

2023 Finals Competition - Lessons Learned Brainstorming

These notes were started at a brainstorming session on 7/27.

Suggestions:

- Try putting mapping person next to monitor watcher person
- Try using external display with laptop for Mission Planner Specialist
- Try putting monitor on tripod
- Better callouts?
- Try using Life360 to keep track of team member locations
- Better battery mounting solution (e.g., Skydio's magnetic solution)
- Velcro straps on sides (not just front and back)
- Grabber Redesign
 - Better servo mounting solution (e.g., smaller servo directly mounted onto grabber)
 - Ratchet solution that allows us to use one servo for two different things (Bobby found a good product to consider: <https://www.vexrobotics.com/217-6048.html>)
 - Better way to open and close the grabber (not relying on callouts - use timing and/or button)
- Servo motor should have an encoder so that team knows exact position
- Didn't have voltage sag here like we did at home (maybe because targets are closer together? Or due to air quality? Or altitude MSL? Air water content?) → check log files
- Consider adding alternate power source during battery swap (took too long to connect sometimes)
 - Why did it take long the first time but not the second time? (For GPS lock)
 - Pixhawk could be powered by BEC
- Alternate charging scheme (like Swing's platform)
- Dedicated role for understanding rules and ensuring compliance
- Role assignment to manage budget and expenses (and maybe do fundraising)
- Make money with our Skydio
- Program Mission Planner to verbally announce battery voltage (and mission time if possible)
 - Or use another device for timer (with automated announcements)
- Always set a rally point to meet after group gets separated
- Buddy system (especially for newbies)
- Review itinerary every day (nighttime or morning or in car)
- Use calendar appointments or some other reminder technique (specific app?) for important items in itinerary (e.g., team photo, award ceremony, etc.)
- Bring fold-up chairs, umbrellas
- Bring ear plugs (for Air Show noise)

- Using landing pad for Air Show was good
- Take team photo with check and trophy (if we win) IMMEDIATELY (on the runway)
- Didn't identify booth location with the 1-week plane building activity in advance, so missed it
- Drone packing strategy worked well
- Last Shuttle from Seaplane Base to main venue is at 8pm so good to park at Seaplane Base for the full day IF we want to picnic lunch at Seaplane Base
- Missed GirlVenture activities; be aware of these next time (missed seeing Beth's friends who are retired combat pilots - Kim Campbell and Tammy Barlette).
- Can use bottled water tied with string to corners of targets to weight them down during practice (saw this at the Warbirds Tram Tour)
- Discuss plans for the prize money in advance of the competition (have a "debate" style discussion of what to do with the money IF we win 1st, 2nd, or 3rd place)
- Need to add emergency contact phone number(s) to travel permission form
- Need to have minimum practice participation requirement in order to participate in Finals
- Do we have visibility into other team's Ground School scores? If so, we should compare our performance against MacIntosh's. (They won by 1 point, and it could have easily been a tie, in which case the Ground School scores would have been used.)
- It was a good idea to practice with Quadzilla on the Friday before the competition, to avoid risk to the competition drone that close to leaving for Wisconsin

Surprises:

- No ground school questions
- No submission of GPS coordinates
- Video Tx power constraint in rules and how/whether we complied
- Ethan's phone number was bogus so he missed group texts
- Only 2 showers (should have checked the listing more carefully)
- House description misleading on number of beds
- Parking cost \$25/day (last year, it was \$15)
- Beth's fighter jet pilot friends were at AirVenture (didn't check prior to trip so not able to take advantage of the opportunity)
- We don't know how much we spent on building Jeff and the RTMT (need to figure that out and do a better job of tracking for next year!)