MN Space Grant 2015 – 2016

Community College Quadcopter Challenge

Post-Challenge Report

Team Name

[Insert a photo showing you and your quad on the competition day, posed or “in action”]

Written by: (full names of all students)

Advisor:

Institution:

Report Date:

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1. **Executive Summary** *(Remove all explanatory text before submission.)*

This report, documenting results from the challenge event, is essentially as an Appendix to your earlier reports so you do not need to go over material that was covered in earlier reports. This Executive Summary should be 1 page (max) of text only briefly stating what happened at the challenge (both days) and, in general terms, how it went. If you suffered any crashes or other types of failures, mention them here (or below) and explain whether or not you were able to repair/recover/continue.

1. **Vehicle Changes Since Earlier Reports**

Briefly explain here, with text and photographs, changes/additions (if any) made to your vehicle since the last report. If you didn’t make any changes between the CDR and the competition, say “None” but leave this section in place to preserve sequential numbering.

1. **Promotional/Education Video and Unique-Capability Video**

Comment on how your videos turned out and include links to where they can be viewed on-line. Note – if you didn’t post your own videos, check with the TAs about where they have re-posted the videos.

1. **Oral Report**

Give some general comments about how the Oral Report went and include at least one photo, with a caption, of the team delivering this report. Note that photos of every team giving their oral report are posted. This section can be brief and is not intended to cover the content of the oral report. Instead, it is included as evidence that the Oral Report was an important part of the challenge event.

1. **Walk-Through Overview (or “Akerman Practice Data Collection”)**

Describe the practice data collection you did in the Akerman Hall atrium on Friday evening and include at least one photo, with a caption, from this activity. Talk about how things went, what you learned from this exercise, and how this activity influenced your team’s approach to Saturday’s in-flight data collection. Save any discussion of actual results (you will present this practice data only if you didn’t get data from actual flying on Saturday) for the sections below.

1. **Challenge Flying Overview (or “Armory Gymnasium Morning Events”)**

Describe what you did in the gymnasium in the morning and include a few photos, with captions, of your team “in action.” Perhaps describe activities in the order your team did them. Save discussion of any actual results for the next sections.

1. **Camera Mount Overview**

Remind the reader what camera(s) you flew for different parts of the challenge, how cameras were mounted and switched between look-out and look-down views, when you used which view, and who on the team watched the camera feed in real time (if you implemented a video telemetry system – that was optional). Wait to give details about the quality of the actual images collected in the sections below.

1. **Sensors and Operations Overview**

Remind the reader what sensors and non-camera hardware you flew for different parts of the challenge and whether or not you swapped out equipment during the challenge. Also talk about Operations – basically who was doing what and how did that go? How did you split your time between flying and not-flying? Who were your main pilots? Was someone watching real-time data telemetry (optional) and what did they do with the data they observed? Or did you pull SD cards and take a preliminary look at the data while the flights were still in progress (optional) and, if so, who did it and how useful was that? Wait to give details about the quality of the data collected in the sections below.

1. **Results: Close-up Imaging**

Briefly describe the close-up imaging course and how well your team did flying it. Include your best (raw) photos and your best (processed) photos, for comparison. For example, photo processing might include zooming in, cropping, adjusting contrast and/or brightness, etc. If you did not have a flying ELEV-8 by the time you reached the close-up Imaging part of the challenge, ask Prof. Flaten (in real time!) about options then explain here what you did as an alternative exercise. What might you do differently if you were to try close-up imaging again?

1. **Results: Exploration – Mapping, Sensing, and Sample Return**

Briefly describe the exploration course and how well your team did flying it, focusing mostly on what you got done rather than on what you didn’t accomplish. (Note – if you were unable to fly the exploration course at all on Saturday, explain why and present your practice exploration results from the Friday walk-through course instead. But if you were able to collect at least some flight data, present that instead of walk-through data even if it isn’t as high quality. If you were only able to fly part of the exploration course on Saturday, ask Prof. Flaten (in real time!) about options.) Include some representative still photos from your in-flight video, a 3-D map (hand-drawn is OK) with labels and dimensions (see posted sample map). Explain how you were able to put length units on your map. State sensor values for ambient conditions and describe any anomalies you discovered. Talk about sample return – which samples did you try to collect and how did that go? If you were able to collect samples, show a photo of each and describe what the samples were (based on visual examination). Talk about any fouls – vehicle exiting past scratch lines, the need for team members to enter the course, etc. Talk about any crashes and/or repairs you had to make during the exploration time. Describe what you might do differently if you had more time or were given another crack at an exploration course.

1. **Unique Capability**

Remind the reader what you implemented for your Unique Capability and explain how that worked out. Point out explicitly whether or not you used the unique capability in the challenge itself and, if so, how well it worked. Include at least one photo, with a caption.

1. **Mystery Challenge(s)**

Briefly explain the mystery challenge(s) and talk about how they went. Include at least two photographs, plus captions as always, of your team “in action” here as well.

1. **Lessons Learned**

State at least three things your team learned from this year’s quadcopter challenge. These might relate to hardware build/test/fly or else to team functioning/planning/operations or else to data analysis/report writing.