matt's LQR in Simulink	7	121
Kyle Trost	Team Lead		4	155
Matt Kelly	Documentation Lead	Started Merge request for issue 44 and recalibrated camera system.	16	159
Dane Larson	Ground Station Lead	Adapters working and tested. Cleaning up and submitting a merge request	5	117
Jakub Hladik	Test Lead	Continued work on the controls graph.	3	107

Tyler Imboden	Quad Software Lead	continued work on 2nd quad	6	113
Blake Pries	Communications Lead	Began working on the manual assist flight mode. Some drone assembly/soldering	7	80

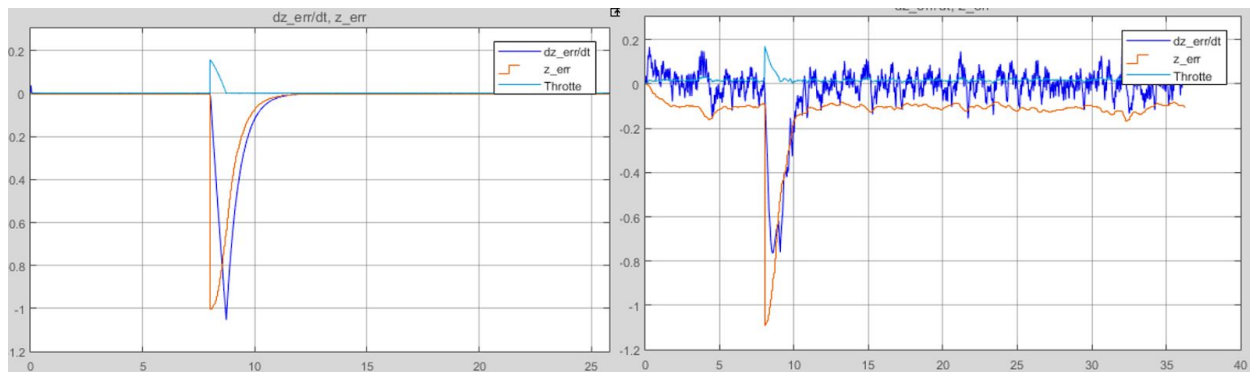


Figure 1. System unstable when all input channels are active. Plots shown are z-position (relative to setpoint), z-velocity, and throttle input (not to scale).