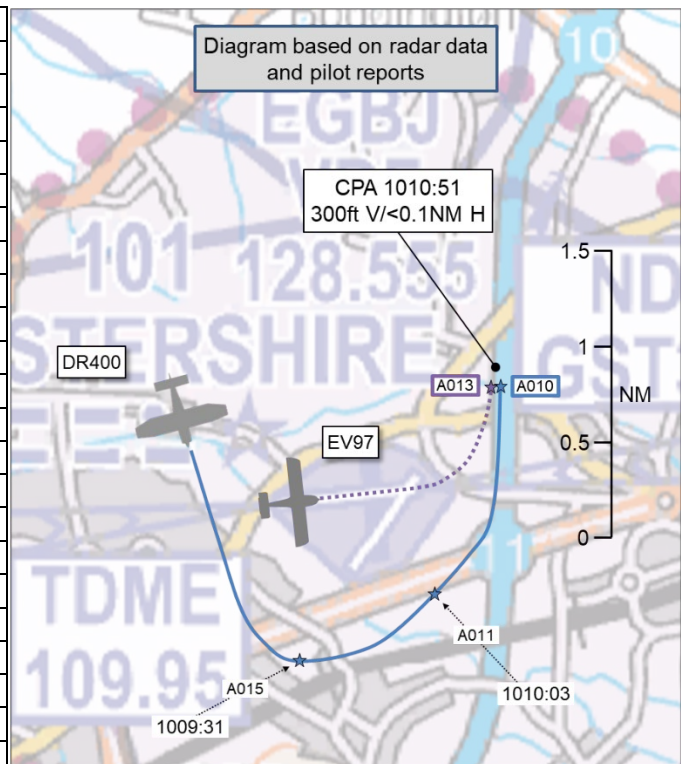


AIRPROX REPORT No 2023238

Date: 17 Oct 2023 Time: 1011Z Position: 5154N 00209W Location: Gloucestershire Airport ATZ

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	DR400	EV97
Operator	Civ FW	Civ FW
Airspace	Gloster ATZ	Gloster ATZ
Class	G	G
Rules	VFR	VFR
Service	ACS	ACS
Provider	Gloster Tower	Gloster Tower
Altitude/FL	1000ft	1300ft
Transponder	A, C, S	A, C, S
Reported		
Colours	White, green	Grey, blue
Lighting	Beacon	None
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	1000ft	"in the climb"
Altimeter	QFE (1012hPa)	QFE (1012hPa)
Heading	010°	090°
Speed	90kt	80kt
ACAS/TAS	PilotAware	Not fitted
Alert	None	N/A
Separation at CPA		
Reported	0ft V/30m H	100ft V/300m H
Recorded	300ft V/<0.1NM H	



THE DR400 PILOT reports that, while descending on the deadside to RW09LH pattern, the RT was very busy and they could not report descending deadside until 1200ft. They were still on the deadside at that time. Tower informed them to report downwind and Traffic Information was a Eurostar upwind. They cannot recall if it was to be in the circuit or leaving. They instructed their student to remain just between the 27 threshold and the motorway. Their relative position was just about at the aerodrome perimeter and to the west of the M5 motorway. They were level at 1000ft on QFE 1012hPa just before the live-side. Allowing for drift of 10°, they were heading 010° and about halfway along the crosswind leg (1/2NM from RW09 centreline) [when] an EV97 was sighted in their 9 o'clock position. This aircraft was at their level and climbing on a converging heading of about 040-050°. Once seen, they took control of their aircraft from the student and carried out a steep, slight descending turn to the right to ensure separation. They assumed the helicopter circuit was active, so did not descend below 900ft to avoid encroaching the helicopter circuit of 750ft. They returned the aircraft to 1000ft once clear and continued onto the downwind leg. They then handed control back to the student. The EV97 continued to climb away to the north of the aerodrome.

[The pilot of the DR400 commented that] ATC had informed them that the EV97 was 'upwind' hence they were looking to their starboard side and the aircraft was on their port side.

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

THE EV97 PILOT reports that they were given take-off clearance by ATC for RW09LH with a left-hand turn-out to head in a westerly direction. They took off and established the aircraft in a climb at an airspeed of 80mph. Still within the airfield boundary, and climbing through around 600ft, they were given information by ATC to be aware of another aircraft on its crosswind leg. They acknowledged that transmission and kept a lookout. They spotted the aircraft on a converging course and immediately

turned away from it in a northerly direction. They then continued in the climb and onto a westerly direction when north of the airfield.

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

THE GLOSTER CONTROLLER reports that [the pilot of the EV97] had been cleared for take-off on RW09 for a local flight to the west. [The pilot of the DR400] was joining via the standard overhead join. Traffic Information was passed to both pilots on the position of the other. They observed both aircraft in the crosswind position, [the EV97] appearing to be above and slightly to the northwest of [the DR400]. As [the pilot of the DR400] turned downwind, they observed them descend slightly. [The pilot of the DR400] reported that they would be filing an Airprox.

Factual Background

The weather at Gloucestershire Airport was recorded as follows:

METAR EGBJ 171020Z 08012KT 9999 FEW019 13/07 Q1014
 METAR EGBJ 170950Z 08012G22KT 9999 FEW016 12/07 Q1014

The ‘Guide to VFR flying to and from Gloucestershire Airport’ on the Gloucestershire Airport website provides the following details regarding the overhead join for fixed-wing aircraft:

- Fly around the overhead until you’re parallel to the runway in use and, approximately, half a mile south of the landing threshold. [..]
- When you’re parallel to the runway, start your descent below 2000ft QFE.
- Cross the upwind end of the runway at 1000ft QFE – not below and not in the climb-out area! Keep a very good lookout for aircraft departing from the runway and instrument training traffic, which may be going around. Some business jets and several of our lighter microlight types have excellent climb performance.
- Use the crosswind leg to spot other crosswind, and downwind traffic.

CAA CAP1535 ‘The Skyway Code’ provides the following diagram depicting the procedure for a typical overhead join:

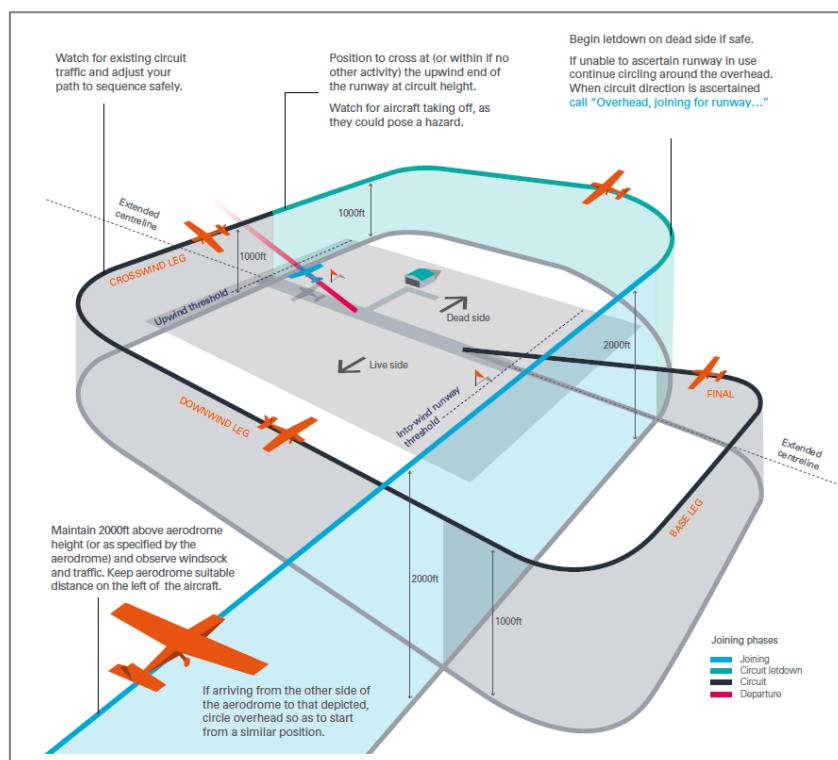


Figure 1 - Diagram of the Overhead Join as published in The Skyway Code

Analysis and Investigation

CAA ATSI

Synopsis: The DR400 was being flown by a student under instruction. The student was conducting a standard overhead join from the north, they had descended on the deadside for the RW09 left-hand pattern. They had just passed through the RW09 climb-out lane when the Airprox occurred. They described the Tower frequency as being busy, and reported that they could not get their descending deadside call in until they were passing 1200ft, and that the aircraft was level at 1000ft just before they reached the live side of the circuit.

The EV97 pilot had just departed RW09 and was in a climbing left turn to head in a westerly direction.

The unit was operating split positions i.e., Tower and Approach. The Approach controller was undertaking their validation with the CAA in attendance. RW09 was the declared runway in use and the traffic loading on both positions was reported by the unit to be high.

ATSI had access to reports from the pilots of both aircraft, an initial report from the Tower controller and a subsequent unit investigation report. The RT and Area Radar recordings were reviewed for the relevant period. The RT loading was almost constant throughout the period of the review. In the interest of brevity, only the exchanges between the Tower controller and the pilots involved in the Airprox have been included in this report. Screenshots have been taken from the Area Radar recordings with the aircraft levels displayed as Flight Levels. The QNH entered into the radar display processor was 1015hPa, a difference of 54ft when calculating altitude. The aerodrome elevation as published in the UK AIP is 101ft.

At 1003:00 the EV97 pilot reported ready for departure and was instructed to hold position.

At 1007:40 the EV97 pilot was instructed to line-up and wait RW09.

At 1008:00 the DR400 pilot called the Tower controller inbound from the north and was instructed to, *“report descending on the deadside, traffic is a Cirrus descending ahead of you and the helicopter circuit is active.”* The pilot read back *“report descending deadside.”*

At 1008:20 the DR400 pilot reported *“we’re just approaching the overhead now, is that the Cirrus one ahead of us?”* The controller responded, *“affirm, believed to be just starting the downwind leg.”* The pilot responded, *“roger visual with them.”*

At 1009:30 the EV97 pilot was instructed, *“left turn west, RW09 cleared for take-off, surface wind zero eight zero, one three.”* The pilot read back, *“cleared take-off.”* (Figure 2)

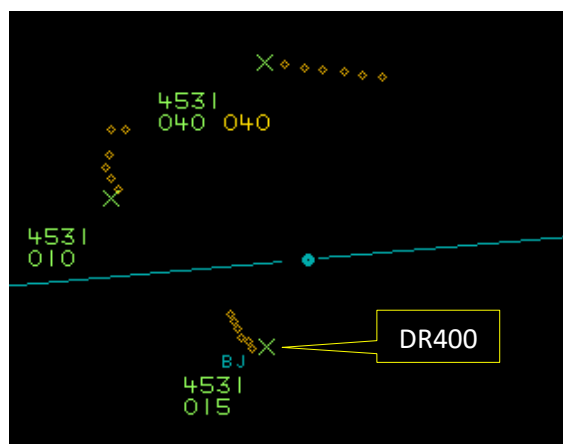


Figure 2 – 1009:30

At 1010:10 the DR400 pilot was advised, *“traffic upwind, just airborne, is a Eurostar.”* The pilot responded, *“roger traffic, descending deadside.”* (Figure 3)

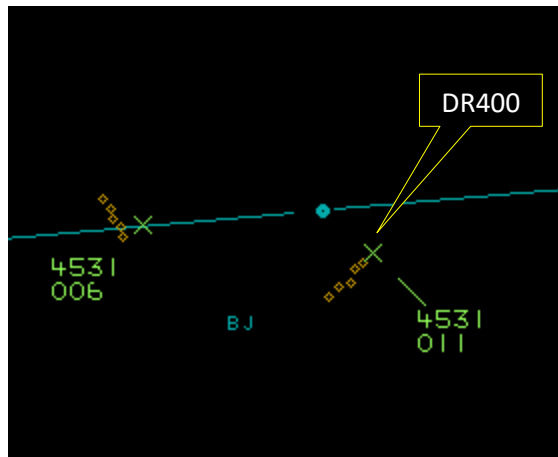


Figure 3 – 1010:10

At 1010:20 the EV97 pilot was advised, “traffic is a Robin descending on the deadside, shortly to turn crosswind.” The pilot responded, “Roger copy that.” (Figure 4)

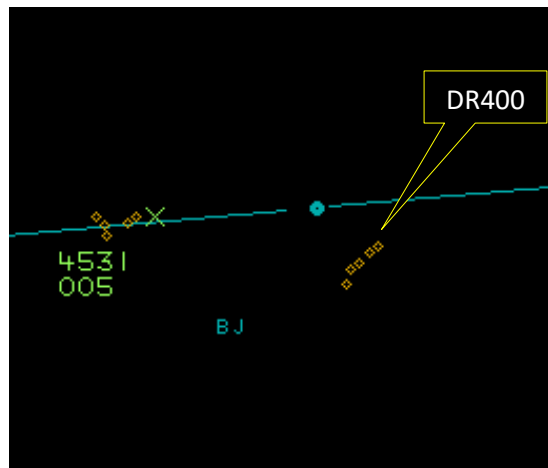


Figure 4 – 1010:20 (the aircraft are not visible due to the radar overhead)

At 1010:51 CPA (as timed and measured by the RAC) occurred, with the aircraft reported as being separated by 0.0NM laterally and 300ft vertically. The EV97 was still not visible to the radar in Figure 5 below.

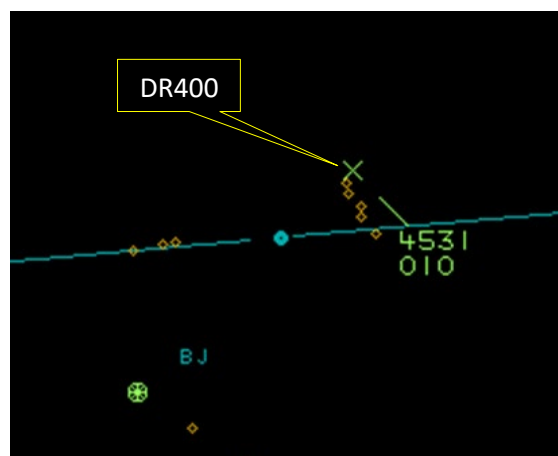


Figure 5 CPA – 1010:51

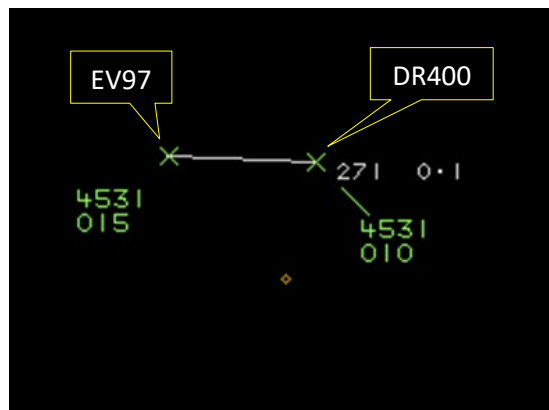


Figure 6 – 1010:58 Post CPA (as soon as the aircraft became visible to radar again)

At 1011:30 the DR400 pilot reported downwind to land and advised the controller, “*we’ve just had an Airprox with that Eurostar.*” The controller responded, “*roger, report final.*”

Analysis: The Tower controller was operating in high traffic levels with the frequency extremely busy with traffic arriving, departing, and operating in the fixed-wing and helicopter circuits. There were also vehicles calling for clearance to move around the airfield.

The controller appeared to be prioritising the RT calls well, however, the RT loading was such that the DR400 pilot struggled to make their ‘descending deadside’ report at the appropriate time. The report was eventually made in response to the Traffic Information they received on the EV97 after it was airborne. In their subsequent report the controller confirmed that they had observed both the DR400 and the EV97 on the crosswind leg, the investigator has interpreted this to mean that the late call from the pilot did not have any impact on the controller’s awareness of the position of the DR400 in the circuit.

When the Traffic Information was passed to the DR400 pilot, the position of the EV97 was described as “*traffic upwind, just airborne.*” The subsequent report received from the DR400 pilot could be interpreted that they hadn’t quite assimilated the ‘just airborne’ element of the Traffic Information and only assimilated the ‘upwind’ element, and that this resulted in their focus being to the starboard side of their aircraft rather than to the port side. Whilst the DR400 pilot eventually sighted the EV97, and the EV97 *could* be described as being upwind, with the benefit of hindsight perhaps the sighting might have been earlier, had a description that could not be misinterpreted been used e.g., “*just airborne, turning to the west.*”

The Traffic Information passed to the EV97 pilot alerted them to the DR400 on the crosswind leg and this assisted the pilot in gaining sight of the DR400, albeit perhaps a little late. Passing Traffic Information ahead of the take-off clearance may have assisted the EV97 pilot to sight the DR400 earlier and would have provided them with the option to delay their take-off until the DR400 had passed through the climb-out lane.

Gloucestershire Airport Unit Investigation

The investigator has reviewed the RT recordings and discussed the incident with the ATCO concerned.

The ATC service was split into Tower and Approach. The Approach controller was carrying out a validation with the CAA in attendance. The incident had no impact on the validation. RW09 was in use and traffic (and RT) loading on both positions was high but the weather conditions were good. METAR: 0950 08012G22KT 9999 FEW1600 12/07 Q1014.

Timeline:

At 1007:50, [the pilot of the DR400] contacted the Tower from APP noting that they were positioning for RW09 to descend on the deadside. The Tower controller provided Traffic Information on a Cirrus

descending ahead of them into the circuit and that the helicopter circuit was active. The controller requested that [the pilot of the DR400] report descending deadside.

At 1008:05, [the pilot of the DR400] reported that they were just approaching the overhead and asked "*is that the Cirrus one ahead of us?*"

Tower responded - "[DR400 callsign] *affirm, believed to be just starting the downwind leg*". [The pilot of the DR400] responded stating that they were visual.

At 1009:18, Tower - "[EV97 callsign], *left turn west, runway 09 cleared for take-off, surface wind 080/13*". [The pilot of the EV97] replied "*Cleared take-off, [EV97 callsign]*".

At 1010:03, Tower - "[DR400 callsign] *traffic upwind, just airborne is a Eurostar*". [The pilot of the DR400] replied "*Copy traffic, [DR400 callsign], descending on the deadside*".

Tower - "[EV97 callsign], *traffic is a Robin descending on the deadside, just starting to turn crosswind*". [The pilot of the EV97] replied "[EV97 callsign] *Copy that [EV97 callsign]*".

The Tower controller then cleared the Cirrus pilot to land.

At 1011:24, [The pilot of the DR400] called "[DR400 callsign] *is downwind to land and just had an Airprox with the Eurostar*". Tower replied "[DR400 callsign] *roger report final*".

At 1012:10, [the pilot of the EV97] was transferred to approach. The Tower ATCO handed-over the position and placed into provisional inability. This was only for a short time as it was confirmed by the MATS that there were no issues with how the ATCO had handled the information passed before the Airprox.

Following this, [the pilot of the DR400] was cleared to land, however, the aircraft was sent around at 1014 due to deer that were approaching the runway. Other aircraft were delayed for this reason and [the pilot of the DR400] was instructed to orbit at the start of the downwind leg. The aircraft was then cleared to land at 1023 and landed at 1024 without further incident.

In interview, the ATCO concerned confirmed the details of the event and reflected on two key elements. They noted that:

1. [The pilot of the DR400] carried out a slightly wider (and 'non-standard') overhead join, therefore, possibly putting [the DR400] closer to the departing aircraft as [the pilot of the DR400] turned crosswind.
2. The EV97 take-off roll is relatively short and initial climb performance is quite good. This will more readily put these type of aircraft into a closer position with aircraft descending from the deadside crosswind.

Although an Airprox was declared by [the pilot of the DR400], there is no evidence to confirm how close the aircraft were and the actual risk of collision. Therefore, with appropriate Traffic Information passed, the cause of the incident was possibly the late sighting of the departing EV97 by the pilot of [the DR400]. The investigation will be re-opened should the Airprox Board determine any other factors.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and both aircraft could be positively identified from Mode S data (see Figure 7). The EV97 first appeared on radar at 1010:51 and this is the moment assessed to have been CPA. The track of the EV97 before CPA has been shown in the diagram as an approximation. The separation of the aircraft at CPA has been determined from the radar data.

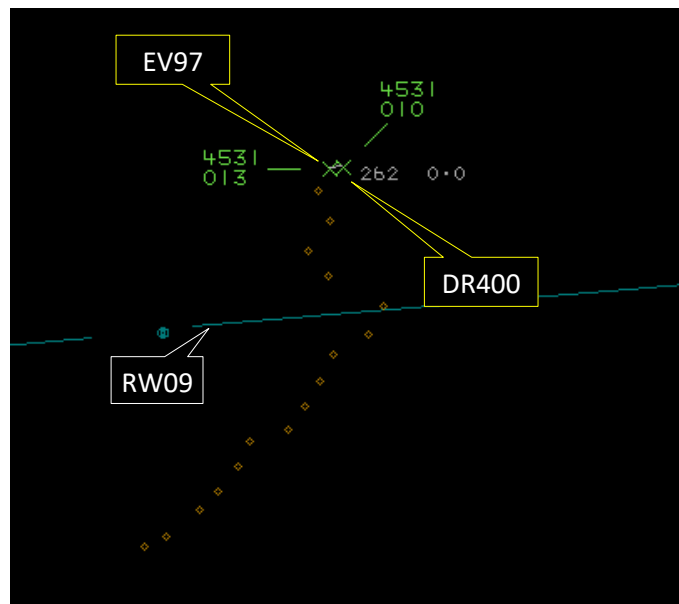


Figure 7 – 1010:51

The DR400 and EV97 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 DR400 and an EV97 flew into proximity in the Gloucestershire Airport ATZ at 1011Z on Tuesday 17th October 2023. Both pilots were operating under VFR in VMC, in receipt of an ACS from Gloster Tower.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, a report 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 actions of the pilot of the DR400 and noted that they had approached Gloucestershire Airport from the north and had intended to join overhead for RW09. Members noted that the pilot of the DR400 had transmitted that they had been approaching the overhead and had queried (uninvolved) traffic in the circuit. Seventy seconds later, the Gloster controller had passed a clearance to the pilot of the EV97 for take-off and had subsequently advised the pilot of the DR400 that the EV97 was "*upwind, just airborne*". Members noted that the pilot of the DR400 had acknowledged the information on the EV97 and reported that they were descending on the deadside. Members also noted that the Gloster Tower frequency had been congested to such a degree that the pilot of the DR400 had not been able, until that moment, to have transmitted their position as requested. Notwithstanding, members pondered the Traffic Information regarding the EV97 in the context of the relative positions of the two aircraft. The pilot of the DR400 explained in their narrative report that they had looked for the EV97 to their right when, in fact, the EV97 had been to their left.

Members agreed that, although the pilot of the DR400 had already gathered some situational awareness of the EV97 (given that they had just heard a take-off clearance) they had had an incorrect mental model of the position of the EV97 (**CF5**) based upon their interpretation of the word 'upwind' in the Traffic Information passed by the Gloster controller. Members surmised that the pilot of the DR400

¹ (UK) SERA.3205 Proximity.

² (UK) SERA.3225 Operation on and in the Vicinity of an Aerodrome.

had believed that the EV97 had been 'upwind of their current position' and not 'at the upwind end of the runway'. Members agreed that the EC equipment fitted to the DR400 would not have been expected to have detected the presence of the EV97 and have provided an alert to its position (**CF6**).

Members reflected on the shape of the circuit flown by the pilot of the DR400 and wondered why they had chosen such a wide circuit. Member's attention was drawn to the procedure for an overhead join as provided on the Gloucestershire Airport website and agreed that the following points were particularly pertinent:

Cross the upwind end of the runway at 1000ft QFE – not below and not in the climb-out area. Keep a very good lookout for aircraft departing from the runway and instrument training traffic, which may be going around. Some business jets and several of our lighter microlight types have excellent climb performance.

Members were in agreement that the pilot of the DR400 had not executed their overhead join into the circuit correctly (**CF4**). It also occurred to members that, had it been the case that the pilot of the DR400 had crossed to the live-side of the runway at the upwind threshold, there may not have been any confusion as to the relative position of the EV97. Further, some members suggested that it may have been prudent for a pilot sat in the left-hand seat of the DR400 to have taken the opportunity to have visually acquired the EV97 whilst in their descent on the deadside. Nevertheless, members noted that the pilot of the DR400 had visually acquired the EV97 as it appeared in their 9 o'clock position whilst on the crosswind leg. It was agreed that to have first sighted the EV97 at the point of CPA effectively constituted a non-sighting (**CF8**).

Turning their attention to the actions of the Gloster controller, it was noted that the Traffic Information passed to the pilot of the EV97 on the DR400 had placed the DR400 in their respective mental models as "*descending on the deadside, just turning crosswind*". Members assessed that the Gloster controller had assumed the position of the DR400 had been in accordance with the usual circuit pattern (**CF2**) in that they had expected it to have crossed the upwind threshold of the runway. Consequently, members agreed that the Gloster controller had held inaccurate situational awareness of the position of the DR400 and had not been aware that it had actually been further east (**CF3**). Having agreed that, members returned to their thoughts on the Traffic Information passed to the pilot of the DR400 that the EV97 had been 'upwind'. Members subsequently agreed that the Gloster controller had passed Traffic Information to the pilot of the DR400 based on an inaccurate, or ambiguous, relative position and that that had not aided their understanding of the traffic situation to manage a deconfliction (**CF1**).

Members next considered the actions of the pilot of the EV97 and noted that, after they had received a clearance for take-off, Traffic Information on the position of the DR400 had been passed. Again, in accordance that the Gloster controller had not been aware of the exact position of the DR400, members surmised that the pilot of the EV97 had not had reason to expect the DR400 had entered the climb-out area. Nevertheless, members noted that the DR400 had not been visually acquired until the crosswind leg and, as such, assessed that it had been sighted late (**CF7**).

Concluding their discussion, members summarised their thoughts and agreed that the pilot of the DR400 had flown a non-standard circuit pattern and that the Gloster controller had not been aware of its exact position. Traffic Information passed to the pilot of the DR400 had been misinterpreted and Traffic Information passed to the pilot of the EV97 had not alerted them to the presence of the DR400 in the climb-out area. As such, members were in agreement that there had been a risk of collision (**CF9**) and that it had been the late visual acquisition of the DR400 by the EV97 pilot, and their subsequent urgent avoiding action, that had increased separation at the last minute. The Board assigned Risk Category B to this event.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK**Contributory Factors:**

2023238				
CF	Factor	Description	ECAIRS Amplification	UKAB Amplification
Ground Elements				
• Situational Awareness and Action				
1	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
2	Human Factors	• Expectation/ Assumption	Events involving an individual or a crew/ team acting on the basis of expectation or assumptions of a situation that is different from the reality	
3	Contextual	• Traffic Management Information Action	An event involving traffic management information actions	The ground element had only generic, late, no or inaccurate Situational Awareness
Flight Elements				
• Tactical Planning and Execution				
4	Human Factors	• Action Performed Incorrectly	Events involving flight crew performing the selected action incorrectly	Incorrect or ineffective execution
• Situational Awareness of the Conflicting Aircraft and Action				
5	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				
6	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				
7	Human Factors	• Identification/ Recognition	Events involving flight crew not fully identifying or recognising the reality of a situation	Late sighting by one or both pilots
8	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				
9	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 Assessment³

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

Ground Elements:

Situational Awareness of the Confliction and Action were assessed as **partially effective** because the Gloster controller had inaccurate situational awareness of the position of the DR400 with which they passed inaccurate Traffic Information to the pilot of the EV97.

Flight Elements:

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

Tactical Planning and Execution was assessed as **partially effective** because the pilot of the DR400 had not turned onto the crosswind leg at the upwind end of the runway, but further east.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because the pilot of the DR400 had inaccurate situational awareness of the position of the EV97.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the EC device fitted to the DR400 would not have been expected to have detected the presence of the EV97.

See and Avoid were assessed as **partially effective** because the pilot of the DR400 had not visually acquired the EV97 until the moment of CPA.

