

EE CprE SE 491 - MAY15-28

MicroCART Senior Design Team

Meeting Minutes - Week 7

October 14, 2014

Attendance:

Team Members: (All Present)

Paul Gerver
Tyler Kurtz
Joe Benedict
Jacob Rigdon
Matt Vitale
Ravi Nagaraju
Adam Campbell

Advisors: (All Present)

Dr. Phillip Jones
Dr. Nicola Elia

Agenda Items and Discussion

1) Bluetooth and Wi-Fi communications

- Able to pair Bluetooth with laptop and configure Bluetooth module from a "factory reset" state using Putty on the laptop
- Currently unable to send communications from the Zybo back to the laptop
 - a) Issue may be related to the SDK workspace sharing all the tasks
- Next steps:
 - a) Restructuring the SDK
- Work on 2-way communication after project is rebuilt

2) Motors

- Motors run fine on 450 Hz frequency
- Confirmed there's no performance difference (RPM measurements) between 450 Hz and 50 Hz signals
- PWM decoder is working
- Next steps:
 - a) Establish a 5.0 V supply to run the receiver (Zybo may supply 3.7 V only)
 - b) Bind receiver to transmitter
 - c) Begin writing the mixing code

- 3) Zybo board
 - Mounted on the Flame Wheel chassis (easily adjustable and replaceable)
 - Next step:
 - a) Find a way to tap 5.0 V from the board for the receiver power
- 4) 3-axis sensor
 - Appears the clock is too fast and still trying to identify the cause
 - Disabling the interrupts was suggested
 - Dr. Jones suggested more team members assist with this important task due to the complicated nature of the issue
- 5) Data logging
 - Develop file format that allows proper file retrieval for plotting
 - Next steps:
 - a) Run tests with demo quadcopter to verify flight data is captured and plotted properly (automatically?) after test ends
- 6) Battery regulators
 - KiCad PCB design tool is not user friendly
 - Will use Eagle design tool instead (compatible with Gerber file type)
 - Dr. Jones advised Gerber file type is best for PCB designs (universally recognized)
 - Functions needed on the Zybo battery regulator
 - a) Step-down voltage from battery input to steady 5.0 V
 - b) Output signal for monitoring the battery voltage level (sent to Zybo)
 - c) LED to indicate low battery
 - d) LED to indicate reverse polarity of battery connection
 - e) Cut-off battery protector to prevent over-discharging
 - Functions needed on the motors battery regulator
 - a) Output signal for monitoring the battery voltage level (sent to Zybo)
 - b) LED to indicate low battery
 - c) LED to indicate reverse polarity of battery connection
 - d) Cut-off battery protector to prevent over-discharging

Deliverables for next week

Ravi

- Updated voltage regulator schematics sketched by Monday
- Update website with links to wiki page, relevant datasheets and other information

Jacob

- Focusing on Bluetooth communication with the Zybo Board

Paul

- Help with establishing communications with the sensor board
- Perform a test flight of the demo quad and automatically plot the flight data

Tyler

- Study the camera system
- Understand how to work the Tx receiver through C code or the FPGA board
- Work on getting the board onto the copter for some tests

Joe

- Continue characterization of the quadcopter for simulations
- Continue with online controls course via Georgia Institute of Technology
- Create design file in AutoCAD for the adapter to connect the quad to the test bench
- Learn about PID controllers
- Teach Matt how to use AutoCAD design software

Matt

- Continue working on the 3-axis sensor board to establish 2-way communications
- Learn how to use AutoCAD design software from Joe

Adam

- Work more with the Bluetooth module and get bi-directional communication working between the Zybo processor and my computer