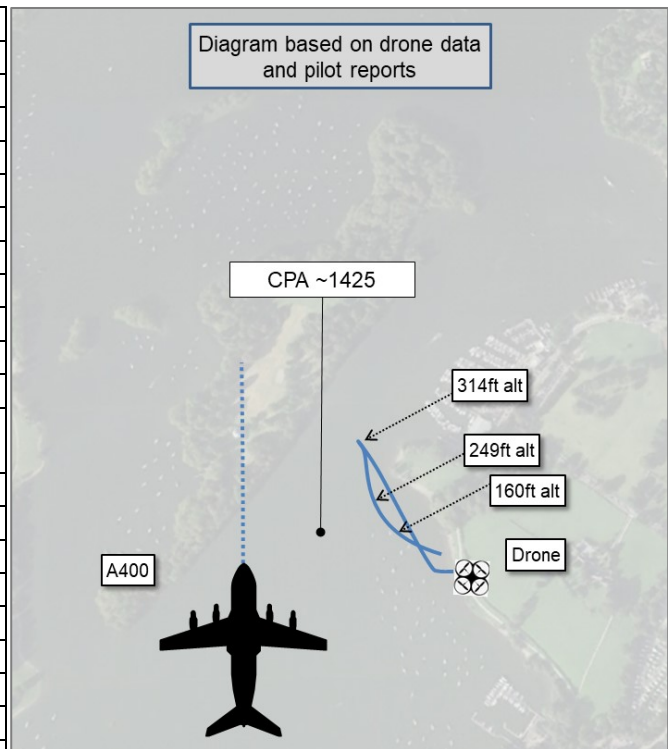


AIRPROX REPORT No 2021001

Date: 06 Jan 2021 Time: ~1425Z Position: 5421N 00255W Location: Lake Windermere

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Drone Quadcopter	A400
Operator	Civ UAS	HQ Air (Ops)
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	None	Listening Out
Provider	N/A	LL Common
Altitude/FL	230ft ¹	NK
Transponder	Not fitted	Not seen on radar ²
Reported		
Colours	Grey	Grey
Lighting	Strobe	Strobe, Nav, landing
Conditions	VMC	VMC
Visibility	8km	>10km
Altitude/FL	160ft	250ft
Altimeter	NK	NK
Heading	350°	360°
Speed	Not reported	270kt
ACAS/TAS	Not fitted	TCAS II
Alert	N/A	None
Separation		
Reported	700ft V/200m H	Not seen
Recorded	NK	



THE DRONE OPERATOR reports that they heard the aircraft approaching and began to reduce the drone’s altitude because they were unable to locate the approaching aircraft’s direction due to the sound reflecting off the hillside. They descended to about 25-30m and decided to fly the drone further towards the shoreline, towards some boats moored in the area knowing the approaching aircraft would not fly close to the rigging and a boat is more visible than a drone. They located the aircraft at about 1km flying out of the sun, they decided to hover over the boats. They believe that the aircraft came to within 10-30ft of their previous location before they had moved their drone. They had checked the NATS site and there were no NOTAMs in place for military low-flying aircraft. They had heard another 1 or 2 drones flying in the area and, about 15mins later when they were returning to their car, another aircraft, a fast jet, flew past.

The pilot assessed the risk of collision as ‘High’.

THE A400 PILOT reports that they were notified by the RAF Safety Centre that the UK Airprox Board had raised an Airprox with a drone. The sortie was planned and briefed as normal with no NOTAM avoids within the Lake District / LFA17 [Low Flying Area 17]. During the low flying booking on the Centralised Aviation Data Service (CADS), RPAS activity was seen and briefed during the mission briefing as "see and avoid" with best effort made to avoid during the flight laterally and vertically. At circa 1420Z, they entered low level in the south end of LFA17. Nothing was seen or noted at the reported time of the incident. It was a crystal-clear day and all 3 crew were heads out in the cockpit during this phase. It is notable that the CADS conflict check & low flying booking comes very late on in the planning cycle, at which point it is difficult to change the route. A NOTAM would be a much more effective

¹ Drone altitude derived from the drone operators flight recording software.

² The A400 pilot reported mode A, C and S, which were visible on radar prior to the Airprox before the A400 pilot descended below radar coverage when entering the low-level system.

protection for RPAS activity as this would be seen by crews at the planning stage and laterally avoided. CADS conflicts are usually treated as "see and avoid" or best effort to avoid laterally and vertically. From CADS, on passing the initial RPAS conflict, they were at 1000ft AGL in the descent and laterally displaced as per the CADS line. This CADS area would match with the time of reporting. The second CADS conflict was avoided vertically, executing this valley above 1000ft AGL.

The pilot assessed the risk of collision as 'Low'.

Analysis and Investigation

A400 operating Authority

There is a bit of a disconnect between the Military 250ft MSD and the UAS 400ft limit in that there is a built in 150ft confliction zone without any requirement for UAS to report their position. I commend the user in this case for submitting a report and for submitting data onto CADS, but CADS is an early situational awareness tool and not a guarantee that everyone is going to avoid you. The team conducted their pre-flight preparation in an appropriate manner and adjusted their planned flight route for the potential CADS confliction using both height and horizontal deconfliction measures. Given the increasing use of UAS in the national airspace and the current low flying methodology used in the UK (you can plan anywhere as long as it isn't in an avoid or prohibited in the Low Flying Handbook (LFHB)) we are operating in the *small sky little drone* mindset when operating below 400ft. I believe there will come a time where there is a requirement to either further restrict military low flying to designated routes (as in the US airspace) within which drone flying is prohibited above 250ft or further increase either the reporting requirements and/or the electronic conspicuity of UAS to ensure that the overlap in use of airspace is managed to ALARP.

UKAB Secretariat

The Drone Quadcopter and A400 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.³

In a telephone call the drone operator said that they always have the drone's strobe lighting on and they always set the drone's 'return-to-home' at a level well below the normal operating height of low-flying aircraft (subject to the local area and obstacles) to ensure they can deconflict from any aircraft that may appear in their operating area. It was obvious that the drone operator had a good understanding of their responsibilities.

Comments

HQ Air Command

This Airprox was subject to a Local Investigation. The drone operator is to be commended for raising this Airprox and for their subsequent actions upon hearing an aircraft. Although the reported distances are large, this type of report helps to build awareness and can help provide ways to mitigate the risk of MAC with a drone. The publishing of civilian drone flights on CADS helps reduce the risk of collision; however, CADS has been subject of many Airprox discussions, where the data is historical and often the inputted data may not be wholly accurate, reducing the effectiveness for crews. A NOTAM also has merits for this type of operation, highlighting areas for crews to possibly avoid particularly if there are multiple drone operations. As the RAF Brize Norton DDH states, 'there will never be a substitute for good lookout and proactive decision making, as demonstrated by the drone operator on this occasion'. Due to the large CPA and the actions of the drone operator, the risk of collision was low.

³ SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

Summary

An Airprox was reported when a Drone Quadcopter and an A400 flew into proximity at Lake Windermere at about 1425Z on Wednesday 6th January 2021. Both pilots were operating under VFR in VMC, neither pilot in receipt of a service.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, drone flight recording and reports from the appropriate operating authorities. Relevant contributory factors mentioned during the Board's discussions are highlighted within the text in bold, with the numbers referring to the Contributory Factors table displayed in Part C.

Due to the exceptional circumstances presented by the coronavirus pandemic, this incident was assessed as part of a 'virtual' UK Airprox Board meeting where members provided a combination of written contributions and dial-in/VTC comments.

The Board began by looking at the actions of the drone operator. They agreed that their actions served to demonstrate how safe activity by a drone operator in Class G airspace should be conducted to minimise the risk of collision with other airspace users. When the drone operator heard the low-flying aircraft approaching, they immediately descended the drone and recovered it to a safer area, which limited the risk of the drone and A400 coming into proximity. Prior to their flight the drone operator had checked the Military operational low flying training timetable, which is useful as a guide but not always fully up to date. If they had contacted the Low Flying Cell (LFC) they would have been supplied with the current low flying activity. The LFC would have entered their flight into the CADS system, this would have served to warn military pilots to increase their situational awareness when in the notified area of the drone. When a drone operator contacts the LFC this does not automatically generate a NOTAM if they are planning to remain below 400ft, in line with normal drone operating parameters. The drone operator said they were looking for any NOTAMs for military low-flying aircraft, although this action was commendable, routine fixed wing military low flying does not require a NOTAM and fixed wing aircraft can be operating down to 250ft Minimum Separation distance (MSD) as part of their ongoing requirement to conduct operational training.⁴

The military Board member said that airspace users can contact the LFC to request information about low-flying aircraft in their operating area.⁵ Equally the LFC encourage drone operators and civil aircraft operating at lower levels who may conflict with military low-flying operations to inform them of their activity, either by email or telephone, so the LFC can log the activity on CADS. If the LFC believe a NOTAM⁶ is required the LFC will redirect the drone operator to AROps (arops@caa.co.uk) to request NOTAM action. AROps will not publish a NOTAM for a RPAS unless they are operating above 400ft or outside normal RPAS operating constraints. Notifying the LFC should not be confused with NOTAM action which must be requested separately from AROps and considering doing both can be considered good practice.

Next the Board looked at the actions of the A400 pilot. They had checked CADS prior to their flight and were aware of the possibility of drone activity around their planned route and had briefed all the crew members to maintain an enhanced lookout when operating within the LFA's. The Board noted that although activity notified to the LFC and logged in CADS can alert military pilots to the activity on their planned route, it may not be available to the pilot if the LFC do not receive the information prior to a military pilot completing their pre-flight planning and leaving their planning facility for their aircraft. The A400 was equipped with TCAS II, but this requires the conflicting aircraft to be transponding for the confliction to be recognised, which was not the case in this incident (**CF2**).

⁴ This MSD is reduced to 100ft for helicopters and for fixed wing in certain dedicated military low flying areas.

⁵ <https://www.gov.uk/low-flying-in-your-area/find-out-about-low-flying-in-your-area>

⁶ A NOTAM is a notice to alert aircraft pilots of potential hazards along a flight route or at a location that could affect the safety of the flight. It is not an avoidance instruction.

The Board agreed with the A400 Operating Authority's remarks regarding conflict between standard drone operating heights and low flying military aircraft. As a result, the Director undertook to contact the CAA RPAS unit to ensure that they are aware of this particular occurrence as it is an example of an area of potentially unmitigated risk which deserves consideration in the evolution of drone regulation.

The drone operator knew that the military conduct low-flying in the area and the A400 pilot was aware that there was a high probability of drone activity in the area, therefore both pilots had generic information on the other aircraft (CF1). Turning to the risk, the Board quickly agreed that the prompt actions of the drone operator had resolved the conflict and there was no risk of collision, category E.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

2021001				
Factor	Description	ECCAIRS Amplification	UKAB Amplification	
Flight Elements				
• Situational Awareness of the Conflicting Aircraft and Action				
1	Contextual	Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late, or only generic, Situational Awareness
• Electronic Warning System Operation and Compliance				
2	Technical	ACAS/TCAS System Failure	An event involving the system which provides information to determine aircraft position and is primarily independent of ground installations	Incompatible CWS equipment

Degree of Risk: E.

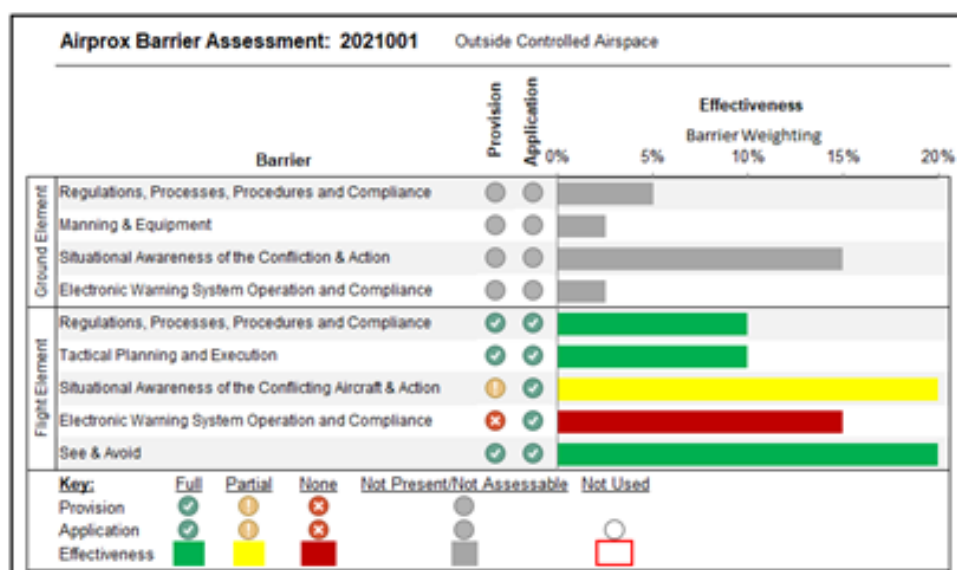
Safety Barrier Assessment⁷

In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that the key factors had been that:

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because the drone operator aware of the probability of military low-flying aircraft in the area and the A400 pilot was aware from CADS that there was drone activity in the area.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the A400's EWS could not detect the non-transponding drone.



⁷ The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).