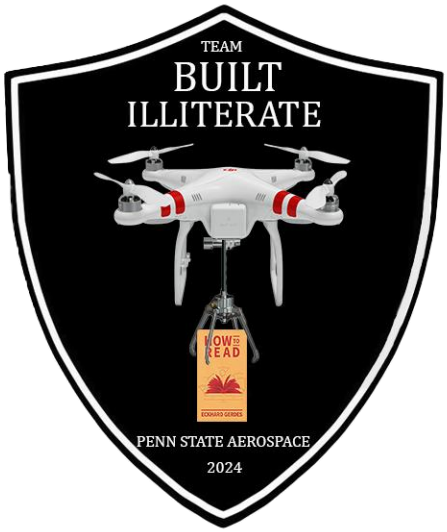
# Flight Safety Checkout Milestone




March 26, 2024

## Achievement

For what our team understood as the evaluated criteria of the milestone, I would say that we completed it on time. The date we set for ourselves to be ready to be evaluated was February 20th, and we were ready to be checked by the end of this class period. However, professors were busy with their own work and helping other students, not to mention there was not much time left in the period, so the team's first evaluation was completed at the beginning of the next class, February 22nd. Sadly, our drone was not passed, so more work was needed to be allowed to fly.

Several weeks went by, including spring break, where software/logic issues were being worked on until the team was finally able to have a successful Flight Safety Checkout (FSC) on March 14th. This gap in time took longer than anticipated to fix our issues, but we were finally able to have it completed about 2 business weeks later than the original deadline.

## Roadblocks

The major roadblock the team encountered was creating the controller for throttle and maneuvering the drone. The trouble started with mapping the throttle to an appropriate number range for the Arduino to understand the pulse width modulation (PWM) output for the motors. Then, tuning the logic for controlling the speed of each motor during roll, pitch, and yaw became tedious. Sometimes a motor would stop spinning, other times the motors would try to correct the drone in the wrong direction, but most of the time the motors did not react enough to the user or automatic correction inputs. Through much trial and error, the team has gotten to a point where the logic operates as it should, and the motor reactions need to be tuned through gain values.

This roadblock could have been avoided, or at least lessened, if the team understood what was expected of us for the FSC. In the email we received from Dr. Johnson at the end of January,

the team did not interpret that needing “good” maneuverability of the drone was necessary, just that pilot commanded maneuvers existed. This misunderstanding led us to believe that our first FSC would grant us a success, which was not the case. Working logic for the controller – both pilot-commanded and automatic – could have been tinkered with while the kill switch and stick mapping was being done. By overlapping our work, the milestone could have been met closer to the initial due date.

## Lessons Learned

I feel as though there were not as many lessons learned, as there was just general learning occurring during the process of figuring out the logic. Understanding the way that onboard electronics perceived the code was more challenging than expected and should have been allotted more time to complete than what was given. Also, realizing that taking a step back to look at the whole picture of what is going on can help determine a better route to solving the problem. Several times, the team was attempting to solve a coding issue, but in the process of trying to solve our issue, we realized that it had already been solved elsewhere in the code and time was just wasted.

Finally, tying back to the second paragraph of the Roadblocks section, reading instructions more clearly and even asking questions to specify information can go a long way. Time can be saved by having multiple group members attempt to work on various parts of the code if it is known that a problem needs to be solved. This will allow for better time management on milestones moving forward.