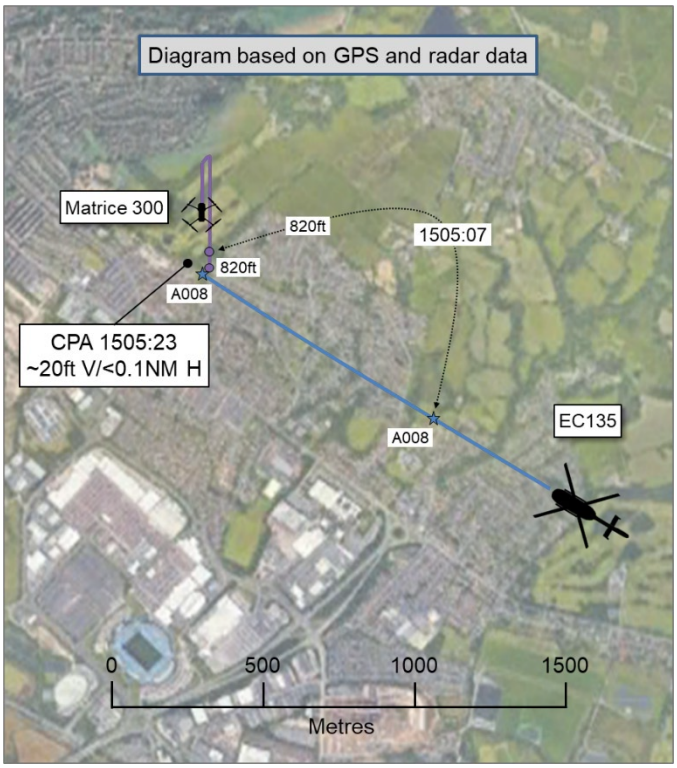
AIRPROX REPORT No 2024257

Date: 10 Oct 2024 Time: 1505Z Position: 5336N 00232W Location: 4NM W Bolton

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	EC135	Matrice 300
Operator	NPAS	Civ UAS
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VLOS (Specific Cat.)
Service	Listening Out	None
Provider	Barton Information	N/A
Altitude/FL	A008	820ft
Transponder	A, C, S	Not fitted
Reported		
Colours	Blue, yellow	Black
Lighting	Nav, landing, strobe	Nav
Conditions	VMC	VMC
Visibility	>10km	5-10km
Altitude/FL	1100ft	100m
Altimeter	QNH (1010hPa)	AGL
Heading	320°	180°
Speed	120kt	<4kt
ACAS/TAS	TAS	Not fitted
Alert	None	N/A
Separation at CPA		
Reported	0ft V/100ft H	100ft V/0.1NM H
Recorded	~20ft V/<0.1NM H	



THE EC135 PILOT reports that they were en-route to a task in the Horwich area of Manchester. As they approached the task area, they, and the rear seat Tactical Flight Officer (TFO), observed a large black drone passing down the starboard side of the aircraft at the same altitude approximately 100ft away. There was no avoiding action taken as they were already passing the drone and the conflict had passed, albeit purely by luck. They turned the aircraft in order to regain visual contact. They observed the drone at a lower altitude and displaying a white strobe.

Utilizing the onboard camera systems, they followed the drone to a landing site […]. At the landing point, there seemed to be two operators dressed in orange high-visibility clothing. Given their clothing and the size of the drone, this looked to have been a commercial operation. They were able to call for assistance from a police ground patrol in order to speak with the operators and gain details of their operation and their permissions.

At the time of the incident, [the pilot of the EC135] had been flying at 1100ft on the Manchester QNH of 1010hPa and the aircraft RadAlt was indicating 650ft AGL [they recall]. The helicopter returned to base without further incident. There were no NOTAMs of the [drone] operation on the morning daily pre-flight brief (and this was confirmed after landing). [A drone planning app] was also consulted after landing with no notifications seen, although, approximately 5min after checking, a new notification appeared for the area but with timings outside the period in which they had been flying when the incident occurred.

[The pilot of the EC135 opined that] contributory factors included a high workload, rising ground, and that they were unaware of the drone operation.

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

THE MATRICE 300 PILOT reports that they were gathering photogrammetry images of a construction site on Friday 10th October. On Thursday evening, around 1557, they had submitted a flightplan on [a drone planning app] logging their mission flightplan. Conducting the mission requires a set altitude and theirs was 100m (i.e. 328ft). Around 14min into their flight, they observed an aircraft, [the EC135], to the west [they recall] approaching rapidly. Their initial thoughts were to pause the drone and determine the route of the police helicopter before descending to 52m (170ft). After realising that the police [had been] sent to their drone, they resorted to landing it. A police unit was despatched to their location [and a police officer] requested their documentation.

Their initial thought was shock at the incident as a whole. Their drone flies an autonomous route and they had to make sure that they knew their directional heading before avoidance decisions could have been undertaken as the drone was at its waypoint and was about to change its course. Their CAA Ops manual suggests that [to avoid a] head-on collision, manoeuvre right. However, if they had moved right, they would have gone towards the oncoming manned aircraft as it had circled clockwise on approaching the drone. There was a potential to have got caught in the downwash from the helicopter. They had to quickly gather their thoughts and consider bringing the drone [back] to their location and safely land it. The helicopter proceeded to circle the site. They [wish they had] asked their observer to record that part. Due to their task operating the drone, they did not film any of the incident from the drone or from the ground.

After all the commotion had ceased, [the police officer] called for [the pilot of the EC135] to stand down. [The pilot of the Matrice 300 commented that] a question remained about their elevation at take-off [and they explained that] it was determined when setting the mission. The drone's height was 100m AGL so they do not know the reason for any intimidation with the use of a crewed aircraft or for such a response from the police to members of the public. [The pilot of the Matrice 300 opined that] this incident should not have occurred [if there had been] appropriate checks from the police simply checking the [drone planning app] portal where pilots upload mission plans that show the coverage areas.

[The pilot of the Matrice 300 commented that they believe that] the police were aware of the drone and location, and they did not expect the helicopter to approach in such a manner and follow the drone by circling it multiple times.

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

THE MANCHESTER BARTON AFISO reports that, while operating on the frequency, there were no reports of an Airprox. A telephone call was taken by the VCR Assistant from the [pilot of the EC135], at around 1545, to advise they had had an Airprox with a "*commercial drone*" at Middlebrook VRP at 500ft. The pilot asked if they knew about the drone or had seen any reference to it. The VCR Assistant advised the pilot that due to the location being outside their FRZ, they would not have been notified of this flight and could not see any notifications on their NOTAM briefings.

Factual Background

The weather at Manchester was recorded as follows:

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METAR COR EGCC 101520Z AUTO 26007KT 230V290 9999 SCT039 10/01 Q1010 NOSIG
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Analysis and Investigation

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and the EC135 could be positively identified from Mode S data (see Figure 1). The EC135 was depicted on the radar replay at Flight Levels. An appropriate correction was applied to determine its altitude. The Matrice 300 was not observed on the radar replay, however, the pilot of the Matrice 300 kindly supplied GPS track data for their flight. The elevation of the terrain at the take-off point for the Matrice 300 was 492ft. At CPA, the Matrice 300 was 328ft above the elevation of its take-off point.

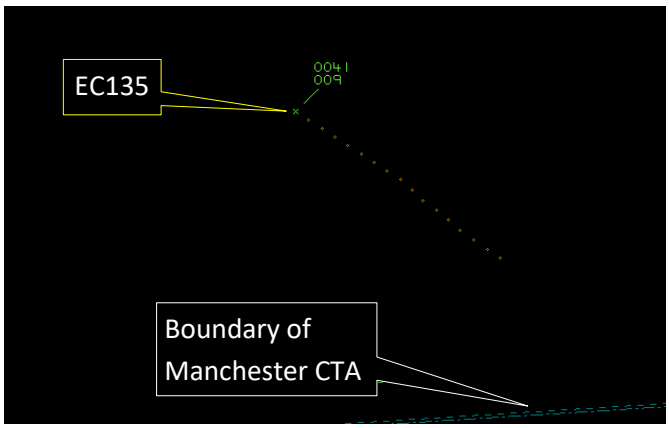


Figure 1 – CPA at 1505:23

A representative from the drone flight planning app company confirmed that a 'flightplan' for the Matrice 300 had been submitted on the 10th October at 1454:48 (3min after the Matrice 300 had first taken-off). The 'flightplan' stated an intended flight from 1457 to 1527 within the bounds shown in Figure 2 and up to a height of 100m AGL. However, the status of the flight could not be confirmed as, reportedly, there had been no notification of it having commenced.

Figure 2 – The area indicated by the 'flightplan' submitted by the pilot of the Matrice 300.

It was by combining the different data sources that the diagram was constructed and the separation at CPA determined. After CPA, the EC135 was observed to climb to 1000ft and conduct several orbits of the area.

The EC135 and Matrice 300 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[1] The Operational Authorisation issued to the operator of the Matrice 300 specified the authorised types of operation: a) VLOS as per the definition given in UK Regulation (EU) No. 2019/947, Article 2(7). b) Flights within 150m of Residential, Commercial, Industrial or Recreational Areas.[2] During the flight, the remote pilot shall: avoid any risk of collision with any manned aircraft and discontinue a flight when continuing it may pose a risk to other aircraft, people, animals, environment or property.[3]

Summary

An Airprox was reported when an EC135 and a Matrice 300 flew into proximity 4NM west of Bolton at 1505Z on Thursday 10th October 2024. The EC135 pilot was operating under VFR in VMC listening-out

[1] (UK) SERA.3205 Proximity.
[2] Operational Authorisation (Specific Category) as issued to the operator of the Matrice 300 4.1(a) and (b).
[3] Assimilated Regulation (EU) 2019/947- UAS.SPEC.060 Responsibilities of the remote pilot (3)(b).

on the Barton Information frequency and the Matrice 300 pilot was operating under VLOS in VMC 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, a report from the AFISO involved and GPS track data from the Matrice 300. 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 pilot of the EC135. Members reviewed the NATS radar replay and noted that, at the moment of CPA, the Mode C return from the transponder fitted to the EC135 had indicated FL009. Having corrected the Flight Level to an altitude, and noted that the elevation of the terrain at the location of CPA had been approximately 500ft AMSL, members concluded that the EC135 had been approximately 300ft AGL. This, members agreed, was congruent with the pilot of the EC135 having reported that the Matrice 300 had been visually acquired co-altitude given that the Matrice 300 had recorded its height as 328ft AGL. A member with particular knowledge of police aviation operations explained that the pilot of the EC135 had operated under an easement from the regulations pertaining to low flying in accordance with their Police Air Operator's Certificate (PAOC). Nevertheless, members wondered what mitigations had been in place to ameliorate the risk of encountering a UAS in that height band (up to 400ft AGL outside an FRZ) in which a UAS may routinely operate. Indeed, members agreed that the TAS fitted to the EC135 would not have been expected to have detected the presence of the Matrice 300 (**CF3**). Further, members noted that a NOTAM had not been issued, nor had one been required, for the flight of the Matrice 300. It was agreed by members that the pilot of the EC135 had not had situational awareness of the Matrice 300 until it had been visually acquired (**CF2**) and that to have sighted it at the moment of CPA effectively constituted a non-sighting (**CF5**).

Members next considered the actions of the pilot of the Matrice 300. It was noted that a 'flightplan' had been submitted for their flight approximately 3min after the Matrice 300 had first launched. Members agreed that, with only a few minutes from submission of the 'flightplan' to the launch of the Matrice 300 and then to the moment of CPA, it had been extremely unlikely that the pilot of the EC135 would have been aware of the presence of the Matrice 300 from the 'flightplan' notification. Regardless, members noted that the drone flight planning app had not been consulted by the pilot of the EC135 before their flight, only once they had returned to base. One member pondered the numerous apps available that accept notifications of UAS flights and wondered how these might be drawn into an integrated flight planning resource in the future for crewed aviation and UAS operators alike.

Members returned to their thoughts on the actions of the Matrice 300 pilot and noted that they had not had situational awareness of the presence of the EC135 until it had been visually acquired (**CF2**). Members noted that, having sighted the EC135, the pilot of the Matrice 300 had considered an appropriate course of action and it was acknowledged that they had interrupted the autonomous operation of the UAS. However, members agreed that the correct action in this instance would have been to have discontinued their flight altogether or to have manoeuvred the Matrice 300 in such a way as to have ensured that no risk of collision had been present (in accordance with Assimilated Regulation (EU) 2019/947- UAS.SPEC.060 Responsibilities of the remote pilot (3)(b)). Consequently, members agreed that their dynamic plan had not been adapted to meet the needs of the situation (**CF1**) and concluded that, by maintaining their position (at height) the pilot of the Matrice 300 had, effectively, flown into conflict with the EC135 (**CF4**).

Concluding their discussion, members agreed that, although the pilot of the EC135 had not had situational awareness of the Matrice 300 and had not visually acquired it until the moment of CPA, the pilot of the Matrice 300 had sighted the EC135 in time to have taken effective avoiding action. However, members were in agreement that the pilot of the Matrice 300 had not adapted their plan sufficiently and had not discontinued their flight. Members agreed that safety margins had been reduced below the norm and that the risk of collision that had existed had not been averted (**CF6**). The Board assigned Risk category B to this event.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2024257			
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
	Flight Elements			
	• Tactical Planning and Execution			
1	Human Factors	• Insufficient Decision/Plan	Events involving flight crew not making a sufficiently detailed decision or plan to meet the needs of the situation	Inadequate plan adaption
	• Situational Awareness of the Conflicting Aircraft and Action			
2	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			
3	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			
4	Contextual	• Loss of Separation	An event involving a loss of separation between aircraft	Pilot flew into conflict
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 Aircraft	An event involving a near collision by an aircraft with an aircraft, balloon, dirigible or other piloted air vehicles	

Degree of Risk: B.

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:

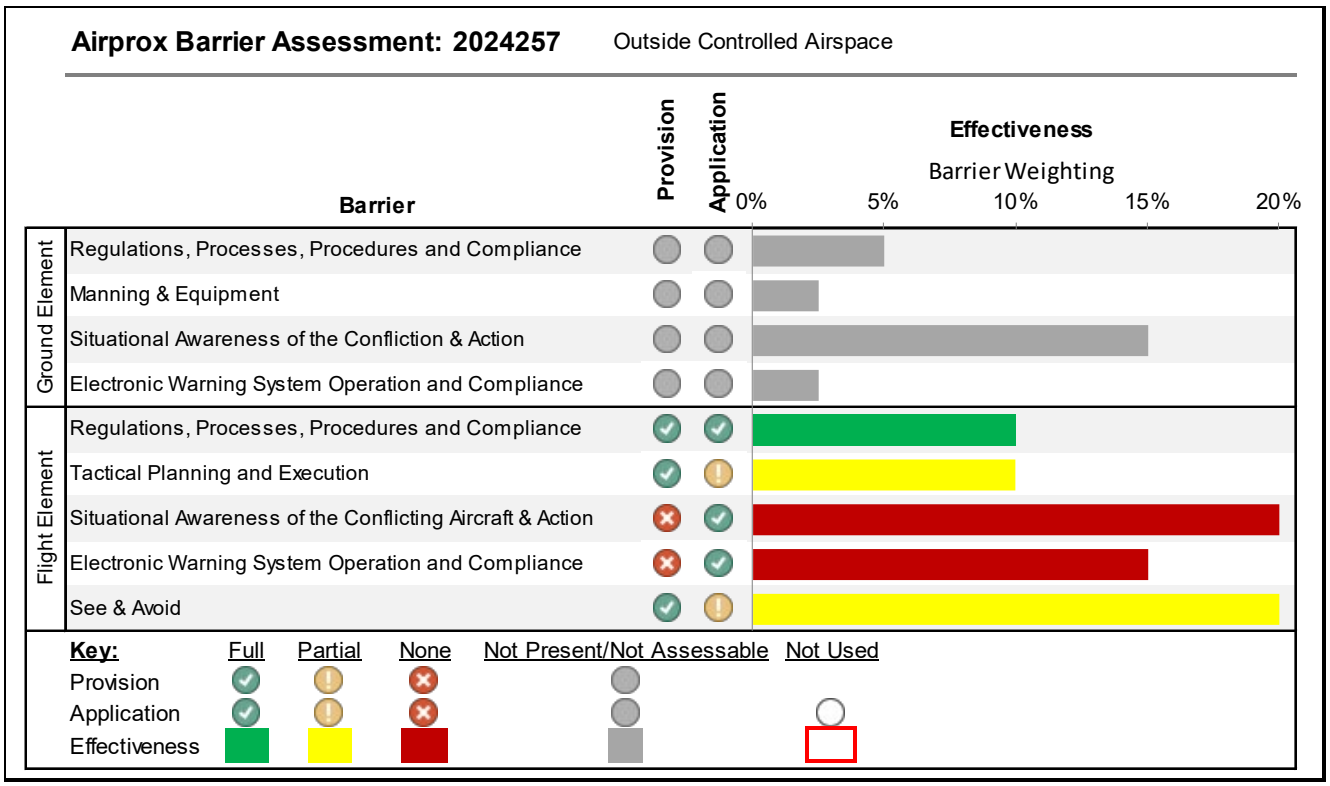
Tactical Planning and Execution was assessed as **partially effective** because, after having visually acquired the EC135, the pilot of the Matrice 300 had interrupted the autonomous operation of the UAS but had not manoeuvred it sufficiently to have avoided a risk of collision with the EC135.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither pilot had situational awareness of the presence of the other aircraft until visually acquired.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the TAS fitted to the EC135 would not have been expected to have detected the presence of the Matrice 300.

See and Avoid were assessed as **partially effective** because the pilot of the Matrice 300 had not manoeuvred the UAS sufficiently to have avoided a risk of collision with the EC135.

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


Airprox Barrier Assessment: 2024257
Outside Controlled Airspace
Barrier
Provision
Application
Effectiveness
Barrier Weighting
0%
5%
10%
15%
20%
Ground Element
Regulations, Processes, Procedures and Compliance
Manning & Equipment
Situational Awareness of the Confliction & Action
Electronic Warning System Operation and Compliance
Flight Element
Regulations, Processes, Procedures and Compliance
Tactical Planning and Execution
Situational Awareness of the Conflicting Aircraft & Action
Electronic Warning System Operation and Compliance
See & Avoid
Key:
Full
Partial
None
Not Present/Not Assessable
Not Used
Provision
Application
Effectiveness