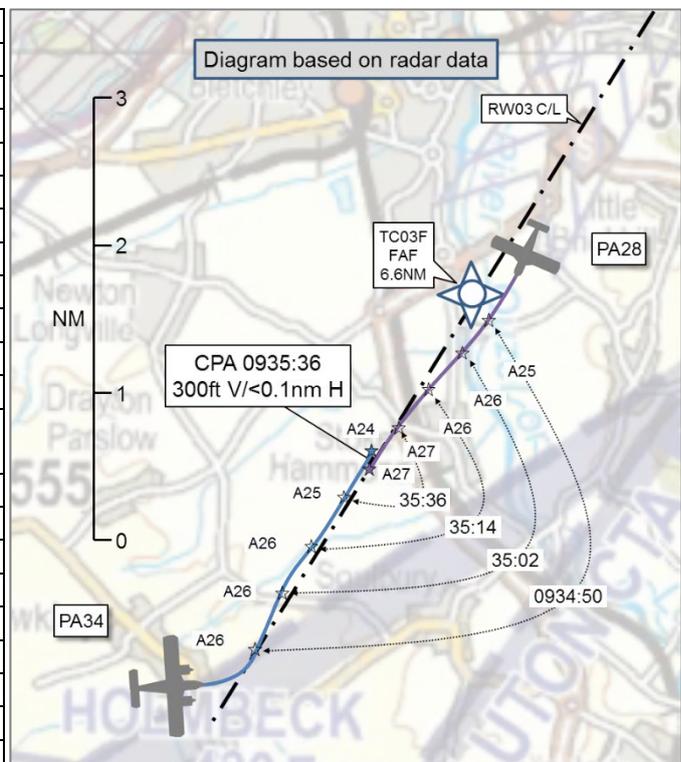


AIRPROX REPORT No 2019104

Date: 15 May 2019 Time: 0935Z Position: 5157N 00044W Location: 8.3nm SW Cranfield - elev 360ft

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	PA34	PA28
Operator	Civ FW	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	VFR
Service	Procedural	None
Provider	Cranfield APP	N/A
Altitude/FL	2400ft	2700ft
Transponder	A,C,S	A,C
Reported		
Colours	White/blue	Blue/white
Lighting	Strobe, landing, nav	Strobes
Conditions	VMC	VMC
Visibility	>10km	NK
Altitude/FL	2500ft	NK
Altimeter	QNH	NK
Heading	030°	NK
Speed	110kt	NK
ACAS/TAS	TCAS I	Not fitted
Alert	TA	N/A
Separation		
Reported	100ft V/100m H	Not seen
Recorded	300ft V/<0.1nm H	



THE PIPER PA34 PILOT reports he was conducting an IR Skills Test involving an RNAV approach for RW03 at Cranfield. Cranfield had cleared them for the approach and, when they became established on the Final Approach Track a TCAS indication appeared indicating an aircraft flying directly towards them, straight ahead, at an altitude of 2500ft, 2nm away. The appropriate avoiding action was taken by the examiner, descending and turning left. The aircraft, a PA28, was seen and its registration was noted. From what he could see the PA28 pilot did not adjust his track, heading or altitude, which suggested that they were not seen. He reported this to ATC after the go-around and was informed that the PA28 pilot was not in communication with Cranfield.

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

THE PIPER PA28 INSTRUCTOR reports that he had been totally unaware of the close proximity of another aircraft until informed 5 days after the event and could not recollect all the details of his flight. He had not been in communication with any ATSU but confirmed he had been keeping a good lookout at all times.

THE CRANFIELD APPROACH CONTROLLER reports that the first he knew of the incident was when the pilot of the PA34 reported that a PA28, registration given, had just passed in front of him. He informed him that the pilot was not working his frequency. No Airprox was called on the frequency and the flight continued as normal.

Factual Background

The weather at Cranfield was recorded as follows:

METAR EGTC 150920Z 09006KT 020V140 CAVOK 14/07 Q1027=

Analysis and Investigation

UKAB Secretariat

Cranfield was not equipped with surveillance equipment. Consequently, without R/T communication from the PA28 pilot, or visual contact, which was not likely because the aircraft was over 8nm away from the airport, the controller could not have been aware of the PA28's presence.

The PA34 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 hazard¹. If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right².

A portion of the RW03 RNAV approach plate is shown below:

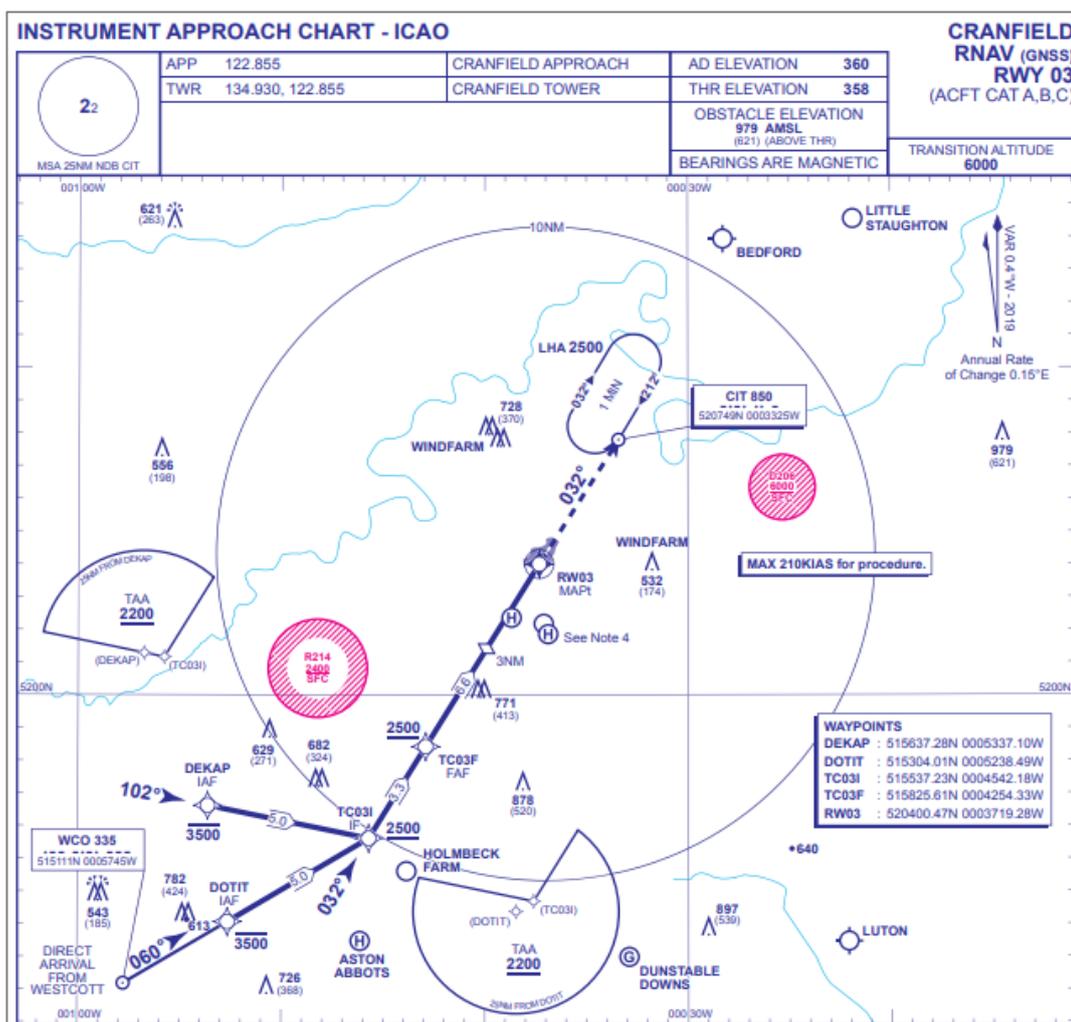


Figure 1

Summary

An Airprox was reported when a PA34 and a PA28 flew into proximity near Cranfield at 0935hrs on Wednesday 15th May 2019. The PA34 pilot was conducting an RNAV approach and operating under IFR in VMC, the PA28 pilot was operating under VFR in VMC. The PA34 pilot was in receipt of a Procedural Service from Cranfield, the PA28 pilot was not in receipt of an ATS.

¹ SERA.3205 Proximity.

² SERA.3210 Right-of-way (c)(1) Approaching head-on.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots, the Cranfield Approach controller, area radar and RTF recordings and reports from the appropriate ATC and 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 turned their attention to the actions of the PA28 pilot. Members noted that the aircraft was carrying out a cross-country training task with an instructor and a student, and that they had approached to about 4nm south of Cranfield before turning onto the reciprocal track of the RW03 approach path. Several members commented that Cranfield was a busy training airport, especially with pilots carrying out IFR approaches, and that they would have expected the PA28 instructor to have been aware that IFR training was highly likely in that location. In their opinion, routeing reciprocally down the 'feathers', which indicated an IFR approach, at just above the approach altitude without contact with ATC (**CF4**) was not a good example to show the student. Furthermore, they were surprised that they were not in receipt of any ATS or even listening out on an appropriate frequency. GA members commented that a communication plan should have been addressed during their planning for the flight (**CF3**), and that it would have been prudent to have contacted Cranfield Approach to pass their details even if they were not intending to fly through the 'feathers'. The Board noted that the instructor had commented that he had been 'keeping a good lookout' but it was evident that he had not seen the PA34, although it had passed close horizontally, 300ft below. (**CF6**). This again highlighted the limitations of the see-and-avoid barrier, and the advantages of employing other MAC mitigations such as contacting ATC or installing one of the increasingly affordable collision warning systems. Fortunately for the PA28 pilots, the PA34 was equipped with TCAS, which had alerted on the PA28.

Turning to the actions of the PA34 crew, members noted that they had been operating under IFR, carrying out an RNAV approach to RW03 at Cranfield, under examination conditions. They were in receipt of a Procedural Service because Cranfield was not equipped with surveillance equipment. Consequently, the controller would not have been aware of the proximity of the PA28 and could not have passed any information about its presence without contact with its pilot (**CF1**, **CF2**). The PA34 pilot had received a TCAS TA (**CF5**) about an aircraft flying directly towards them at the same altitude of about 2500ft, and a range of 2nm. Given the likely closure rate, this would have given about 30-40secs before the aircraft passed, and some members wondered whether the PA34 examiner might have taken earlier action than he did and immediately turned away (nominally to the right for a head-on encounter, but acknowledging that he would not wish to turn in front of the PA28 that was to his right ahead). Other members commented that, under examination conditions, the examiner may have hoped to be able to continue their approach for the benefit of the student and, noting that there was some height difference, to only intervene if absolutely necessary because abandoning the approach would not only have financial implications for the student but could have upset their composure for a further approach. Ultimately, members agreed that the PA34 examiner was clearly monitoring the PA28 on TCAS and, although closely judged, when it became apparent that a conflict was imminent, had taken control to turn left and descend to increase the vertical separation.

Turning to the risk, members noted that, as a result of the PA34 examiner's manoeuvre, at CPA the aircraft were separated by 300ft vertically albeit less than 0.1nm horizontally. Prior to CPA, although the PA28 pilot had not seen the PA34, the pilot of the latter aircraft had received a TCAS TA about the PA28 and had also established visual contact during his avoidance manoeuvre. As a result, the Board agreed that although safety had been reduced, the PA34 examiner's monitoring of the PA28 and his subsequent avoiding action had been effective in averting the risk of a collision. Accordingly, the incident was assessed as risk Category C.

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

2019104-Barriers			
CF	Factor	Description	Amplification
Ground Elements			
• Situational Awareness and Action			
1	Contextual	• Situational Awareness and Sensory Events	Only generic, late or no Situational Awareness
2	Human Factors	• Conflict Detection - Not Detected	
Flight Elements			
• Tactical Planning and Execution			
3	Human Factors	• No Decision/Plan	Inadequate planning
4	Human Factors	• Communications by Flight Crew with ANS	Pilot did not communicate with appropriate controlling authority
• Electronic Warning System Operation and Compliance			
5	Contextual	• ACAS/TCAS TA	TCAS TA / CWS indication
• See and Avoid			
6	Human Factors	• Monitoring of Other Aircraft	Non-sighting or effectively a non-sighting by one or both pilots

Degree of Risk: C

Safety Barrier Assessment³

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 Cranfield was not equipped with surveillance radar; consequently, the controller would not have been aware of the presence of the PA28.

Flight Elements:

Tactical Planning and Execution was assessed as **ineffective** because the PA28 instructor did not contact Cranfield ATC although he had passed close to the airfield and the instrument approach path to RW03.

Electronic Warning System Operation and Compliance were assessed as **partially available** because only the PA34 was equipped with a collision warning system.

See and Avoid was assessed as **effective** because the PA34 pilot obtained visual contact with the PA28.

³ 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: 2019104		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 Conflicion & 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 Used		
Provision	✓	!	✗	●				
Application	✓	!	✗	●	○			
Effectiveness								