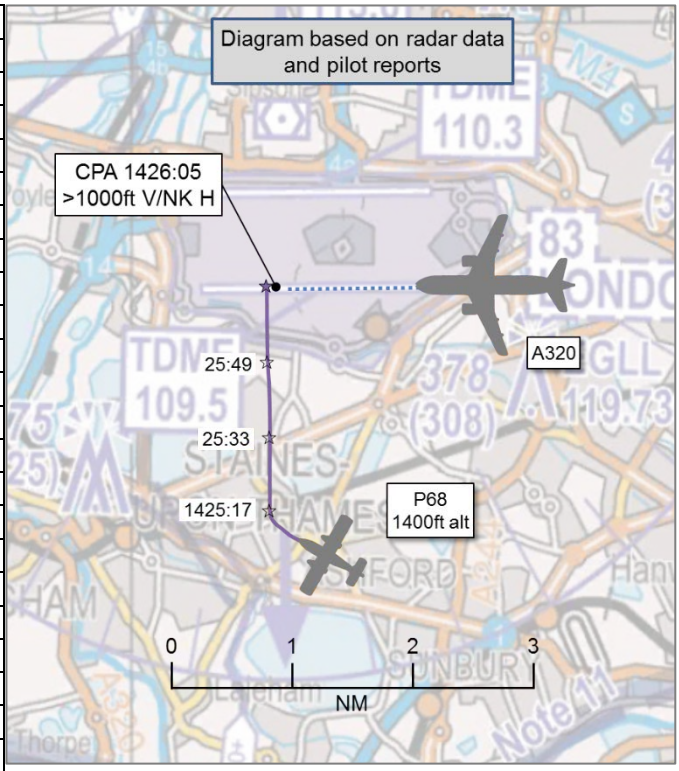
AIRPROX REPORT No 2020058

Date: 28 Jun 2020 Time: 1426Z Position: 5128N 00028W Location: London Heathrow

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	A320	P68
Operator	CAT	Civ Comm
Airspace	London CTR	London CTR
Class	D	D
Rules	IFR	VFR
Service	ACS	ACS
Provider	Heathrow Tower	Heathrow Tower
Altitude/FL	NK	1400ft
Transponder	A, C, S	A, C, S
Reported		
Colours	NR	White/Blue
Lighting	Not specified	NR
Conditions	VMC	VMC
Visibility	10km	10km
Altitude/FL	1000ft	1500ft
Altimeter	QNH (1010hPa)	QNH
Heading	270°	360°
Speed	145kt	110kt
ACAS/TAS	TCAS II	Not fitted
Alert	TA	N/A
Separation		
Reported	500ft V/0m H	1000ft V/0.3NM H
Recorded	>1000ft V[1]/NK H	



THE A320 PILOT reports that, shortly after rotation, a VFR aircraft was noted to be flying in front of them, left-to-right, at around 1500ft. The traffic was carefully monitored visually and on the TCAS; aural alerts were inhibited but the intruder turned amber with a minimum vertical separation of 500ft noted by the flight crew. Precise lateral separation is unknown, but the pilot estimates that they passed straight under. It was the closest they've ever seen an aircraft, especially during that dynamic phase of flight, and they would be interested to see the flight traces.

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

THE P68 PILOT reports they were cleared by ATC (Tower) for a northbound leg. The crew had visual contact with the departing A320 from RW27L at all times while crossing the centreline to the north and felt safe with the visual separation and distance, with no need to consider any avoiding measures. They heard the Tower controller and the crew of the A320 exchange some comments about the separation; however, they do not remember the exact wording. During the crew's mission within Heathrow CTR, they were cleared to cross the RW on several legs northbound and southbound with visual separation, which conforms with the requirements for separation within Class D airspace.

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

THE HEATHROW TOWER CONTROLLER reports that [the P68 pilot] had been undertaking north/south crossings over Heathrow at 1500ft VFR. Each pass was slightly further west than the previous pass and the next pass was expected to be approximately overhead taxiway FOXTROT. The controller was aware of the requirement in Class D airspace to pass Traffic Information between IFR and VFR traffic, along with the duty-of-care requirement to provide an adequate safety buffer between

[1] The P68 was never below 1400ft while crossing the RW centreline and the A320 first displayed on radar at 400ft when the P68 was already north of the RW centreline. Thus the vertical separation cannot have been less than 1000ft.

the aircraft to enable safe manoeuvring. They were also aware of the meteorological criteria for VFR aircraft crossing the ATZ, and how this was to be determined. In accordance with the meteorological requirements, they had informed [the P68 pilot] that they were unable to offer a VFR crossing of the ATZ while a band of weather passed through, reducing the reported visibility to below 5000m. During this period of weather, they instructed [the P68 pilot] to orbit at the southern end of their pass. Once the visibility had improved to a point where they were able to offer [the P68 pilot] a VFR crossing, and with a gap in arrivals, the controller lined up [the A320] and instructed [the P68 pilot] to begin their northbound route, anticipating that they would be approaching the southern airport boundary after the departure. They passed Traffic Information and cleared [the A320 pilot] for take-off and, as the A320 started to roll, they realised that the wind acting upon [the P68] had become more southerly and it was tracking northbound more quickly than they had anticipated. They updated Traffic Information to [the A320 pilot] as they rolled and continued to monitor the relative positions and tracks of the aircraft, determining that there was no risk of collision. [The P68] passed overhead the runway just after [the A320] rotated. On changing frequency, the A320 pilot asked if the traffic overhead was alright, and they replied that it had been VFR traffic. The controller thought that the criteria for IFR and VFR in class D had been met, but they didn't feel that they had provided a large enough safety buffer with which they would be comfortable. Consequently, on later passes, they cleared [the P68 pilot] no further than the airport boundary each time in order to better judge the relative speeds and be better equipped to arrange its flight to route further clear of departing IFR traffic.

This was a traffic situation which the controller had not worked before, and had only seen with the controller handing the position over to them. On being relieved, and continuing after the end of their shift, they thought about and analysed the situation and, although they believed that they had met the VFR/IFR in class D requirements and were confident that there was no risk of collision, they understood that they should have built in an additional safety buffer by either delaying the P68 starting the pass or delaying the A320's take-off clearance.

Factual Background

The weather at London Heathrow Airport was recorded as follows:

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METAR COR EGLL 281420Z AUTO 25014KT 9999 -RA FEW029/// SCT038/// //////CB 17/14 Q1010
RERA TEMPO SHRA=
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Analysis and Investigation

CAA ATSI

The A320 was an IFR flight departing Heathrow. The pilot was in receipt of an Aerodrome Control Service from Heathrow Tower on frequency 118.505MHz. The P68 was on a VFR survey flight from [a local airfield]. In the days leading up to the Airprox, the aircraft had been operating survey flights in and around the Heathrow area. On this particular day, the survey required multiple crossings of the CTR. At the time of the Airprox the aircraft was crossing the CTR south-to-north. The P68 pilot was also in receipt of an Aerodrome Control Service from Heathrow Tower on frequency 118.505MHz. At the time of the Airprox Heathrow ATC was operating single runway mode, with one controller dealing with arrivals and departures from RW27L and overflights.

ATSI had access to two reports from the pilot of the A320, one from the pilot of the P68 and one from the Heathrow controller. The Heathrow 10 radar replay data and the unit radio recordings were reviewed for the period of the incident. The RTF was busy throughout the period of the review. In the interest of brevity only the subject aircraft have been included in this report.

Screenshots produced in this report are provided using recordings of the Heathrow 10 radar. Levels indicated are in altitude. All times UTC.

At **1424:06**, and having just completed a north-to-south pass, the P68 pilot advised the controller *"[P68 C/S], line is completed"* the controller instructed the pilot *"[P68 C/S] proceed northbound"*

(Figure 1). At **1425:11**, the A320 pilot was issued with their take-off clearance and the P68 had just completed a 360° left turn (Figure 2).

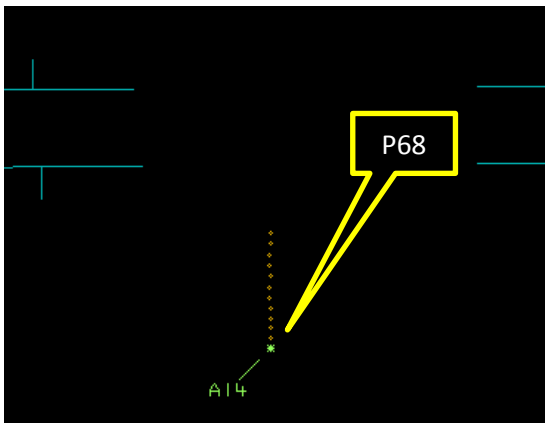


Figure 1 – 1424:06

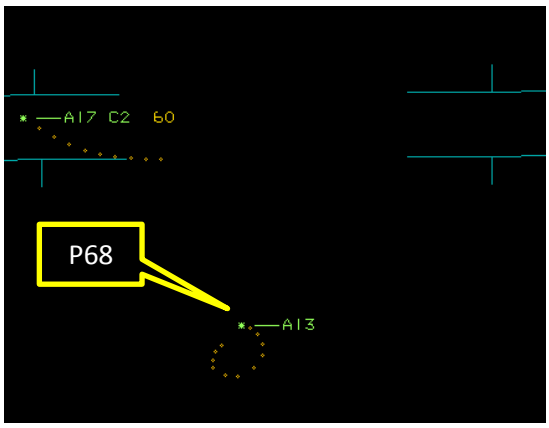


Figure 2 – 1425:11

At **1425:23**, the controller passed Traffic Information to the P68 pilot *"[P68 C/S] traffic information, a three twenty just commencing their departure roll runway two seven left".* The pilot responded, *"copy that, we have the traffic in sight, [P68 C/S]"* (Figure 3). At **1425:41**, the controller passed Traffic Information to the A320 pilot *"callsign, traffic information, light fixed wing transiting south-to-north, fifteen hundred feet".* The A320 pilot had commenced their take-off roll and did not respond (Figure 4).

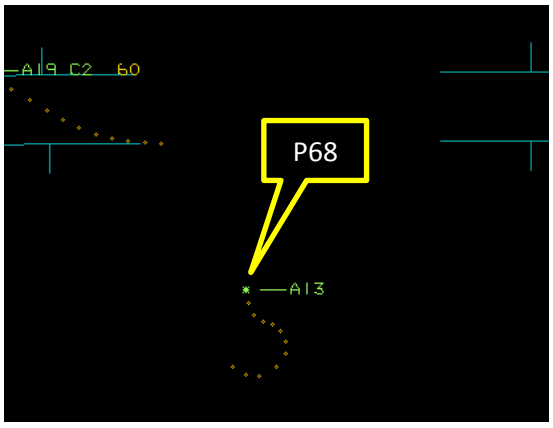


Figure 3 – 1425:23

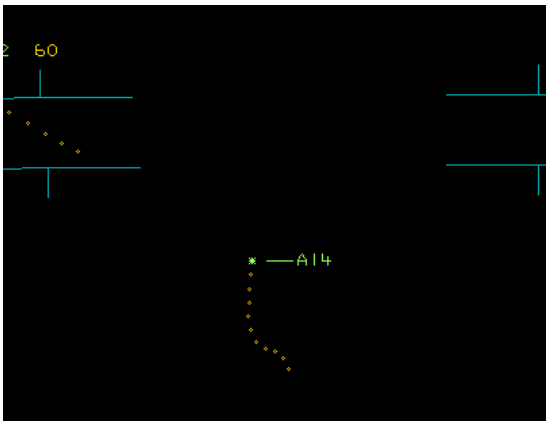


Figure 4 – 1425:41

At **1425:54**, the P68 was at the southern aerodrome boundary, tracking north and indicating altitude 1400ft (Figure 5).

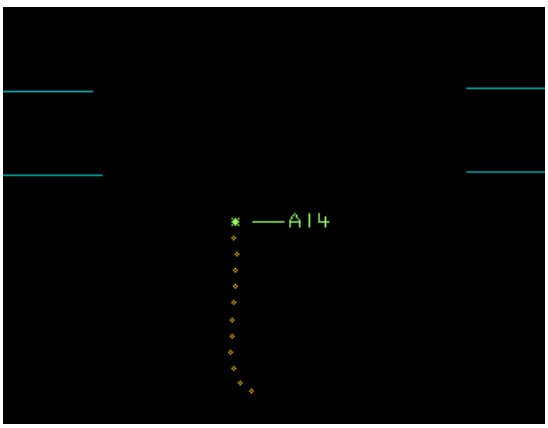


Figure 5 – 1425:54

Figure 6 – 1426:00

At **1426:06**, CPA had occurred and the P68 could be seen on the surface movement radar as being to the north of RW27L; the A320 was airborne, displaying an indicated altitude of 400ft, climbing (Figures 7 and 8).

Figure 7 – 1426:06 (surface radar)

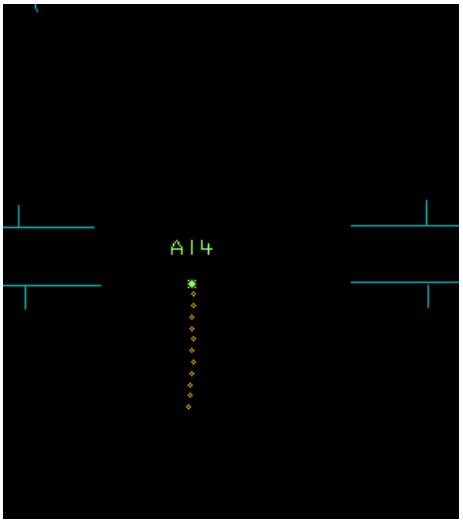


Figure 8 – 1426:06 – (NATS radar)

The A320 did not display on the Heathrow 10 radar replay until **1426:18** (Figure 9). The P68 had been indicating altitude 1400ft as it crossed above the runway. The trajectory below, and Figures 7 and 8 above, indicate that the P68 passed ahead of, and 1000ft or more above, the A320.

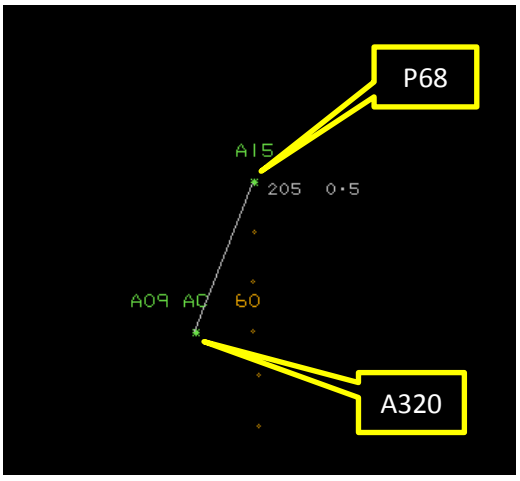


Figure 9 – 1426:18

The Heathrow controller was providing an Aerodrome Control Service to arriving, departing and overflying traffic in Class D airspace. 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. Within Class D Airspace, controllers are required to pass Traffic Information to aircraft operating IFR on VFR traffic and to pass Traffic Information to aircraft operating VFR on IFR traffic and, in both circumstances, provide avoidance advice if requested.

Traffic Information was passed to the P68 pilot just after the take-off clearance was given to the A320 and the pilot reported visual with the traffic. In the pilot report they stated that they had been visual with the A320 on the threshold and maintained visual contact with it throughout the A320 departure, and that they had no concerns as to their proximity.

Traffic Information was passed to the A320 pilot after they had commenced their take-off roll. This was not acknowledged by the pilot and it is unclear from the reports received from the A320 pilot whether they received the Traffic Information during what would have been a period of high cockpit workload. However, the pilot did report that they were visual with the P68 and had monitored it both visually and on TCAS.

The controller stated in their report that they had been expecting the P68 to be at the southern aerodrome boundary after the A320 had departed but noticed that the southerly wind was acting upon the P68 and that the aircraft was moving faster than they had anticipated. Upon reflection, they said that for future passes they would issue a clearance limit of the aerodrome boundary to enable them to better judge the relative speeds. It was noted from the radar replay that the indicated ground speed of the P68 on the south to north leg was up to 50kt faster than on the north to south leg (84kt and 134kt (max)).

The report received from the controller was very honest and reflective, in that they acknowledged that whilst they had passed the necessary Traffic Information, they did not feel that they had provided a large enough safety buffer with which they were comfortable, and that, on reflection, they should have either delayed the pass of the P68 or delayed the A320 departure. Following this event, Heathrow ATC Safety Department issued a briefing to controllers reminding them of the potential safety scenarios that non-standard flights can generate, together with further guidance on how to manage them.

UKAB Secretariat

The A320 and P68 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[2] 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.[3]

Summary

An Airprox was reported when an A320 and a P68 flew into proximity at London Heathrow airport at 1426Z on Sunday 28th June 2020. The A320 pilot was operating under IFR in VMC and the P68 pilot was operating under VFR in VMC. Both pilots were in receipt of an Aerodrome Control Service from Heathrow Tower.

[2] SERA.3205 Proximity.
[3] SERA.3225 Operation on and in the Vicinity of an Aerodrome.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both aircraft, transcripts of the relevant RT frequencies, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and 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.

Due to the exceptional circumstances presented by the coronavirus pandemic, this incident was assessed as part of a 'virtual' UK Airprox Board meeting where members provided dial-in/VTC comments. Although not all Board members were present for the entirety of the meeting and, as a result, the usual wide-ranging discussions involving all Board members were more limited, sufficient engagement was achieved to enable a formal assessment to be agreed along with the following associated comments.

The Board first considered the actions of the A320 pilot. A lengthy discussion took place regarding the timing of the Traffic Information from the Heathrow Tower controller during their take-off roll. The Board heard from civil airline pilot members that the likelihood of the A320 crew even having heard the Traffic Information during what had been an exceedingly busy phase of flight was extremely low. Members agreed that, due to the A320 crew concentrating on the departure (**CF4**), they had not assimilated the Traffic Information (**CF3**) and had therefore had no situational awareness of the presence of the P68 (**CF2**). The Board considered that the first that the A320 pilot had known of the presence of the P68 had been as they had rotated and become visual with the P68, and that this had probably been coincident with the appearance of the P68 on the A320's TCAS (**CF6**). Furthermore, members agreed that, without having assimilated the Traffic Information from the Heathrow controller, the pilot had been concerned by the visual proximity of the P68 (**CF7**) and the amber indication of the target aircraft on their TCAS (**CF5**).

Turning to the actions of the P68 pilot, members quickly agreed that they had been unconcerned by the event because they had been visual with the A320 throughout its take-off and initial climb and had assessed there to be adequate separation throughout their passage over the RW.

The Board then discussed the actions of the Heathrow Tower controller and the scheduling of the survey task. Members thanked the controller for their open and honest self-analysis and agreed that the effect of the southerly wind had been underestimated and that this had led to the P68 crossing in front of the departing traffic rather than behind it as the controller had intended. The Board also agreed that, by the time the controller had assessed that the P68 would pass in front of the A320, it had been too late to issue Traffic Information (**CF1**) to the pilot of the A320 with any degree of certainty that this would have been received and acknowledged during their take-off roll. An ATC member wondered why the survey task had been scheduled to take place during daylight hours over the main in-use runway at a major airport. The Board then heard from an ATC advisor that survey flights such as this were not uncommon and were usually programmed to take place when traffic levels were expected to be low. This event had taken place during the COVID-19 pandemic and, as such, traffic levels at the airport had been vastly reduced compared to the norm. Indeed, traffic levels were so low at Heathrow that, unusually, single RW operations were being conducted for both departures and arrivals.

Considering the risk involved in the Airprox, there was much discussion over what might have happened had the A320 rotated earlier and/or climbed faster than anticipated by the controller. Members agreed that the outcome could have been very different, but that they had to assess the risk on the merits of what actually took place rather than what might have happened had circumstances been different. The Board took into account the recorded separation at CPA and the fact that the P68 pilot had been visual with the departing A320 throughout the duration of the incident. Accordingly, members agreed that although safety had been degraded, no actual risk of collision had existed and therefore assigned a Risk Category C to this event.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2020058		
CF	**Factor**	**Description**	**Amplification**
	Ground Elements		
	• Situational Awareness and Action		
1	Human Factors	• ANS Traffic Information Provision	TI not provided, inaccurate, inadequate, or late
	Flight Elements		
	• Situational Awareness of the Conflicting Aircraft and Action		
2	Contextual	• Situational Awareness and Sensory Events	Pilot had no, late or only generic, Situational Awareness
3	Human Factors	• Understanding/Comprehension	Pilot did not assimilate conflict information
4	Human Factors	• Distraction - Job Related	Pilot engaged in other tasks
5	Human Factors	• Interpretation of Automation or Flight Deck Information	Pilot was concerned by the proximity of the other aircraft
	• Electronic Warning System Operation and Compliance		
6	Human Factors	• Interpretation of Automation or Flight Deck Information	CWS sighting report
	• See and Avoid		
7	Human Factors	• Perception of Visual Information	Pilot was concerned by the proximity of the other aircraft

Degree of Risk: C

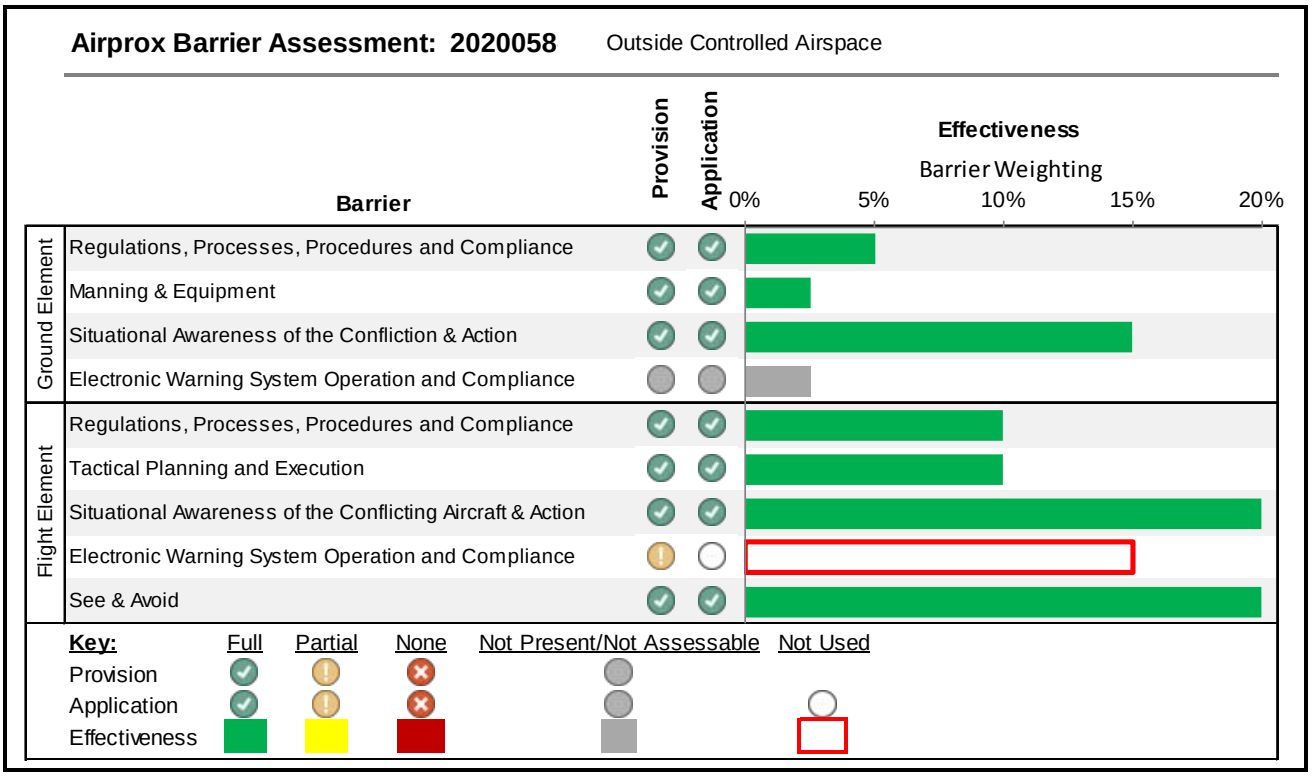
Safety Barrier Assessment[4]

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

Flight Elements:

Electronic Warning System Operation and Compliance were assessed as **not used** because all TCAS RA warnings are inhibited below 1000ft ± 100ft agl and all aural annunciations are inhibited below 500ft ± 100ft agl.

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


Airprox Barrier Assessment: 2020058
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