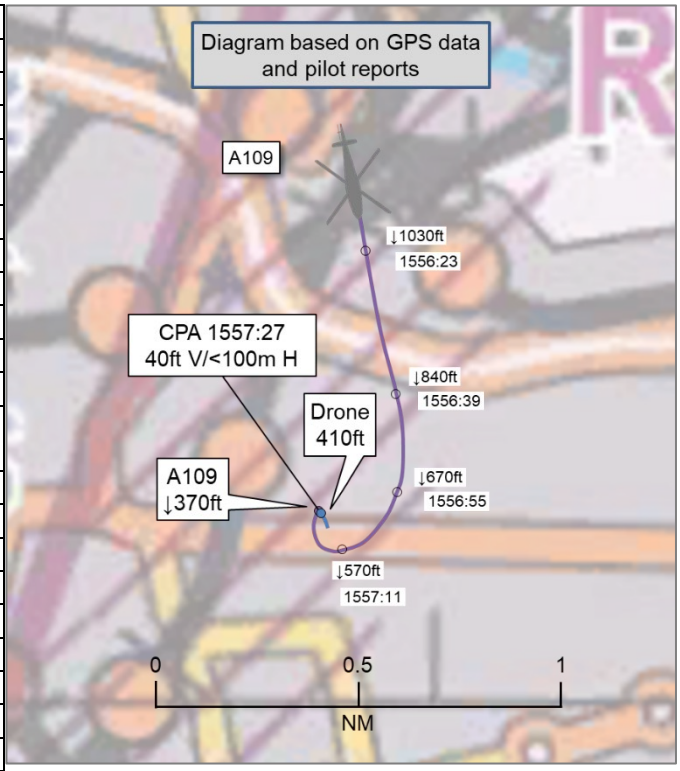
AIRPROX REPORT No 2022154

Date: 02 Jun 2022 Time: 1557Z Position: 5130N 00015W Location: 3.5NM NW London Heliport

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Mavic Pro 2	A109
Operator	Civ UAS	Civ Helo
Airspace	London CTR	London CTR
Class	D	D
Rules	VLOS	VFR
Service	None	Radar Control
Provider	N/A	Heathrow Radar
Altitude/FL	410ft	370ft
Transponder	Not fitted	A, C, S
Reported		
Colours	Grey	Silver
Lighting	None	Anti-col, Strobes, Nav, Landing
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	400ft	300ft
Altimeter	amsl	QNH (NK hPa)
Heading	135°	045°
Speed	NK	60kt
ACAS/TAS	Not fitted	TAS
Alert	N/A	None
Separation at CPA		
Reported	50ft V/0ft H	30ft V/25m H
Recorded	40ft V/<100m H	



THE MAVIC PRO 2 PILOT reports that they were flying in order to photograph a site [in the locality of the Airprox]. They had permission to take-off from a garage forecourt nearby and had registered the flight prior to launch using the Altitude Angel Guardian app. While orbiting the site at 400ft, they suddenly heard a noise to the north-east of their location which they recognised as a helicopter. The helicopter appeared without warning as if it had just taken-off nearby and to their surprise and concern they saw it appear on the monitor of their phone screen, which they were using to control the drone, showing that it had passed just underneath it. They immediately hovered the drone and checked their [aircraft location] app which showed the aircraft. [They recall that] the helicopter had flown off to the southwest, so they continued their flight plan before landing. They phoned [the helicopter operating company] the following day and also the following week and had a helpful conversation with [one of their staff] who said that the helicopter had taken-off from a playing field nearby which was why it was still low and then said that they could file an Airprox report if [the Mavic Pro 2 pilot had] wanted to. It appeared that both pilots had been operating legitimately and they had both been following appropriate regulations, but it had left them since feeling concerned about the possible consequences for the helicopter if a rotor had struck the 2kg[1] drone. They could not have known the aircraft was about to enter the drone's operating area in advance as it had only just taken-off. [They opine] that, in order to avoid this kind of event in future, if helicopters are going to be flying at below 400ft in urban or non-airfield areas, it would be sensible for the pilots to check the Altitude Angel Guardian app before take-off. It was a highly unusual coincidence that they both happened to be in the same airspace at the same time but there could have been unfortunate consequences.

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

[1] Mavic Pro 2 drone maximum take-off mass is listed as less than 1Kg, approximately 2lbs.

THE A109 PILOT reports that, on final approach to an off-airfield landing site in the London Control Zone (but outside any Drone No-Fly Zones (FRZ)), a small-to-medium sized drone was spotted by the flight crew, just above the rotor-disk. Avoiding action was taken and the landing was completed without further incident. The flight was inbound to a landing site approximately 1NM off Heli-Lane H10 (outside the Heathrow Inner Area), where a landing had been made earlier in the day. A short recce was conducted to ensure the landing site was clear and a wide 180° turn was made to place the aircraft on a final approach track into wind. As the aircraft descended through approximately 300ft, a drone was spotted close to and above the rotor-disk and avoiding action was taken to increase rate of descent and turn away from the drone. Once observed to be clear of the aircraft, the final part of the approach and subsequent landing was conducted as normal. Although it was not suspected that any collision occurred, a walkaround inspection of the aircraft after landing was carried out. No damage was found and no aircraft limits had been exceeded. Following sectors were completed without incident.

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

THE HEATHROW SVFR CONTROLLER received no report of an Airprox on their frequency.

Factual Background

The weather at Heathrow was recorded as follows:

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METAR COR EGLL 021550Z AUTO 13010KT 9999 NCD 19/08 Q1019 NOSIG
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Analysis and Investigation

NATS Safety Investigations reviewed this event and their observations and findings are summarised below:

[The A109 pilot] was on the Heathrow SVFR frequency from 1550:23 (when the pilot requested zone transit to a private site from the north) until 1556:25, when the pilot reported that they were letting down at the private site. The aircraft was indicating 1000ft at this time and the descent that followed was done without further communication with the SVFR controller. The pilot did not report any Airprox or any other incident to the SVFR controller whilst on frequency.

A radar recording of the time period [was reviewed and it was] assessed that there were no associated primary or secondary contacts visible on radar at the approximate time of the event.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and only the A109 was detected, however, the pilots of both aircraft have been able to supply the UKAB Secretariat with GPS data files relating to their flights but, although position and altitude data was present in the file for the Mavic Pro 2 flight, it did not have any associated time stamp. The GPS data from both flights has been combined and cross-referenced with the pilot reports to determine the CPA, which was possible as, although the aircraft tracks cross on three occasions, on only one of these was the A109 below the level of the Mavic Pro 2, as stated in both pilot reports. This occurred, using the time stamp of the A109 GPS track, at 1557:27, Figure 1.

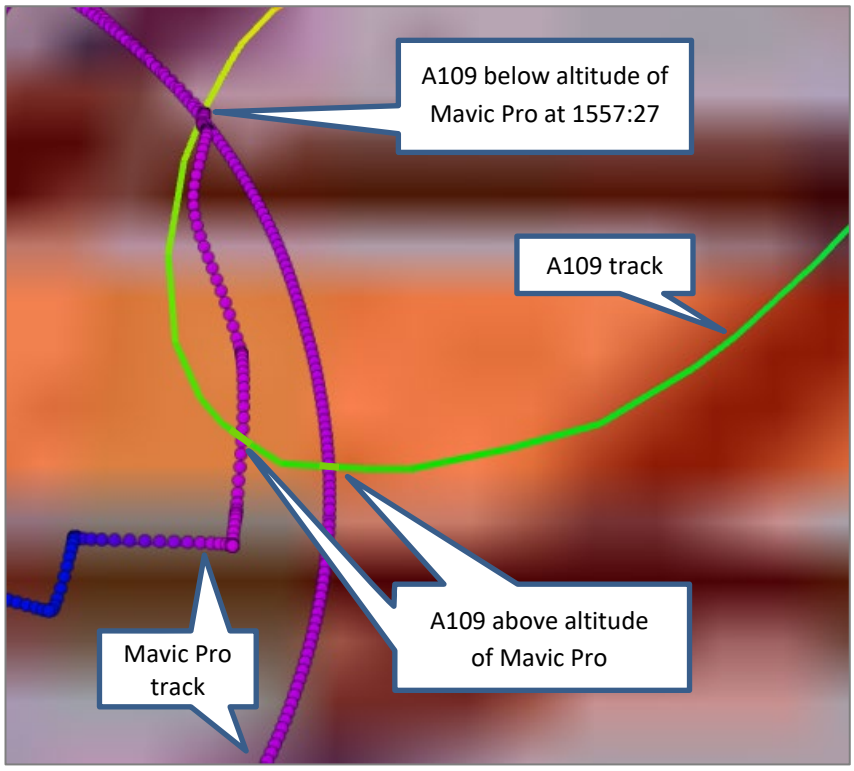


Figure 1 – Aircraft tracks cross

The A109 pilot descended through 410ft, the altitude of the Mavic Pro, at approximately 1557:25, 2sec before the tracks crossed which is taken to be CPA, with 40ft vertical separation. Although exact measurement of horizontal separation has not been possible, due to the near parallel nature of the aircraft tracks before crossing, it is assessed that it was less than 100m, which aligns with the separation stated by the pilots.

The Mavic Pro 2 and A109 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[2] During the flight, the remote pilot shall keep the unmanned aircraft in VLOS and maintain a thorough visual scan of the airspace surrounding the unmanned aircraft in order to avoid any risk of collision with any manned aircraft. The remote pilot shall discontinue the flight if the operation poses a risk to other aircraft, people, animals, environment or property.[3]

Summary

An Airprox was reported when a Mavic Pro 2 and an A109 flew into proximity 3.5NM northwest of London Heliport at 1557Z on Thursday 2nd June 2022. The A109 pilot was operating under VFR in VMC and in receipt of a Radar Control service from Heathrow Special; the Mavic Pro 2 pilot was operating under VLOS rules and not in receipt of an ATS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, GPS data files, reports from the air traffic controllers involved 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.

The Board first considered the actions of the Mavic Pro 2 pilot and members were encouraged that the pilot had taken steps to make other airspace users aware of their flight by registering their flight on the

[2] (UK) SERA.3205 Proximity.
[3] Regulation (EU) 2019/947 as retained (and amended in UK domestic law) Under the European Union (Withdrawal) Act 2018 - UAS.SPEC.060 Responsibilities of the remote pilot (2)(b).

Altitude Angel Guardian app. A discussion followed regarding how other airspace users might access this information and a civil helicopter pilot member stated that a number of the larger commercial helicopter operators now utilise traffic awareness equipment that will take information from the Altitude Angel Guardian app and display it to the pilot. The Board noted that, although that the pilot had been maintaining VLOS with the Mavic Pro 2 and scanning the airspace, they had not become visual with the A109 until at or after CPA (**CF5**). Members went on to agree that the Mavic Pro 2 pilot had not had any prior awareness of the presence of the A109 (**CF3**) and members wondered whether, had the pilot been accompanied by an observer, they may have been able to visually acquire the A109 at an earlier stage.

Next, members considered the actions of the A109 pilot and noted that the pilot had reported having a TAS, which would have been incompatible with, and therefore unable to detect the presence of, the Mavic Pro 2 (**CF4**). The Board agreed that the A109 pilot would not have had any prior awareness of the presence of the Mavic Pro 2 (**CF3**) prior to sighting it and that they had only visually acquired it at CPA, as it had passed above their rotor disk (**CF5**).

The Board then considered the involvement of the Heathrow Radar SVFR controller. Noting that the Mavic Pro 2 had not been visible to them on their radar, members agreed that this would have meant that the controller would not have had any awareness of the presence of the Mavic Pro 2 (**CF2**) and, as a result, they had not detected the conflict (**CF1**) which had left them unable to offer any assistance to the A109 pilot.

Finally, in assessing the risk of collision, the Board noted that the EC equipment carried by the A109 pilot had been unable to detect the Mavic Pro 2 nor display the information that had been registered on the Altitude Angel Guardian app. Members agreed that that neither pilot had had any prior situational awareness regarding the presence of the other aircraft and, although both had become visual, it had been at or shortly after CPA, too late to have enabled them to have taken any avoiding action to materially increase separation. Therefore, the Board concluded that providence had played a major part in events, that the separation that had existed had been fortuitous and the bare minimum, and that there had been a serious risk of collision (**CF6**). As such, the Board assigned a Risk Category A to this Airprox.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2022154			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Situational Awareness and Action			
1	Human Factors	• Conflict Detection - Not Detected	An event involving Air Navigation Services conflict not being detected.	
2	Contextual	• Traffic Management Information Action	An event involving traffic management information actions	The ground element had only generic, late, no or inaccurate Situational Awareness
	Flight Elements			
	• Situational Awareness of the Conflicting Aircraft and Action			
3	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late, inaccurate or only generic, Situational Awareness
	• Electronic Warning System Operation and Compliance			
4	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
	• See and Avoid			
5	Human Factors	• Monitoring of Other Aircraft	Events involving flight crew not fully monitoring another aircraft	Non-sighting or effectively a non-sighting by one or both pilots

	• Outcome Events			
6	Contextual	• Near Airborne Collision with RPAS	An event involving a near collision with a remotely piloted air vehicle	

Degree of Risk: A

Safety Barrier Assessment[4]

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

Ground Elements:

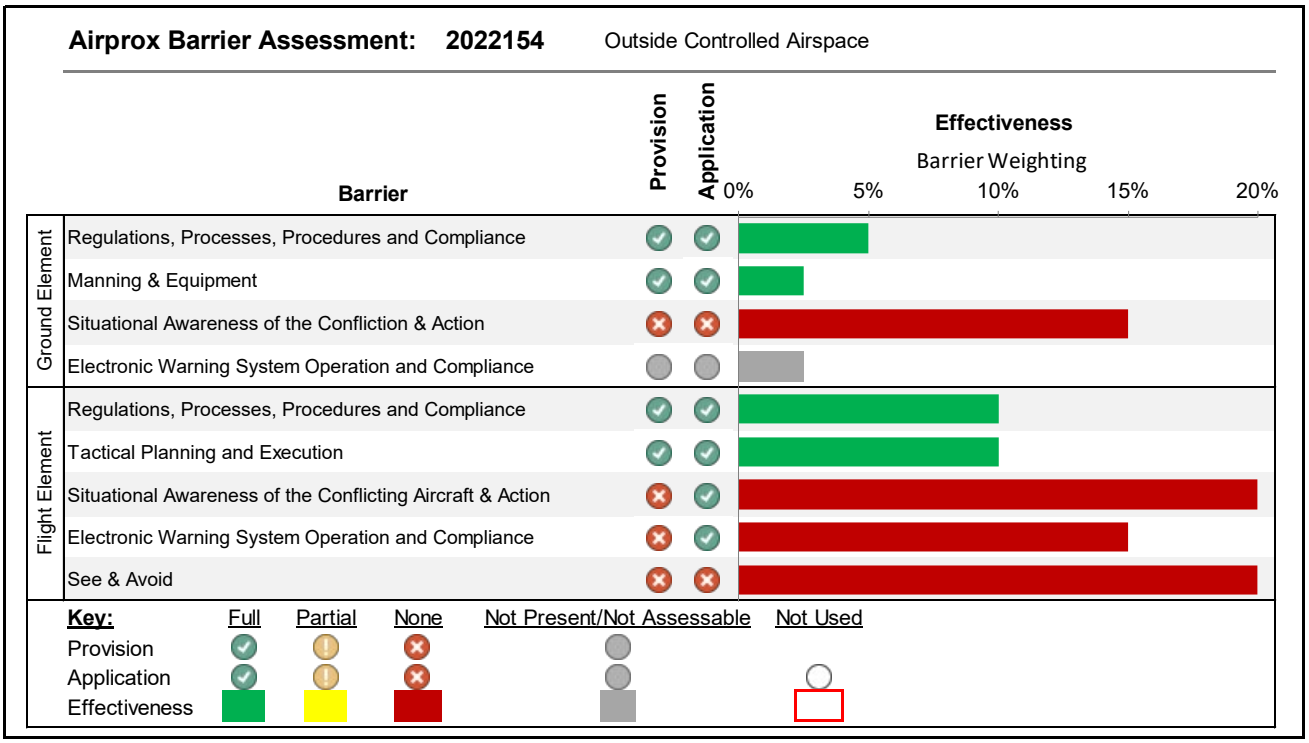
Situational Awareness of the Confliction and Action were assessed as **ineffective** because the Heathrow Radar controller had not had any awareness of the presence of the Mavic Pro 2 and had therefore been unable to detect the conflict.

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither pilot had had any awareness of the presence of the other aircraft prior to sighting it.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the TAS fitted to the A109 had been unable to detect, and had therefore been incompatible with, the Mavic Pro 2.

See and Avoid were assessed as **ineffective** because, although both pilots had become visual with the other aircraft, this had only occurred at CPA when it had been too late for them to have taken any effective avoiding action.



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