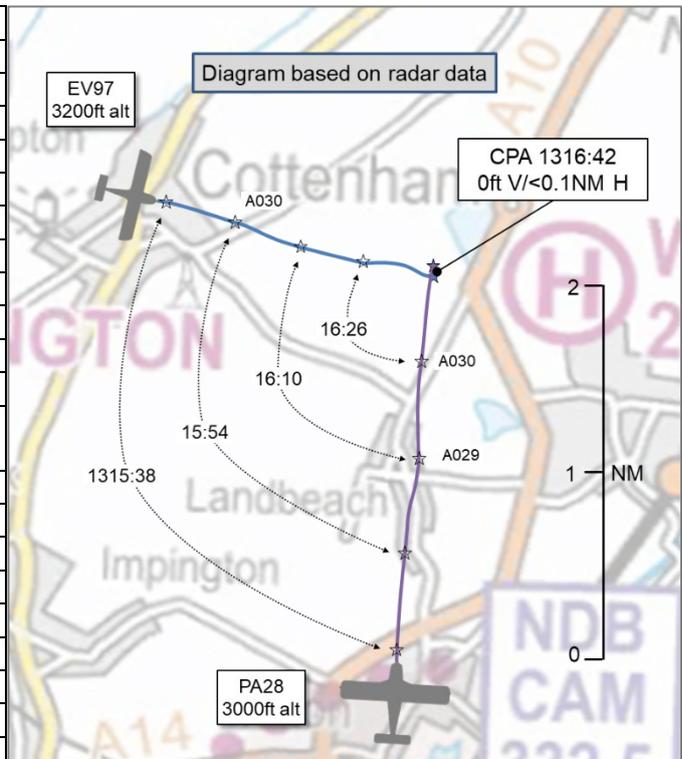


AIRPROX REPORT No 2021173

Date: 05 Sep 2021 Time: 1317Z Position: 5216N 00009E Location: 5NM N Cambridge airfield

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	EV97	PA28
Operator	Civ FW	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Listening Out	None
Provider	Lakenheath	None
Altitude/FL	3000ft	3000ft
Transponder	A, C, S	A, C
Reported		
Colours	Silver, green, blue	White and yellow
Lighting	None	Landing, taxi, nav, strobe, beacon.
Conditions	VMC	VMC
Visibility	5-10km	>10km
Altitude/FL	3000ft	3000ft
Altimeter	QNH (1021hPa)	QNH (1022hPa)
Heading	102°	006°
Speed	95mph	110kt
ACAS/TAS	SkyEcho II	Not fitted
Alert	None	N/A
Separation at CPA		
Reported	0ft V/100m H	300ft V/300m H
Recorded	0ft V/<0.1NM H	



THE EV97 PILOT reports that on leaving [departure airfield], the weather was sunny with light winds and scattered cloud just above 2000ft. The cloud became more occasional and, having engaged with the East Midlands radar controller, they requested a climb to 4000ft to get above it. They were on the edge of their [East Midlands] radar coverage while below 2000ft and only a Basic Service was possible, but this was resolved once at 4000ft. They remained clear of controlled airspace and stayed as far to the north of Northampton Sywell as possible, conscious of the LAA rally and the likely traffic density there. Progressing to the east, they left the East Midlands frequency as they had left their area of coverage. They were conscious that Cambridge and Marham were closed and awaited contact with Lakenheath. In the event, [when listening out, they could hear that the] Lakenheath controller was busy talking to two pilots, including one involved in instrument procedures. They report that they had not yet established contact [with the Lakenheath controller] when they noticed the white and yellow PA28 to their right, at their level, alarmingly close and, they judged, [posing an] imminent risk of collision. They took immediate evasive action by rolling left to a high angle of bank and pushing [forward on the controls]. They felt that there was no time to turn right and pass behind the PA28 as they judged that if they had turned to the right, they would have immediately collided head-on with the PA28. Once [the aircraft attitude was] recovered, they had lost 350ft within a few seconds. They did not see the PA28 again. They did not pursue contact with Lakenheath after the incident and flew on directly to [their destination] airfield and landed uneventfully. They add that they have since thought a great deal about how they might have reduced the risk of this happening. Their opportunity for a radar service was limited. They considered that perhaps they could have chosen to maintain an irregular level, such as 3200ft, rather than 3000ft. They were using SkyDemon duplicated on two iPad Minis, linked to a [TAS device]. They report that they were maintaining a good visual scan but that their passenger had been looking at an iPad immediately prior to the event, and had seen no plot of traffic that might have represented the PA28.

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

THE PA28 PILOT reports that they had departed [departure airfield] and had taken up a northerly heading toward their destination. They changed frequency to Cambridge Approach/Traffic on 120.965MHz. They made calls to the other traffic [on the frequency stating] their departure airfield, destination airfield, callsign/type, climbing through 1500ft to 3000ft on 1022hPa QNH and heading. They then left the Cambridge Airfield area and began to tune in London Information for the rest of the flight, at which time the other aircraft appeared, tracking west-to-east, below them. They then carried on with London Information for the remainder of the flight.

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

THE LAKENHEATH CONTROLLER reports that they did not speak with the EV97 pilot and do not recall observing it on radar.

THE CAMBRIDGE AIR TRAFFIC UNIT supervisor reports that they were closed on the day of the Airprox, however, the RT recording system was active and, having reviewed the recordings, they confirm that, of the two aircraft involved, only [the PA28 pilot] called on the frequency to confirm their intentions to transit over the ATZ northbound. No further calls were made by this aircraft and no report of an Airprox was received on their frequencies.

Factual Background

The weather at Mildenhall was recorded as follows:

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METAR EGUN 051356Z 18006KT 9999 FEW060 26/15 A30131
METAR EGUN 051256Z 16006KT 9999 FEW060 25/15 A3013
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Analysis and Investigation

UKAB Secretariat

An analysis of the radar replay was undertaken along with the RT recordings from Cambridge. The PA28 pilot was recorded on the Cambridge frequency at 1310:50 passing information regarding their routing. After this time, from the radar tracks, it can be seen that they continued on a relatively constant heading and maintained their altitude. There was an unrelated aircraft observed on radar at 1315:30 which flew parallel to, and then converged with, the PA28 (Figure 1). The unrelated aircraft then passed below the PA28 shortly after 1316:00 (Figure 2) and cleared to the west.

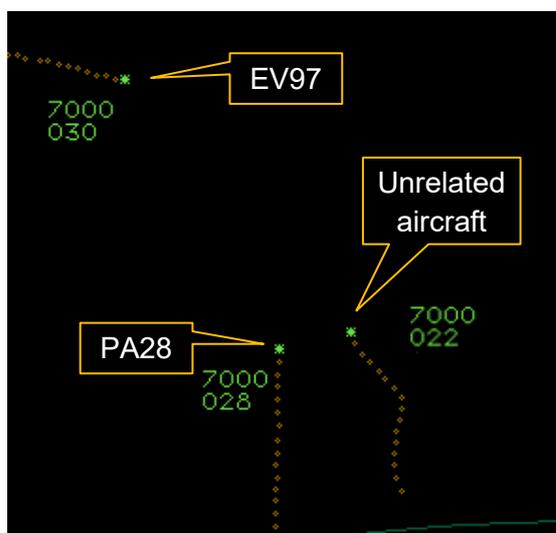


Figure 1 – 1315:30

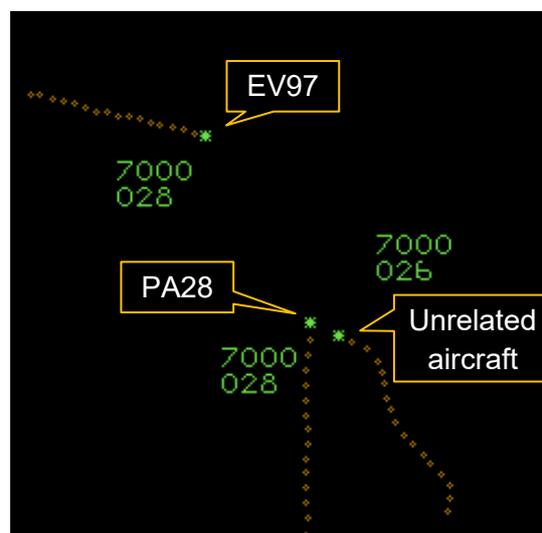


Figure 2 – 1516:00

¹ QNH reported in inHg, 3012 is equivalent to 1020hPa.

The EV97 was observed to also have been maintaining a relatively constant track and altitude up to the point at which CPA occurred, which happened between radar sweeps. The minimum recorded separation occurred approximately 1sec after actual CPA and was at 1316:42 (Figure 3). On the following radar sweep, the left turn made by the pilot of the EV97 was visible, and a descent registered on the Mode C readout, before the pilot then resumed their original heading.

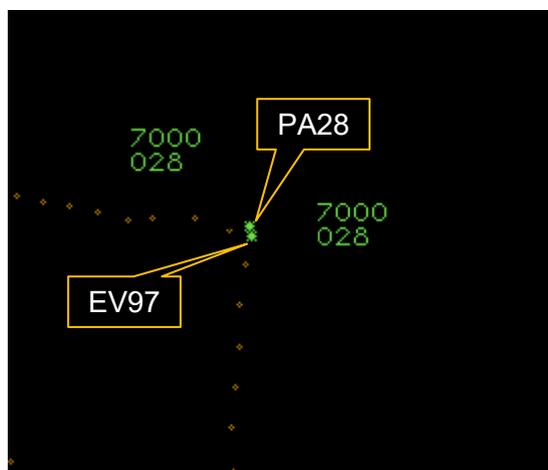


Figure 3 – CPA

At 1318:43 the PA28 pilot made contact with London Information.

The EV97 and PA28 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 If the incident geometry is considered as converging then the EV97 pilot was required to give way to the PA28.³

Summary

An Airprox was reported when an EV97 and a PA28 flew into proximity 5NM N of Cambridge airfield at 1317Z on Sunday 5th September 2021. Both pilots were operating under VFR in VMC, neither pilot was in receipt of an Air Traffic Service.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, 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.

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 a combination of written contributions and dial-in/VTC comments.

The Board first considered the actions of the EV97 pilot. Members noted that they had previously been under a Traffic Service from East Midlands radar and had intended to request a service from Lakenheath, however, at the time of the Airprox they were not in receipt of an ATS. The Board discussed that, although the EV97 pilot had had a TAS available, their equipment could only detect aircraft that carried specific conspicuity equipment, which the PA28 did not have, and so no alert had been generated (**CF2**). Members concluded that without an ATS, or an alert from their CWS, the EV97 pilot did not have any situational awareness relating to the presence of the other aircraft (**CF1**).

² (UK) SERA.3205 Proximity.

³ (UK) SERA.3210 Right-of-way (c)(2) Converging.

The PA28 pilot was also not in receipt of an ATS at the time of the Airprox but did later request a Basic Service from London Information. As a result the PA28 pilot also did not have any awareness of the presence of the EV97 (**CF1**). Members highlighted that under a Basic Service there was no requirement for the FISO/controller to monitor the flight and that collision avoidance remained the responsibility of the pilot.

The Board then discussed the geometry of the Airprox and noted that the aircraft had been converging and maintaining a steady relative bearing for some time until the point of the Airprox. Members commented that in such a situation visual detection of conflicting traffic is particularly difficult, the result of which had been a late sighting of the PA28 by the EV97 pilot (**CF3**) and an effective non-sighting by the PA28 pilot (**CF4**). The GA member suggested that occasional “weaving” could act as a mitigation for this and also stated that such manoeuvring may enable a pilot to scan areas that are often obscured from view, such as below the aircraft’s nose. The discussion then moved to other tools that could mitigate the risk of collision such as pilots choosing to cruise at irregular cruising altitudes.

Finally, in assessing the risk of collision, the Board discussed that, as neither pilot had had any awareness of the presence of the other, both had been relying on their lookout for collision avoidance. Members agreed that, in this case, safety had not been assured and that there had been a risk of collision (**CF5**), but that the action of the EV97 pilot had generated sufficient separation to reduce that risk, although not remove it entirely. Accordingly, the Board assigned a Risk Category B to this Airprox.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2021173			
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
Flight Elements				
• Situational Awareness of the Conflicting Aircraft and Action				
1	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late or only generic, Situational Awareness
• Electronic Warning System Operation and Compliance				
2	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				
3	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
4	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				
5	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 Assessment⁴

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

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

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither pilot had any knowledge regarding the presence of the other aircraft prior to sighting it.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the equipment carried on the EV97 was unable to detect the PA28.

See and Avoid were assessed as **partially effective** because the EV97 pilot saw the PA28 late and only in time to take emergency avoiding action.

Airprox Barrier Assessment: 2021173		Outside Controlled Airspace		Effectiveness				
Barrier		Provision	Application	Barrier Weighting				
				0%	5%	10%	15%	20%
Ground Element	Regulations, Processes, Procedures and Compliance	●	●					
	Manning & Equipment	●	●					
	Situational Awareness of the Conflicting Aircraft & 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	■	■	■	■	□			