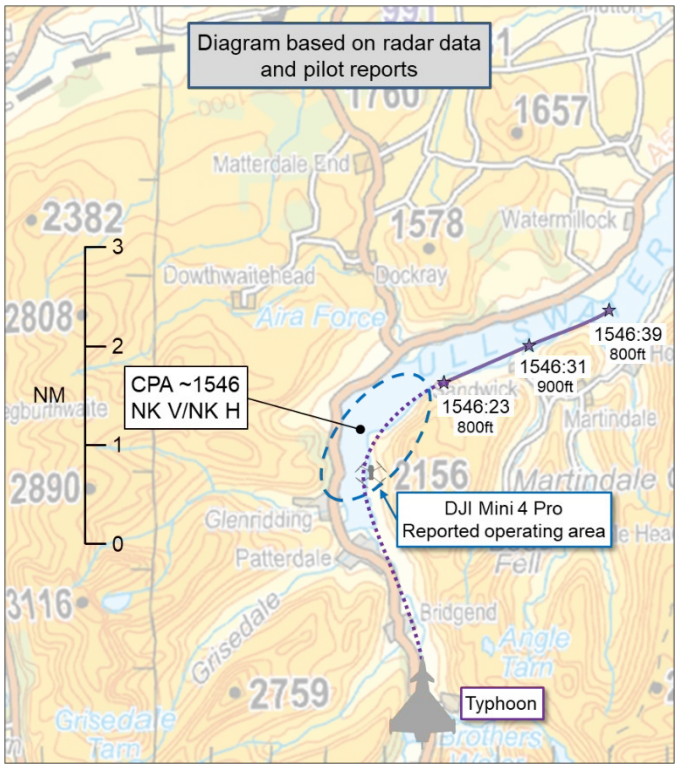
AIRPROX REPORT No 2024283

Date: 13 Nov 2024 Time: ~1546Z Position: 5433N 00256W Location: Ullswater

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	DJI Mini 4 Pro	Typhoon
Operator	Civ UAS	HQ Air (Ops)
Airspace	London FIR	London FIR
Class	G	G
Rules	VLOS	VFR
Service	None	None
Provider	N/A	Low Level Common
Altitude/FL	NK	~800ft
Transponder	Not fitted	A, C, S
Reported		
Colours	Light grey	NR
Lighting	Single white LED	Strobes and nav.
Conditions	VMC	VMC
Visibility	>10km	NR
Altitude/FL	300ft	250ft
Altimeter	NK	NK
Heading	270°	NR
Speed	0 kt	420kt
ACAS/TAS	Not fitted	Not fitted
Separation at CPA		
Reported	0ft V/100m H	Not seen
Recorded	NK V/NK H	



THE DJI MINI 4 PRO PILOT reports they were flying the Mini 4 Pro (MTOW <250g) within VLOS over Ullswater, taking single images and shooting a panorama from various locations close to the launch site on the shore. Heights above the launch location varied from around 30ft to a maximum of around 300ft. As a (retired) Air Traffic Controller (Aerodrome/Approach Radar) they were very aware of the possibility of encountering low flying aircraft and had previously been monitoring the Low Level Common frequency whilst in their car over a period of a couple of hours but had only heard distant transmissions, none intelligible. However, at the time of the Airprox they were out of the car on the lake shoreline and not monitoring the radio. They had been flying for around 6min when they became aware of a sudden and loud jet aircraft noise coming from the south. They immediately considered following 'best practice' and reducing height, but knowing that low level jet aircraft fly down to 250ft AGL (or below) considered that descending might exacerbate the situation so concentrated on trying to acquire the other aircraft visually. When they did so, it was too late to try and assess the relative positions [as the Typhoon appeared from behind a shoreline tree from where they were flying]. Indeed, whilst searching for the jet they had temporarily lost sight of the drone. All of this occurred within seconds of first hearing the jet, so the opportunity of taking any meaningful avoiding action was effectively zero. Just [prior] to first hearing the jet they had taken a shot looking south, recorded by the drone as time 1445:50; there was no sign of the Typhoon on this shot. They then turned the drone onto approximately west and took another shot timed at 1446:05. After the Typhoon had passed they turned the drone to look north along the lake and immediately took another shot, timed at 1446:41,[1] the Typhoon could just be seen in the distance along the lake at what appears to be a similar height to the drone.

They would assess that the Typhoon passed at either the same height as they were flying or lower, but they did not have both in sight at the same time. [They opined that] lateral separation would have been impossible to assess anyway due to the disparate size of the two aircraft [and noted that the DJ Mini 4

[1] The times noted here are as referenced by the drone operator, and minus 1hr from their reported estimate of CPA.

Pro did not have conflict alert software]. However, the drone operator also reported that the Typhoon was 100m to the southeast on first sighting and co-altitude or below the drone.

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

THE TYPHOON PILOT reports that during a currency flight they were conducting some low level flying in LFA 17, during which they unknowingly had an Airprox with a drone. The size and type of drone is unknown. This [report was] submitted on request of the UK Airprox Board after an Airprox was reported by the drone operator.

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

Factual Background

The weather at Newcastle Airport and RAF Leeming was recorded as follows:

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METAR EGNT 131520Z 27009KT 9999 FEW007 09/08 Q1033
METAR EGXE 131520Z 13001KT CAVOK 11/07 Q1033 NOSIG RMK BLU BLU
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Both airfields are 50NM from Ullswater with a different landmass, but the weather was generally CAVOK to the north and south, with the Typhoon pilot estimating a clearance below cloud of 2000ft in the vicinity of Ullswater.

Analysis and Investigation

Coningsby A3 BM Safety

The investigation included a review of the report narrative and liaison with the Typhoon pilot.

The outcomes were recorded as follows, a drone operator reported an Airprox within the LFA 17 of which the Typhoon pilot was unaware. No NOTAMs were in place (not mandated), and the drone was unsighted by the Typhoon pilot.

It was noted from the CAA website that:

> Notifying airspace users of drone and remotely piloted events or activity. "Drone and remotely piloted aircraft flying Visual Line Of Sight below 400 feet above ground level are not deemed to be unusual aerial activity and therefore are not always required to be subject to NOTAM action. However, there are instances where a NOTAM is appropriate (such as flying near a hospital explained above) or where an operator may wish to fly with a NOTAM in place.

The investigator commented that this serves to highlight the importance of lookout, especially in the Low Level (LL) congested environments, particularly as there is often no prior warning of drone activity via NOTAM or CADS etc.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and the Typhoon was seen intermittently tracking approximately north at 1542:50 26.9NM south of the reported point of the Airprox. At 1546:23 the Typhoon reappeared on radar 1NM north-northeast of the reported point of the Airprox at 800ft AMSL which equates to approximately 300ft AGL at Ullswater (Figure 1).

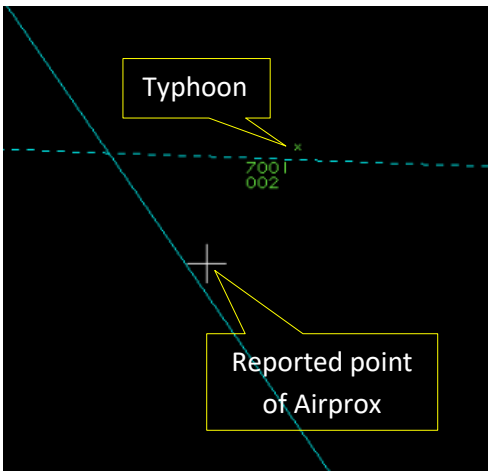


Figure 1 1546:28 distance from reported point of Airprox 1.2NM

CPA was assessed as being at approximately 1546 with the vertical and lateral separation unknown.

The DJI Mini 4 Pro and Typhoon 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]

Comments

HQ Air Command

This incident highlights the limitations of see and avoid in the low-level environment when acquiring fast moving or small air systems. The Typhoon pilot was unaware of the DJI Mini 4 Pro throughout the incident and was therefore unable to take avoiding action. While the UAV operator did hear the Typhoon, they believed reducing height would increase the likelihood of a collision. When they did visually acquire the Typhoon, it was too late to take meaningful avoiding action. Deconfliction could have been achieved in the planning stage if the Typhoon crew were aware of the UAV activity, or in flight if the UAV was fitted with conflict alert software or a compatible form of electronic conspicuity.

Summary

An Airprox was reported when a DJI Mini 4 Pro drone and a Typhoon flew into proximity at Ullswater at approximately 1546Z on Wednesday 13th November 2024. The DJI Mini 4 Pro pilot was operating under VLOS in VMC not in receipt of a FIS and the Typhoon pilot was operating under VFR in VMC communicating on the Low Level Common frequency, also not in receipt of a FIS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, and a report from the appropriate operating authority. 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 discussed the actions of the DJI Mini 4 Pro drone pilot and noted that the pilot had been required to have been able to monitor around the drone and discontinue the flight in the event that an aircraft might come into conflict. Members discussed the drone pilot's awareness of the locality and knowledge that fast jets could have been operating in the area. Some members considered it had been

[2] (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.
[3] Assimilated Regulation (EU) 2019/947- UAS.OPEN.060 Responsibilities of the remote pilot (2)(b)

unfortunate that the drone pilot had been unable to continue monitoring the low level frequency, while other members considered that the pre-flight planning could have been improved by perhaps calling the promulgated low-flying information line number[4] to enquire about planned low level flying in the area. However, the Board recognised that there had been potential limitations to the latter option due to availability of information within the flight planning cycles, which may vary according to aircraft type. Members further discussed alternative pre-flight planning methods and mitigations, such as having pre-planned actions in the event of hearing or sighting a fast jet for different portions of the DJI Mini 4 Pro drone flight, dependant on its location, that might otherwise have allowed the drone pilot to have taken a different course of action to discontinuing the flight. The Board understood the drone pilot's rationale for not immediately discontinuing the flight on first hearing a fast jet, and agreed that the drone pilot had gained late situational awareness of the presence of the Typhoon (**CF1**). Furthermore, members agreed that the timeframe between hearing and sighting the Typhoon relative to the position of the drone had meant the drone pilot had not sighted the Typhoon until after CPA (effectively, a non-sighting) (**CF2**) and, as such, had been unable to manoeuvre the drone appropriately or in a timely manner. The Board also agreed that the terrain had been a factor in obscuring the position of the Typhoon from the drone pilot during its low level operation (**CF3**) and some members wondered whether the drone pilot had been able to optimise their position for visual-line-of-sight (VLOS) of the drone's surroundings. While the Board acknowledged the DJI Mini 4 Pro drone pilot's knowledge of airspace, members discussed the practicality for all drone pilots to understand the rules of the air and the requirement to register with the Drone and Model Aircraft Registration and Education Service (DMARES)[5] which was designed to educate aeromodellers and drone pilots in such areas.

Turning their attention to the actions of the Typhoon pilot, the Board noted that, due to the lack of a requirement for the drone pilot to have notified their flight, the Typhoon pilot had had no prior knowledge of its operation and had, therefore, had no situational awareness of the drone's predicted presence or intended flight (**CF1**). Members agreed that it was unsurprising that the Typhoon pilot had had little time to recognise the DJI Mini 4 Pro whilst flying past at an estimated 420kts and had been unsighted on it (**CF2**), and that any opportunity for an advanced sighting would have been further obscured by the terrain (**CF3**).

On finalising their discussion and assessing the Risk Category, the Board agreed that safety had been much reduced below the norm (**CF4**) and that a collision between the Typhoon and the DJI Mini 4 Pro had been avoided by serendipity and the inaction of the DJI Mini 4 Pro pilot, who had been concerned about taking the correct action on hearing the Typhoon and unable to react expeditiously on sighting it. As such, the Board awarded a Risk Category B to this event.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2024283			
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
	• See and Avoid			
2	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
3	Contextual	• Visual Impairment	Events involving impairment due to an inability to see properly	One or both aircraft were obscured from the other
	• Outcome Events			
4	Contextual	• Near Airborne Collision with RPAS	An event involving a near collision with a remotely piloted air vehicle	

[4] Low flying military aircraft. Find out about low flying in your area. GOV.UK Website.
[5] DMARES drone registration UKCAA Website.

Degree of Risk: B.

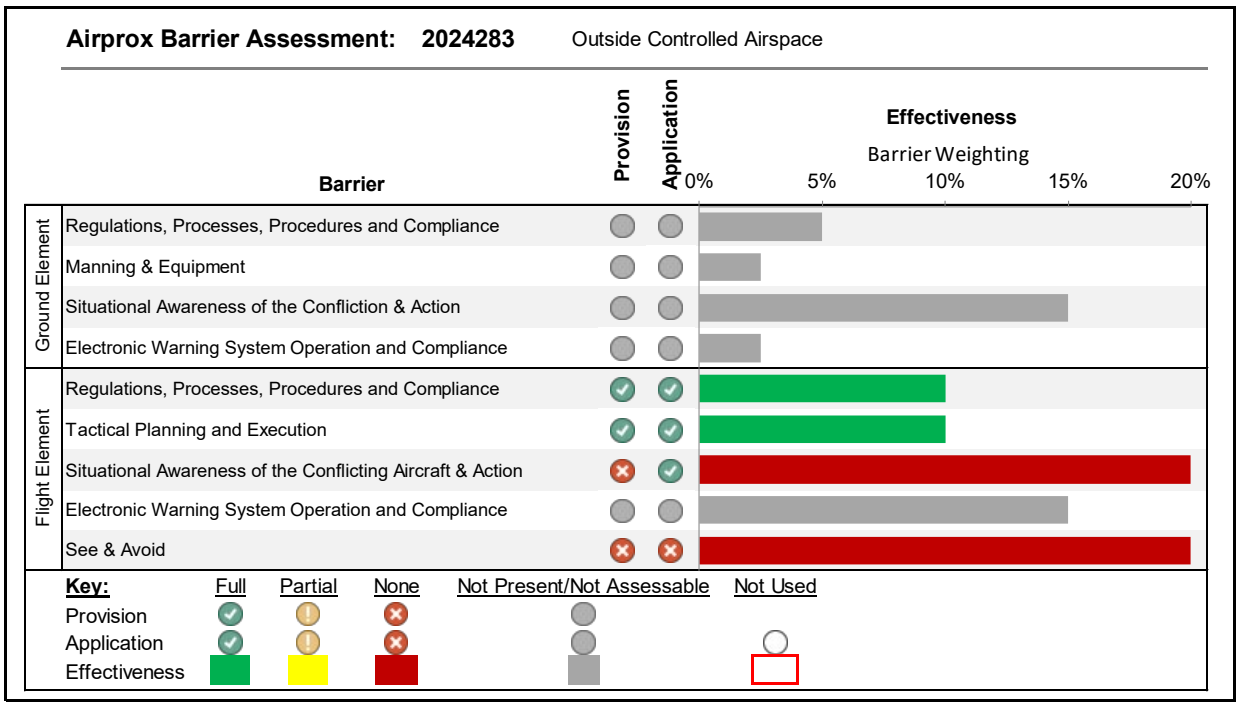
Safety Barrier Assessment[6]

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 **ineffective** because the Typhoon pilot had no situational awareness of the drone operation and the DJI Mini 4 Pro pilot had late situational awareness of the Typhoon on hearing the fast moving traffic briefly before sighting it.

See and Avoid were assessed as **ineffective** because the Typhoon pilot had not sighted the DJI Mini 4 Pro and the DJI Mini 4 Pro pilot had not seen the Typhoon prior to CPA.



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