

towards the beacon, to come back down their left side. The instructor informed the student (who had now levelled off at 3000ft at 110kt), that this would happen; the student had not seen the helicopter. The instructor advised the student to descend to 2500ft (although he was on a test flight and did not want to intervene unless essential) and the helicopter passed down the left side with adequate separation. The instructor stated that he maintained continuous visual contact with the helicopter and that he did not feel there was ever a risk of collision.

He assessed the risk of collision as 'None'.

THE CAMBRIDGE TOWER/APPROACH CONTROLLER reports operating initially cross-coupled¹ Tower and Approach frequencies. The Extra 200 pilot departed from Cambridge Airport under VFR to the local flying area and came into conflict with an AW109 at altitude 3000ft, in the CAM hold, and who's pilot was in receipt of a Procedural Service. Traffic information had been passed to both pilots as soon as the Extra 200 pilot reported on the Approach frequency, but the AW109 pilot stated that the aircraft had passed close to each other and wished to file an Airprox.

Factual Background

The weather at Cambridge was recorded as follows:

METAR EGSC 081350Z 26012KT 9999 FEW025 06/01 Q1017

The CAM NDB hold is defined as a right-hand holding pattern, not normally below altitude 3000ft, at a maximum speed of 210kt indicated airspeed and length of duration 1min².

A transcription of the relevant combined Cambridge Tower/Approach frequencies is as below. Because the Twr and App frequencies were initially cross-coupled, all Twr and App calls would be simultaneously heard on both frequencies. Those addressed to Twr but also on App are labelled Twr (App). Those addressed to App but also on Twr are labelled App (Twr).

From	To	Speech Transcription
Extra 200	Twr(App)	Er [Extra 200 C/S] request taxi to Charlie (1344:00)
Twr(App)	Extra 200	[Extra 200 C/S] taxi to Charlie, report ready for departure
Extra 200	Twr(App)	Report ready for departure [Extra 200 C/S]
AW109	App(Twr)	(1344:20) [AW109 C/S] five miles to the Charlie Alpha Mike
App(Twr)	AW109	(1344:30) [AW109 C/S] er, on reaching the Charlie Alpha Mike report entering the hold
AW109	App(Twr)	Wilco [AW109 C/S]
Extra 200	Twr(App)	[Extra 200 C/S] holding point Charlie (1345:20) ready for departure
Twr(App)	Extra 200	[Extra 200 C/S] via Charlie enter, backtrack, line up and wait, runway two three
Extra 200	Twr(App)	Enter, backtrack, runway two three [Extra 200 C/S] (1345:30)
AW109	App(Twr)	[AW109 C/S] Beacon, joining (1347:50)
App(Twr)	AW109	[AW109 C/S] confirm entering the hold
AW109	App(Twr)	Affirm, entering the hold
App(Twr)	AW109	[AW109 C/S] thank you, report (1348:10) ready for the procedure
AW109	App(Twr)	Wilco [AW109 C/S]
Twr(App)	Extra 200	[Extra 200 C/S] runway two three, clear for (1348:40) take off, surface wind estimated westerly one two knots
Extra 200	Twr(App)	Clear take off [Extra 200 C/S]
[Tower and Approach frequencies were split at 1350:00]		

¹ The frequencies are 'linked', such that pilots on one frequency can hear transmissions made to and from those on the other.

² UK AIP AD 2-EGSC-8-4, dated 18 Sep 2014.

From	To	Speech Transcription
Tower	Extra 200	[Other C/S] roger, break, [Extra 200 C/S] traffic, a police helicopter operating over the city, (1350:50) last known altitude one thousand feet
Extra 200	Tower	Copy that, keep a look out, [Extra 200 C/S] er also overhead er the runway, departing to the west
Tower	Extra 200	Roger to the west,(1351:00) er you're no longer going northwest, confirm?
Extra 200	Tower	Say again
Tower	Extra 200	[Extra 200 C/S] I believed you was going to the northwest, confirm?
Extra 200	Tower	Er that's correct yeah [Extra 200 C/S] (1351:10)
Tower	Extra 200	Roger [Extra 200 C/S] you're departing to the west or to the northwest?
Extra 200	Tower	Er we were departing to the west [Extra 200 C/S] (1351:20)
Tower	Extra 200	Roger [Extra 200 C/S] contact Cambridge approach, one two three decimal six
Extra 200	Tower	One two three six [Extra 200 C/S]
Extra 200	Approach	Cambridge approach [Extra 200 C/S] er with you, request basic service
Approach	Extra 200	[Extra 200 C/S] (1351:40) Cambridge Approach, Basic Service, Cambridge Q N H one zero one seven, Charlie Alpha Mike hold active, altitude three thousand feet, Agusta one oh nine
Extra 200	Approach	(1351:50) Er hold active three thousand feet, er Basic Service [Extra 200 C/S]
Approach	Extra 200	[Extra 200 C/S] Cambridge Q N H one zero (1352:00-) one seven, what level you climbing to?
Extra 200	Approach	Er one zero one seven, if we can have er maximum of four thousand
Approach	AW109	[AW109 C/S] traffic airborne northwest-bound's an Extra (1352:10) climbing to altitude four thousand feet
Approach	AW109	[AW109 C/S] (1352:20) traffic airborne northwest-bound's an Extra climbing to altitude four thousand feet [Part simultaneous transmission]
AW109	Approach	????? [Part simultaneous transmission]
AW109	Approach	And that's head to head in the hold [Momentary break in transmission] and that'll be an Airprox (1352:30) please
Approach	AW109	[AW109 C/S] roger
Approach	Extra 200	[Extra 200 C/S] you visual with the Agusta one oh nine? (1352:40)
Extra 200	Approach	Er yes we are, we've just gone past it [Extra 200 C/S]

Analysis and Investigation

CAA ATSI

ATSI had access to reports from both pilots and the Cambridge Tower/Approach controller, area radar recordings and transcription of the Cambridge Tower and Approach frequencies. Screenshots produced in the report are provided using the area radar recordings. Levels indicated are in flight level which is approximately 120ft lower than the actual altitude.

An Airprox was reported by the pilot of an Agusta AW109 when the aircraft came into proximity with an Extra 200 whilst the AW109 was in the Cambridge RW22 hold at 3000ft in Class G airspace. The AW109 pilot was operating under IFR on a training flight from a nearby airfield and was in receipt of a Procedural Service from Cambridge Approach. The Extra 200 pilot was operating under VFR on a local flight from Cambridge and was in receipt of a Basic Service, also from Cambridge Approach. Cambridge were providing a Basic Service without the aid of surveillance equipment. Initially, a Procedural Approach was provided with the frequency combined with Tower, but at 1350:00, just prior to the occurrence, the frequencies were split and another controller took over the Approach control function.

At 1337:40, the AW109 pilot contacted Cambridge Approach, maintaining 3000ft. Following a brief RT exchange to establish the altitude, he was cleared to the CAM at 3000ft and a Procedural Service was agreed. The AW109 pilot was instructed to squawk 6177 (this squawk is used by Cambridge as a conspicuity code for all IFR aircraft receiving a Procedural Service).

At 1338:20, the Approach controller asked the AW109 pilot his intentions and the pilot responded by requesting to enter the hold, carry out one or two holds followed by a procedural NDB/ILS approach and return to base. At 1346:05, the AW109 was approaching the overhead from the northwest (Figure 1). There was also an unrelated contact operating at an indicated FL039. The frequencies were still combined and, during this period, the Extra 200 pilot was cleared to enter the runway and backtrack pending his takeoff clearance. The Extra 200 pilot had already received his departure clearance but that was not part of the frequency recordings provided.

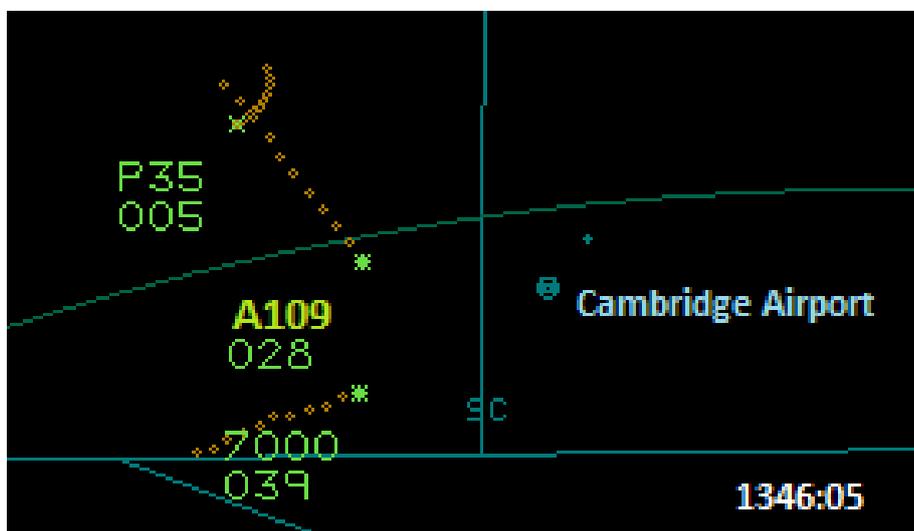


Figure 1

At 1348:00, the AW109 pilot reported entering the hold and then, at 1348:30, the Extra 200 pilot was cleared for takeoff.

At 1350:00, the frequency was split with Aerodrome and Approach functions being provided independently. At 1350:22 (Figure 2), the AW109 was on the downwind leg of the hold and the Extra 200 was passing an indicated FL014 in a left turn.

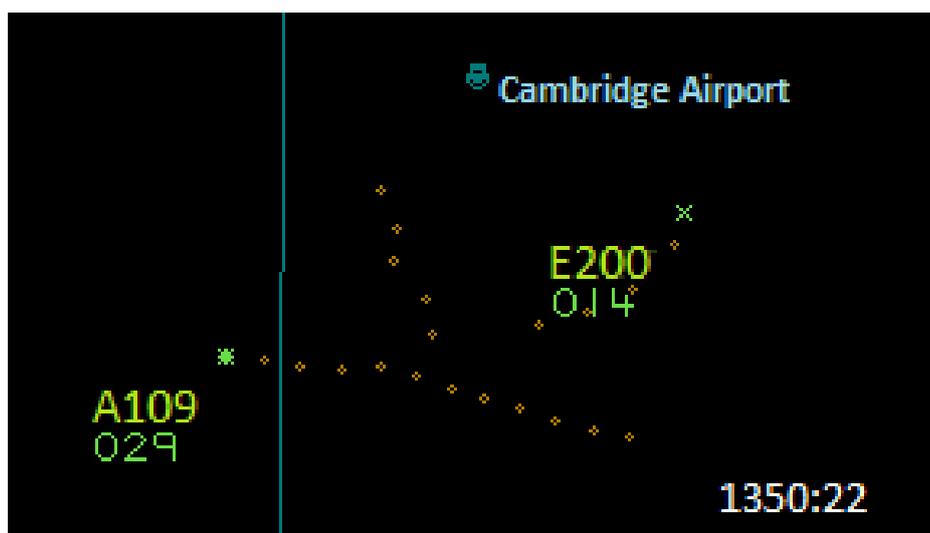


Figure 2

At 1350:22, the Tower controller received a request from the pilot of another unrelated aircraft to transit the ATZ. This resulted in the requirement to pass Traffic Information to other aircraft including the Extra 200. The Extra 200 pilot acknowledged the Traffic Information and reported overhead the airfield "...departing to the west".

The controller questioned this report as he was expecting the aircraft to route to the northwest. The Extra 200 pilot did not appear to understand this and the controller repeated the request for clarification: “[Callsign] I believed you was going to the northwest confirm”

The pilot responded : “That’s correct yeah, [Callsign]”

The controller queried again: “Roger [Callsign], you’re departing to the west or northwest”

The pilot responded: “We were departing to the west, [Callsign]”

Following the exchange of questions, the controller immediately transferred the Extra 200 pilot to Approach control. The Extra 200 pilot called the Approach controller and requested a Basic Service at 1351:30. The controller responded, confirmed the Basic Service, and issued Traffic Information on the AW109, holding at 3000ft. Figure 3 shows that the hold was being correctly flown by the AW109 pilot and Figure 4 showed the relative aircraft positions at 1351:50; consistent with the Extra 200 pilot report.

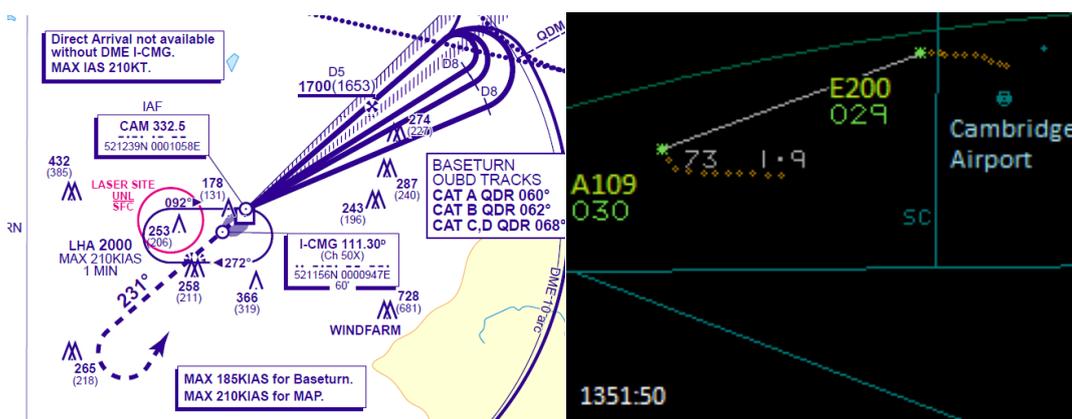


Figure 3



Figure 4

At 1352:00, the Approach controller asked the Extra 200 pilot what height they were climbing to, to which the pilot replied “a maximum of 4000”.. The controller immediately passed Traffic Information to the AW109 pilot about the Extra 200. There was no response from the AW109 pilot so within 10 seconds the controller repeated the Traffic Information.

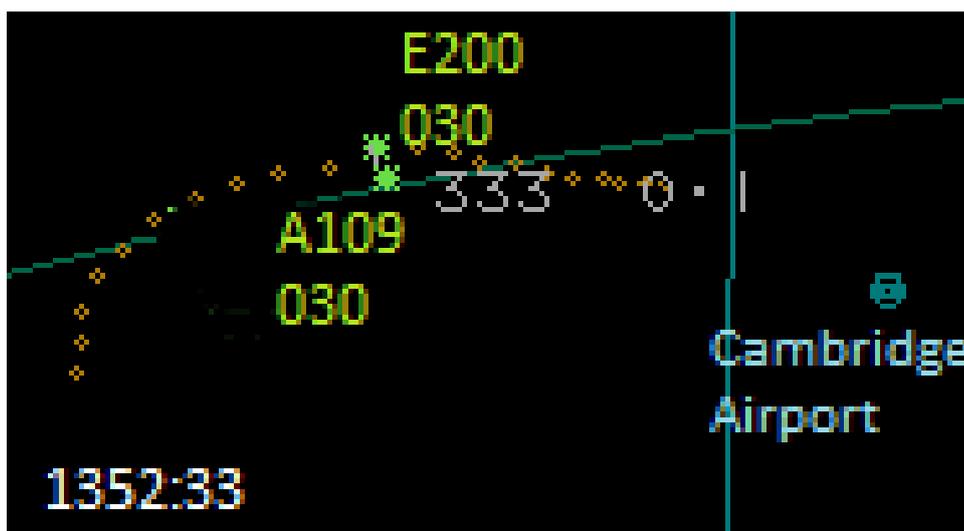


Figure 5

At 1352:33, the AW109 and Extra 200 passed (Figure 5). Radar showed that both aircraft indicated FL030 (although the Extra 200 pilot stated in the written report that he advised his student to descend to 2500ft) and 0.1nm apart. As the AW109 pilot acknowledged the Traffic Information, he also reported the Airprox.

It is likely the Cambridge Tower controller, whilst providing the Tower and Approach functions combined, did not consider the Extra 200 to be a factor to the holding AW109 as he expected the Extra 200 to track to the northwest. Therefore he did not provide Traffic Information to the AW109 pilot. It is likely his thoroughness in establishing which way the Extra 200 was routing was due to his concern that such routing would be towards the holding traffic he had previously been working when the frequencies were combined. When he confirmed that the Extra 200 was tracking westbound he handed the aircraft straight over to the Approach controller who was best placed to provide Traffic Information.

There was no record of conversation between the Cambridge Tower and the Approach controllers, both operating in the VCR, so the contents of the handover at 1350:00 are not known. When two-way communications were established, the Approach controller asked the Extra 200 pilot what height he was climbing too. On receipt of this information he immediately issued Traffic Information to the AW109 pilot. Both pilots were operating in Class G airspace and, although the controller did not have to separate these aircraft, he was responsible for providing Traffic Information to the AW109. Whilst the controller was not obliged to provide Traffic Information to aircraft under a Basic Service, he may pass Traffic Information on initial contact, to assist the pilots situational awareness, which he did.

The Extra 200 pilot, on receiving the Traffic Information, sighted the AW109 and continued to climb to 3000ft in a westerly direction, the reciprocal track to the inbound hold. The AW109 pilot did not see the Extra 200 until late, whilst being given Traffic Information about the Extra 200. He took his own avoiding action by altering course to the right whilst remaining at 3000ft. The Extra 200 pilot did not know an Airprox had been reported until telephoning the ATSU about an unrelated matter, although the Extra 200 pilot was on the same frequency when the AW109 pilot reported the Airprox.

The unit carried out an investigation within days of the occurrence and subsequently issued a new instruction whereby VFR departing aircraft would be subject to a climb restriction when the CAM hold is active, or if the Approach controller deems that a potential conflict may arise. This further included a reminder of mutual Traffic Information.

UKAB Secretariat

The AW109 and Extra 200 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard³. If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right⁴. If the incident geometry is considered as converging then the AW109 pilot was required to give way to the Extra 200⁵.

Summary

An Airprox was reported when an AW109 and an Extra 200 flew into proximity at 1352 on Monday 8th December 2014. Both pilots were operating in VMC, the AW109 pilot under IFR in receipt of a Procedural Service and the Extra 200 pilot under VFR in receipt of a Basic Service, both from Cambridge Approach.

³ SERA.3205 Proximity.

⁴ SERA.3210 Right-of-way (c)(1) Approaching head-on.

⁵ SERA.3210 Right-of-way (c)(2) Converging.

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 a report from the appropriate ATC authority.

The Board first considered the Cambridge ATC actions. The Tower/Approach controller had been notified that the Extra 200 pilot would depart via a 270° left turn through the airfield overhead and then to the northwest. He was therefore working under the assumption that the Extra 200 track would quickly pass clear of the CAM hold. When the Extra 200 pilot reported after take-off that he would be departing to the west, the controller spent some time confirming the pilot's intentions before transferring him to the Approach frequency, which had been split from Tower frequency about 1½min previously. When the Extra 200 pilot then checked-in on the Approach frequency, he was passed Traffic Information on the AW109 that was in the CAM hold at 3000ft. ATC members felt that the Tower controller might have been better served by passing Traffic Information on the AW109 as soon as the Extra 200 pilot had announced his change of departure intentions rather than pass him to the Approach controller first for him to do so. Although the information that the AW109 was in the hold would have been available to the Extra pilot given the initial cross-coupling of the frequencies, and notwithstanding that the Tower controller was not obliged to pass Traffic Information (but had a duty of care to do so), the Board considered that the delay in formally passing Traffic Information to the Extra 200 pilot until he was on the Approach frequency was contributory to the Airprox.

Turning to the pilots' actions, the Board noted that the Approach and Tower frequencies were initially cross-coupled, enabling both the AW109 and Extra 200 pilots to hear each others' transmissions. Members were cognisant of potential cockpit workload when conducting teaching activities but noted that the Extra 200 pilot could have assimilated that the AW109 pilot had entered the CAM hold well before he took off. As a local operator, it was assumed that he would be aware of the hold, and that it was established with a base of 3000ft. It appeared to Board members that the Extra 200 instructor had allowed his student to depart on a heading other than that notified, ultimately on the reciprocal track to the inbound leg of the CAM hold, and at the base altitude of the hold. The Board noted that the instructor did not want to intervene 'unless essential'; however, some members felt that the purpose of the flight was to examine the aerobatic skill of the student, not the outbound transit, and that, in the phase of flight they were in, the instructor had been in the best position to intervene. In the event, the Board noted that he saw the AW109 at a reported range of about 2nm and maintained continuous visual contact with it for about 1min. They also noted that he was aware that his student, who had levelled at the same altitude as the helicopter, had not seen it. That they then passed it co-altitude, at a range of 0.1nm, led the Board to agree that the cause of the Airprox had been that the Extra 200 pilot had flown through the CAM hold and into conflict with the AW109. They also considered that safety margins had been much reduced as a result, despite the fact that the Extra 200 instructor was visual with the AW109 and would presumably not have allowed his candidate pilot to collide with it.

Members commented that although the Rules of the Air/SERA defined the minimum level of conduct, it remained in the interest of all aviators to perform their activities with due consideration, courtesy and allowance for others. In this case, with the AW109 pilot necessarily attempting to fly the CAM hold, the Extra 200 pilot could easily have remained clear of the hold with little additional effort.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Extra 200 pilot flew through the CAM hold and into conflict with the AW109.

Contributory Factor: Cambridge ATC did not provide timely Traffic Information on the holding AW109.

Degree of Risk: B.