

DUAS24

Posted on 04.01.2024 by Rupert Dent

Category: [Drone](#)

Report Title Minor collision with window catch

Initial Report

Minor collision with window catch resulting in no injuries and no damage to UAS/Drone. During an FPV Indoor flight, when attempting to finish a transition to an open window, the UAS clipped the window catch causing it to lose control and fall to the ground outside from a height of 5m. The UAS fell vertically as designed and shut off power to the motors. The battery detached as designed on contact with the ground. Upon inspection no visual damage to the drone and no error messages received on power up. Test flight flown and normal operations resumed. Security have logged a near miss in accordance with their procedures, incident report form filed in accordance with OA and OM.

Upon Investigation the following conclusions were drawn:

1. Whilst having an open window allows completion of a filming transition, best practice would be to keep the window closed and worst-case scenario accept a low-speed impact with the window by the UAS/Drone as opposed to moving between regulatory regimes from inside to outside filming.
2. When flying in FPV (First Person View) it is accepted that there is a small increase in risk of collision due to the binocular view given by the goggles. Whilst this can be mitigated with experience, protruding obstacles such as the window catches may interfere with the Field of Vision in question and additional considerations should be made when planning the UAS FPV flight.
3. Considering the potential risk of an impact with an uninvolved person when operating outside, a marshal or visual observer should have been present within what could be described as the cone of impact. Whilst the flight was never planned to fly externally, this consideration should have been made.
4. Upon reviewing the footage, it appears the UAS was carrying out a braking motion (Nose Pitching Up) and in an almost stationary hover with minimal forward speed, it appears the collision happened as a result of the braking pitch manoeuvre, causing the impact with the window catch.
5. One safety factor when using a quadcopter is that during a failure or impact the UAS spirals in a vertical path, which means that in this instance it fell extremely close to the building.

However, in an event where the UAS had greater forward motion the cone of impact is increased.

6. The controller used to operate the UAS in this instance does not allow the full range of motion (backwards flight) which may otherwise have prevented the incident after the collision. Consideration of flight path needs closer analysis to ensure any inability to fly backwards is mitigated adequately, or alternatively a standard controller allowing full freedom of motion should be used.

Lessons learned.

In summary it is important to consider the additional risks of FPV flight where a transition from indoor to outdoor flight is planned or a possibility. The Remote Pilot has been briefed on this and will ensure these additional risks are mitigated in future.

Comment

Well, this is an excellent report for the FPV community. These days there are an increasing number of YouTube videos that have been taken by an FPV Drone flying indoors and outdoors, frequently transitioning from one environment to the other, several times. To my mind they create some remarkable cinematic effects and are likely to be used more often in the future. What is worth thinking about, however, is the transition from the indoors regulatory environment (essentially one governed by Health and Safety) to the outdoors regulatory environment (regulated by the Civil Aviation Authority) and, as pointed out in this report, the associated different risk mitigations that need to be considered.

One item that springs to mind from this report is the use of vision protection systems. If the FPV Drone in question had any in the first place, they must have been switched off in order to allow the transition. With them on, unless their activation distance had been reduced to a very low number indeed, they would have made it impossible to fly out of the narrow window, so we imagine they were switched off. If flying a pre-determined scenario using FPV equipment, the general issue of flying in close proximity to anything needs careful risk mitigation. Perhaps it would have been a good idea to fix some red tape to the window catch in order to have made it more visible to the pilot? If vision systems are switched off or are just not available and there is no reverse functionality, these are two particular risk areas that need specific risk mitigation.



