AIRPROX REPORT No 2022137

Date: 12 Jul 2022 Time: 0832Z Position: 5126N 00040W Location: 1.5NM N Ascot

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	R44	PC12
Operator	Civ Helo	Civ FW
Airspace	London CTR	London CTR
Class	D	D
Rules	VFR	VFR
Service	Radar Control	Radar Control
Provider	Heathrow Radar	Heathrow Radar
Altitude/FL	1200ft	1100ft
Transponder	A, C, S	A, C, S
Reported		
Colours	Dark Blue	Silver, Blue
Lighting	Beacon	Pulse recognition
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	1100ft	1100ft
Altimeter	QNH (1023hPa)	QNH
Heading	South	Southerly
Speed	105kt	190kt
ACAS/TAS	Not fitted	TCAS I
Alert	N/A	None
Separation at CPA		
Reported	25ft V/50-60m H	100ft V/0.1NM H
Recorded	100ft V/<0.1NM H	

THE R44 PILOT reports that they departed on a flight to a private landing site with their family on board. Good VFR conditions were forecast and prevailed along the entire route of flight. The helicopter is dark blue in colour and the flashing beacon on the helicopter's tail boom was operating during the flight (and confirmed as working during their pre-flight inspection of the aircraft). Upon departure they contacted Heathrow Radar on 125.625Mhz and obtained a clearance to transit the Heathrow Control Zone routing to Burnham, Ascot, Thorpe and Byfleet Bridge. They were identified on radar (with a squawk code) and cleared to enter controlled airspace to fly under visual flight rules (VFR) and not above an altitude of 1200ft (on a QNH of 1023hPa). It was also confirmed that they were under Radar Control upon entering controlled airspace. Upon reaching Burnham, they turned to a southerly heading to track towards Ascot. The controller advised them that a PC12 aircraft was cleared along the same route and would be overtaking them, as it was much faster. The controller also advised that the PC12 pilot had visual contact with the R44. They acknowledged the transmission and continued along their route in straight and level flight. At this point, whilst they were aware that another aircraft would overtake, they derived some assurance from the following factors:

- Both aircraft were inside controlled airspace and under Radar Control.
- The pilot of the PC12 aircraft had confirmed that they had the R44 in sight.
- They were in straight and level flight.
- They could not see behind and therefore could not take any avoiding action.
- They had the right of way.

Moments later, at approximately 0832, the PC12 aircraft passed to the right of them at such close proximity, and at such high speed, that they determined that there was a very high risk of collision. The PC12 was slightly below them and banked slightly when overtaking. Two of their passengers also witnessed the PC12 overtaking and one, who was sitting directly behind them in the rear right passenger seat, was able to read the [two letters] within the PC12's registration. Suffice it to say, had the PC12

been stationary on the ground and they were hover taxiing past it, they would have given it a wider berth than it gave them in the air. Having checked FlightRadar24 they could see that their groundspeed was about 92kt while the PC12's groundspeed was about 191kt. They did not encounter any wake turbulence. The PC12 continued along its path, turned left at Ascot and proceeded to its destination. The R44 pilot subsequently asked the Heathrow controller to confirm whether the PC12 pilot did actually have them in visual contact and the controller confirmed that the PC12 pilot did. They then noted to the controller that the PC12 passed at an "uncomfortably close" distance and the controller replied that it was the PC12 pilot's responsibility. They did not recall any comment on the radio from the PC12 pilot. They continued the flight without incident and landed safely. They considered that the PC12 had passed so close to their aircraft, and at such a high speed, that there was a high risk of collision. Had the PC12 collided with them, it would almost certainly have resulted all on board being killed. After this occurrence, they sought to identify and contact the PC12 pilot. They called Heathrow ATC over the telephone, explained the situation, and were informed of the PC12's registration. They subsequently made contact with the owner of the PC12 using information from the G-INFO website and discussed the matter in some detail with a representative of the organisation that manages the aircraft in question. In particular:

• The occurrence happened in controlled airspace between two aircraft under Radar Control, albeit on VFR clearances.
• The PC12, being a heavy and high performance general aviation aircraft, is typically equipped with advanced traffic detection equipment to supplement the pilot's see-and-avoid obligations.
• The pilot of the PC12 had indicated that they had visual contact with the R44 and it was therefore incumbent on them to maintain visual separation and to overtake at a safe distance.
• Although they accepted that the Heathrow controller's attention may have been diverted elsewhere and that instructions had already been issued, they wondered whether a collision alert was triggered by the radar systems and whether a further warning could have been issued to either pilot to facilitate safe separation.

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

THE PC12 PILOT reports that they navigated to north of Stansted at 2300ft London QNH and east of Luton, below the London TMA. They contacted Luton Radar on 129.55MHz for a Traffic Information Service and asked for a handover to Heathrow for clearance along the low-level visual corridor from Burnham NDB to Ascot; a route they are familiar with. On contact with Heathrow they were cleared to enter the zone not above 1200ft QNH to route west of the line Burnham to Ascot. They were level at 1100ft west of the track Burnham to Ascot when the controller advised of same direction helicopter traffic approaching Ascot. Both they and their colleague clearly spotted the traffic and identified it as a Robinson R44 helicopter. There was also two-way communication between the helicopter pilot and the controller that there was a fast approaching PC12. They informed the controller that they had visual contact with the helicopter. They were approaching the helicopter from behind at a lower altitude and to the west. From this position they could clearly see the helicopter/pilot out of the left-side window and judged that their lateral separation and vertical separation combined with their closing speed was sufficient to pass without any danger to either aircraft even if the helicopter made a course change. As they approached the 4 o'clock position they banked slightly right 5° to further illustrate to the helicopter pilot that they were visual and maintaining good separation. Having passed the helicopter on the right-hand side and once ahead by a suitable distance they navigated to join the circuit at [destination]. They heard the helicopter pilot ask the controller if they had been visual. In their opinion, considering the constraints of the low-level corridor in terms of available altitude and lateral deviation, they kept within these constraints to the satisfaction of the controller, as well as giving the helicopter suitable visual clearance, and at no time compromised the safety of either aircraft.

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

THE LL SVFR CONTROLLER reports that an R44 routing to [redacted] on SSR code 7033 had been issued with a clearance to cross the Heathrow zone west of BUR-ASCOT not above 1200ft. A PC12 going to [destination] called on frequency and requested a zone transit and was also given clearance to cross west of BUR-ASCOT not above 1200ft on SSR code 7034. The PC12 was considerably faster than the R44 and, when north of Ascot at approximately 0832, passed underneath it. Traffic Information

was passed to [PC12 C/S] to advise that they were catching up with the traffic and the pilot reported that they were visual. Traffic Information was also passed to the [R44 C/S] to advise that the other aircraft was coming from behind and would overtake. The pilot of the [R44 C/S] advised that they had the PC12 in sight (they recalled) and asked if the PC12 pilot had them in sight when they were behind. The [PC12 C/S] had previously reported visual.

Factual Background

The weather at Heathrow was recorded as follows:

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METAR COR EGLL 120820Z AUTO 25006KT 220V310 9999 NCD 24/13 Q1023 NOSIG=
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Analysis and Investigation

NATS Safety Investigations

The pilot of [the R44 C/S] contacted the Heathrow SVFR frequency at 0824:27 to request a London CTR transit. The controller issued [R44 C/S] SSR code 7033, QNH1023 and confirmed that it was a Basic Service outside controlled airspace. The pilot read this back, and requested to route from their present position, 1NM east of Denham, to BUR-ASCOT-THORPE and to exit the zone via Byfleet bridge. The controller advised the pilot that they were identified and then issued a clearance to enter the London Control Zone not above 1200ft VFR, and to route west of BUR-ASCOT. At 0826:17 the controller advised the pilot of [R44 C/S] that they had entered controlled airspace and changed the service to Radar Control. This was read back correctly by the pilot. The controller then issued further clearance to [R44 C/S] that after ASCOT they were to route via Thorpe and to leave via M25 Byfleet. This was read back correctly by the pilot. The pilot of [PC12 C/S] contacted Heathrow SVFR frequency at 0827:16 when they were 6.7NM NNE of Denham, to request a London CTR transit. The controller issued [PC12 C/S] SSR code 7034. At 0827:40 the controller advised the PC12 pilot that they were identified, and the service was a Basic Service, and issued clearance to enter the London Control Zone not above 1200ft VFR, to route west of BUR-ASCOT. This was readback correctly by the pilot. At 0829:55 the controller advised the PC12 pilot that they had entered controlled airspace and changed the service to a Radar Control Service. The controller then dealt with another VFR aircraft that was requesting a zone crossing.

Figure 1

At 0831:28 the controller issued Traffic Information to the PC12 pilot stating "*There is traffic in your 12 o'clock, range of about 2 miles also west of BUR-ASCOT*" (See Figure 1). [The R44] was ahead by 2.6NM and had a ground speed of 98kt displaying altitude 1200ft. [The PC12] had a ground speed of 208kt and indicated 1100ft. The PC12 pilot responded that they were visual. The controller then issued Traffic Information to the R44 pilot at 0831:39 and stated "[C/S] *there is traffic behind you approaching quite quickly. It's a PC12 showing the same level by one mile. Inbound to [destination].*" The R44 pilot responded and asked if the transmission was for them. The controller

responded "*Affirm, it's about one mile behind you, it has you in sight, yeah, it's your six o'clock, it's quite quick*". The R44 pilot responded that they would keep a good look out. The pilot of [PC12 C/S] then requested the destination of the helicopter and was advised that they would be routing M25 Thorpe direction. This was acknowledged by the PC12 pilot.

Figure 2
Multi-track radar at 0832:46 showed the PC12 indicating 1100ft overtaking the R44 which was indicating 1200ft.

Following [PC12 C/S] passing the R44 and [when the PC12 was] ahead by 1.1NM, at 0833:29 the pilot of [R44 C/S] requested confirmation that the PC12 pilot had had them in sight from behind. The controller advised them that the pilot had reported having them in sight. [PC12 C/S] then reported visual with their destination and they left the frequency.

At 0834:06, after [PC12 C/S] had left the frequency, the pilot of [R44 C/S] came on frequency and stated, *"And Heathrow from [C/S], that PC12 came uncomfortably close to us, just to mention"*. The controller responded *"Thanks understood. That's on him obviously. He had you visual".*

[R44 C/S] reported that they were at approximately 1100ft on QNH 1023hPa. Radar showed the aircraft at 1200ft. Mode S information on the [PC12 C/S] showed that they were at 1100ft on QNH 1023. Therefore, vertical separation between the aircraft was calculated to be 100ft although the pilot of [the R44] estimated the separation was 25ft.

The R44 and PC12 pilots were VFR flights in Class D airspace. CAP493 MATS Part 1 Section 1 Chapter 2 (2.1 Classification of Airspace) details:

2.1 The classification of the airspace within an FIR determines the flight rules which apply and the minimum services that are to be provided. These are summarised below.

Class	Flight Rules	Aircraft Requirements	Minimum Services by ATC Unit
D	IFR and VFR	ATC clearance before entry. Comply with ATC instructions.	(a) Separate IFR flights from other IFR flights; (b) Pass traffic information to IFR flights and SVFR flights on VFR flights and give traffic avoidance advice when requested; (c) Pass traffic information to VFR flights on all other flights and provide traffic avoidance advice when requested.

Table 1: Classification of Airspace

CAP493 MATS Part 1 Section 1 Chapter 2 (2.1 Classification of Airspace) 2.2 further states:

> 'Notwithstanding the minimum service requirements associated with each airspace classification, the primary objective of air traffic services is to prevent collisions between aircraft (SERA.7001(a)). In support of this objective, on any occasion a controller considers it necessary in the interests of safety, traffic information and, where appropriate traffic avoidance advice, shall be provided. Pilots are responsible for collision avoidance (SERA.3201) and should be aware of the existence of factors that might adversely affect the ability of a controller to detect a collision hazard and provide timely and accurate traffic information, and when surveillance-based ATS being provided, traffic avoidance advice'

CAP493 MATS Part 1 Section 1 Chapter 5 (3.1 Control of VFR flight) also states:

> '3.1 The minimum services provided to VFR flights in Class D airspace are specified at Section 1, Chapter 2, paragraph 2. Separation standards are not prescribed for application by ATC between VFR flights or between VFR and IFR flights in Class D airspace. However, ATC has a responsibility to prevent collisions between known flights and to maintain a safe, orderly and expeditious flow of traffic. This objective is met by passing sufficient traffic information and instructions to assist pilots to 'see and avoid' each other as specified at Section 3, Chapter 1, paragraph 2A.2.'

In this scenario, the controller passed appropriate Traffic Information to both pilots and was advised by the PC12 pilot that they were visual with R44. As the controller had passed the Traffic Information required, with confirmation received from the PC12 pilot that they were visual (and therefore responsible for passing the R44 with appropriate spacing) no further action was assessed as required by the controller.

UKAB Secretariat

The R44 and PC12 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] If the incident geometry is considered as overtaking then the R44 pilot had right of way and the PC12 pilot was required to keep out of the way of the other aircraft by altering course to the right until it was entirely past and clear.[2]

Summary

An Airprox was reported when an R44 and a PC12 flew into proximity at Ascot at 0832Z on Tuesday 12th July 2022. Both pilots were operating under VFR in VMC, and both pilots were in receipt of a Radar Control Service from Heathrow SVFR.

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 traffic controller 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 considered the actions of the R44 pilot. They had been cleared to proceed along the low-level route and had not been able to see the PC12 approaching from behind (**CF7**). Although they had been made aware of the approaching PC12 by the controller, they had not been expecting it to route so close when overtaking. Members noted that comments in the pilot's report made it seem as though the pilot had been expecting the controller to deconflict the aircraft on the route, in fact, this was not the case, for aircraft operating VFR in Class D airspace, controllers are required to pass Traffic

[1] (UK) SERA.3205 Proximity.
[2] (UK) SERA.3210 Right-of-way (c)(3) Overtaking.

Information, but pilots are responsible for their own separation. That being said, members understood that the pilot would have been taken by surprise that the PC12 had routed so close and, because they had not been able to see the PC12 as it overtook, they had been unable to take any action to improve the separation (**CF6**).

Turning to the actions of the PC12 pilot, members first wondered whether the pilot had had a requirement to transit at such speed on the low-level route, given that they were always likely to encounter slower speed helicopters along the way. Members were informed by those familiar with PC12 operations, that the pilot had been flying at typical transit speed. The pilot had been given Traffic Information by the controller about the R44 ahead, and had reported visual, so members wondered why the pilot had chosen to route quite so close to the R44 and thought that by doing so they had not fully executed their responsibility to remain clear of the aircraft they had been overtaking (**CF2**) and had flown close enough to cause the R44 pilot concern (**CF5**). Members noted that the PC12 pilot had reported being familiar with the route and thought that, by asking for the destination of the R44, the PC12 pilot had probably been anticipating that it was going to turn to the left after Ascot and so not be a factor as they had passed along the right-hand side and, by remaining below the level of the helicopter, would have avoided causing problems with wake-turbulence. Furthermore, the pilot probably had not wanted to deviate too far from the standard route, given the nature of both the controlled airspace and built-up areas around it. That being said, members thought that the PC12 pilot would have been better served giving the R44 a wider berth, not just to avoid startling the other pilot, but also to ensure that if the other pilot made an unexpected manoeuvre, they had had adequate separation, and time, to alter their own course accordingly (**CF3**). The PC12 had been fitted with a TCAS I, but the pilot had not reported receiving an alert, and it was unclear whether this had been because the TCAS I had been inhibited at low-level, or whether the pilot had simply not recalled receiving an alert (**CF4**).

The Board then discussed the actions of the controller. Whilst acknowledging that the controller had not been required to deconflict the two aircraft, some members wondered whether the controller could have done more to prevent the incident. However, controlling members quickly refuted this, the controller had given both pilots Traffic Information, updated it and received confirmation that the PC12 pilot had been visual with the R44. Members were reminded that on the radar screen the controller would not have had the resolution to see whether the PC12 would pass at 50m or 150m away. Furthermore, they noted that for the low-level routes to work, it was reliant upon pilots being VFR and taking their own separation, the only way to deconflict otherwise would be to have one aircraft using the route at a time because there was no room within the CTR for controllers to deconflict using height separation. They commented that use of the routes required pilots to exercise good airmanship and that once a pilot reported visual they would not normally return to question them a second time. The Heathrow SVFR position operated with aircraft at low-levels and, because of the nature of the routes and the levels of the aircraft, the STCA was inhibited (**CF1**).

When assessing the risk of collision, the Board took into consideration the reports of the pilots and the controller, together with the radar screenshots. They discussed the VFR nature of the low-level routes, how there was no stipulated separation, and they acknowledged that 100ft radar separation did not necessarily equate to an actual separation of 100ft, due to radar tolerances. However, the PC12 pilot had been visual throughout, therefore although they assessed there had been no risk of collision, they agreed that the nature of the incident, with little room to react if either pilot made an unexpected manoeuvre, meant that safety had been degraded; Risk Category C.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2022137			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Electronic Warning System Operation and Compliance			
1	Technical	• Conflict Alert System Failure	Conflict Alert System did not function as expected	The Conflict Alert system did not function or was not utilised in this situation

	Flight Elements			
	• Regulations, Processes, Procedures and Compliance			
2	Human Factors	• Use of policy/Procedures	Events involving the use of the relevant policy or procedures by flight crew	Regulations and/or procedures not complied with
	• Tactical Planning and Execution			
3	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
	• 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	• 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
7	Contextual	• Visual Impairment	Events involving impairment due to an inability to see properly	One or both aircraft were obscured from the other

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:

Ground Elements:

Electronic Warning System Operation and Compliance were assessed as **not used** because STCA was not employed on Heathrow SVFR.

Flight Elements:

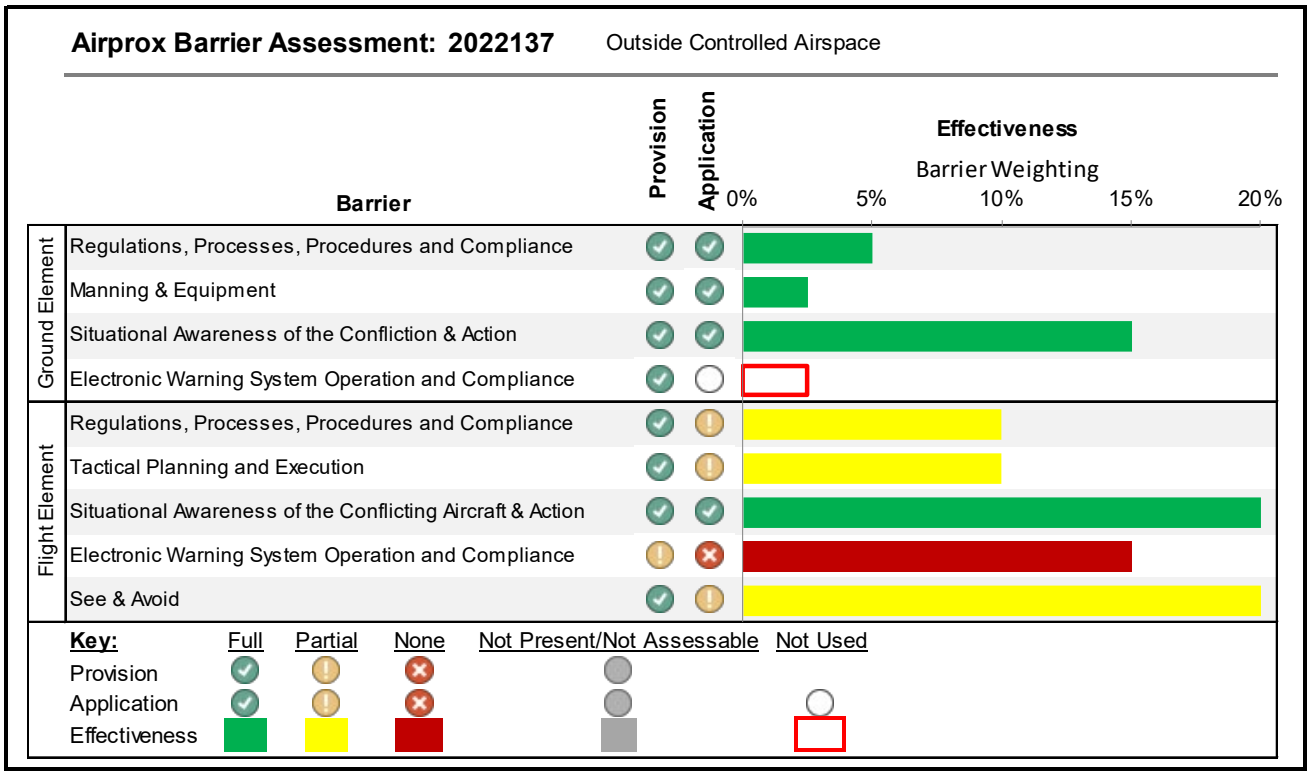
Regulations, Processes, Procedures and Compliance were assessed as **partially effective because** the PC12 pilot had not complied with the (UK) SERA regulation regarding overtaking.

Tactical Planning and Execution was assessed as **partially effective** because the PC12 pilot could have given the R44 a wider berth as they overtook.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because it would have been expected that the TCAS I on the PC12 would have alerted, but none was reported.

See and Avoid were assessed as **partially effective** because the R44 could not see the PC12 as it approached from behind and the PC12 pilot flew close enough to cause the R44 pilot concern.

[3] 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: 2022137
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