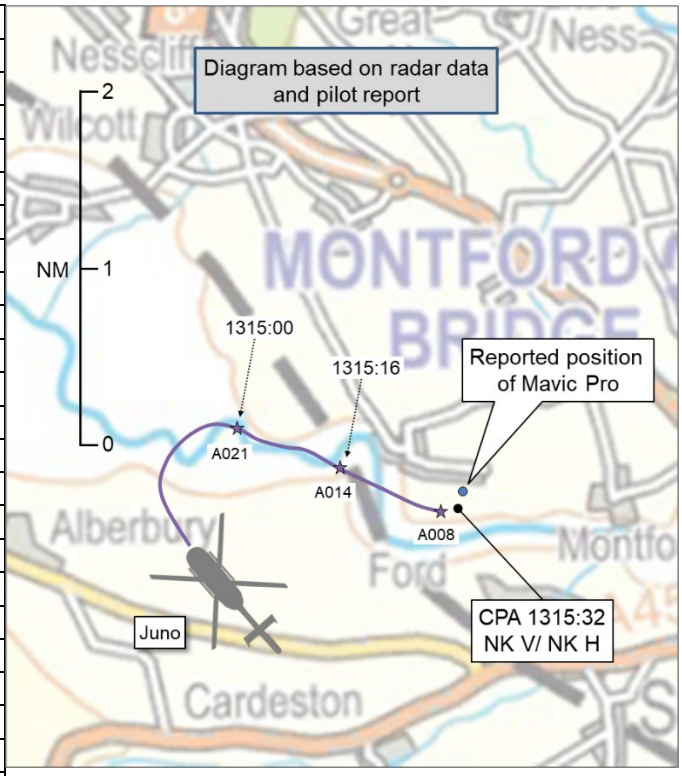
AIRPROX REPORT No 2022219

Date: 26 Jul 2022 Time: 1316Z Position: 5244N 00253W Location: 4.5NM WNW Shrewsbury

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Mavic Pro	Juno
Operator	Civ UAS	HQ Air (Trg)
Airspace	London FIR	London FIR
Class	G	G
Rules	VLOS	VFR
Service	None	Basic
Provider	N/A	Shawbury
Altitude/FL	NK	820ft
Transponder	Not fitted	A, C, S
Reported		
Colours	Grey	NR
Lighting	LEDs	NR
Conditions	VMC	VMC
Visibility	>10km	NR
Altitude/FL	400ft	900ft
Altimeter	agl	NR
Heading	090°	NR
Speed	NK	NR
ACAS/TAS	Other	NR
Alert	None	NR
Separation at CPA		
Reported	275ft V/<500ft H	>500ft V/NR H
Recorded	NK V/NK H	



THE MAVIC PRO PILOT reports that they were conducting an automated 'zig-zag' flight in the open FIR. On the day in question, they emailed Shawbury Ops, as is requested by the RAF, to advise of their intention to conduct drone operations at the given location. The time of operation was given as between 1200 and 1700, and with the maximum height of 120m and 500m radius of the given map reference. No confirmation of receipt of information was provided.

At approximately 1400 they became aware that a Eurocopter was approaching directly from the west. It was fast and at low-level. It appeared from their point of view that the Eurocopter could have been low enough to conflict with their UAS. As soon as they identified that a conflict might occur, they assumed manual control and descended to ground level and landed. They immediately checked planefinder.com, which was running on their tablet and showed ADS-B data. It identified the aircraft as a [Juno] and that their height was 675ft. The [Mavic Pro] had been flying at 400ft. They were surprised that the conflict had occurred as they had assumed that the pilots of all the aircraft in the LFZ would have had knowledge of their operation and would have kept a wider separation. They emailed Shawbury Ops again to confirm they had received their earlier advice and to raise their concern about the proximity of the incident. [Shawbury Ops] confirmed that they did have the first email and said they would investigate and get back to them but so far they have heard nothing. The RAF ask drone pilots to notify them of operations in the LFZ, but this incident did not give them much confidence in this system.

The pilot assessed the risk of collision as 'None'.

THE JUNO PILOT reports that they were aware of the location of the notified drone flying and had ensured that they were above the maximum height of the planned drone flight of 120m. They did not visually acquire the drone but had been more than happy with their height to ensure deconfliction.

The pilot perceived the severity of the incident as 'Low'.

THE SHAWBURY CONTROLLER reports that the Airprox wasn't reported on any ATC frequency and the ATC Supervisor at the time of the Airprox had no knowledge or awareness of an Airprox event. The video/audio data was unavailable as non-quarantined data is automatically deleted after 30 days.[1]

The controller perceived the severity of the incident as 'Negligible'.

Factual Background

The weather at Shawbury was recorded as follows:

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METAR EGOS 261320Z 33009KT 9999 FEW035 SCT045 18/09 Q1021 NOSIG RMK BLU BLU
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Analysis and Investigation

THE SHAWBURY STATION FLIGHT SAFETY OFFICER reports that they had investigated the Airprox with reference to reports from ATC and the Juno pilot. They report that the drone pilot had gauged the distance between their drone and the Juno as an Airprox but there was at least 500ft of separation and no compromise of safety. They opined that "*Drone operators do not get a no-overfly exclusion zone but [the helicopter operations] will endeavour to keep their distance if conditions allow. Ultimately, the onus is on the drone operator to avoid any manned aircraft".* The Juno Captain commented that the max-ceiling was quoted as 120m (which is the standard maximum height for drones) but they work with vertical height in feet which has a potential to cause an issue.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and the Juno was positively identified from Mode S data. The Mavic Pro did not appear on radar (see Figure 1).

The Juno was observed on radar to be at FL006 at the time of CPA. The Shawbury QNH had been recorded as 1021hPa a few minutes later and it was therefore determined that the Juno had been at approximately 820ft AMSL and descending. The pilot of the Mavic Pro reported that their drone had been flying to a maximum height of 400ft AGL. The elevation of the terrain at the reported position of the Mavic Pro is approximately 240ft AMSL. It was therefore calculated that the vertical separation at CPA may have been a minimum of 180ft but this could not be positively determined. Based on the radar position of the Juno and the reported position of the Mavic Pro, the horizontal separation at CPA had been approximately 0.1NM but this could not be positively determined either. The diagram was constructed from the radar position of the Juno and its calculated altitude, and the reported position of the Mavic Pro.

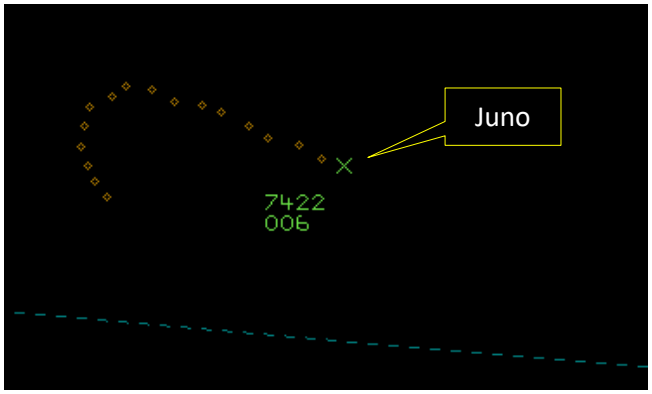

Figure 1 - CPA at 1315:32

The Mavic Pro and Juno 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

[1] The UKAB Secretariat received notification of the Airprox approximately 2 months after the incident.
[2] (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

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]

Comments

HQ Air Command

The drone operator should be commended for their proactive engagement with Shawbury in notifying them of their flight, even though the current CAA drone regulations do not require notification for a drone flight below 400ft AGL (120m AGL). Thanks to this prior notification, the Juno crew was aware of the drone flight and factored in vertical deconfliction in that area to ensure no risk of collision. It is unfortunate that the drone operator did not receive acknowledgement of their notification and that they had an expectation of an exclusion zone around their flight. In a very busy area such as LFA 9, it can be difficult to give both lateral and vertical avoidance to the drone flying area. Drones are notoriously difficult to spot from the air; crews are predominantly reliant on drone operators to keep their drone clear when aware of any approaching crewed aviation. The drone operator conducted the correct actions on becoming aware of the Juno. It can be difficult to gauge separation from the ground and the drone operator is thanked for their submission of an Airprox; it is only through examination of both crewed and uncrewed elements of an Airprox involving a drone that safety shortfalls and improvements can be identified.

Summary

An Airprox was reported when a Mavic Pro and a Juno flew into proximity 4.5NM west-northwest of Shrewsbury at 1316Z on Tuesday 26th July 2022. The Mavic Pro pilot was operating under VLOS in VMC and not in receipt of an ATS, the Juno pilot was operating under VFR in VMC and in receipt of a Basic Service from Shawbury.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, reports from the air traffic controller 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 submission of the Airprox report by the pilot of the Mavic Pro and wondered why there had been a significant delay. Members wished to highlight that a more timely submission of a report after an occurrence would have facilitated the preservation of pertinent information relating to the incident. Notwithstanding, members turned their attention to the actions of the Mavic Pro pilot on the day in question and were heartened that they had taken appropriate steps beforehand to have informed the Shawbury Unit of their intended flight. That there had been no acknowledgement of the flight details by the Shawbury Unit was unfortunate. Members noted that the Mavic Pro pilot had had no situational awareness of the Juno until it had been visually acquired. Members acknowledged that, upon sighting the Juno, the Mavic Pro pilot had assessed the situation and had landed the drone in plenty of time to avoid a conflict, but had nonetheless been concerned by the proximity.

Members next turned their attention to the actions of the Juno pilot. It was noted that the Mavic Pro pilot had quoted the vertical extent of their flight in metres and that the pilot of the Juno had highlighted that that could have caused confusion. However, some members suggested that it may not have been fully appreciated by the pilot of the Juno that the Mavic Pro had been operating up to 120m/400ft above ground level. Had that been the case, the pilot of the Juno may have not have chosen to descend to such a low level in an area in which they had had generic situational awareness that a drone had been

[3] EASA Part UAS.OPEN.060 Responsibilities of the remote pilot (2)(b).

operating. Members noted that the TAS fitted to the Juno would not have detected the presence of the Mavic Pro and that it had not been visually acquired by the pilot of the Juno.

Concluding their deliberations, members were satisfied that normal safety standards and parameters had pertained and, as such, the Board assigned Risk Category E. Members agreed that the following factors (detailed in Part C) had contributed to this Airprox:

CF1. The pilot of the Mavic Pro had not had situational awareness of the Juno until it had been visually acquired. The pilot of the Juno had had generic situational awareness of the presence of the Mavic Pro.

CF2. The TAS fitted to the Juno would not have been expected to have detected the presence of the Mavic Pro.

CF3. The pilot of the Juno had not sighted the Mavic Pro.

CF4. The pilot of the Mavic Pro had been concerned by the proximity of the Juno.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2022219			
CF	**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, inaccurate 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
	• See and Avoid			
3	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
4	Human Factors	• Perception of Visual Information		Pilot was concerned by the proximity of the other aircraft

Degree of Risk: E

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:

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because neither pilot had had Situational Awareness of the other before the pilot of the Mavic Pro had visually acquired the Juno.

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

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the TAS fitted to the Juno would not have been expected to have detected the presence of the Mavic Pro.