Design and build drones for environmental monitoring and sustainable precision farming

Operational procedures

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1 Mission Planning

Communication is key! Both the main operator and co operators are to verbally confirm things are as they should be and when the drone is armed and disarmed.

1.1 Flight planning

The high level part: A list of the environmental conditions, equipment and objective.

- Mission objective: Outdoor test flight for design iteration # 1.
- Date: 10-08-2023
- Weather: 19 degrees centigrade; partly cloudy and wind speeds at about 7 m/s.
- Equipment: fully charged laptop with telemetry, drone, batteries, controller, extra propellers.
- Battery: 2x 5000 mAh batteries. 1 fully charged, 1 at approx. 90%
- NOTAM: cleared for 10:00 till 11:30.
- Payload: None.
- First-aid kit: Provided by instructors.
- Safety gear: High-viz vests, safety googles and possibly hardhats.
- Fail safes: Dead-man switch, Geo-fence (75 meters height) and RC loss (Return mode).
- While drone is not in use: Remove propellers and engage kill switch.
- Arming procedures: Kill switch engaged and battery disconnected while the propellers are mounted.

1.2 Pre-flight

I.M.S.A.F.E for both the operator and 'co-operator(s)'. Done in order to check the health and mental state of the operators as to deem them ready for flight.

- Illness: Both in good health.
- Medication: None.
- Stress: None; both fresh of summer vacation.
- Alcohol: None.
- Fatigue: None.
- Emotion: Both well and happy.

1.3 In-flight

Things to remember in-flight:

- The operator must keep his/her eyes at the drone at all time. If the operator wants more information regarding obstacles, weather, altitude etc. he/she is to ask the co-operator monitoring the system via the telemetry on PC.
- The co operator must keep an eye on weather, GPS signal, altitude and the battery status.

1.4 Post-flight

Post-flight operations and in case of a crash.

- Verify that everything brought to the flight area is returned safely (OBS especially the batteries!).
- In case of data collection: Remember to store the data collected.
- In case of a crash: Salvage and repair
  - Salvage: Leave the crash site as is until it have be investigated. Was it pilot error, hardware, software etc. When done salvage everything and bring it home.
  - Repair: Fix the broken parts and test if the drone is operational again.

Did anything happen during the mission that we can learn from in regards to future missions?