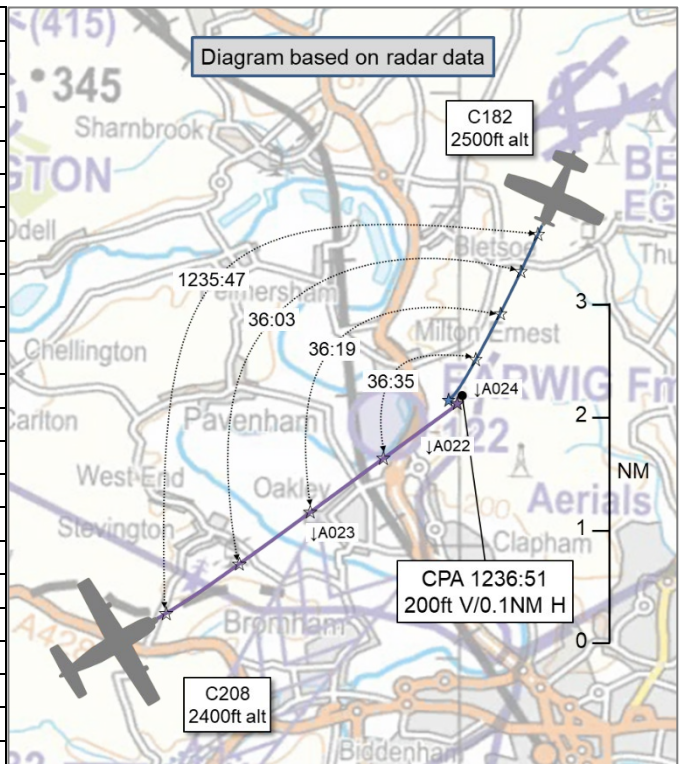


AIRPROX REPORT No 2021206

Date: 04 Oct 2021 Time: 1237Z Position: 5211N 00030W Location: 2.5NM NW of Bedford

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	C182	C208
Operator	Civ FW	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	VFR
Service	ACS	Basic
Provider	Cranfield Tower	London Info
Altitude/FL	2400ft	2200ft
Transponder	A, C, S	A, C, S
Reported		
Colours	White, red	White, red, blue
Lighting	Nav, strobes	Nav
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	2500ft	2000ft
Altimeter	QNH (NK hPa)	QNH (NK hPa)
Heading	212°	'North-east'
Speed	115kt	135kt
ACAS/TAS	Not fitted	Not fitted
Separation at CPA		
Reported	100ft V/100ft H	400ft V/400m H
Recorded	200ft V/0.1NM H	



THE C182 PILOT reports routing via Moreton-in-Marsh, DTY, CIT and then Cranfield. After 2 holds, they were cleared for RNP RW21 via ADSON, maintaining 3500ft, then cleared to descend in the procedure to call final approach track established. They routed via ADSON and [the intermediate fix] at 2500ft, called final approach track established at 1237 and 8DME and were told to contact Tower and report final approach fix (6.6DME). Whilst setting the flaps to 10°, their MPL student spotted an aircraft pass very closely, 100ft under the port wing and no more than 100ft laterally. The pilot looked behind and confirmed the proximity of the aircraft, which appeared to be a high wing Cessna, on a reciprocal course to them. It was white with yellow coach lines [they recalled]. They informed the Tower controller, who had no information on other aircraft, so the pilot requested that they check with the Approach controller as there was a risk of conflict. The Approach controller confirmed that they weren't in communication with any aircraft in that position. Given the workload, phase of flight and conducting MPL training, their ability to maintain external look-out was compromised and no avoiding action would have been possible if the aircraft had been on conflicting paths; a traffic avoidance system could have provided an alert and avoiding action could have been initiated.

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

THE C208 PILOT reports positioning an aircraft to [their destination airfield] for maintenance. They departed [their departure airfield], VFR, with a Traffic Service from their ATC. They switched to Cranfield Approach [they recalled], which was not offering a Traffic Service, and stayed to the west of the Cranfield Zone. They then switched to London Information before changing to the Safetycom frequency for the approach to [their destination]. They were expecting, and keeping a lookout for, Cranfield and other traffic. They were operating a 'see-and-be-seen' and 'keep a good lookout' approach, yet were still caught by surprise by the C182. They grabbed the controls ready for any evasive action, but held straight as they could tell that the aircraft would pass above them and to their left. The C182 appeared to have been coming at them and manoeuvred to pass to their left and above; by the time they were focused on the other aircraft, they could tell it would be passing them. The C182 was just about close

enough to be able to read its registration. The C208 is not fitted with any TCAS. Earlier this year, the pilot bought [an electronic conspicuity device] for it, which they have been using with SkyDemon. Unfortunately, for operational reasons they were unable to bring it on this flight. They expect there may have been a different outcome if they had had it. After this incident it is now company policy to always have [an electronic conspicuity device] transmitting. This is also a good reminder to keep a very good lookout.

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

THE CRANFIELD AERODROME CONTROLLER reports that they were providing an Aerodrome Control Service on 134.930MHz when the pilot of the subject aircraft (C182 c/s) reported on frequency, on long final for RW21, carrying out an RNP approach. During the approach phase, the pilot of the aircraft reported an aircraft had become 'uncomfortably close', approximately opposite direction. The controller informed the Approach controller, who was busy with other aircraft. After clearing the subject aircraft for a low approach, they coordinated with the Approach controller to see if they were aware of any aircraft that could be the traffic, but the Approach controller said that they had nothing which matched the description. They passed this information to [the C182 pilot] when the C182 was in the climb-out, prior to passing them back to Approach. During the exchange with the Aerodrome controller, the pilot did not report an Airprox.

THE LONDON FISO reports that the Cessna 208 pilot called London Information to request a Basic Service from [departure airfield] to [destination airfield]. The pilot contacted London Information at 1231 and left the frequency at 1237. Approximately 3 weeks later, the FISO was informed by [NATS] Safety Investigations that the pilot subsequently submitted an Airprox report for a confliction that occurred whilst they were receiving a service from London Information. The pilot did not report this on the frequency at the time. Unfortunately, due to the timescales involved, they have no clear recollection of this session and so can add no further information to the investigation.

Factual Background

The weather at Cranfield was recorded as follows:

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METAR EGTC 041220Z 22014KT 9999 SCT032 14/08 Q1008=  
METAR EGTC 041250Z 22015KT 9999 SCT034 15/08 Q1007=
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Analysis and Investigation

Cranfield ATC

The SATCO listened to the RT recordings for both TWR and APP frequencies, spoke to both ATCOs, and reviewed the FPS from the entire day.

The RT recordings showed that [the C182] was transferred to TWR from APP in the normal way and, until the point that the pilot declared that an aircraft had passed below them 'very closely', the approach appeared to be normal, and continued to be so after the incident. At the point that the pilot of [the C182] queried the other aircraft, TWR asked APP if there was anything on their frequency that was likely to be the subject aircraft, and received a negative response. In the 30min prior to the incident, [the C208 pilot] was not in contact with APP or in receipt of a service. RT recordings have not been listened to beyond that time, as it is unusual that a transit aircraft be on frequency for a period longer than that (but they are available). FPS for the entire day did not indicate that [the C208 pilot] was in receipt of a service on the 4th October. In the 30min preceding the incident, normal and appropriate Traffic Information was given by both the TWR and APP ATCOs where required.

NATS Safety Investigations

The UK Airprox Board notified Safety Investigations of a pilot reported Airprox between [a C208] and [a C182]. [The C208] was displaying a Mode-A 1177 code at the time of the event and was receiving a Basic Service from London Information. The pilot of [the C208] did not report an Airprox on the frequency. The pilot of [the C182] was believed to be in contact with Cranfield ATC.

Information available to the investigation included:

- CA4114 from the London Information FISO (LFISO)
- Airprox Report from pilot of [the C208]
- Radar and RT recordings
- CAP 774

The London Information (LFIS) position was operated in a combined configuration with a FISO under training (LFISO UT) and an Instructor (LFISO OJTI)

The C208 was outbound from [departure airfield] to [destination airfield]. The C182 routing was unknown and appeared to be enacting navigation manoeuvres within the vicinity of Bedford. [The C182] displayed a Mode-A code of 7417 (Cranfield IFR Conspicuity).

The pilot of [the C208] first reported onto the LFIS frequency at **1231:19** (all times UTC), requesting a Basic Service and was initially instructed to standby due to a LFIS position handover.

At **1232:04**, the now incumbent LFISO UT requested flight information from the pilot of [the C208]. The pilot stated that they were just passing Milton Keynes, at altitude 2500ft. The pilot stated they required a Basic Service for a few minutes prior to their arrival at [destination airfield]. The pilot was instructed to squawk 1177 and informed they were receiving a Basic Service, which was acknowledged. [The C208]'s Mode-A had displayed an Oxford approach code of [redacted] prior to contact with LFIS.

NODE Radar displayed [the C208] continuing on a north-easterly track, initially maintaining altitude 2500ft. [The C182] turned onto a south-westerly track at approximately **1235:11** at an altitude of 2400ft. [The C208] had descended to indicated altitude 2300ft at this time, 6.3NM south-west of [the C182] on an opposite direction track.

As the two aircraft approached 3NM distance on opposite direction tracks, [the C182] was maintaining altitude 2500ft, whilst [the C208] was maintaining 2400ft. As the two aircraft approached 1NM distance, [the C208] displayed altitude 2200ft against [the C182] displaying altitude 2500ft. [the C182]'s Mode-S BPS¹ displayed QNH 1008hPa (London QNH was 1009hPa). [The C208] did not display a BPS setting.

NODE Radar displayed the closest point of approach (CPA) between [the C208] and [the C182] occurred at **1236:51**, with 0.1NM lateral and 200ft vertical distance (see Figure 1). [The C182] displayed a radar-derived rate of descent (ROD) of 170fpm; [the C208] displayed a ROD of 305fpm.

Note: LFIS is a non-radar service that only provides a Basic Service. CAP774 1.1 states that *'regardless of the ATS being provided, pilots are ultimately responsible for collision avoidance and terrain clearance.'*

The pilot of [the C208] requested to leave the LFIS frequency at **1236:55** to free-call Safetycom. The pilot of [the C208] did not report an Airprox on the LFIS frequency.

¹ Barometric Pressure Setting.



Figure 1 – CPA

The Airprox occurred when [the C208 pilot] had initiated their descent into [destination airfield], on an opposite direction track to [the C182]. The pilot of [the C208] had requested to leave the LFIS frequency almost coincident with the closest point of approach between the two aircraft. Closest Point of Approach occurred at **1236:51** and was recorded on Multi-Track Radar as 0.1NM and 200ft. The incident was resolved by, according to the Airprox report from the pilot of [the C208], [the C182] passing above and to the left of their aircraft. No avoidance manoeuvre was enacted.

UKAB Secretariat

The C182 and C208 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 head-on or nearly so then both pilots were required to turn to the right.³ If the incident geometry is considered as converging then the C182 pilot was required to give way to the C208.⁴

Summary

An Airprox was reported when a C182 and a C208 flew into proximity 2.5NM NW of Bedford at 1237Z on Monday 4th October 2021. The C182 pilot was operating under IFR in VMC and in receipt of an ACS from Cranfield Tower; the C208 pilot was operating under VFR in VMC and was not in receipt of an ATS.

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.

The Board first considered the actions of the C182 pilot and heard from a GA pilot member that instructing instrument approaches is a particularly busy task. That said, lookout remains an important part of any flight, particularly when ATC is unable to assist pilots with Traffic Information if the ATC unit is not equipped with surveillance equipment (as was the case here). Members agreed that the C182 pilot had not had any situational awareness of the presence of the C208 (**CF4**) and opined that electronic conspicuity equipment compatible with the equipment on the C208 may have assisted the

² (UK) SERA.3205 Proximity.

³ (UK) SERA.3210 Right-of-way (c)(1) Approaching head-on.

⁴ (UK) SERA.3210 Right-of-way (c)(2) Converging.

C182 pilot in this case. The Board agreed that, without any information regarding the relative position of the C208, the C182 pilot had been relying on their lookout to detect other aircraft and that they had not sighted the C208 in sufficient time to be able to manoeuvre to increase the separation between the 2 aircraft (**CF6**).

Turning to the actions of the C208 pilot, the Board noted that they had reported being in contact with Cranfield Approach at the time of the Airprox, but that this had not actually been the case. The Board considered that it was probably in the usual work-cycle of the C208 pilot to contact Cranfield Approach when passing close to the ATZ, as they were clearly aware that Cranfield can be busy with other traffic, but could not explain why they had not done so on this occasion. The Board's view was that, had the C208 pilot contacted Cranfield as they transited to the north-east, then the C208 would have become 'known traffic' to Cranfield and Traffic Information could have been passed to both pilots on each other's aircraft. Therefore, the Board considered that the C208 pilot not contacting Cranfield Approach had been contributory to the Airprox (**CF3**). Members also noted that the C208 pilot usually flew with a portable electronic conspicuity device, but that this had not been available to the pilot on the day of the Airprox. Therefore, the Board concluded that the C208 pilot had not had any situational awareness of the presence of the C182 (**CF4**) which had also left them relying on lookout alone to detect other aircraft; the Board considered that the C208 pilot had sighted the C182 at a late stage (**CF5**) but in sufficient time to judge that the C182 would pass above them, albeit with a reduced vertical and horizontal separation. The Board was heartened to hear that it had now become company policy for the C208 to carry electronic conspicuity equipment on all flights.

There then followed a lengthy discussion regarding the proliferation of RNP approaches outside controlled airspace. The Board noted that these approaches are not printed on VFR charts and so are not immediately visible to pilots navigating by these means. The Board wished to emphasise to pilots the importance of pre-flight planning in understanding of the airspace to be navigated as it is becoming more and more common for aerodromes situated within Class G airspace (such as Cranfield) to have instrument approaches in the Class G airspace surrounding the ATZ.

The Board then considered the actions of the Cranfield Tower and Approach controllers and quickly agreed that there had been little that they could have done to assist either pilot in this case. The Board noted that Cranfield is not equipped with any surveillance equipment and members agreed that the C208 had been unknown to either of the Cranfield controllers. Therefore, neither controller had had any situational awareness of the presence of the C208 and so the conflict could not have been detected by the Cranfield controller(s) (**CF1, CF2**) and Traffic Information could not have been passed to the C182 pilot conducting their instrument approach. This led to a discussion on the current trials being undertaken at certain aerodromes of systems other than assured radar surveillance systems. The Board noted that the trials were only on units with AFISOs (not controllers) and wondered if the intention was to perhaps expand these trials to include units with air traffic controllers. The Board heard from an ATM advisor that these trials are in their infancy and that work is still underway to define the parameters within which these equipments can be used. Therefore, any possible expansion to include air traffic control units is the subject of ongoing work but they advised the Board that it is likely to be some time before more clarity on the use of Flight Information Display Systems by controllers will be available.

Finally, the Board considered the risk involved in this Airprox. Members noted that both pilots had assessed the risk of collision as 'High', although their independent estimates of the separation differed considerably. However, the data from the NATS radar replay showed that the actual recorded separation was between the 2 pilots' estimates and that the 2 aircraft had passed quite close to each other. Noting that the C182 pilot had not seen the C208 in time to take any action to increase separation, and that the C208 pilot had only seen the C182 in sufficient time to judge that the aircraft would pass above their own, the Board concluded that safety had not been assured and that a risk of collision had existed (**CF7**). Accordingly, the Board assigned a Risk Category B to this Airprox.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK**Contributory Factors:**

2021206				
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
Ground Elements				
• Situational Awareness and Action				
1	Human Factors	• Conflict Detection - Not Detected	An event involving Air Navigation Services conflict not being detected.	
2	Contextual	• Traffic Management Information Action	An event involving traffic management information actions	The ground element had only generic, late, no or inaccurate Situational Awareness
Flight Elements				
• Tactical Planning and Execution				
3	Human Factors	• Communications by Flight Crew with ANS	An event related to the communications between the flight crew and the air navigation service.	Pilot did not request appropriate ATS service or communicate with appropriate provider
• Situational Awareness of the Conflicting Aircraft and Action				
4	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late, inaccurate or only generic, Situational Awareness
• See and Avoid				
5	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
6	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				
7	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 Assessment⁵

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 neither the Cranfield Tower controller nor the Cranfield Approach controller had any situational awareness of the location of the C208 relative to the C182, and therefore neither was able to detect a conflict between the 2 aircraft.

Flight Elements:

Tactical Planning and Execution was assessed as **partially effective** because the C208 pilot, although reporting that they contacted Cranfield, did not in fact Contact Cranfield Approach as they passed close to the Cranfield instrument approach pattern.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither the C182 pilot nor the C208 pilot had any situational awareness of the presence of the other aircraft.

⁵ The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).

See and Avoid were assessed as **partially effective** because the C208 pilot saw the C182 at a late stage, and the C182 pilot did not see the C208 until it was too late to take any action to increase separation.

Airprox Barrier Assessment: 2021206		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 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:		<u>Full</u>	<u>Partial</u>	<u>None</u>	<u>Not Present/Not Assessable</u>	<u>Not Used</u>		
Provision	✓	⚠	✗	○				
Application	✓	⚠	✗	○				
Effectiveness								