Introduction to Drone Technology (IDT)

Module 11 - Maiden Flights

Class Objectives

Primary

1. Run through checklists and conduct flight operations.
2. Fly manually in Position mode
3. Record GPS coordinates for processing and optimising
4. Fly autonomously using mission mode.

Day Schedule

0900 - 0930	Presentation with Christian
0930 - 0945	Safety Briefing
0930 - 1010	Prepare for flight, Ready to go airside
1030 - 1200	Flight Slot #1
1200- 1300	Lunch Break, prepare to go airside
1300 - 1315	Prepare at flight line
1315 - 1515	Flight Slot #2
1515 - 1545	Debrief, Flight Log Submission

* = Estimated Time

Airside Rules.

- Same rules as bigger commercial airports (CPH, BLL)
- Guest Pass Visible at all times.
- No Smoking, No alcohol consumption when airside.
- Must be accompanied by Tutor when airside (no bathroom breaks)
- Give way to aircraft.

Flying Rules

- Listen to DPA (Drone-Pilot Assistant) and Tutors at all times
  - Do not take off until cleared to do so
  - Land in a controlled and safe manner.
- Be aware of your surroundings.
- **Do not pass the flight line** until instructed it is safe to do so.
- **Never** Fly over fellow students or persons.
- Notify Tutors and Other Teams if attempting an autonomous flight
- Have Fun!

Safety Gear & Clothing

- Mandatory Safety Gear
  - High Visibility Jacket
  - Hard Hat
  - Safety Goggles

- Appropriate Clothing
  - Warm Jacket
  - Thick Gloves and Socks
  - Decent Shoes

Crashes

- Disarm/ Use Killswitch after crash has occurred.
- Do NOT cross the flight line until safe to do so.
- Take a photo of the crash site before picking up.
- Disconnect battery if possible
- Retrieve all parts before moving from crash site
- Return behind the Flight line before assessing.

Verification Field

- 2 Flight Lines
- 6 Supervisors

Mission Upload

- New node: idt_mission
- Requires comma-separated GPS coordinates (Lat, Long, Alt)
- Alternate to use .plan files
- Uses current GPS position as takeoff point
- Return to Home behaviour

> ros2 run idt upload_mission <path_to_file.txt/.plan>

Autonomous Mode

- Notify supervisor before doing auto mode
  - show Supervisor mission plan through QGroundControl

- Arm Drone **manually before** switching to mission mode
- Never arm drone through QGroundControl.

Module 11 Debrief

Group Feedback

How did your flights go?

Did you encounter any problems (or crashes?)

Did you discover anything that is useful for future flights?

Logging

Pilot Log

- Required by law for non-private flights
- Good way to keep track of flight hours

Data

- Date/time
- Weather
- Location
- Drone
- Flight Duration
- Maximum Flight Altitude
- Reason for Flight

Date	Time (24h)	Drone	Location	Weather	Flight Duration (HH:MM)	Maximum Alititude (m)	Purpose	Remarks
06/08/2024	10:00	DJI Mini Pro	Hans Christian Andersen Airport	20 Degrees	0:25:00	120m	Flight Training	Example Entry
30/08/2024	14:00	Mavic 3 Thermal	Halskenbjerg, Herning	25 Degs, No wind	0:25:00	95	Blueberry Field Inspection	CoffeeDrone Flight
30/08/2024	12:30	Mavic 3 Thermal	Henning Thybo, Arnborg	25 Degs, No wind	0:35:00	90	Potato Field inspection	CoffeeDrone - Flights in proximity to Glider school, avoidance of Tug-planes
30/08/2024	11:30	Mavic 3 Thermal	Halskenbjerg, Herning	25 Degs, No wind	0:30:00	95	Blueberry Field Inspection	CoffeeDrone Flight
03/07/2024	13:30	Mavic 3 Thermal	Dalum Landbrugsskole	16Degs, 5m/s Wind	0:10:00	95	Oats Field Inspection	CoffeeDrone Investigation
		Mavic 3 Thermal	HCA Airport		3:00:00	50	Wild Drone sound calibration	

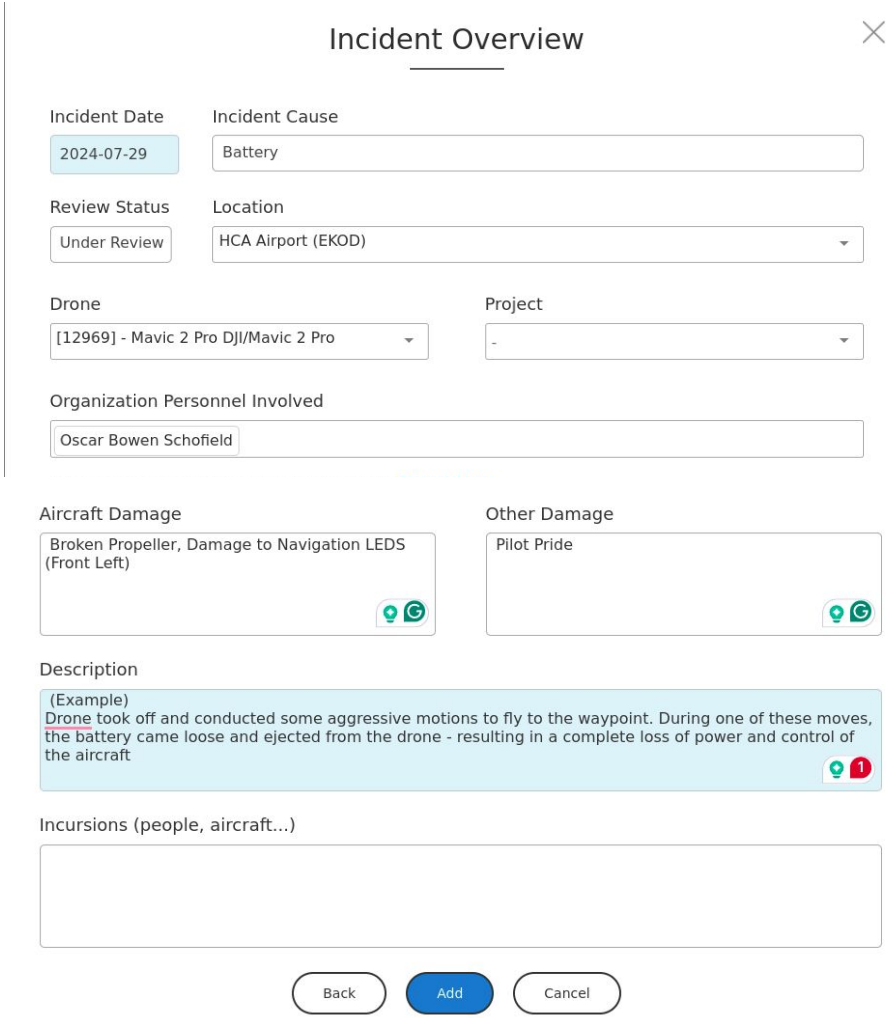
Logging

Crash Log

- Important for documenting cause of crash
  - Risk mitigation

Data

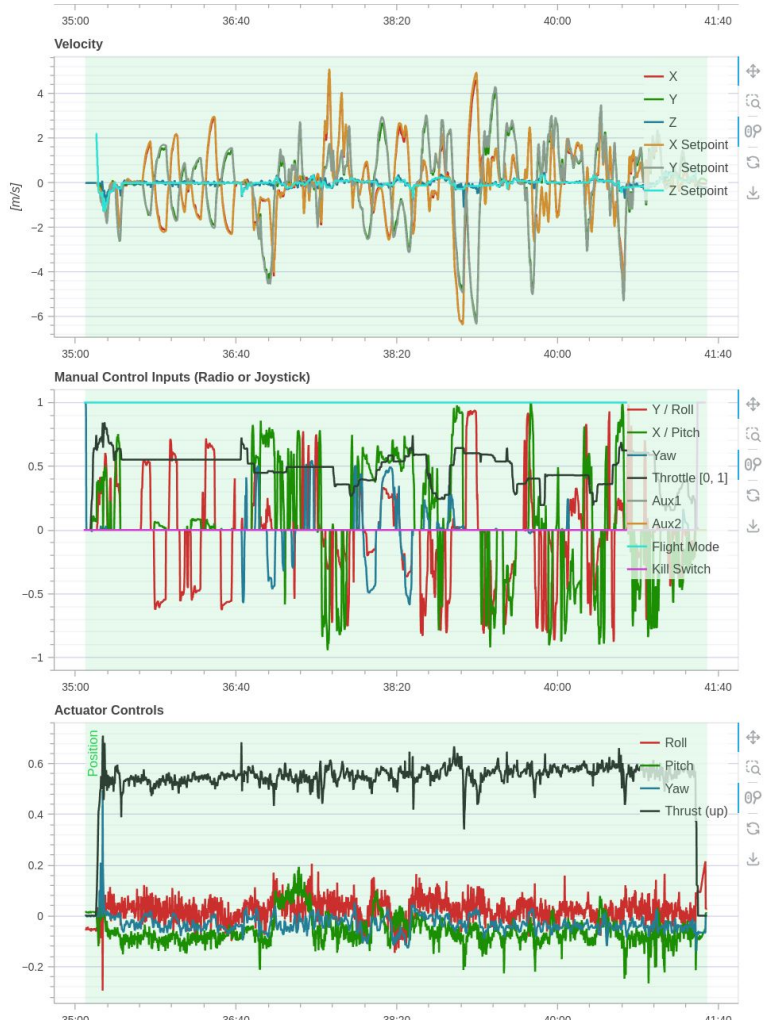
- Date/time
- Weather
- Location
- Pilot
- Drone
- Cause of crash
- Flight Log
- Pictures



Flight Review

During Flight, the Flight Controller saves all information to a ULOG file

- https://review.px4.io
- Data can be replayed to look and assess the performance of the drone
- Example Flight Log



Tasks

1. Download the flight log template and personally fill out piloting
2. Download your flight logs for the day though QGroundControl
    a. Create a brief text file, outlining pilots for AM/PM sessions, crash event (and who flew)
    b.
3. Create a zip folder with your group number and upload to itsLearning
4. Visit review.px4.io and upload a flight log from today.
5. Perform any repairs or preparation for next flight.