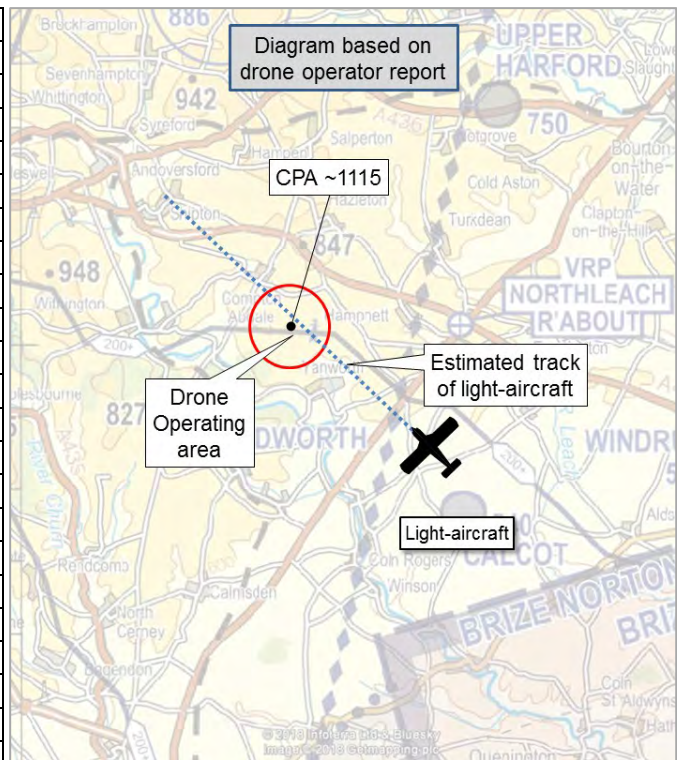


**AIRPROX REPORT No 2018098**

Date: 19 May 2018 Time: 1115Z Position: 5150N 00153W Location: 2nm west Northleach VRP

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

Recorded	Aircraft 1	Aircraft 2
Aircraft	Drone	Light-aircraft
Operator	Civ Comm	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	
Service	None	
Provider	N/A	
Altitude/FL	NK	
Transponder	None	
<b>Reported</b>		
Colours	Black, Red	
Lighting	None	
Conditions	VMC	
Visibility	>10km	
Altitude/FL	360ft agl	
Altimeter	NK	
Heading	030°	
Speed	20kt	
ACAS/TAS	Not fitted	
<b>Separation</b>		
Reported	100ft V/400m H	
Recorded		NK



**THE DRONE OPERATOR** reports that he advised Brize Norton ATC at 09:23 BST of his intent to fly his fixed-wing sub-7kg drone over farmland about 1 mile west of the town of Northleach at a maximum height of 400ft. He said he would notify Brize Norton ATC on completion. At 12:14 BST, he heard a light-aircraft heading towards his operating area, approximately 1km distant. He saw the aircraft visually at approx 800m, flying parallel to the pylons, at a height of 450-500ft AGL he believed. He assessed that if the aircraft stayed on its present course, it would enter the operational area of his UAV and separation would be less than 100m. He instructed the drone to roll as a visual warning to the aircraft. The light-aircraft did not appear to alter course or height, so the drone was instructed to descend rapidly to maintain separation. After descent, the drone started an automatic climb back to the programmed mission operating height (360ft), so a second emergency descent was initiated to ensure the drone remained clear of the light-aircraft; this second descent brought the drone into contact with a power-cable between the 200ft pylons and the drone was destroyed. The light aircraft then flew directly over the area where the drone had been operating and continued in a north-westerly heading.

He perceived the severity of the incident as 'Medium'.

**THE LIGHT-AIRCRAFT PILOT** could not be traced.

**BRIZE NORTON** reports that the drone operator gave his location as approximately 2.3nm west of the Northleach VRP (a very popular VRP approximately halfway between Brize and Gloucester Airport and also commonly used by aircraft operating to and from Kemble and Rendcomb). This is in Class G airspace and therefore an aircraft operating there would not necessarily be under the control of Brize ATC. The ATC watch log had no record of the incident being reported by an aircraft pilot or the drone operator. A review of the flight strips from the day showed only one aircraft worked by Brize ATC taking a routing at that time that could possibly take it close to this location but, on viewing online photographs this aircraft was red in colour and the drone pilot reports the aircraft in question as being white. An aircraft at that location, at the estimated height by the drone operator of 500ft would most likely be

below radar/RT coverage from Brize. Unfortunately, Brize does not have a radar replay capability and so they could not add any further value to the investigation other than to pass their thanks to the drone operator for informing them of his location and being diligent enough to report this incident. Although tracking down the light-aircraft involved may prove difficult, they opined that this drone operator was contributing to the safe operation of drones in general.

## Factual Background

The weather at Brize Norton was recorded as follows:

METAR EGVN 191050Z 11005KT 9999 FEW048 18/05 Q1024 BLU NOSIG=

The UK has a derogation from the SERA.5005 overall 500ft rule as specified in ORS4 1174. This states that:

- a) *The Civil Aviation Authority (CAA) permits, under SERA.3105 and SERA.5005(f), subject to the condition set out in subparagraph (b), an aircraft to fly elsewhere than as specified in SERA.5005(f)(1) at a height of:*
- i) less than 150 metres (500 feet) above the ground or water; or*
  - ii) less than 150 metres (500 feet) above the highest obstacle within a radius of 150 metres (500 feet) from the aircraft.*
- b) *The aircraft must not be flown closer than 150 metres (500 feet) to any person, vessel, vehicle or structure except with the permission of the CAA.*

## Analysis and Investigation

### UKAB Secretariat

The drone operator and light-aircraft pilot shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard<sup>1</sup>.

## Comments

### Drone Operating Company

The operating company opined that this Airprox highlights again the issue of GA traffic flying just below 500ft AGL. It also highlights the increased risk of flying close to major pylons/wires in a repeated manner to survey crops below those wires. The [drone] pilot's initial actions were correct, with the emergency descent reducing height by 100ft, remaining above the pylon/wire height; however, the drone's automatic response to climb back to original altitude caused the operator to reapply the emergency descent to ensure he remained clear of the light aircraft, inadvertently taking the drone below 200ft by the wires. This second descent caused a collision with the wires and breakup in flight of the polystyrene wings/body of the UAV. The drone operating company noted that they had conducted over 9000 UAS sorties to date and its only two Airprox occurrences had both been in the last two weeks.

## Summary

An Airprox was reported when a drone and an unknown light-aircraft flew into proximity at about 1115hrs on Saturday 19<sup>th</sup> May 2018. The drone operator was operating under VFR in VMC and not in receipt of a service. The light-aircraft pilot could not be traced.

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<sup>1</sup> SERA.3205 Proximity.

## **PART B: SUMMARY OF THE BOARD'S DISCUSSIONS**

Information available consisted of reports from the drone operator and the appropriate ATC and operating authorities.

The Board began by looking at the actions of the drone operator. They noted that the drone was a fixed-wing UAS and that the drone operator had commanded the drone to carry out a roll to try to alert the light-aircraft pilot to the drone's presence. This was a reasonable manoeuvre but, due to the small size of the drone, members thought it unlikely that the light-aircraft pilot would have seen the drone unless he happened to have been looking in that direction and was close. Members noted that the drone had automatically resumed its original height after completing the first emergency descent and they wondered whether the commanded descent had been as a result of a pre-programmed automatic emergency feature or just a normal descent command. If the former, then they wondered whether the software should be set up to remain at the emergency height once commanded; if the latter, then the potential for a subsequent unwanted climb by the drone should be highlighted to other operators. The Board members commended the drone operator for having contacted Brize Norton as the local ATC unit to advise them of his operation and thereby enhance Brize ATC's situational awareness. However, they were mindful that this did not provide any form of protection to the drone other than to allow the potential for Brize ATC to pass such information to aircraft that they might be talking to in the area. In this instance it unfortunately seemed that they were not in communication with the light-aircraft pilot and so they could not provide any information. The Board noted that trying to accurately assess the height of aircraft from the ground is fraught with difficulty and so could make no comment regarding the drone operator's perception that the light-aircraft was flying at or below 500ft.

The Board then looked at the actions of the light-aircraft pilot. Whilst he was likely operating within the rules of the airspace, members agreed that he would have been better served by communicating with Brize Norton ATC; even if they could not see him at the level he was operating they could have advised him of the location and height that the drone was operating. Although the light-aircraft pilot was entitled to fly where he was, in doing so he was required to fly no closer than 500ft to any person, vessel, vehicle or structure (which includes pylons and power cables). Without any corroboration, the Board could not conclude whether this requirement had been met by the light-aircraft pilot; nevertheless, some members noted the risks associated with operating at minimum heights during routine transits and opined that greater altitudes offered numerous benefits to light-aircraft pilots.

The Board then turned to the cause of the Airprox. They agreed that the drone operator had done everything he could to avoid the light-aircraft and that the light-aircraft pilot had probably not seen the drone. Both parties had an equal right to operate where they were and so the Board thought that the incident was probably best described as a conflict in Class G resolved by the drone operator. The Board then looked at the risk; although safety had been reduced, they concluded that the drone operator's actions had been timely and effective to the extent that there had been no risk of collision - risk Category C.

## **PART C: ASSESSMENT OF CAUSE AND RISK**

Cause: A conflict in class G resolved by the drone operator.

Degree of Risk: C.

### Safety Barrier Assessment<sup>2</sup>

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

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<sup>2</sup> The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).

**Flight Crew:**

**Situational Awareness and Action** were assessed as **ineffective** because the light-aircraft was not communicating with Brize Norton and therefore could not receive information about the drone operation. Neither could the drone operator attain any situational awareness about the light-aircraft.

