

Senior Design May 22, 43

MicroCART Senior Design Team

Week 13 Report

January 25 - January 31

Faculty Advisor: Philip Jones

Members:

Ryan - System architect

Zach - Groundstation lead, co system architect

Reid - GUI team lead, Test station sub-team

Ellissa - GUI sub-team

Colton - Git manager, Firmware lead

Carter - Web Master, OptiTrack Lead

Brandon - Project Lead, Test Station lead

Links

- [Shared Google drive folder](#)
- [Order list](#)
- [Crazyflie inventory](#)

Summary of Progress this Week

- Removed position and velocity portions of student controller, consolidated source code down to be easier to understand. - Colton, Ryan
- Researched updating the crazyflie over USB using the microcontroller's DFU mode. Needs additional work to fully implement, in progress. [Issue #81](#) - Colton
- Working with Zach to create a new attitude rate setpoint communication protocol. Need to define packet format the ground station will send to the crazyflie for attitude rate PID control. [Issue #93](#) - Colton

Pending Issues

- -----DR. JONES ATTENTION REQUIRED-----
No longer need temp_crazyflie_repo
(<https://git.ece.iastate.edu/danc/temp-crazyflie-repo>), but don't have permission to

delete it. Jones needs to delete it, settings > general > advanced > delete. I created this repo while troubleshooting.

MicroCART_Crazyflie_Firmware repo can also be deleted (https://git.ece.iastate.edu/danc/MicroCART_Crazyflie_Firmware), this was a pre-existing repo that was blank and unused, currently only has a copy of the stock Crazyflie firmware and will not be used - Colton

Individual Contributions

Team Member	Contributions	Hours	Total Hours
Brandon Cortez	<ul style="list-style-type: none"> - Trained on SIC 3D printers - Printed prototypes of test stand leg extensions for pitch/roll orientation - Designed possible alternative test stand pitch/roll orientation - got side mount printed and began testing 	5	75
Reid Schneyer	Trained on SIC 3D Printers, redesigned PCB	5	74
Colton Glick	<ul style="list-style-type: none"> - Simplified student controller by removing position controller - Removed redundant function calls for the attitude rate controller - Explored DFU flashing modes - Spoke with Crazyflie dev, will be working on streamlining usb flashing https://github.com/bitcraze/crazyflie-firmware/issues/923 - Understand USB requests and DFU mode more, working to implement communication loop to reboot into DFU mode - Working with Zach to setup new setpoint packet protocol to control the crazyflie with <i>attitude rate</i> PID control, needs work 	8	89
Ellissa Peterson	Creating ground station GUI: Determined data that needs to be displayed Set up Bitcraze VM to use crazyflie software	6	50
Ryan Hunt	helped remove redundant function calls and created more layers to the student controller.	5	61

Carter Irlmeier	Met with ETG and Fan after meeting, waiting on Jones to help with data streaming before moving forward	2	52
Zachary Eisele	Worked on decoding packets from adapter Setparam is working Getparam is working but has an issue Logging file is set up, needs firmware update to log proper values	8	101

Comments and Extended Discussion

- Firmware team and ground station team will be working together this week to set up rate setpoints through ground station and to work on setting up a full version of the log file

Plans for coming Week

- Would like to get a QT PY controller and 3D printer filament ordered.
 - Need to check sizing of QTPY pins, had to do some hacky stuff to kicad footprint
- Test and decide on final test stand/leg configuration and design
- Design and prototype PCB housing
- Get USB firmware flashing working - Colton
- Write new attitude rate setpoint packet protocol for firmware - Colton