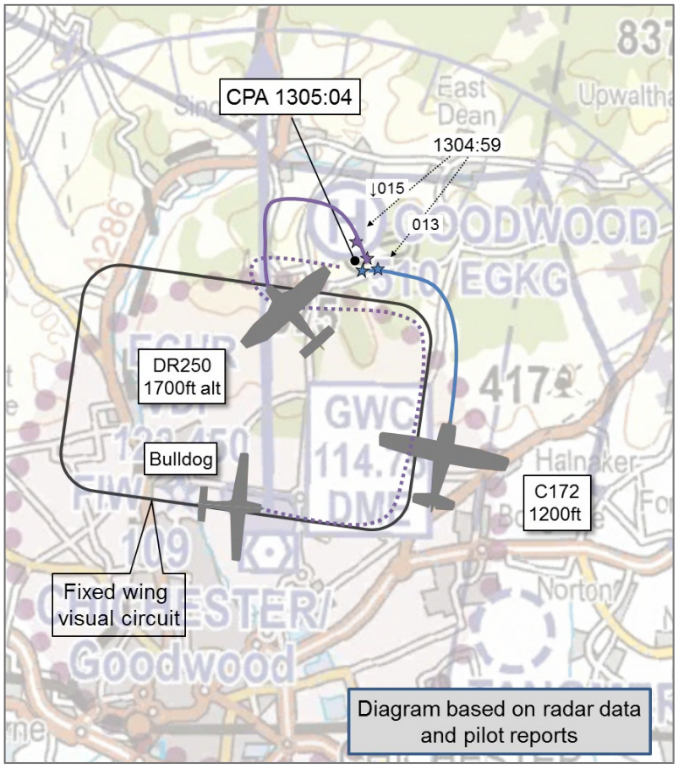
AIRPROX REPORT No 2019066

Date: 23 Feb 2019 Time: 1305Z Position: 5053N 00044W Location: Goodwood

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	C172	Bulldog
Operator	Civ FW	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	AFIS	None
Provider	Goodwood	
Altitude/FL	1200ft	
Transponder	A, C, S	A, C[1]
Reported		
Colours		Red, White
Lighting		Strobes
Conditions	VMC	VMC
Visibility	5km	10km
Altitude/FL	1200ft	1400ft
Altimeter	NK	NK
Heading	280°	080°
Speed	90kt	105kt
ACAS/TAS	Not fitted	Not fitted
Separation		
Reported	NR	30ft V/65m H
Recorded	N/K	



THE C172 INSTRUCTOR reports that whilst flying downwind for RW10 at Goodwood, a blue and white Robin appeared on the nose at the same attitude approximately 500m away. He banked the aircraft to the right and then another previously unseen aircraft passed close down the port side.

He assessed the risk of collision as 'High'.

The C172 STUDENT reports this was his first lesson within the Goodwood circuit. Prior to getting airborne they briefed on the noise abatement procedures and the various landmarks to look out for at certain points in the circuit. They took off shortly after 1240hrs and performed two circuits which went well. On the third circuit the instructor was still talking through everything as they took off and turned inside the racecourse, as per the first two circuits. The Instructor spotted and pointed out a blue aircraft coming towards them from the right at an angle of 30° from their heading. He believed the other aircraft was not talking to Goodwood so they did not know its intentions. He was concentrating on the controls within the cockpit, whilst maintaining 1200ft in the circuit. As the blue aircraft came closer the instructor said that he thought it would pass over them, but then took over the controls and banked right and downward to avoid it, at the moment he did, they saw the red underbelly of an aircraft that flashed past their left in the climb. The instructor seemed shocked but, thanks to his actions, both planes passed by, one above, right-to-left, and the other to their left in the climb. The student reported being shocked and scared, neither aircraft was communicating with Goodwood and they had no idea of their intentions; in his opinion, they appeared to be 'joy-riding' and joining up in a formation.

THE BULLDOG PILOT reports that he departed from RW10 and routed north of Goodwood racecourse; once clear of the ATZ he set course heading 080°. He then became visual with a Cessna in the opposite direction and approximately ½nm away. He performed a brief wing waggle to see whether they had seen him but, with no response, he made a turn to the right to pass south of the aircraft by about 200ft.

[1] Reported by the pilot but not seen on the NATS radars.

Having just left the Goodwood frequency, he then returned to it to hear a Cessna call downwind, with this information he decided to contact the school on landing. He was meeting up with a Robin aircraft so his look-out was good at the time. After landing and discussing the incident with the other instructor, he discovered the C172 was in the circuit. He opined that it had been well outside the published track for the visual circuit, which should be flown very specifically for noise abatement. He himself was outside the ATZ, although with hindsight he thought that he should have given a greater margin north of the airfield to anticipate any wide circuits. An Instructor himself, he thought this problem arose when students were taught to turn at 500ft and then climb 700ft on crosswind to circuit height at 1200ft, making the circuits excessively large. In the past students were taught to keep the downwind leg close to the airfield in case of an engine failure, but that this does not seem to happen anymore.

He assessed the risk of collision as 'Low'.

THE DR250 PILOT reports that he was on a pleasure flight with the intention of flying to Goodwood to meet up with a friend and then conduct some formation work. He was running late so, as he approached Goodwood, he called on the frequency to ask whether the Bulldog was still there. He was told he was at the pumps and about to leave so the DR250 pilot replied that he was now north abeam Goodwood and would wait for the Bulldog to take-off. He then proceeded to fly a wide-and-high anti-clockwise orbit at 2050ft around the zone watching the Bulldog until he took off. He saw him take-off and watched him fly to mid-point downwind and leave the circuit in a northerly direction. At this time he was north abeam Goodwood so he did a 220° turn around Goodwood racecourse and started a descent to form up with the Bulldog on his starboard side. When he was NE of the racecourse, heading SE at 1700ft, he saw the Bulldog do a very abrupt 90° angle of bank turn to the right. Immediately afterwards he saw the C172 flying straight-and-level in the position that the Bulldog had been, he observed all of this from the port side of the aircraft, 500-600ft above. He then heard the C172 pilot call Goodwood to say there had been two Robins travelling the wrong way in the circuit. The Bulldog continued on the planned route and he closed in and formed up as intended at 1200ft. He estimated the C172 was 500ft below him and in his 10 o'clock 1/2nm away, and opined that there was no risk of collision between them.

Factual Background

The weather at Shoreham was recorded as follows:

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METAR EGKA 231250Z 11011KT 9000 NSC 11/07 Q1033=
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Analysis and Investigation

CAA ATSI

The C172 was formally identified via the area radar recording. The DR250 was transponding code 7000 and, whilst the aircraft could not be formally identified via the area radar recording, its track was consistent with the written reports and the pilot position reports made on the R/T. The Bulldog was not transponding and did not display on the NATS area radar recording. The visual circuit was busy with other aircraft not displayed on the area radar recording. In the interest of brevity only those aircraft that had some influence on the Airprox narrative have been mentioned in this report.

At 1246:10, the C172 pilot reported ready for departure for their circuit detail and was given take-off at their discretion RW10.

At 1246:40, the DR250 pilot called the Goodwood FISO advising that they were waiting for the Bulldog and enquired as to the whether the Bulldog had departed yet. The FISO advised the pilot that the Bulldog was currently at the fuel pumps taking on fuel. The DR250 pilot responded that they would listen out for it. A Basic Service was agreed, and the pilot advised the FISO that they were *"at 2800ft, going to fly north abeam you and then turn around and hopefully collect the Bulldog on the way".* The FISO acknowledged and passed the pilot the QNH 1033hPa and Traffic Information on two flights operating in the local area VFR.

At 1257:20, the C172 pilot reported downwind and the FISO advised the pilot that there was another company C172 ahead of them on final approach and to report final.

At 1259:10 a Cub pilot was given low approach and go-around at their discretion. The FISO confirmed with the Cub pilot that would be remaining in the circuit after the go-around.

At 1300:10, the Bulldog reported ready for departure. The FISO asked the C172 pilot for a position report and the pilot responded that they were on final.

At 1300:20, the FISO asked the Bulldog pilot if they were visual with the C172 on final and they respond with negative but that they were ready for an immediate departure. The pilot was advised to report lining up RW10.

At 1300:35, the Bulldog pilot reported that they had the C172 in sight.

At 1300:50, the FISO passed Traffic Information to the Bulldog pilot on the Cub ahead remaining in the circuit and issued take-off at their discretion; the pilot advised that they had the Cub in sight.

At 1301:10 the C172 was given touch and go at their discretion.

At 1301:20 the waiting DR250 pilot was advised that their playmate (the Bulldog) was airborne. The pilot responded with thank you and that they had the Bulldog visual.

At 1302:00, a pilot transmission was heard *"coming left"* this was followed by another pilot transmission with a different voice *"visual".*

At 1302:40, the Bulldog pilot advised the FISO that they were crosswind and that they planned to come alongside the Cub aircraft and then depart to the east. The FISO acknowledged and said that it would be a Basic Service for now, that there were 3 aircraft operating in the local area, and requested that the pilot report changing frequency.

At 1304:00 (Figure 1), a primary contact appeared on the radar replay just ahead of the DR250.

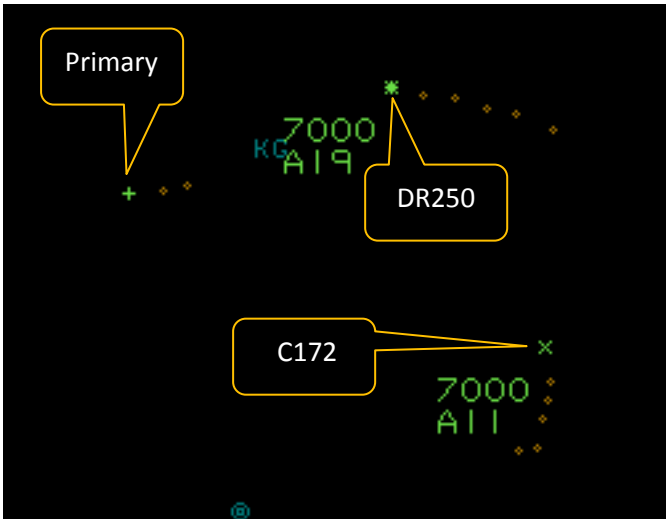


Figure 1 - 1304:00

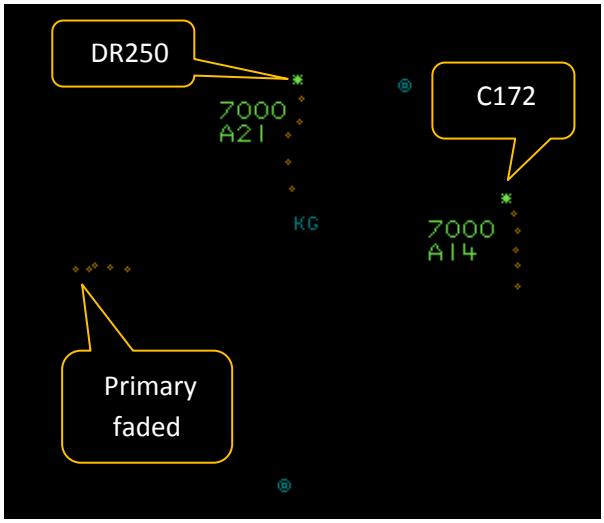


Figure 2 - 1304:40

At 1304:30the Cub pilot reported late downwind for a touch-and-go.

At 1304:40 (Figure 2), the Bulldog pilot advised the FISO that they were departing to the east and the FISO acknowledged. On the radar the primary target faded in a position consistent with the late downwind call from the Cub pilot

CPA between the C172 and the DR250 was at 1305:03 with a separation of 0.1nm laterally and 500ft vertically (Figure 3). The Bulldog did not display on the radar recording and so CPA between the Bulldog and the C172 could not be determined.

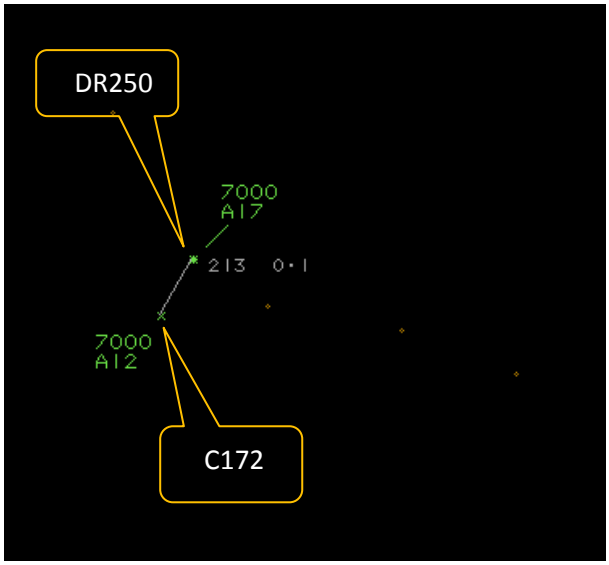


Figure 3 - 1305:03 CPA between the C172 and the DR250.

At 1305:15, the C172 pilot advised the FISO that they were downwind, and that two Robins had just flown straight past them. The FISO advised that an aircraft had departed about 10mins previously.

The Goodwood FISO did not have access to surveillance equipment and was wholly reliant on position reports and information from pilots when providing Traffic Information. The frequency was very busy with other circuit traffic and departing traffic not mentioned in this report. Throughout the period of ATSI review of the R/T recording the FISO could consistently be heard passing relevant Traffic Information to pilots.

The DR250 pilot was in receipt of a Basic Service and reported being *"at 2800ft, going to fly north abeam you and then turn around and hopefully collect the Bulldog on the way".* This narrative would suggest that the join with the Bulldog was going to take place north of the aerodrome at 2800ft. This information was not updated at any point. Altitude 2800ft is well above both the visual circuit height and the upper limit of the ATZ. As such the FISO would not have considered the C172 circuit traffic to be relevant traffic to the DR250 pilot.

The Bulldog pilot was in receipt of a Basic Service. The Bulldog pilot was passed Traffic Information on the C172 when the C172 was on final approach and the Bulldog was lining up on the runway. The pilot confirmed that they had the C172 in sight. The FISO could then reasonably expect that the Bulldog would be aware that the C172 was following behind them in the circuit.

The C172 pilot was in receipt of an Aerodrome Flight Information Service. The C172 was on final approach as the Bulldog departed RW10. The FISO could reasonably have expected that the Bulldog would remain ahead of the C172 in the circuit until the Bulldog departed the circuit. The FISO is only required to intervene if they have sight of a potential incident about occur. The incident occurred 2.2nm from the Aerodrome, at a time when the FISO was very busy dealing with other traffic and was unlikely to have seen the incident unfold.

The Airprox took place in Class G airspace where collision avoidance is ultimately the responsibility of the pilots.

UKAB Secretariat

The Chichester/Goodwood fixed-wing noise abatement circuit procedures are at Figure 4 (taken from their website). The RW10LH pattern is shown on the diagram at the beginning of this report.

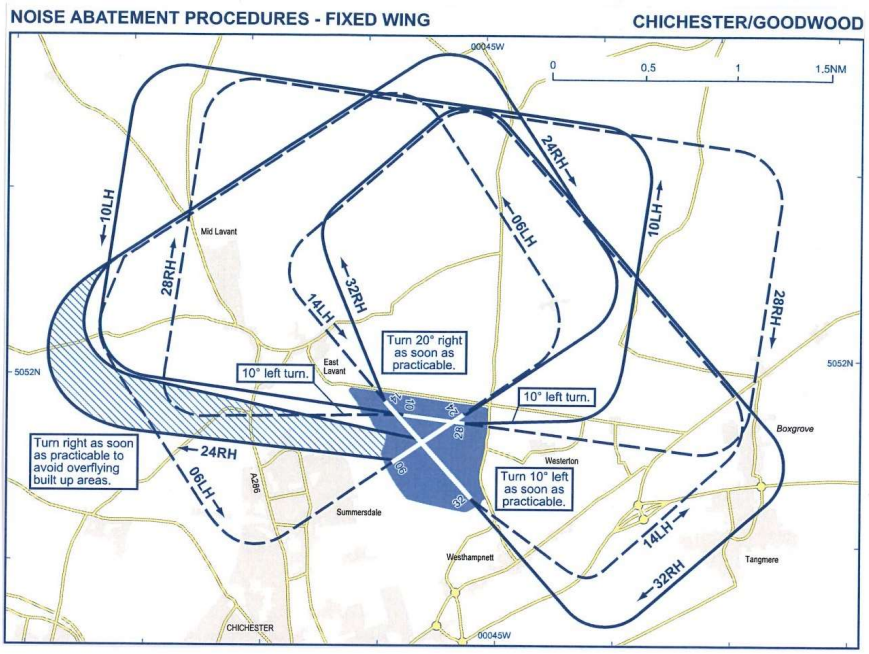


Figure 4 Chichester/Goodwood Fixed-Wing Noise Abatement Procedures.

Although the DR250 and the C172 had 500ft separation at CPA, the screenshots at Figures 5 and 6 (taken from the NATS radar) show that, just prior to CPA, the DR250 had descended to 1500ft and was only 200ft above the C172, 0.2nm separated, before climbing back to 1700ft at CPA.

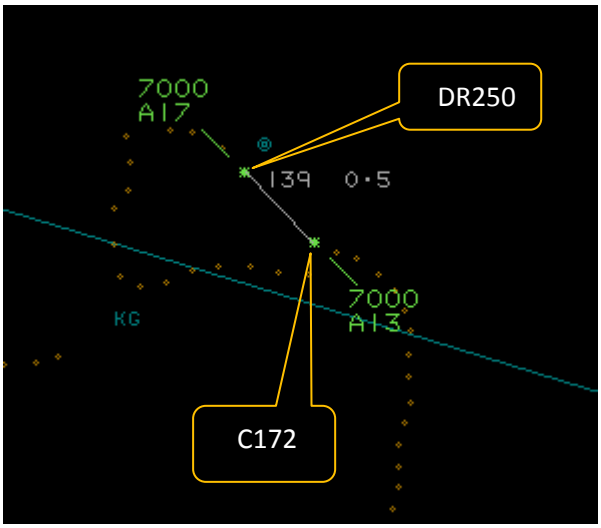


Figure 5 1304:55

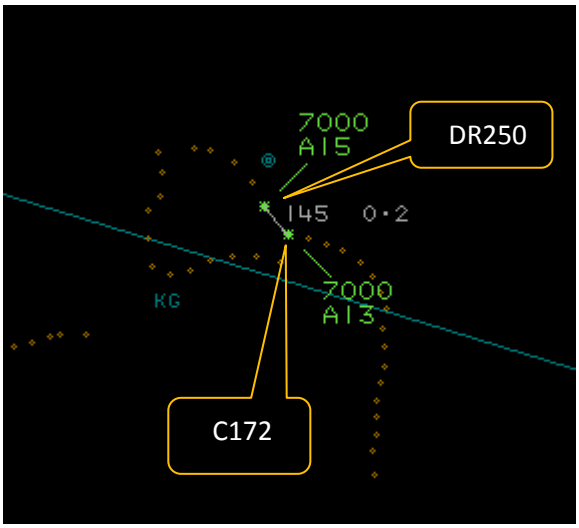


Figure 6 1304:59

When an aircraft carries a serviceable transponder, the pilot shall operate the transponder at all times during flight, and pilots engaged in formation join-ups are expected to continue operating the transponder until established in formation[2]. All 3 aircrafts' pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard[3]. If the incident geometry between the Bulldog and the C172 is considered as head-on or nearly so then both pilots were required to turn to the right[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].

[2] SERA 13001 Operation of SSR transponder.
[3] SERA.3205 Proximity.
[4] SERA.3210 Right-of-way (c)(1) Approaching head-on.
[5] SERA.3225 Operation on and in the Vicinity of an Aerodrome.

Summary

An Airprox was reported when a C172 and a Bulldog flew into proximity at 1305hrs in the vicinity of Chichester/Goodwood on Saturday 23rd February 2019. Both pilots were operating under VFR in VMC, the C172 pilot in receipt of an AFIS from Goodwood and the Bulldog pilot had just left the Goodwood frequency.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both aircraft and that of the DR250, transcripts of the relevant RT frequencies, radar photographs/video recordings, reports from the FISO involved and reports from the appropriate ATC 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 looked at the actions of the C172 pilot. Although the Bulldog pilot had commented about the size of the visual circuit the C172 had flown, members agreed that although the student may have been flying slightly outside the published circuit pattern it was not by an unreasonable amount and that slight deviations should be expected from student flying, which included variations in height. Members also noted that parts of the published visual circuit routed outside the ATZ anyway, which in itself somewhat negated the benefits of its presence and protection. Even though the C172 pilot was on the same frequency as the DR250 and the Bulldog as it got airborne, the DR250 and Bulldog pilots had not been specific in their intentions for their RV and so the C172 pilot did not have situational awareness that they planned to join up in the position and height that they did; as a result, he was understandably surprised to see them approaching from the opposite direction to the circuit pattern (**CF1**). GA members wondered whether this lack of situational awareness had been compounded by the attention of the C172 instructor being focused on instructing the low-hours student in the circuit (**CF8**). The C172 instructor had nonetheless observed the DR250 approaching from their right from outside the circuit pattern, but this then undoubtedly focused his attention in that area to the extent that he did not see the Bulldog initially climbing from the airfield and then turn right ahead of and towards them to pass down their left-hand side. Only seeing the Bulldog as he was taking avoiding action on the DR250, it was then too late to take any avoiding action on the Bulldog following what was effectively a non-sighting on his part (**CF9**).

Turning to the Bulldog pilot, members noted that he was due to meet up with the DR250 to conduct some formation flying. The DR250 pilot was later than anticipated and, rather than the original plan to land and then depart together, he decided to hold near the airfield and wait for the Bulldog to join him once airborne. Noting that this was probably an *ad hoc* plan, members wondered to what extent the Bulldog and DR250 pilots had properly thought through their subsequent RV location and join-up. The DR250 pilot proceeded to hold to the north of the airfield and the Bulldog flew north; knowing that the DR250 pilot was waiting for him, the Board thought that the Bulldog pilot was probably task-focused in his effort to obtain visual sighting (**CF8**). As such, it was thought that the Bulldog pilot had not assimilated that the C172 would be a factor when turning downwind, despite being given Traffic Information by the FISO (and reporting visual), prior to getting airborne (**CF6, CF7**). Members agreed that, the Bulldog and the DR250 pilots probably didn't sufficiently think through the wisdom of their positioning just outside the visual circuit and flying in the opposite direction to circuit traffic at the same level (**CF3**, **CF4**) when they were required to avoid the pattern of traffic formed by the visual circuit (**CF2**) even if it was outside the ATZ. Furthermore, neither pilot sufficiently articulated their intentions to the FISO or the rest of the circuit traffic (**CF5**), thereby denying them situational awareness. The Bulldog pilot reported having seen the C172 at ½ nm and that his first action was to waggle his wings to attract the C172 pilot's attention. Members agreed that at ½nm head-on, he would have been far better served by taking more positive action to ensure adequate separation at this point rather than continuing to the point where he was required to take avoiding action to achieve his reported separation of only 65m; although he may have been content with such separation, other pilots may not have the same risk appetite, and he could not be sure that they might not react unpredictably to decrease the separation further (**CF10**). Finally, the Board noted that the Bulldog pilot had reported that his transponder was serviceable and selected but it did not display on the

NATS radars. Given that the other aircraft involved were showing on the radar, members wondered whether the Bulldog transponder may have been temporarily unserviceable. Notwithstanding, the C172 was not fitted with an electronic Collison Warning System and so, in this particular incident, the lack of transponder was not germane to the Airprox.

The Board briefly looked at the actions of the FISO and noted that he had given Traffic Information to the Bulldog pilot on the C172 and believed the DR250 was at 2800ft (the last reported altitude). As such, he could not have predicted that there was likely to be a problem given that he would have perceived that they would be joining up well above the ATZ. Therefore, the Board agreed that he could not be expected to affect further or resolve the outcome of the Airprox given the circumstances.

There was also a discussion about whether standard circular-shaped ATZs, like the one at Goodwood, were generally fit for purpose. Published visual circuit procedures often take aircraft outside these circular ATZ at many airfields and members opined that a lozenge-shaped or even irregular-shaped ATZ to suit individual airfields might be more appropriate than a one-shape-fits-all approach. The CAA SARG Advisor told the Board that considerations such as this were part of a review to modernise UK airspace that was currently in progress at the CAA.

Finally, the Board assessed the risk of the Airprox. Some members opined that, because the Bulldog pilot had been visual with the C172 from a range of ½ nm then there had been no risk of collision (notwithstanding that he had had to take avoiding action as they closed head-on). However, the majority agreed that because the C172 pilot had not been visual with the Bulldog until CPA and after he had taken avoiding action away from the DR250 and towards the Bulldog, the estimated 65m separation when head-on to the pattern of traffic formed by the C172 constituted a situation where safety had been much reduced below the norm; risk Category B.

PART C: ASSESSMENT OF CAUSE AND RISK

Contributory Factors:

	2019066-Barriers.x		
CF	**Factor**	**Description**	**Amplification**
	Ground Elements		
	• Situational Awareness and Action		
1	Contextual	• Situational Awareness and Sensory Events	Only generic, late or no Situational Awareness
	Flight Elements		
	• Regulations, Processes, Procedures and Compliance		
2	Human Factors	• Flight Crew ATM Procedure Deviation	Regulations/procedures not complied with
	• Tactical Planning and Execution		
3	Human Factors	• Insufficient Decision/Plan	Inadequate plan adaption
4	Human Factors	• Aircraft Navigation	Did not avoid/conform with the pattern of traffic already formed
5	Human Factors	• Accuracy of Communication	Ineffective communication of intentions
	• Situational Awareness of the Conflicting Aircraft and Action		
6	Human Factors	• Understanding/Comprehension	Pilot did not assimilate conflict information
7	Human Factors	• Lack of Action	Pilot flew into conflict despite Situational Awareness
8	Human Factors	• Distraction - Job Related	Pilot was distracted by other tasks
	• See and Avoid		
9	Human Factors	• Monitoring of Other Aircraft	Non-sighting or effectively a non-sighting by one or both pilots
10	Human Factors	• Lack of Action	Pilot flew into conflict

Degree of Risk: B.

Safety Barrier Assessment[6]

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

Ground Elements:

Situational Awareness of the Confliction and Action were assessed as **ineffective** because The AFISO did not know that the Bulldog and Robin were going to position just to the north of the visual circuit.

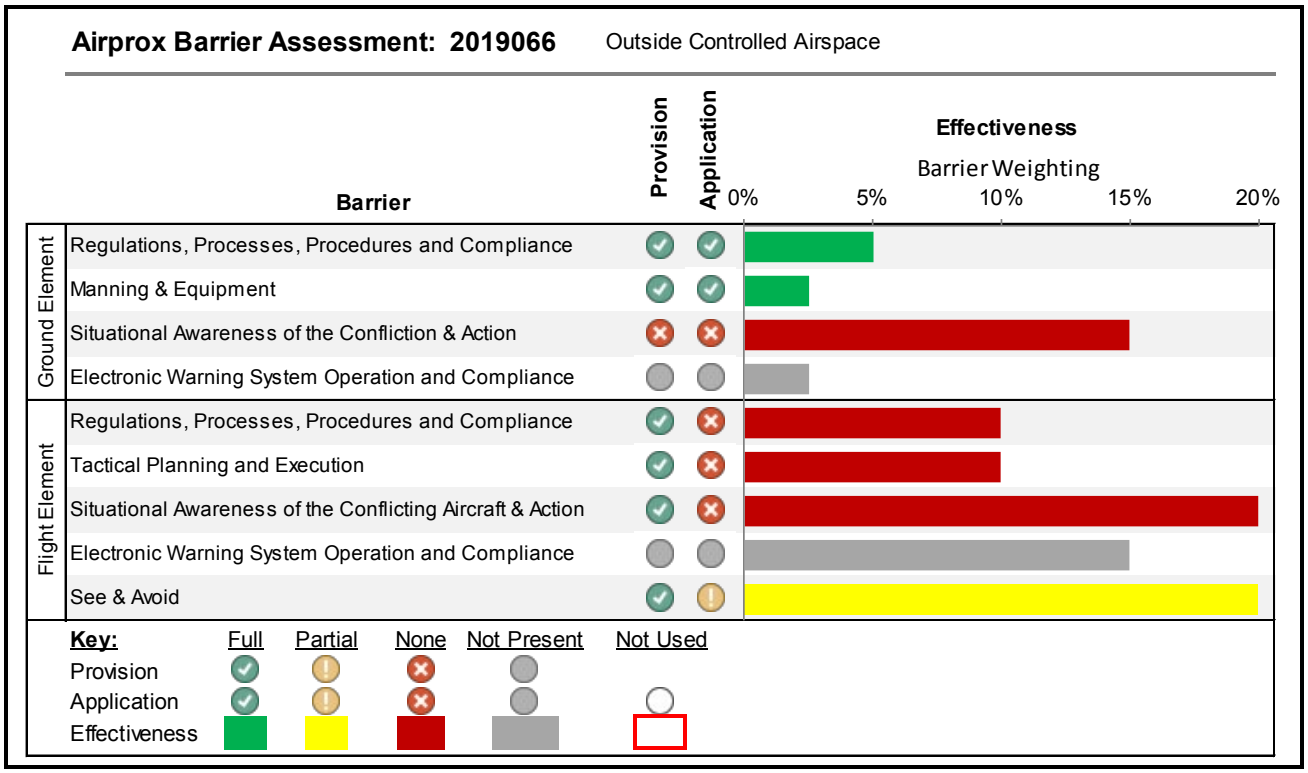
Flight Elements:

Regulations, Processes, Procedures and Compliance were assessed as **ineffective** because the Bulldog pilot did not sufficiently avoid the pattern of traffic in the visual circuit.

Tactical Planning and Execution was assessed as **ineffective** because the DR250 and the Bulldog could have arranged an RV position further away from the visual circuit.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because although the Bulldog and the DR250 pilots knew the C172 was in the visual circuit, they hadn't assimilated that their positioning would affect it.

See and Avoid were assessed as **partially effective** because although the Bulldog pilot saw the C172 at ½nm away, he did not sufficiently avoid it.



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