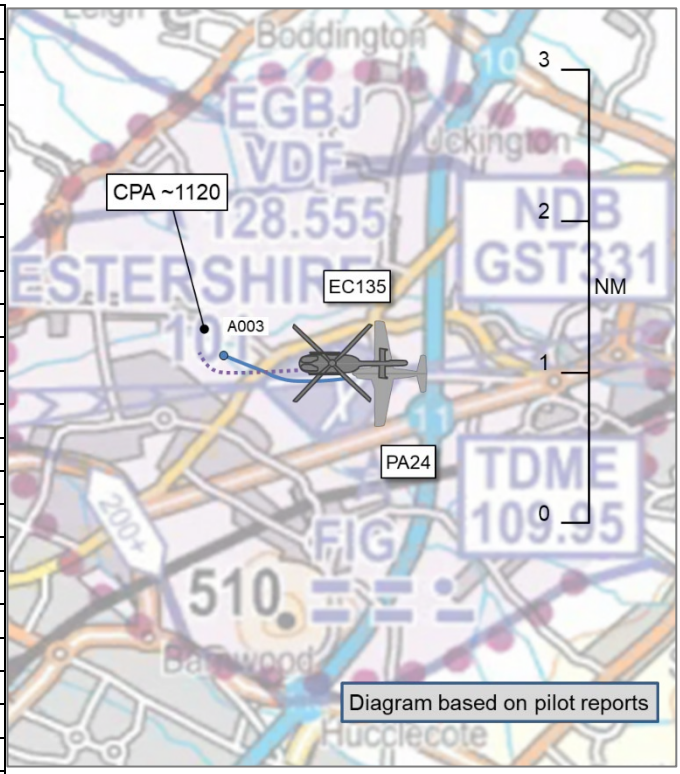
AIRPROX REPORT No 2022002

Date: 12 Jan 2022 Time: 1120Z Position: 5155N 00211W Location: Gloucestershire

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	PA24	EC135
Operator	Civ FW	Civ Helo
Airspace	Gloucestershire ATZ	Gloucestershire ATZ
Class	G	G
Rules	VFR	VFR
Service	ACS	ACS
Provider	Gloster	Gloster
Altitude/FL	300ft	NK
Transponder	A, C[1], S	A, C, S
Reported		
Colours	Red, White	Red
Lighting	Beacon	'Full'
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	500ft	700ft
Altimeter	QNH	QNH
Heading	300°	360°
Speed	90kt	100kt
ACAS/TAS	Not fitted	TAS
Alert	N/A	None
Separation at CPA		
Reported	0ft V/500ft H	Not Seen
Recorded	NK	



THE PA24 PILOT reports that they lined up for departure on RW27 at Gloucester. A small fixed-wing had just completed a touch-and-go and was turning right for noise abatement and into the circuit. Another fixed-wing had called final for RW27. They were instructed to line-up and then immediately cleared for departure. The controller asked the PA24 pilot whether they would like a left or right turnout and they gave the controller the option since they were headed east (070°) directly to [their destination]. The controller cleared them for a right turnout. Immediately after take-off they turned right to route over the golf course on the approved noise abatement track. They were raising the gear and checking Ts and Ps when they saw a large red helicopter pass in front of them, left to right, at the same altitude. They estimated that they were not above 500ft at this point. They immediately ceased the climb and turned left to increase the distance between their aircraft and the helicopter - who continued on track and did not seem to be climbing. They resumed their climb and turned back towards their en-route track (which took them into the downwind for RW27); they saw the helicopter well below them, heading westwards. They did not recall hearing any helicopter instructed on the radio and did not expect to encounter one at the departure end of the in-use runway. They were unable to identify the helicopter since they could not see a registration - it was all-over bright red, not a Robinson and not an Agusta.

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

THE EC135 PILOT reports that once clearance was issued for a standard helicopter departure to the north, and after conducting a lookout turn in the hover, the aircraft was transitioned on runway track (270°) with a gentle climb to approx 300ft before turning right onto north and continuing the climb to 700ft QNH. The standard helicopter departure is to the north, not above 750ft QFE (under the fixed-wing circuit). They were aware of circuit traffic which posed no threat to them under a standard helicopter departure. No Airprox was identified by either pilot in their aircraft and no Airprox was

[1] Mode C reported as on, but was not displaying on the NATS radars

declared on the ATC frequency, and as a result they were unaware of any incident until notified by email.

THE GLOSTER CONTROLLER reports that nothing was reported on frequency at the time and they were unaware of the Airprox, therefore could not remember any specific details.

Factual Background

The weather at Gloucestershire was recorded as follows:

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EGBJ 121120Z 00000KT CAVOK 06/04 Q1042=
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Analysis and Investigation

Gloucestershire Investigation

Relevant portions of the Gloucestershire Investigation were presented in note form which are reproduced below:

No mention or ATC awareness of a potential incident before Airprox report received. Therefore no details in watch log.

1114 [PA24 C/S] requests taxi with H Q42 and given taxi holding point A2.

1118 [EC135 C/S] fully ready and given line-up instructions with one aircraft to depart before this one.

1119 [PA24 C/S] given take off with a right turn to the east and also told not to fly up the final approach track, the partner of this pilot had done this 5 minutes before flying the same route.

1120 2 aircraft transmit at the same time - not believed to be a factor.

1122 Both [PA24 C/S] and [EC135 C/S] given transfer to Approach frequency. No traffic passed to [PA24 C/S] on any helicopters but given the information to hand no definite risk of collision existed, [EC135] would have been 3 minutes ahead, departing northbound against a C208/PA27 departing westbound before setting course.

Replays: the replays were not of the best quality, both traces believed to be the aircraft concerned pass each other 2 miles north of the airfield and 0.5NM apart. [PA24 C/S] should have been at 1100ft QNH and the helicopter not above 750ft QFE. The primary radar does not give level indications but shows the believed helicopter to pass right to left ahead of the fixed-wing aircraft.

The controller didn't remember anything specific and given the time differences between departures and the AIP profile that the aircraft would fly, would only pass relevant Traffic Information as and when required. [EC135] pilot said they didn't remember anything significant about that flight or day, or being in close proximity to any other fixed-wing. They departed to the west before setting course to the north at approximately 700ft.

There was no mention of any incident on frequency, only one helicopter departed within 5 minutes of [PA24 C/S], no other helicopters on the frequency would affect the departure so no Traffic Information was passed by the controller. Given the flight directions requested and heights/altitudes required to be flown there should have been no reason to require Traffic Information. No exact position of where conflict existed, the fixed wing aircraft may have turned too early or the helicopter did not comply with the standard helicopter departure. But given that no radar recordings were available it is difficult to conclude whether Traffic Information was required if both pilots were visual with each other.

CAA ATSI

Both aircraft had just departed Gloucestershire Airport VFR, with the EC135 preceding the PA24 on track to the north, and the PA24 making a right turn to track to the east nearly 4 minutes later. Both aircraft were still within the Gloucestershire ATZ and receiving an Aerodrome Control Service from the Gloucestershire Tower controller, a trainee, (referred to here as the controller), and who was under the supervision of an On-the-Job-Training-Instructor (OJTI).

Screenshots have been taken from the area radar. Gloucestershire does not have a surveillance system other than a primary radar used as an Aerodrome Traffic Monitor and for the provision of surveillance radar approaches. Aircraft levels are displayed as a flight level – add 750ft for altitude.

Based on the report from the pilot of AC1, the PA24, the Airprox is considered likely to have occurred before either aircraft became visible on the radar replay and whilst still in the climb-out area to the west of the airfield, and therefore CPA could not be illustrated. A report from the Radar Analysis Cell (RAC) identified CPA later, to the north of the airfield by which time both aircraft were visible on the radar replay. However, with neither aircraft transponding altitude information, the vertical separation could not be determined.

At 1111:52 the EC135 pilot called for clearance to taxi and the PA24 called at 1113:58.

At 1114:20 the pilot of a C208 awaiting departure to the east was given clearance to "*line up and wait*" on RW27 and was advised that there was a "*Cessna*" to depart ahead of them. The controller then cleared the Cessna for take-off for a departure to the north.

At 1114:38 the pilot of a DR40 which was carrying out right-hand circuits to RW27 reported downwind and was instructed to report final by the controller, who advised them that they were number one.

The controller then asked the pilot of the C208 whether they preferred a left or a right turn after departure. The pilot replied that they could take either, but that they were heading east. The controller passed Traffic Information to them on the previously departing Cessna and then at 1115:15 cleared them for take-off with a right turn to the east.

At 1115:48 the controller advised the pilot of the EC135 "*the fixed wing circuit is active with a Robin on right base. Via holding point x-ray cross RW27, standard helicopter departure to the north, cleared for take-off (surface wind)*".

The EC135 pilot replied: "*visual with the Robinson and clear cross 27, standard helicopter departure to the north – cleared take-off*". At this time the EC135 briefly became visible on the radar replay but then disappeared at 1116:20 until some 5 minutes later (Figure 1).

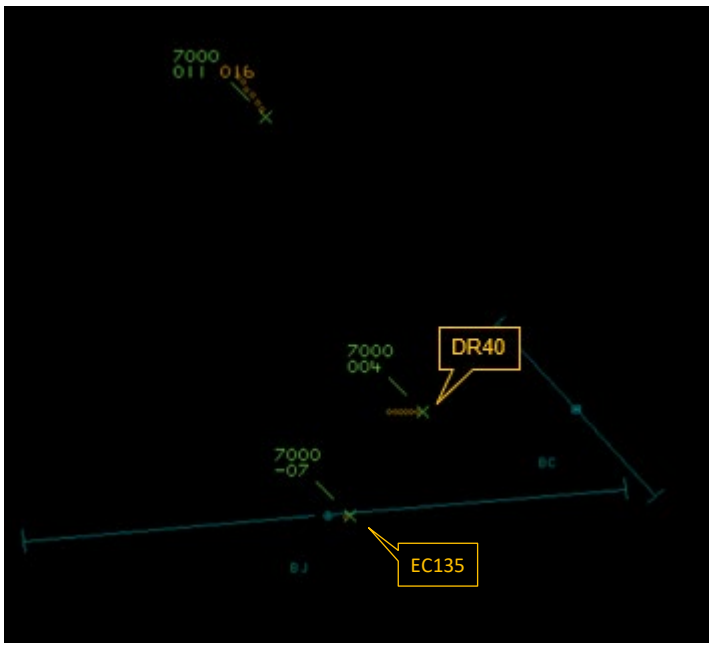

Figure 1 – 1115:48 – add 750ft for aircraft altitude

At 1116:48 the controller cleared a vehicle to cross the runway which was followed by a "*finals*" call from the pilot of the DR40. Before the controller replied, the pilot of another aircraft, a DA42 inbound from the north, made their initial call to the Tower controller at 1117:18 reporting that they were joining right base (Figure 2).

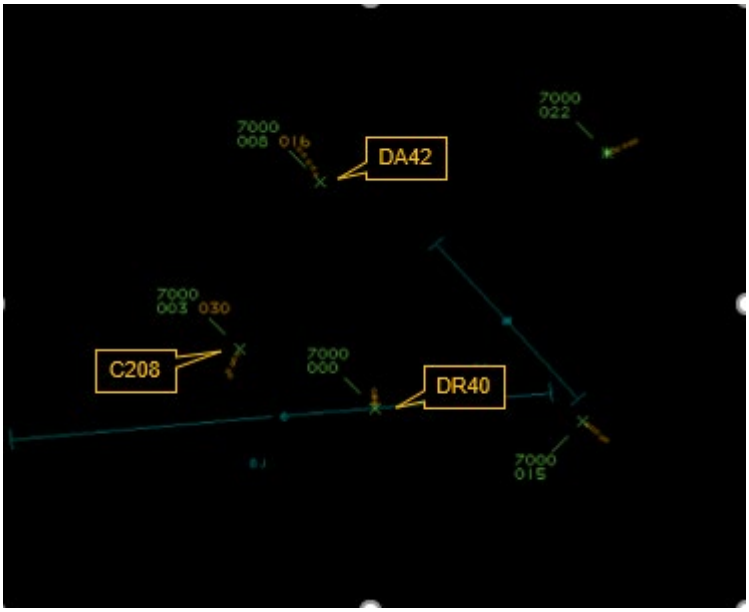

Figure 2 – 1117:18

The controller ignored that call and cleared the pilot of the DR40 for a "*touch and go*". The driver of the vehicle reported clear of the runway and then the driver of a fire vehicle called. The controller ignored the fire vehicle and replied to the DA42 pilot at 1117:38 requesting their range which was reported as "*3.5D*".

The controller started to pass Traffic Information to the pilot of the inbound DA42 on the previously departing C208 but then changed their mind and instead instructed the DA42 pilot to report on final, advising that they were "*number two – number one is a Robin one mile final*".

Then at 1118:07 the OJTI took the frequency and asked the pilot of the C208 if they were going through final approach.

The C208 pilot's reply was slightly garbled but they did advise that they were passing behind the "*Cessna 150*"[2] The OJTI advised them that the instrument approach was active and that there was further traffic inbound to the overhead from the north.

At 1118:20 the pilot of the PA24 reported fully ready but the transmission crossed with the driver of the fire vehicle who had called previously. The controller transferred the previously departing C208 to the approach controller and then asked the pilot of the PA24 to confirm that they were ready for departure, which the pilot did. The controller cleared the PA24 pilot to "*line up and wait Runway 27 – one Robin to depart before you*".

At 1118:52 the inbound DA42 pilot called but again this transmission crossed with a refuelling vehicle (Figure 3).

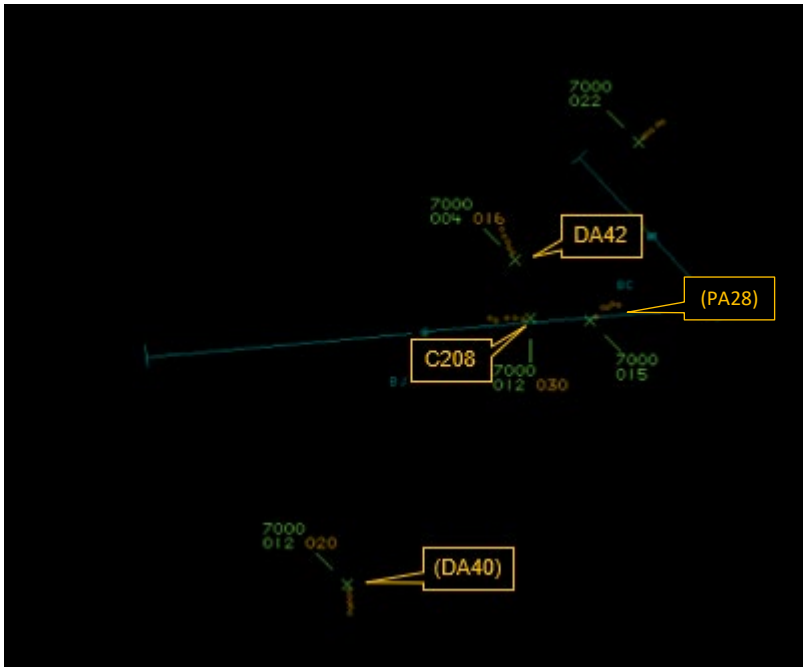

Figure 3 – 1118:52

The controller asked the pilot to call again, and the DA42 pilot advised that they were on base-leg just about to turn finals but that they weren't visual with the one ahead. The controller advised the pilot that they were number one, adding that there was a "*Caravan*"[3] to depart ahead of them.

The controller then, at 1119:20 asked the pilot of the PA24 if they would prefer a left or a right turnout. Although again this transmission crossed with another pilot's, the pilot of the PA24 advised that they could take either, but that they were following the previously departed C208. The OJTI then took the frequency and replied: "*Ok yeah, please if you don't go straight up final approach track like the last one - right turn to the east, Runway 27 - cleared for take-off (surface wind)*" (Figure 4).

[2] Possibly the DA40.
[3] PA24 Comanche

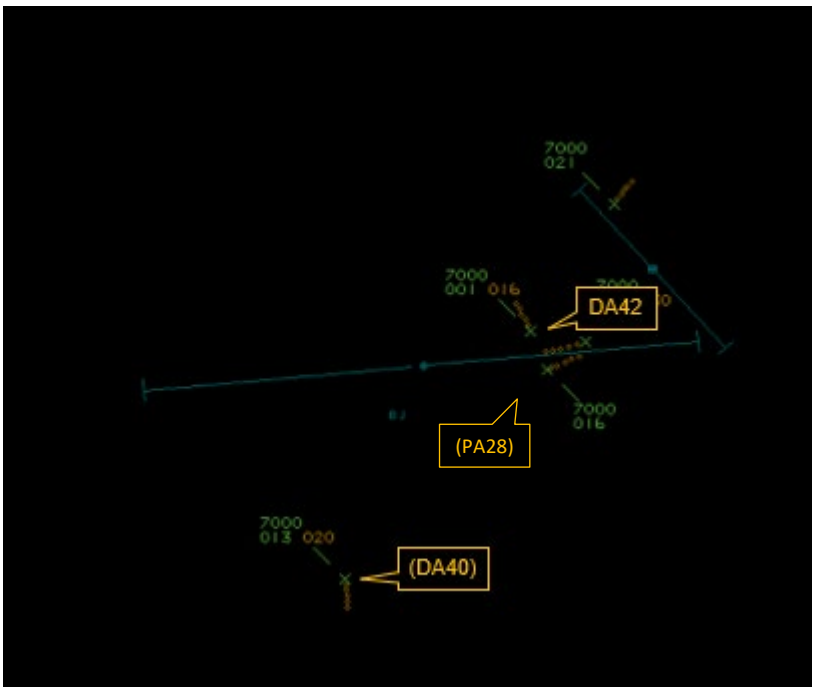

Figure 4 – 1119:20

At 1119:38 the pilot of a DA40 called for join from the south for a "*standard overhead join*." The controller instructed them to report descending on the deadside and passed Traffic Information on a PA28 also routing to the overhead but from the east.

Immediately following that, the pilot of the PA28 and another pilot called up simultaneously.

At 1120:05 the controller cleared the pilot of the DA42 to land. The pilot requested a touch and go into the circuit, which they believed they had specified in their booking, and so the controller re-cleared them for the touch and go, advising "*also in the circuit is a Robin on crosswind*".

There were again two simultaneous transmissions from pilots at 1120:30 (Figure 5).

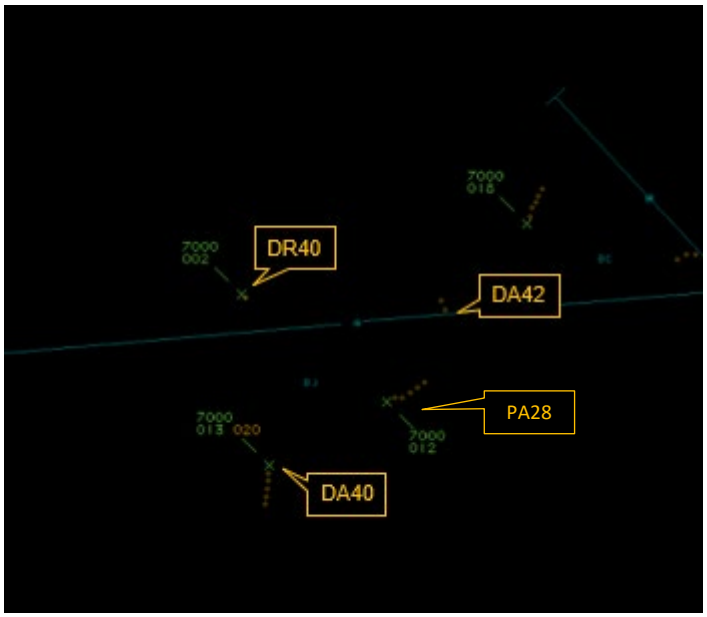

Figure 5 – 1120:30

The controller called the pilot of the PA28 and requested they repeat their transmission: "*we're 2000ft and we're just crossing the runway to descend on the deadside*". The controller asked: "*are you visual with a Robin?*" which the PA28 pilot confirmed that they were not.

It is considered that CPA between the PA24 and the EC135 would likely have occurred at some point during this period.

The controller then called the pilot of the DA40 inbound from the south and requested they report their position. However, the pilot of the DR40 in the circuit took the call instead and replied "*we're just outside turning aircraft, just about to turn downwind. We're visual with him*". (Figure 6).

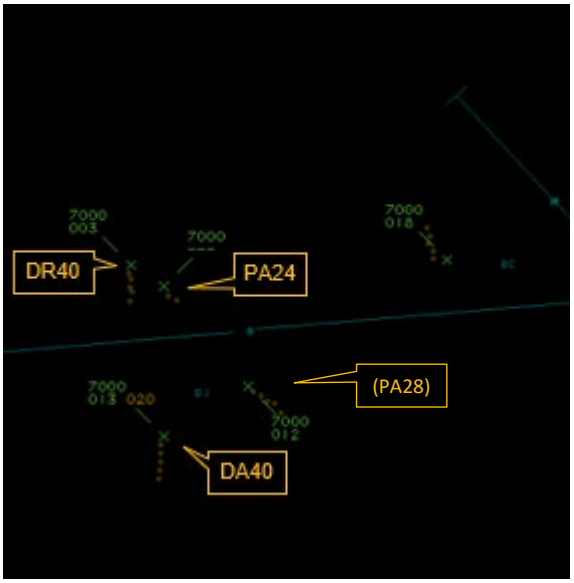

Figure 6 – 1120:48 – PA24 visible on radar replay

The CPA reported by the RAC was at 1121:15 (Figure 7).

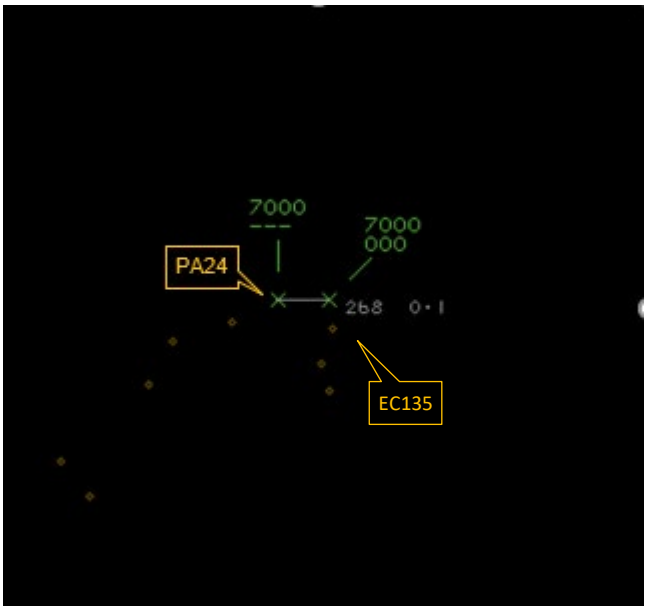

Figure 7 – 1121:15

This has been discounted as CPA by ATSI as the report from the pilot of the PA24 stated that after the Airprox in the climb-out they turned downwind and saw the helicopter again, well below them.

Analysis

ATSI had access to reports from both pilots. A review of the Gloucestershire RTF and the area radar replay was completed. No reports were received from the Gloucestershire trainee controller nor the OJTI, (or the approach controller who might have had other observations to make). Instead, the unit

sent in a short investigation report. The unit was subsequently sent a draft copy of the CAA ATSI synopsis with a list of questions to be answered.

The situation leading up to the Airprox involved a number of aircraft joining from all directions, an aircraft in the circuit and aircraft departing and waiting to depart. There were also a number of calls from drivers of vehicles on the airfield during this period, and simultaneous transmission from pilots and vehicle drivers. (Vehicle drivers are able to hear aircraft calls but not vice versa).

On two occasions, departing aircraft were lined-up on the runway and then asked what clearance they preferred rather than before having them line-up.

It should also be noted that whilst this scenario was developing, and indeed following CPA, other aircraft were continuing to track inbound with the Approach controller, but which were not yet on frequency.

Finally, it was felt that the impact of a previous departure flying through and then up the final approach, and also the use of the overhead join at such a busy airfield should be taken into consideration.

The traffic situation appeared to be well handled until 1120:30 when simultaneous transmissions were received, one of which was the initial call from the pilot of the PA28 inbound to the overhead.

The controller asked the PA28 pilot if they were visual with the Robin (DR40), (which was crosswind). The controller did not advise the PA28 as to the actual position of the DR40, and the PA28 pilot subsequently reported that they were not visual with it.

The controller then asked the pilot of the DA40 inbound from the south for their position. However, the pilot of the DR40 in the circuit replied instead and reported their position as being *"just outside turning aircraft, just about to turn downwind. We're visual with him*". (The DR40 pilot was likely visual with the previously departing PA24). Apparently not noticing that this was the pilot of the DR40, the controller instructed them to follow the PA28, possibly in the belief they were speaking to the pilot of the DA40. The pilot of the DA40 did not subsequently respond either. The radar replay (Figure 6) illustrates that this plan might have been sound.

CPA was estimated to have occurred during this period. It was noted that 4 minutes had elapsed between the times the EC135 and PA24 pilots had been cleared for take-off.

According to the Gloucestershire MATS Pt 2, and UK AIP, fixed-wing departures from Runway 27, under noise abatement requirements:

> *"…are to execute a 10° right turn when passing – and not before – the upwind end of the runway. Tracking 280°M, climb through 600 ft QFE before turning left. Jet aircraft are to climb through 1400ft QNH before executing any further turn. Aircraft unable to comply with 10° turn after departure should advise ATC and climb straight ahead through 1400 ft QNH."*

The instructions do not mention right turns.

According to the Gloucestershire MATS Pt 2 and UK AIP, a standard helicopter departure is:

> *"Departure into wind or as required, remaining clear of runway-in-use, turning to depart circuit at right angles to runway-in-use (i.e., beneath downwind leg), not above 750 ft QFE, before departing ATZ on required track."*

The pilot of the PA24 reported that they saw a "large red helicopter" just after having made the right turn from the climb-out for noise abatement and raising their landing gear.

The pilot of the EC135 reported departing on a standard helicopter departure to the north, being aware of other circuit traffic, but did not see the PA24.

Neither aircraft appeared to be routing contrary to the clearances issued, although it was considered that the EC135 might have tracked further west than expected before turning north. The investigation report from Gloucestershire ATC noted that due to the elapsed time between departures, there would have been no requirement for Traffic Information to have been passed. It could not be determined due to a lack of initial reporting, whether either the trainee controller or the OJTI saw the EC135 and that it was perhaps still in the vicinity of the climb-out and a potential conflict to the PA24. The unit concluded that it was their belief that:

"The incident itself was caused by either the fixed wing turning early or the helicopter turning late which are the only two aircraft concerned. Neither, having spoken to both pilots, are willing to accept any of this".

Conclusion

The PA24 and EC135 pilots flew into confliction. No Traffic Information had been passed to either pilot on the other by the controller/OJTI who were involved in trying to determine the positions of a number of other aircraft either in or joining the circuit.

With regards to initial and follow-up reporting, Gloucestershire ATC is reminded of its obligations under Regulation (EU) 376/2014 as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018, Article 4,paragraphs 6(d) and 7, to submit a mandatory occurrence report, within 72 hours of when they are first made aware of an occurrence, and to conduct an analysis of the occurrence, in order to identify any safety hazards, followed by submission of follow up reports, in accordance with the 30 day and 3 month timescales contained in Article 11 of the regulation.

UKAB Secretariat

The PA24 and EC135 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[4] 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.[5]

Summary

An Airprox was reported when a PA24 and an EC135 flew into proximity in the visual circuit at Gloucestershire at about 1120Z on Wednesday 12th January 2022. Both pilots were operating under VFR in VMC, both 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, GPS data, reports from the air traffic controllers 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 discussed the actions of the PA24 pilot. They had provided a GPS log file and therefore the Board were able to confidently confirm that the track the pilot took was the correct one, the pilot had not turned downwind early. The track showed that the PA24 had levelled at around 300ft in the climb-out and this was thought to be the area where the Airprox took place. Members discussed whether the right-turn departure, approved by ATC, had introduced the confliction, given that normal operations was for departures to turn left. However, it was quickly agreed that the profile the PA24 pilot flew was akin

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

to climbing into the visual circuit, and so it was agreed that the right-hand departure track itself was not a contributory factor. The PA24 pilot was on the same frequency as the EC135 and members wondered whether they should have been aware of its positioning as it climbed away from the airfield, however, the PA24 pilot had not received any Traffic Information from ATC and was not expecting to encounter it on climb-out (**CF5**). The pilot saw the EC135 late, (**CF7**), but was able to take avoiding action.

Turning to the EC135 pilot, they were cleared for take-off 4 minutes before the PA24 and members wondered what had caused the delay for it still to be at low levels in the climb out when the PA24 was cleared for departure. Board members with helicopter experience noted that the pilot could have been conducting a practise emergency, and surmised that conducting a single engine climb-out would have given a similar profile to that described by the pilot, in that they '*transitioned on runway track (270°) with a gentle climb to approx 300ft before turning right onto north and continuing the climb'*. There was nothing to suggest the EC135 pilot was not at liberty to conduct such operations and whilst some members wondered whether they could have announced any practice emergency, or delay to departure on the RT, others pointed out that the frequency was incredibly busy at the time. A practice emergency might also explain why the EC135 pilot was unaware that the PA24 had been cleared for take-off behind them, as cockpit workload would be high. They did not receive any Traffic Information from ATC and although the EC135 was fitted with a TAS and it would have been expected that the TAS would have detected the PA24 and alerted, none was reported (**CF6**). Consequently, the EC135 pilot had no situational awareness that the PA24 was in the vicinity (**CF5**) and did not see it (**CF8**).

Members then discussed that the operations at Gloucestershire Airport were varied and complicated with many differing operations all trying to use the same airspace, in particular helicopters operating beneath the visual circuit on the north side. Members noted that they had previously made recommendations to the Airport to review circuit operations and departure procedures[6]. It appeared that on this occasion neither pilot was doing anything contrary to normal procedures, yet the delay and slow climb of the helicopter led to a confliction with the PA24 climbing out afterwards, leading members to opine that the procedures and processes at Gloucester were inadequate (**CF1**).

Turning to the role of ATC, the frequency was extremely busy with both pilots and drivers of vehicles calling, together with some unusual circumstances, such as an aircraft flying up the approach path and joining pilots not being visual with each other, all of which made for a busy and complex traffic scenario. Still members thought that when clearing the PA24 for take-off the controller should have been looking at the area the aircraft was departing into and should have been able to see that the EC135 was still in the vicinity. In the event, the controller appeared to have an incorrect mental model that the EC135 was not a factor to the PA24 (**CF3**, **CF4**) and so did not provide Traffic Information to either pilot (**CF2**). Members noted that there was an OJTI behind a trainee and some wondered whether there had been sufficient supervision of the trainee by the instructor. However, noting that the ATSI report described that the OJTI took over the frequency on at least two occasions during this period, they thought that the complex situation was challenging and so they could not attribute such a contributory factor on this occasion. It was noted that the controllers did not have an ATM and the radar at Gloucestershire is primary only and of poor quality, so the controllers did not have any external tools to help them with the traffic situation. Whilst the Board felt it was not for them to recommend that units should invest in any particular equipment, a CAA adviser noted that the new procedures for Flight Information Displays (FID), currently available to AFISO units, would in the next few months be updated to include approval for ATC units and that new regulation was to be included in MATS Part 1. The Board felt that this would be a welcome addition to many units to aid situational awareness.

Finally, when assessing the risk of the Airprox, members took into consideration the reports from both pilots and the controller. Although there was no radar to assess, the GPS track of the PA24 gave an indication of the position of the Airprox and the PA24 pilot assessed the separation as at the same level and 500ft away, however, the EC135 pilot had not seen the PA24. The Board therefore agreed that there had been a risk of collision and safety had been much reduced; Risk Category B (**CF9**).

[6] Airprox 2019192, 2019210

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2022002			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Regulations, Processes, Procedures and Compliance			
1	Organisational	• Aeronautical Information Services	An event involving the provision of Aeronautical Information	The Ground entity's regulations or procedures were inadequate
	• Situational Awareness and Action			
2	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
3	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	
4	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			
	• 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	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			
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 Assessment[7]

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

Ground Elements:

Regulations, Processes, Procedures and Compliance were assessed as **ineffective** because the procedures at Gloucestershire airport do not account for the busy, mixed operations that frequently occur.

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

Situational Awareness of the Confliction and Action were assessed as **ineffective** because the controller had not appreciated that the EC135 would be a factor for the PA24 and the controllers' inaccurate situational awareness meant that they had not passed Traffic Information to either pilot.

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither pilot knew the other aircraft was in the vicinity.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the TAS in the EC135 was reported as not alerting, when an alert would be expected.

See and Avoid were assessed as **partially effective** because the PA24 pilot was able to take avoiding action.