Introduction to Drone Technology (IDT)

Airport Work Preparations

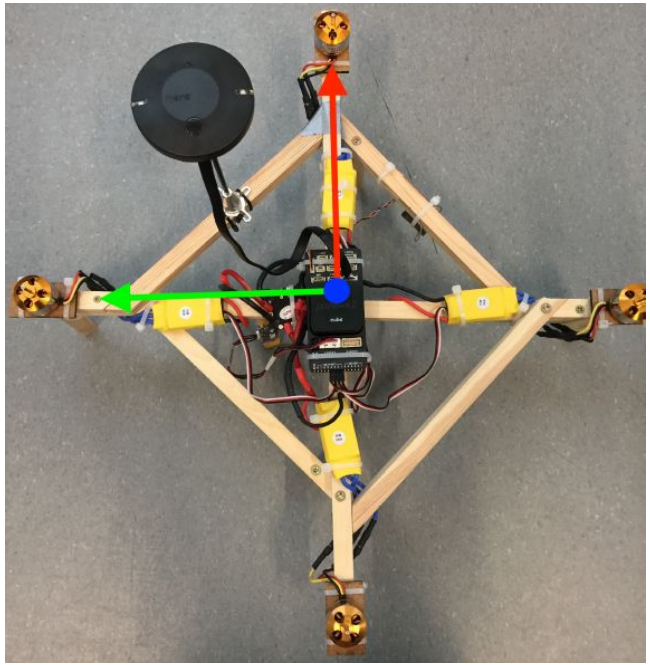
Schedule

Week	Date	Module	Content
47	Nov 22nd	9	Drone Construction
48	Nov 29th	10	Flight Controller Configuration, Calibration, Indoor Tests
49	Dec 6th	11	Outdoor Test Flights, Flight Path Recording*
50	Dec 13th	12	Outdoor Autonomous Test Flights, Course Evaluation

- Transport between SDU and HCAA (meet outside TEK entrance)
  - Bus leaves at **8.15am sharp,** arrive back to SDU at **16.15**
- Bring photo ID (driving license/passport) for airside access weeks 49 and 50

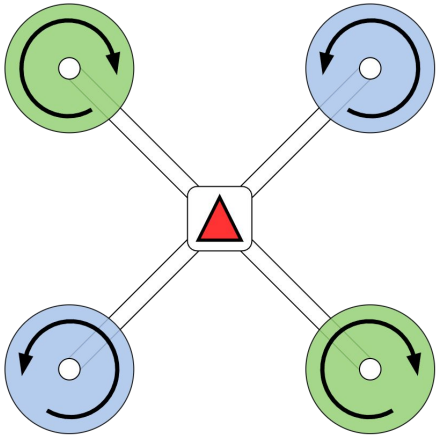
NB: Limited Food options at the airport, there is also a vending machine and coffee machine.
Recommendation: bring a packed lunch.

Task overview

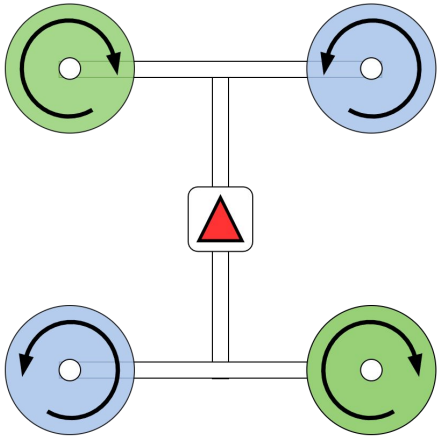


- Step #1: Build a frame
  - Design considerations
- Step #2: Mount and connect hardware
  - Pixhawk 4 Mini Wiring Quick Start
- Step #3: System Configuration and Calibration
  - Continues work from Module 06
- Step #5: First flight and tuning (inside the drone cage)
  - Multicopter PID Tuning Guide
- Step #6: Outdoor flights (both manual and mission)
- Step #7: Autonomous Outdoor Flights (using recorded flight plans)

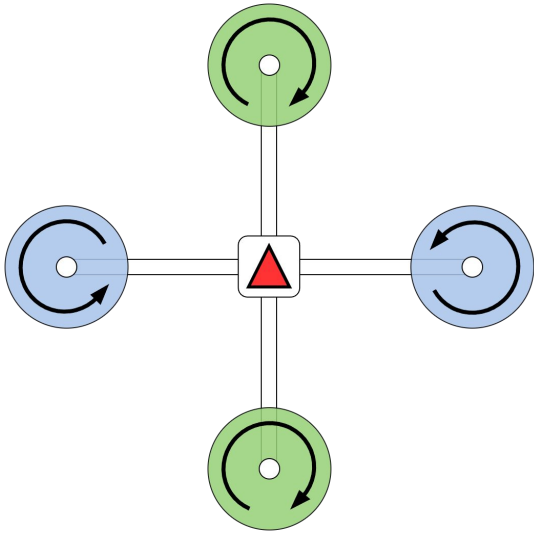
Recommended Configurations



X Type



H Type



Plus Type

Materials and Resources

Materials

- Wood Spars (assorted thicknesses)
- Plywood Plates (3mm, 6.5mm thickness)

- Wood screws
- Assorted Nuts/Bolts
- Zip ties
- Tape
  - Double sided
  - Electrical

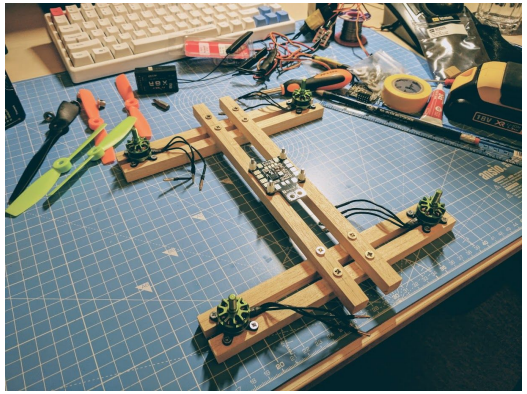
Resources

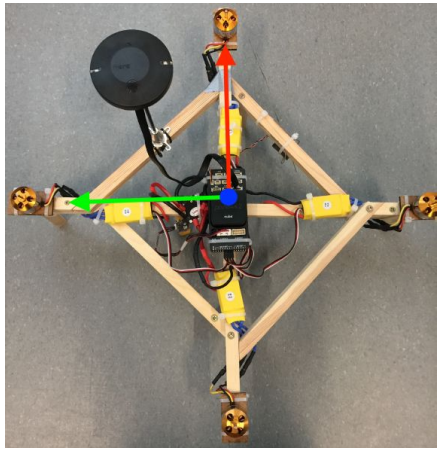
- Tools
  - Drilling
  - Filing
  - Sawing/cutting
- 3D Printing
  - Small parts only - no whole frame.
  - Not providing support for designing/printing

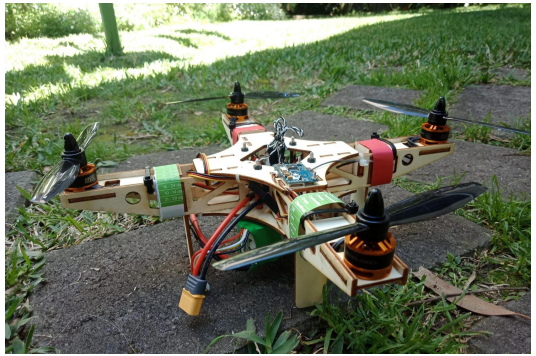
Design Considerations

- Weight vs Time - tradeoffs
- Repairability in mind - Keep it simple, easy to fix in event of crash
- Mounting battery to frame
  - Must be removable
  - Easy to access connector (in Case of Emergency)
- Positioning of components
  - Flight Controller placed near centre of mass
  - Propulsion electronics and control hardware
- Landing legs
  - Ability to withstand heavy landings
  - Provide clearance from grass

Design inspiration







Preparation Tasks

- Decide on Frame Configuration (X-type, H-type, Plus-type)
- Create a rough sketch
  - Positions of components on the frame
  - Dimensions of arms and baseplate
- Read through four Drone Components sections on Confluence (Link)
  - Flight Control hardware
  - Powertrain
  - Communication and Control
  - Batteries and Electrical Power

Questions?

Contact through ItsLearning