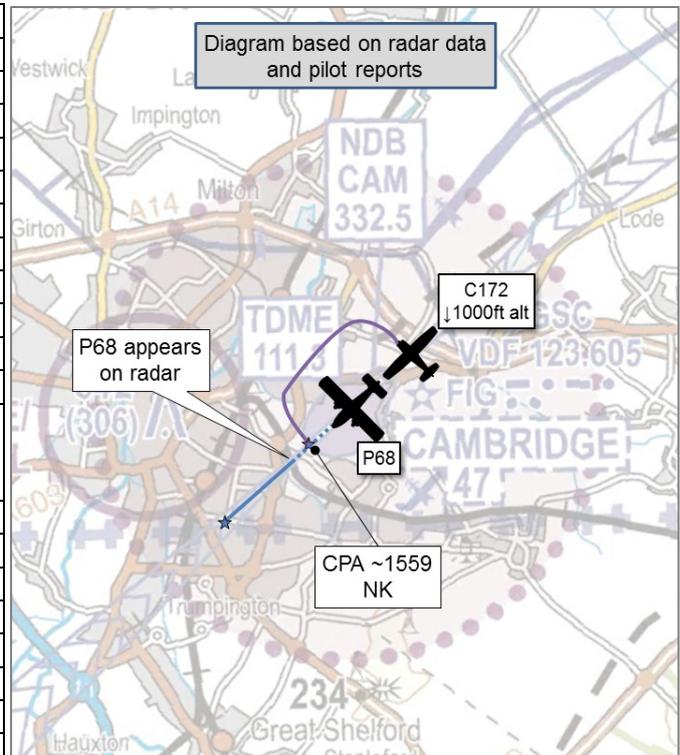


**AIRPROX REPORT No 2019246**

Date: 22 Aug 2019 Time: 1559Z Position: 5212N 00010E Location: Cambridge Airport

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

Recorded	Aircraft 1	Aircraft 2
Aircraft	P68	C172
Operator	Civ Comm	Civ FW
Airspace	Cambridge ATZ	Cambridge ATZ
Class	G	G
Rules	VFR	VFR
Service	ACS	ACS
Provider	Cambridge	Cambridge
Altitude/FL	NK	1000ft
Transponder	A, C, S	A, C
<b>Reported</b>		
Colours	White, Blue	White
Lighting	Nav, Strobe, Landing	Nav, Strobe, Landing, Taxi, Beacon
Conditions	VMC	VMC
Visibility	Not reported	>10km
Altitude/FL	300ft	1000ft
Altimeter	QNH (1023hPa)	QFE (1023hPa)
Heading	230°	140°
Speed	90kt	100kt
ACAS/TAS	Not fitted	Not fitted
<b>Separation</b>		
Reported	<200ft V/0m H	Not seen
Recorded	NK <sup>1</sup>	



**THE P68 PILOT** reports that he took off behind an Extra and his attention was on the Extra to maintain a safe distance from them. Also, due to Cambridge being a controlled airport, he was expecting ATC to inform him of any other traffic and maintain a safe distance from them. At about 200ft, he saw an aircraft in his 1-2 o'clock on the deadside joining crosswind at very low level. He pitched the nose down into straight-and-level flight, the other aircraft overflew him by less than 200ft. Without him spotting the other aircraft or taking action their paths would have led to a mid-air collision. ATC did not warn him about the traffic. Once clear of the conflict he resumed his climb to 2000ft and continued straight out. Only when the aircraft had cleared him and had started to join downwind did the Tower controller query what the aircraft was doing; it became clear that it was a student who had not understood their clearance. So as not to unnerve the student, he decided to report the incident after being handed over to Approach.

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

**THE C172 PILOT** reports that he was returning from his cross-country qualifying flight and knew instantly that the airport was extremely busy. In fact, he remembers that he had to wait quite a long time to actually get his call in for joining the airport for an overhead join for RW23. He came overhead and descended deadside to 1000ft. He was told to report ready when crosswind but, at this point, he had already started to turn onto crosswind. He then made a call saying something along the lines of "[C/S] at crosswind" and the controller said something like "but I told you to report ready". After this the controller then told him to carry on as he was. During this time, he did not receive any instructions to, for example, tell him to climb, orbit or manoeuvre in any way. He then reported downwind, then final and landed safely. The flying club was informed of the Airprox by RAC on 9th September 2019, so this report is from what he can remember.

<sup>1</sup> CPA occurred prior to the P68 appearing on radar.

**THE CAMBRIDGE AERODROME CONTROLLER** reports that he had been in position for 1hr, working heavy traffic levels. The C172 student pilot called for an overhead join, which was approved. The P68 pilot was cleared for take-off, RW23. The pilot of the C172 reported descending deadside, and was instructed to report ready to turn crosswind, with Traffic Information on the departing P68. A few moments later the C172 was seen turning onto the downwind leg having failed to make the crosswind call. The P68 was transferred to Cambridge Radar, the pilot reported an Airprox at approximately 1604hrs with Radar, passing within 300ft of the C172 on departure while with Cambridge Tower.

## Factual Background

The weather at Cambridge was recorded as follows:

METAR EGSC 221550Z 26014KT 9999 SCT042 23/12 Q1023

## Analysis and Investigation

### ATSI

An Airprox was reported when a Partenavia P-68 (P68) and a Cessna 172 (C172) came into proximity in the visual circuit at Cambridge Airport. Both pilots were in receipt of an Aerodrome Control Service from Cambridge Tower. The screenshots in this report are taken from the area radar recording and are not indicative of what was displayed on the Cambridge Aerodrome Traffic Monitor at the time of the event. The Levels displayed in the screenshots are Flight Levels and the QNH data entered into the Radar Display was 1024, a difference of 11HpA=297 feet. The R/T was constant throughout the period leading up to the incident.

At 15:54.00, the C172 pilot reported 2 miles north of Cambridge and requested an overhead join at 2000ft. The controller instructed the pilot to *“join, report in the overhead, height two thousand feet, QFE 1021, RW23.”* The pilot readback only the QFE.

At 15:58.40 (Figure 1), the P68 pilot was cleared for take-off RW23 (P68 not yet visible on radar).

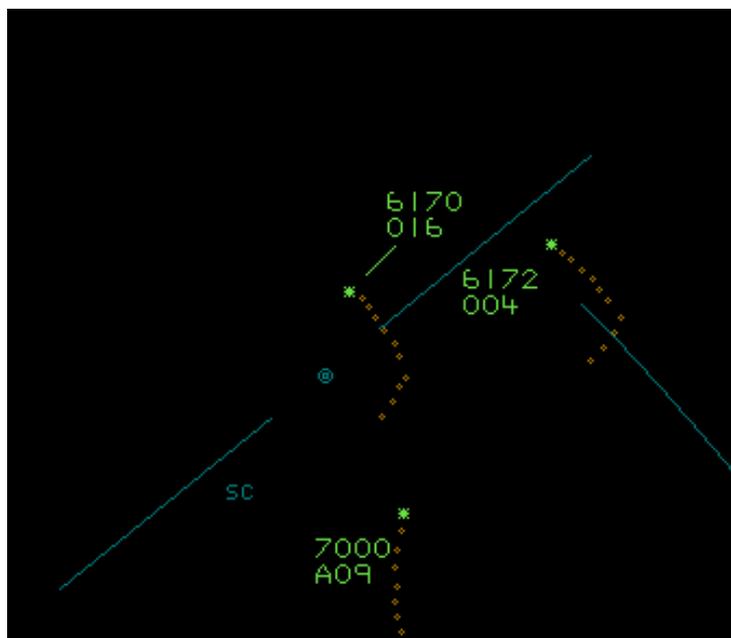


Figure 1-15:58.40 (C172 6170 Squawk)

At 15:59.10 (Figure 2), and having omitted the overhead report, the C172 pilot reported descending deadside. The controller responded, *“roger descend deadside, roger report ready to turn crosswind, traffic on the roll now departing straight ahead, Partenavia.”* The pilot responded, *“roger that (callsign)”*. [Note: the 7010 squawk in Figure 2 is the E200 that departed just ahead of the P68].

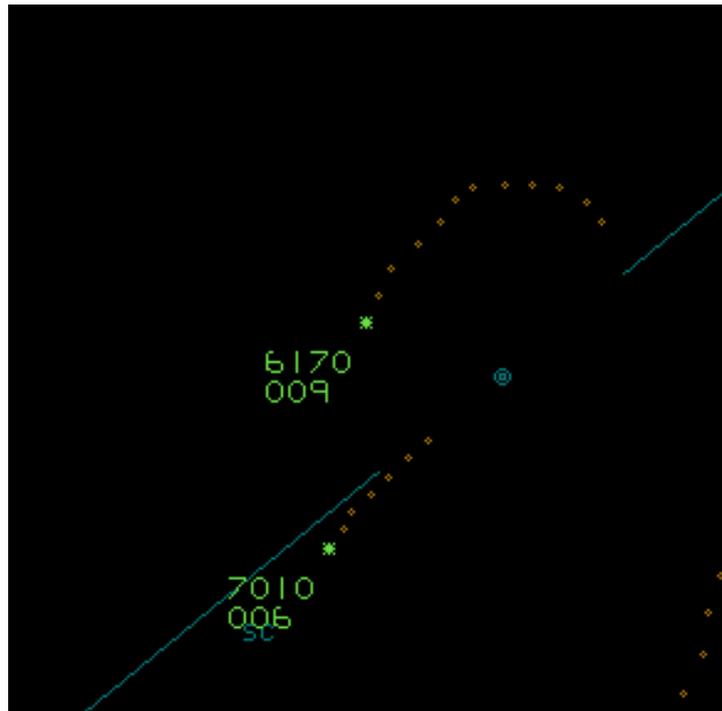


Figure 2-15:59.10

At 15:59.50 (Figure 3), the P68 first appeared on the radar replay with the aircraft separated by 0.7nm laterally and 400ft vertically. Although the 2 aircraft flew closer than this as they crossed tracks, this was the closest point that could be measured using the available radar pictures.

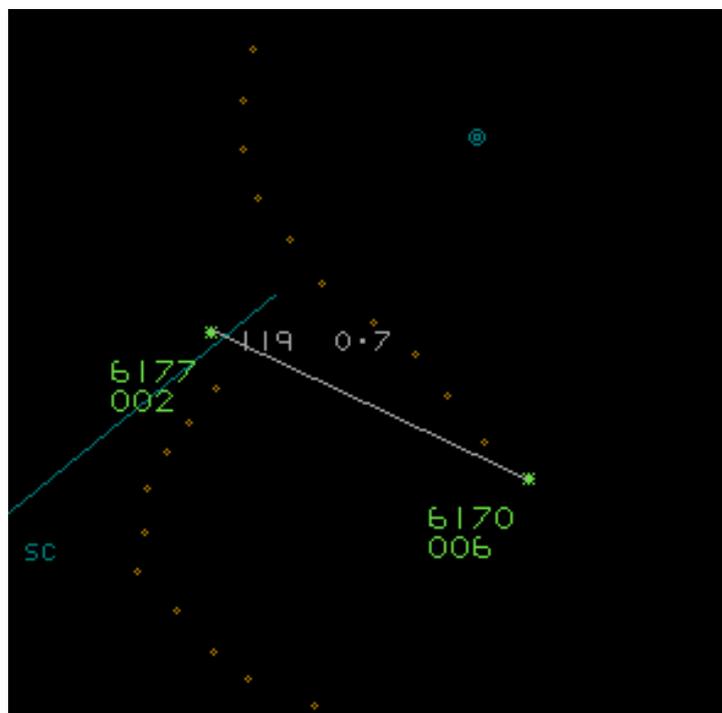


Figure 3-15:59.50. P68 6177 Squawk (closest point that could be measured)

At 16:00.10 (Figure 4), the controller asked the C172 pilot to report their position. The pilot responded, "*currently turning onto downwind*". the controller responded, "*the instruction was to report ready to turn crosswind.*" The pilot responded, "*my bad (callsign)*".

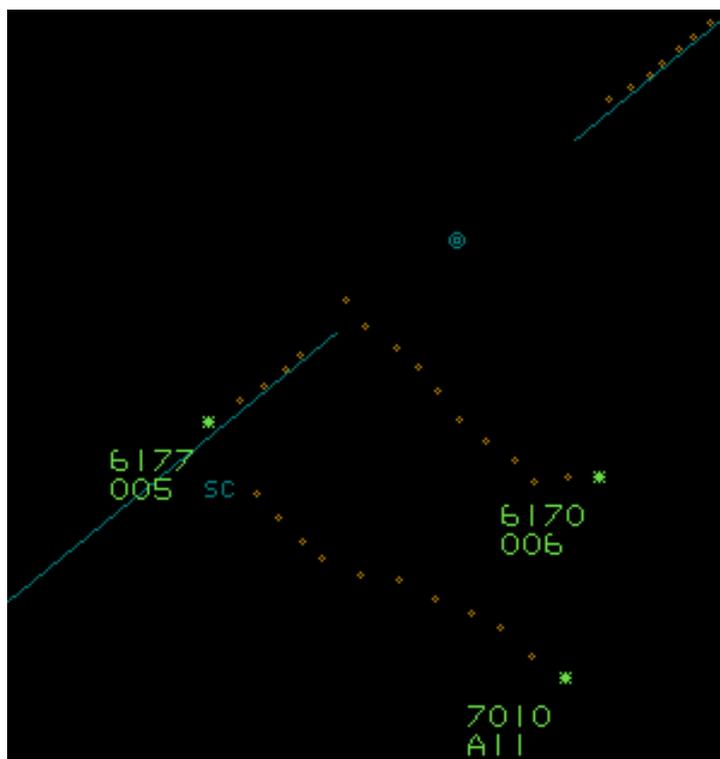


Figure 4-16:00.10

At 16:02.20 the P68 pilot was transferred to the Cambridge Radar controller.

The C172 Student pilot was instructed to report in the overhead but did not make this report. When the C172 pilot subsequently reported deadside descending, they were instructed to report ready to turn crosswind. The pilot did not make this report and proceeded to turn crosswind, passing north to south in front of the departing P68.

On receipt of the deadside descending report, Traffic Information was immediately passed to the C172 pilot on the P68 rolling for departure and this was acknowledged by the C172 pilot. Whilst it may have been useful for the P68 pilot to have been provided with Traffic Information on the C172 descending on the deadside, it is not good controlling practice to interrupt pilots while they are on their take-off roll, instead the controller appears to have requested that the C172 pilot report ready to turn crosswind, in a likely attempt to keep the aircraft on the deadside while the P68 departed.

In the absence of the overhead report from the C172 pilot, the controller would not have recognised that the C172 was going to be relevant traffic to the P68 pilot prior to issuing them with their take-off clearance.

### Cambridge Airport Investigation Report

The Tower controller had been in position for 1 hour prior to the incident. He described the traffic loading as heavy and, as it had been forecast to be heavy, he had asked for a safety controller to be in the room who he could call on should the traffic levels become unmanageable. He reported that he had not seen the Airprox and the pilot failed to make the “ready to turn crosswind” check that he had been asked to do. The frequency and surveillance replays confirm the controllers report. The pilot failed to make the ready to turn crosswind report and had been passed traffic information on the departing P68. The surveillance replay indicates that the C172 passed between 800ft and 500ft above the P68. The Airprox was as a result of pilot error from a student pilot who was not close enough to endanger either aircraft.

## UKAB Secretariat

The P68 and C172 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard<sup>2</sup>. 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<sup>3</sup>.

### Summary

An Airprox was reported when a P68 and a C172 flew into proximity in the Cambridge ATZ at 1559hrs on Thursday 22<sup>nd</sup> August 2019. Both pilots were operating under VFR in VMC and in receipt of an Aerodrome Control Service from Cambridge Tower.

### **PART B: SUMMARY OF THE BOARD'S DISCUSSIONS**

Information available consisted of reports from both pilots, radar photographs/video recordings and reports 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 began by looking at the actions of the C172 pilot. Members noted that he was a student returning from a cross-country qualifying flight and that, given that his readback of clearance messages was inaccurate or missing (**CF5**), some wondered if the level of radio traffic and the busy visual circuit meant that he may have been operating at close to the upper limit of his capacity for his level of training. Whether or not this was the case, it was clear that the C172 pilot had not assimilated the Traffic Information on the departing P68 (**CF6**), which had led to him not seeing it or taking it into account as it departed beneath him as he flew crosswind (**CF8**). Appreciating that the C172 pilot may possibly have initiated his crosswind turn prior to the controller telling him to call ready to turn crosswind, on receipt of the call he should have either rolled out again and continued deadside or at least informed the controller that he was already turning. As it was, he did not comply with the clearance limit from the controller, which he probably did not appreciate, and turned crosswind prior to being cleared (**CF3 & 4**). All of these factors resulted in him not sufficiently integrating behind the departing P68 (**CF7**).

Turning to the actions of the P68 pilot, members noted that, because of the geometry of the encounter, although the pilot had seen the C172 late (**CF9**) he had been able to stop his climb to pass below the C172 on the crosswind leg (**CF10**). This action had ensured that vertical separation was maintained until the P68 had passed sufficiently beyond the C172 for the P68 pilot to continue the climb.

The Board then looked at the actions of the Cambridge controller. He was operating in a high workload environment and this may have resulted in him not recognising the C172 student pilot's capacity to integrate with the evolving busy circuit state. In this respect, some members wondered whether the C172 pilot was using the prefix 'student' in his transmissions, which would have made his inexperienced status readily apparent. Some members wondered if the controller might have been better served by requesting that the C172 pilot remain in the overhead when they requested to join the busy visual circuit, especially because the C172 pilot was a student who would be trying to integrate into the busy circuit whilst coping with a high cockpit workload for his stage of training. Ultimately, because the C172 pilot was not passing relevant position reports the controller did not have full awareness of the C172's position in the ATZ (**CF1**). Notwithstanding, members noted that the controller must have recognised that there was a potential conflict between the joining C172 and departing P68 because he had asked the C172 pilot to report ready to turn; controller members opined that, as a result, in their opinion and even though the circuit was busy, the controller should have been more pro-active in controlling the situation to ensure adequate resolution (**CF2**).

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<sup>2</sup> SERA.3205 Proximity.

<sup>3</sup> SERA.3225 Operation on and in the Vicinity of an Aerodrome.

The Board then looked at the risk. Members noted that the P68 pilot had seen the C172, albeit later than desirable, and had been able to act in what appeared to have been a measured manner to stop his climb and ensure effective separation. It was difficult for the Board to determine the actual separation achieved at their crossing point without radar-derived information, but by projecting the likely rate of climb of the P68 from its recorded first height back to the intersection of the 2 aircrafts' tracks, it seemed probable to the Board that more than 400ft vertical separation had existed at CPA. As a result, whilst this incident could not be considered as having been one where normal procedures and safety standards had pertained, members agreed that the actions of the P68 pilot had removed the risk of collision to the extent that the risk could be assessed as Category C, albeit a high-end Category C.

### **PART C: ASSESSMENT OF CONTRIBUTORY FACTOR(S) AND RISK**

#### Contributory Factor(s):

	2019246		
CF	Factor	Description	Amplification
	<b>Ground Elements</b>		
	<b>• Situational Awareness and Action</b>		
1	Contextual	• Situational Awareness and Sensory Events	Generic, late, no or incorrect Situational Awareness
2	Human Factors	• Conflict Resolution- Inadequate	
	<b>Flight Elements</b>		
	<b>• Regulations, Processes, Procedures and Compliance</b>		
3	Human Factors	• Flight Crew ATM Procedure Deviation	Regulations/procedures not complied with
	<b>• Tactical Planning and Execution</b>		
4	Human Factors	• Action Performed Incorrectly	Did not follow instructions
5	Human Factors	• Accuracy of Communication	Ineffective communication of intentions
	<b>• Situational Awareness of the Conflicting Aircraft and Action</b>		
6	Human Factors	• Understanding/Comprehension	Pilot did not assimilate conflict information
7	Human Factors	• Monitoring of Other Aircraft	Pilot did not sufficiently integrate with the other aircraft
	<b>• See and Avoid</b>		
8	Human Factors	• Monitoring of Other Aircraft	Non-sighting or effectively a non-sighting by one or both pilots
9	Human Factors	• Monitoring of Other Aircraft	Late-sighting by one or both pilots
10	Human Factors	• Perception of Visual Information	Pilot was concerned by the proximity of the other aircraft

Degree of Risk: C.

#### Safety Barrier Assessment<sup>4</sup>

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

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

**Ground Elements:**

**Situational Awareness of the Confliction and Action** were assessed as **ineffective** because the C172 pilot did not report his position in the correct place and so the controller did not have full SA, and the controller did not compensate for the C172 student’s inexperience by taking more definitive and positive control during his airfield join.

**Flight Elements:**

**Regulations, Processes, Procedures and Compliance** were assessed as **ineffective** because the C172 pilot turned crosswind and broke his clearance limit from ATC.

**Tactical Planning and Execution** was assessed as **ineffective** because the C172 pilot did not follow ATC instructions within the ATZ.

**Situational Awareness of the Conflicting Aircraft and Action** were assessed as **partially effective** because the C172 pilot did not assimilate or act on the available Traffic Information on the P68. The P68 pilot did not have accurate information on the position of the C172.

**See and Avoid** were assessed as **partially effective** because the C172 pilot did not see the P68. The P68 pilot saw the C172 late and took avoiding action.

