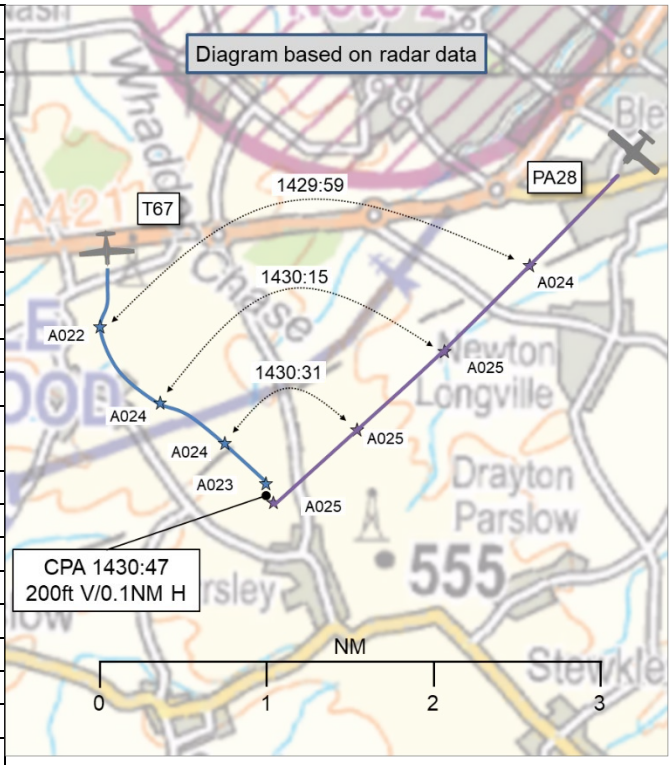
AIRPROX REPORT No 2023021

Date: 23 Feb 2023 Time: 1431Z Position: 5157N 00049W Location: 11NM SW Cranfield

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	T67	PA28
Operator	Civ FW	Civ FW
Airspace	Lon FIR	Lon FIR
Class	G	G
Rules[1]	VFR	IFR
Service	Basic	Procedural
Provider	Cranfield App	Cranfield App
Altitude/FL	2300ft	2500ft
Transponder	A, C, S	A, C, S
Reported		
Colours	Yellow	White
Lighting	Nav, Anti-Col, Landing Light	Standard
Conditions	VMC	VMC
Visibility	>10km	5-10km
Altitude/FL	2500ft	2500ft
Altimeter	QNH (1020hPa)	QNH (N/KhPa)
Heading	150°	255°
Speed	60kt	120kt
ACAS/TAS	FLARM	Not fitted
Alert	TA	None
Separation at CPA		
Reported	100ft V/<0.5NM H	100ft V/300m H
Recorded	200ft V/0.1NM H	



THE T67 PILOT reports the event occurred whilst conducting a stalling demonstration, so at slow speed with limited manoeuvrability; they caught sight of the other aircraft at very close range having been alerted by the [TAS] unit. This alert caught them by surprise as both the instructor and student had completed a good lookout prior to starting the demonstration. By the time they had visually acquired the other traffic it was at its closest point of approach and then rapidly diverged away. Habitually, student flights are conducted to the north of Cranfield; this time, due to the runway in use, they flew to the west of Milton Keynes to conduct the flight, presuming to position to fly a straight in approach when complete. They thought they were well away from the tracks used for transit from CIT to DEKAP (or those used to fly the NDB procedure) but apparently not, as both aircraft found themselves in the same part of the sky. Looking back at the video of the flight, they noted that they did do a lookout but missed the target first appearing on the [TAS] unit. This target subsequently disappeared before reappearing at -100ft and setting off the alarm which caught their attention. As it turns out, they followed the PA28 down the approach and parked almost next to each other. The crews chatted with each other, confirming that they had both seen each other quite late. On reviewing their flight subsequently, the T67 pilot opined that they could see that they made plenty of mistakes, a little bit of complacency/confirmation bias, a big loss of SA, degraded airmanship (TEM) by concentrating more on looking out below and somewhat neglecting to look at the same level, allowing time pressures to become a factor (they were worried about getting back for the next flight), not keeping an adequate listening watch (it was the student's first flight in a light-aircraft so they were talking to them more than they would normally) and trying to complete the sortie profile with adequate distance from a relatively low cloudbase. The pilot wondered if this Airprox could have been mitigated by Cranfield having radar but would like to think the controllers would have seen this developing and called one of the aircraft's attention to the other traffic.

[1] The pilot of AC2 reported operating VFR under a Procedural service but, iaw current rules, a Procedural service is only available to aircraft operating under IFR.

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

THE PA28 PILOT reports the event occurred whilst conducting practice RNP approaches to [destination airfield] RW03 via Initial Approach Fix DEKAP with an airborne time circa 1402. After a successful first RNP03 approach via DEKAP with a low approach and go around and left turn out as instructed by Tower, they were cleared to DEKAP at 2500ft by Cranfield Approach with a Procedural Service. Note that the platform altitude at DEKAP for the RNP03 approach is normally given by ATC as 2500ft with a maximum altitude 3500ft. At about 2.6 miles from DEKAP at a level of 2500ft on a track of approximately 225° and shortly before turning onto a track of 101°M to the Intermediate Approach Fix TC03I, they became aware of an aircraft approaching from the DEKAP area on a closing heading estimated to be 060° at what they judged to be precisely 2500ft. Considering the closing angles of the two aircraft, they suspect that they both may have been in a blind spot due to cockpit/plane structure etc. They opined that their aircraft was where it was supposed to be in an instrument approach, and would not have expected another aircraft to be in that vicinity at any time. Additionally, they would have expected the pilot of the Slingsby to have been listening out on Cranfield's Approach frequency and would therefore have been aware that the instrument approach via DEKAP was active. They considered that the T67 was clearly going to pass behind them, which it did - the PA28 pilot was unable to read the registration of the aircraft. The PA28 pilot noted that their flight continued to a successful RNP03 approach with a landing at 1441.

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

THE CRANFIELD APPROACH CONTROLLER reports that whilst they remember working this aircraft around this time they do not recollect being made aware of an Airprox or there being any other conflicting aircraft on frequency in this position.

Factual Background

The weather at Cranfield was recorded as follows:

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METAR EGTC 231420Z 02012KT 9999 SCT027 BKN034 07/02 Q1020=
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Analysis and Investigation

CAA ATSI

ATSI reviewed the reports, radar replay and the Cranfield RTF and can confirm that [the T67] departed to the north at 1354 and a Basic Service was agreed. There were no further communications between its pilot and Cranfield Approach until 1435:40 when they reported 11 miles to the west requesting a straight-in approach to RW03.

The CPA had occurred earlier, at 1430:47, just as [the PA28 pilot] was reporting IAF DEKAP for their RNP approach to RW03. With no comms from [the T67 pilot], nor surveillance capacity at Cranfield, the controller would not have been aware of the presence of [the T67], and so no Traffic Information was passed.

CRANFIELD AIRPORT UNIT INVESTIGATION

The Cranfield investigation found that:

The Airprox was not reported on frequency. R/T recordings, FPS and surveillance system (on test)[2] did not indicate any aircraft that would have been in conflict. Relevant Traffic Information passed.

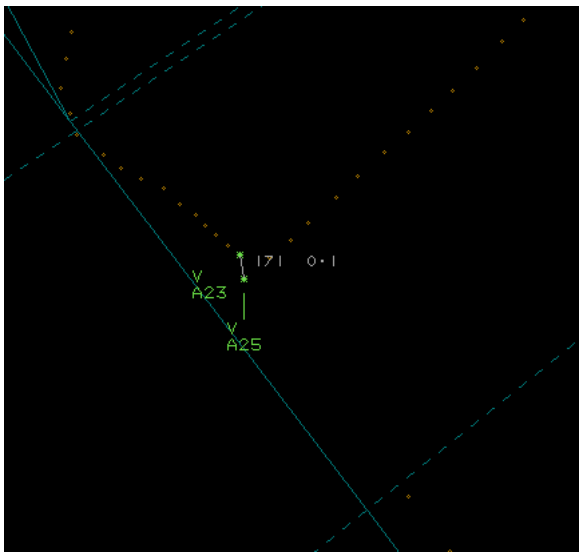
The T67 pilot departed from Cranfield and requested a Basic Service from Cranfield Approach, which was agreed. They reported on frequency that they were departing to the north, which is the normal training area for their operation (they conduct aerobatics normally to the north and north-

[2] ATSI comment – referenced equipment is unapproved at this time.

west of Cranfield). The T67 pilot made no further transmissions on frequency until they reported "11 miles west" and requested a straight in approach. Following co-ordination with the Tower, a straight in approach was granted to position for an 8 mile final due to the IAP traffic, and Traffic Information was passed on the PA28. The PA28 pilot conducted a missed approach from RW21 at 1426 with an instruction to route on track DEKAP (to the south-west of Cranfield) climbing to 2500ft, which was followed. The PA28 pilot reported passing DEKAP at 1431 and continued the approach to land. Neither aircraft reported any conflict. With no surveillance at Cranfield, the Approach controller had no information reported by the T67 pilot that the flight would conflict with IAP traffic. It should be noted that the T67 was not visible on the surveillance system as it only displays ADS-B out, although the flight path of PA28 does not indicate that the aircraft was 11 miles west of Cranfield, rather 11 miles to the southwest, where it would be expected to be when conducting instrument approaches.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and both aircraft were detected and identified using Mode S data. CPA occurred at 1430:47, the aircraft were separated by 0.1NM horizontally and 200ft vertically.



1430:47 – CPA -200ft V/ 0.1NM H

The T67 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.[3] If the incident geometry is considered as converging then the PA28 pilot was required to give way to the T67 pilot.[4]

Summary

An Airprox was reported when a T67 and a PA28 flew into proximity 11NM SW of Cranfield at 1431Z on Thursday 23rd February 2023. The T67 pilot was operating under VFR and the PA28 pilot was operating under IFR in VMC. The T67 pilot was in receipt of a Basic Service from Cranfield Approach and the PA28 pilot in receipt of a Procedural Service from Cranfield Approach.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings and a report from the air traffic controller unit 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.

[3] (UK) SERA.3205 Proximity.
[4] (UK) SERA.3210 Right-of-way (c)(2) Converging.

The Board first discussed the actions of the T67 pilot, commending them on the open and frank explanation of events. Members observed the importance of HASELL checks and opined that the mnemonic helps to trigger relevant thought and action, particularly in this case regarding location of the air exercise and other traffic activity when proximate to recovering traffic. Members again recognised the importance of compatible alerting systems and how this could have enabled greatly improved situational awareness for the pilots of the 2 aircraft involved. Although the T67 carried a TAS unit, the first indication of the PA28 had been missed (**CF8**) and the second noted too late to respond. This had led to reduced situational awareness for the T67 pilot; the PA28 had had no TAS unit and therefore no means of electronically detecting the T67.

Although both pilots had been in receipt of a service from the same unit (Basic for the T67 and Procedural for the PA28), the T67 pilot had not made any calls between departure and their call for recovery (**CF5**). There had been no obligation on the controller to offer warnings to those two crews and, with VMC declared by both pilots, the principle of 'see-and-avoid' had prevailed (**CF1**, **CF2**). The lack of interoperable TAS, minimal RT and there having been no surveillance system available for use by the controller (**CF3**, **CF6**, **CF7**) had led to a much reduced situational awareness and inevitably, a late sighting by the pilot of the PA28 and effectively a non-sighting by the pilot of the T67 (**CF9**, **CF10**).

Members highlighted the need for operators to be thoroughly aware of circuit patterns and significant navigation points when electing to complete training exercises within the local area of busy aerodromes, stressing the need for correlation between official information sources (such as the AIP), and proprietary systems (such as those used for GPS-based navigation and Electronic Conspicuity) (**CF4**).

In determination of risk, members were in agreement that safety had been degraded through the pilot of the T67 having been focussed on the operation of their aircraft to the detriment of their awareness of events around them. Members opined that, had a ground-based surveillance system been available, and the carriage and use of compatible TAS equipment been in place, situational awareness of both pilots and the Cranfield Approach controller may have been significantly increased. That being said, the Board concluded that there had nonetheless been sufficient separation at CPA for there to have been no risk of collision. Accordingly, members assigned Risk Category C to this Airprox.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2023021			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Situational Awareness and Action			
1	Contextual	• ANS Flight Information Provision	Provision of ANS flight information	The ATCO/FISO was not required to monitor the flight under a Basic Service
2	Human Factors	• Conflict Detection - Not Detected	An event involving Air Navigation Services conflict not being detected.	
3	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			
4	Human Factors	• Action Performed Incorrectly	Events involving flight crew performing the selected action incorrectly	Incorrect or ineffective execution
	• Situational Awareness of the Conflicting Aircraft and Action			
5	Human Factors	• Interpretation of Automation or Flight Deck Information	Interpretation of Automation or Flight Deck Information by the flight crew.	Pilot engaged in other tasks
6	Human Factors	• Monitoring of Communications	Events involving flight crew that did not appropriately monitor communications	
7	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

	• Electronic Warning System Operation and Compliance			
8	Contextual	• Other warning system operation	An event involving a genuine warning from an airborne system other than TCAS.	
	• See and Avoid			
9	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
10	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

Degree of Risk: C

Safety Barrier Assessment[5]

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 T67 pilot was in receipt of a Basic Service and there was no requirement for the Controller to monitor the flight and, although the pilots of both aircraft were in communication with Cranfield, there is currently no surveillance capability available to the Cranfield controller to detect the proximity of the 2 aircraft.

Flight Elements:

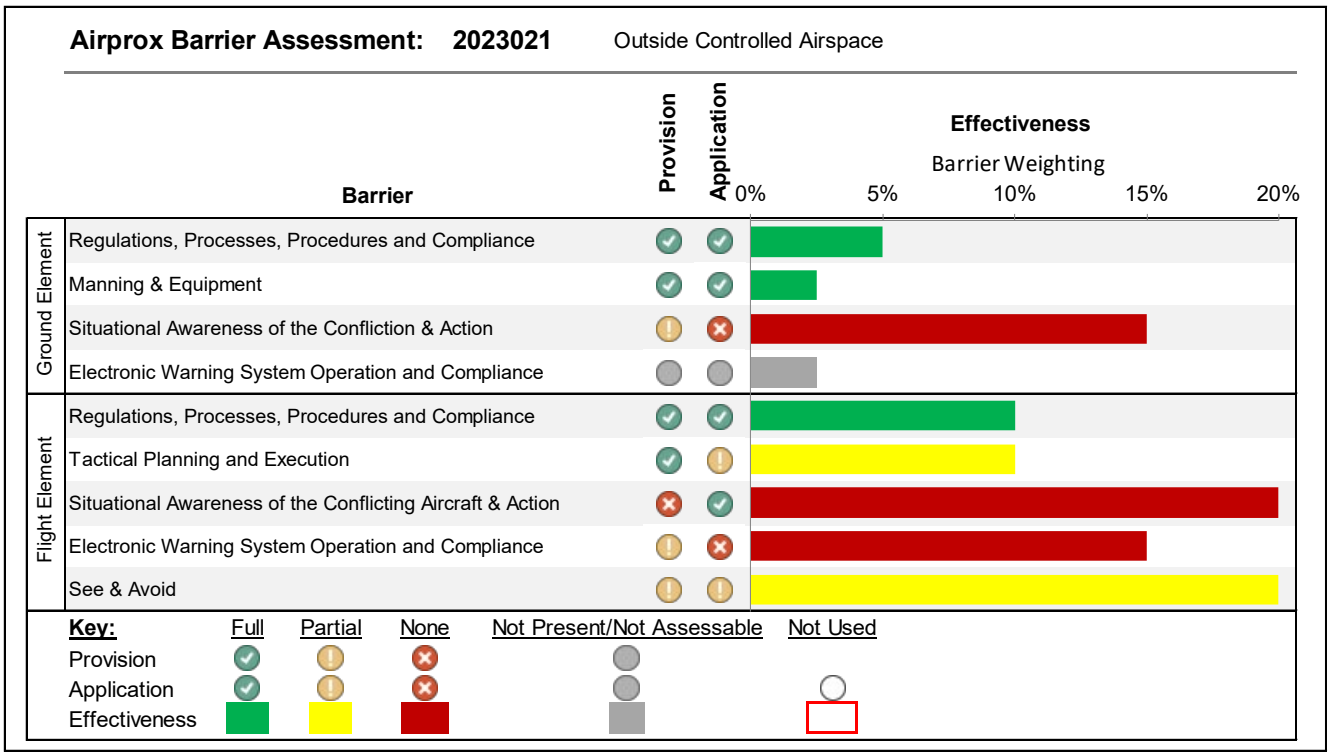
Tactical Planning and Execution was assessed as **partially effective** because the pilot of the T67 chose to recover at an altitude that was likely to conflict with traffic established for an Instrument Approach Procedure.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because the T67 pilot, by their own admission, was distracted by time pressures for further flights and focussed on aspects of their student's first flight, which led to a reduced attention to their listening watch. Limited radio communications meant that both pilots had reduced situational awareness of the relative position of the other aircraft.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because, although the T67 was equipped with EC equipment, the pilot did not notice the first indication of other traffic.

See and Avoid were assessed as **partially effective** because the T67 pilot sighted the PA28 at a later than optimum point.

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


Airprox Barrier Assessment: 2023021
Outside Controlled Airspace
Barrier
Provision
Application
Effectiveness
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:
Full
Partial
None
Not Present/Not Assessable
Not Used
Provision
Application
Effectiveness