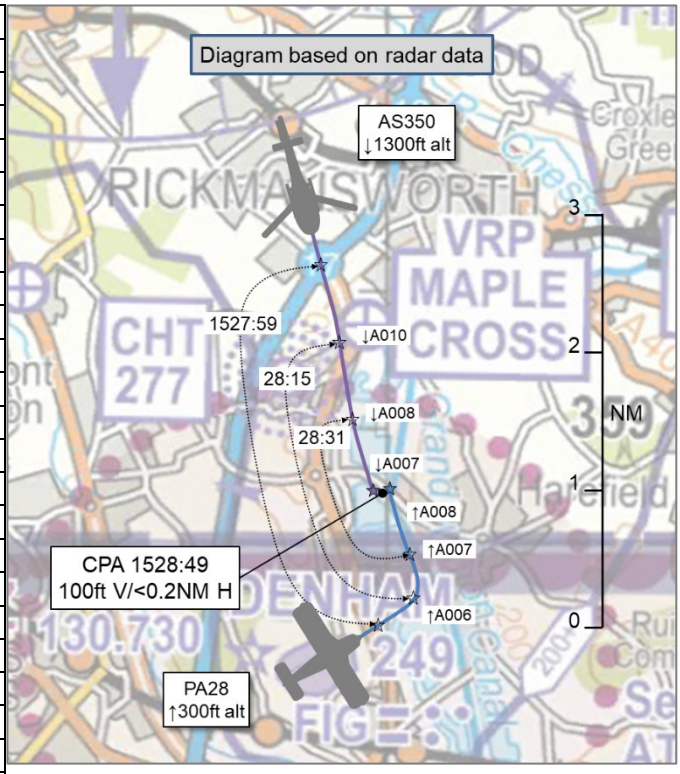
AIRPROX REPORT No 2022035

Date: 21 Mar 2022 Time: 1529Z Position: 5136N 00030W Location: Denham aerodrome

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	PA28	AS350
Operator	Civ FW	Civ Helo
Airspace	Denham ATZ	Denham ATZ
Class	G	G
Rules	VFR	VFR
Service	AGCS	AGCS
Provider	Denham Radio	Denham Radio
Altitude/FL	800ft	700ft
Transponder	A, C, S+	A, C, S+
Reported		
Colours	White, blue, red	Silver, black
Lighting	Strobes, landing	Strobes
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	1000ft	500ft
Altimeter	QNH (1027hPa)	QNH (NK hPa)
Heading	330°	180°
Speed	75kt	100kt
ACAS/TAS	PilotAware	TCAS I
Alert	Unknown	None
Separation at CPA		
Reported	150ft V/<0.5NM H	500ft V/0.5NM H
Recorded	100ft V/<0.2NM H	



THE PA28 PILOT reports that they were lined-up on the RW (06) to fly the circuit. The helicopter called to enter the ATZ to go to a private site in the zone. The pilot was given the airfield information and was told about their PA28 and was advised to join at St Giles for the 06LH circuit. The helicopter pilot acknowledged the information and said they would join at Maple Cross. The AGO then reported over the radio that their PA28 was in the active circuit for 06LH about 3 times and the [helicopter] pilot acknowledged. When they were crosswind, they saw the helicopter at Maple Cross and reported it. The helicopter traffic joined the crosswind leg, opposing circuit traffic. They took control from their student and turned right for separation. They then reported on the radio what happened; the helicopter pilot stated they were not aware of their PA28.

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

THE AS350 PILOT reports that, on approaching Denham, they were given RW06LH and told no traffic. They were asked if they would cross the RW06 threshold or the 'lakes'. Given no traffic, they chose the 'lakes' as their most direct route. A minute or so later, they heard radio transmissions between Denham and an aircraft. They were not distinguishable, but they guessed it was an aircraft approaching the field or on the ground. The AS350 pilot called back and said that if there was a conflicting aircraft they could divert. They received no reply. They then saw an aircraft taking-off from RW06, clearly in sight and climbing out. They positioned nearer to the RW24 threshold, to be well clear of the other aircraft's crosswind leg. They had the other aircraft well in sight the whole time. They were never conflicting, though there probably was not very much vertical distance between the 2 aircraft, but probably half-a-mile of horizontal distance and in perfect visibility.

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

THE DENHAM AIR/GROUND OPERATOR reports that [the PA28] was taxiing to RW06 when they received a free-call from [the AS350 pilot] – a frequent helicopter that lands in Denham village. They passed the RW in use, QNH and circuit state to [the AS350 pilot] and also informed them about [the PA28], which was now ready for departure on RW06. The AGO asked [the AS350 pilot] if they would route via St Giles as they had circuit traffic, but [the AS350 pilot] said that they would route via Maple Cross and keep a lookout. Although [the PA28 pilot] was on the same frequency, they passed Traffic Information to [the PA28 pilot] about [the AS350]. [The PA28] took-off from RW06 and as it climbed and turned over the 'lakes' the pilot reported visual with the helicopter which then, the AGO believes, passed down the port side of [the PA28] and just below.

Factual Background

The weather at Heathrow Airport was recorded as follows:

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METAR COR EGLL 211520Z AUTO 12006KT 080V170 9999 NCD 17/03 Q1027 NOSIG=
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Analysis and Investigation

UKAB Secretariat

An analysis of the NATS area radar replay using the Heathrow 10cm radar was undertaken. Both aircraft were detected by the NATS area radar. The first detection of the PA28 was at 1527:47 as it departed from Denham; at this time the AS350 was southbound, descending from an altitude of 1300ft (see Figure 1). The PA28 was in the process of climbing-out and continued to climb while the AS350 continued its descent on a southbound track. When the PA28 was established on the crosswind leg, the aircraft were separated by 100ft vertically (the AS350 being the higher of the 2 aircraft) and 1.1NM horizontally (see Figure 2).

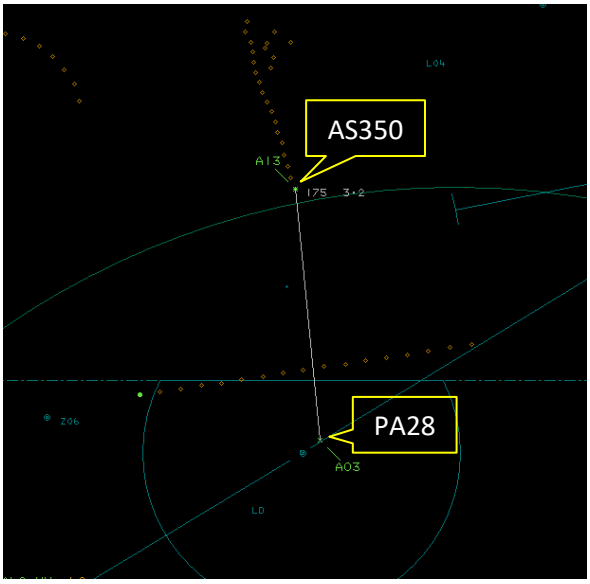


Figure 1 – 1527:47

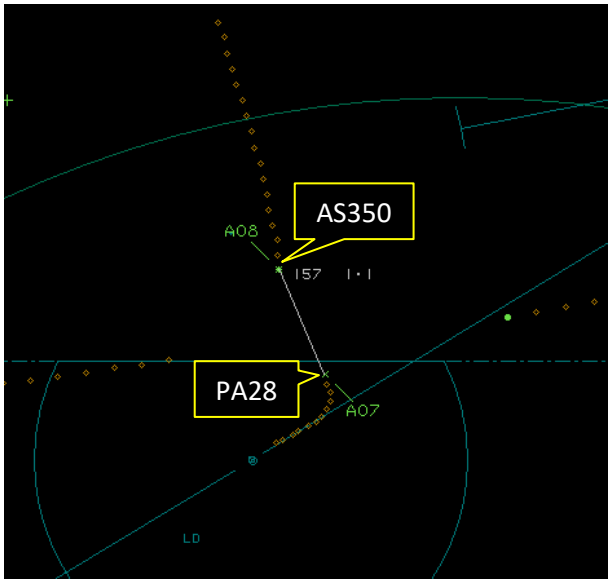


Figure 2 – 1528:31

The PA28 continued to climb on its crosswind leg while the AS350 continued its descent on a southbound track towards the PA28. The aircraft reached the same recorded altitude (800ft) at 1528:39, approximately 10sec prior to CPA. At the first CPA recorded by the radar (at 1528:47 – see Figure 3) the AS350's Mode C readout showed that it had descended to 100ft below the PA28; the radar replay was continued and, one sweep (4sec) later, the recorded separation was identical to the previous sweep (0.2NM horizontally and 100ft vertically – see Figure 4). CPA is therefore assessed to have occurred at 1528:49 – between radar sweeps – with a separation of <0.2NM horizontally and 100ft vertically.

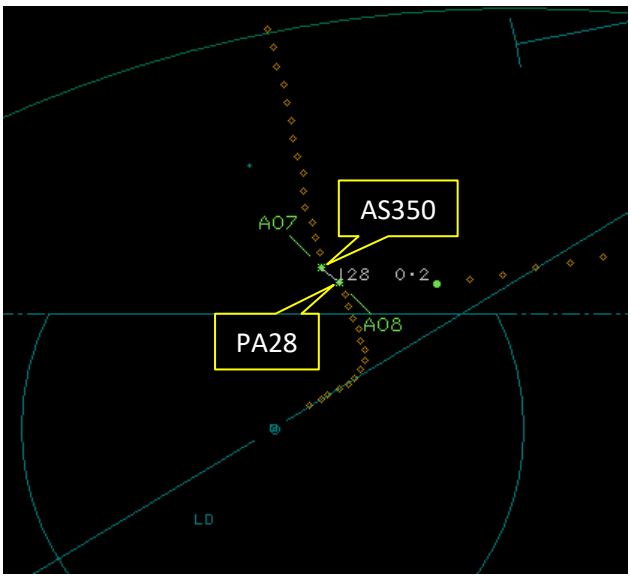


Figure 3 – 1528:47

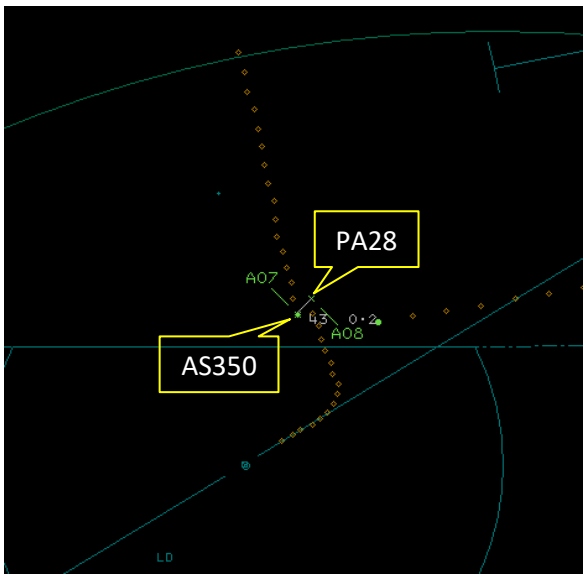


Figure 4 – 1528:51

The PA28 and AS350 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] An aircraft operated on or in the vicinity of an aerodrome shall conform with or avoid the pattern of traffic formed by other aircraft in operation.[2]

Summary

An Airprox was reported when a PA28 and an AS350 flew into proximity in the Denham visual circuit at 1529Z on Monday 21st March 2022. Both pilots were operating under VFR in VMC and both were in receipt of an AGCS from Denham Radio.

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 air ground operator involved. 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 AS350 pilot and noted that they reported being told that there had been no traffic, whereas the PA28 pilot's and AGO's reports suggested that they had been informed of the PA28 lining-up on the RW for departure into the RW06 left-hand circuit. A helicopter pilot member familiar with operations at Denham suggested that the AS350 pilot may have been better served by joining through the St Giles VRP (which is situated approximately 2.5NM to the west of the Maple Cross VRP) and proceeded to their landing area in accordance with the circuit pattern of the RW in use, irrespective of the traffic situation at the time that they called to enter the ATZ, as the distances from the 2 VRPs to their landing area are broadly similar. In the event, the AS350 pilot had chosen to fly in opposition to the crosswind leg for the RW in use but, members agreed, they had sighted the PA28 in good time. However, whilst there was some discussion regarding which aircraft had formed a traffic pattern, the majority of Board members considered that it had been for the AS350 pilot to avoid or comply with the RW06 left-hand circuit once it had become occupied by the PA28, which they had not done (**CF2**). The Board agreed that the AS350 pilot had manoeuvred to their right once they had sighted the PA28, but that they had not displaced their aircraft sufficiently from the PA28 (**CF1**). The Board noted that the AS350 had been equipped with TCAS I, which should have detected the transponder signals from the PA28, but that the AS350 pilot had not reported receiving an alert (**CF4**) which, if received, may have prompted them to have manoeuvred to provide a greater separation from

[1] (UK) SERA.3205 Proximity.
[2] (UK) SERA.3225 Operation on and in the Vicinity of an Aerodrome.

the PA28. The Board agreed that the AS350 pilot had flown close enough to the PA28 to cause its pilot concern (**CF5**).

The Board then considered the actions of the PA28 pilot and noted that they had heard the AS350 pilot calling to enter the ATZ and agreed that this had provided the PA28 pilot with generic situational awareness regarding the positioning of the AS350 (**CF3**). Once again, members noted that the PA28 pilot had been carrying electronic conspicuity equipment that should have been able to detect the AS350's transponder signals, but the pilot did not report having received an alert from this equipment (**CF4**). The Board also noted that the PA28 pilot's belief had been that the AS350 pilot had been aware of their presence, but that this had not been the case. Therefore, the Board considered that the PA28 pilot had been surprised to see the AS350 flying in the opposite direction once they had established on their crosswind leg after take-off and had been concerned enough by how close the AS350 had been to their aircraft (**CF6**) to have taken control of the aircraft from their student in order to manoeuvre away from the helicopter.

Finally, the Board considered the risk involved in this event. Members noted that the PA28 pilot had assessed the risk of collision as 'High', but that the AS350 pilot had assessed the risk of collision as 'None'. Some members felt that because the AS350 pilot had sighted the PA28 at an early stage then any risk of collision had been removed, whilst others argued that the minimal separation at CPA had led to a residual risk of collision, irrespective of the fact that both pilots had had the other aircraft in sight. After further discussion, the Board appeared evenly split between a Risk Category B (safety much reduced, risk of collision) and a Risk Category C (safety degraded, no risk of collision) so the Chair put it to a vote. By a count of 6 votes to 4, the Board assigned a Risk Category C to this Airprox.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2022035			
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
2	Human Factors	• Monitoring of Environment	Events involving flight crew not to appropriately monitoring the environment	Did not avoid/conform with the pattern of traffic already formed
	• 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	Human Factors	• Response to Warning System	An event involving the incorrect response of flight crew following the operation of an aircraft warning system	CWS misinterpreted, not optimally actioned or CWS alert expected but none reported
	• See and Avoid			
5	Human Factors	• Lack of Individual Risk Perception	Events involving flight crew not fully appreciating the risk of a particular course of action	Pilot flew close enough to cause concern
6	Human Factors	• Perception of Visual Information	Events involving flight crew incorrectly perceiving a situation visually and then taking the wrong course of action or path of movement	Pilot was concerned by the proximity of the other aircraft

Degree of Risk: C

Safety Barrier Assessment[3]

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

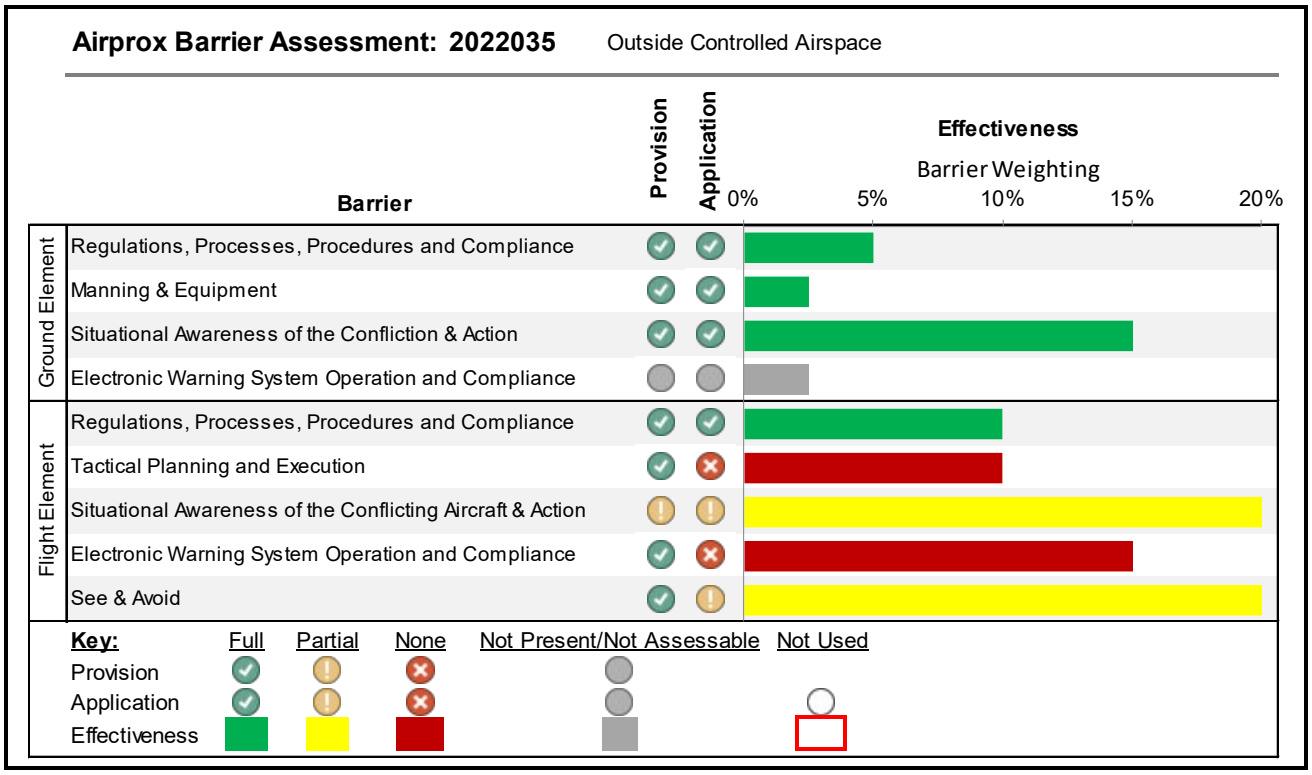
Flight Elements:

Tactical Planning and Execution was assessed as **ineffective** because The AS350pilot elected to route in such a manner that they would be opposing any traffic on crosswind for the runway in use and subsequently did not conform with or avoid the traffic pattern formed by the PA28.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because the PA28 pilot had only generic situational awareness of the AS350 entering the Denham ATZ and did not assimilate that the AS350 pilot's routing may have meant that they would encounter the helicopter on climb-out on the crosswind leg.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because The TCAS I equipment fitted to the AS350 did not alert the pilot to the proximity of the PA28, and the electronic conspicuity equipment carried by the PA28 did not detect the presence of the AS350.

See and Avoid were assessed as **partially effective** because, although the AS350 pilot sighted the PA28 as it departed from the runway, they did not ensure sufficient separation from the PA28 on its crosswind leg.



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