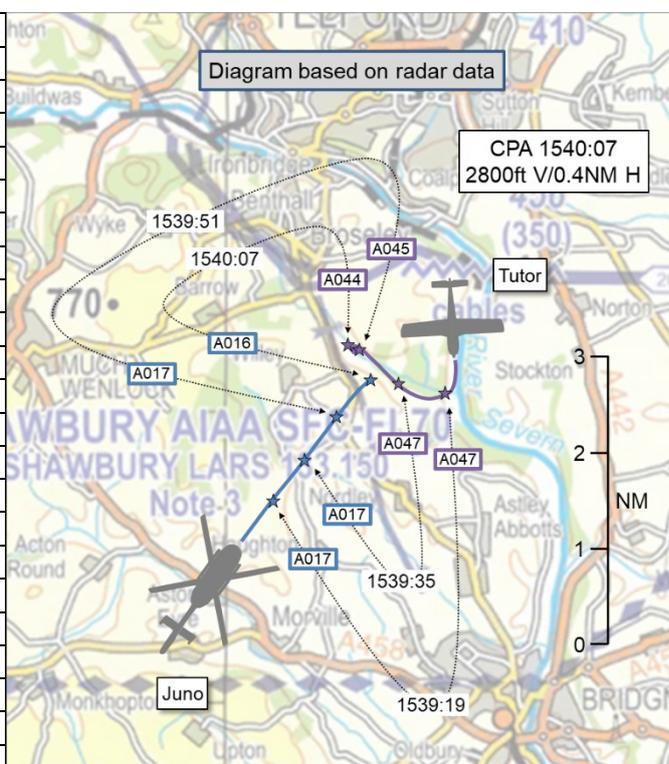


AIRPROX REPORT No 2022267

Date: 28 Nov 2022 Time: 1540Z Position: 5235N 00228W Location: 6NM SW Cosford

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Juno	Tutor
Operator	HQ Air (Trg)	HQ Air (Trg)
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Basic	Traffic
Provider	Shawbury Low Level	Shawbury Zone
Altitude/FL	1600ft	4400ft
Transponder	A, C, S	A, C, S
Reported		
Colours	Yellow, black	White
Lighting	Strobe, nav	HISL
Conditions	VMC	VMC
Visibility	>10km	NR
Altitude/FL	1600ft	NR
Altimeter	QNH	NR
Heading	038°	NR
Speed	110kt	NR
ACAS/TAS	ACAS	TAS
Alert	TA	None
Separation at CPA		
Reported	1200ft V/<200m H	NK V/NK H
Recorded	2800ft V/0.4NM H	



THE JUNO PILOT reports that during a nav-route, heading northeast to a turning point on the eastern edge of Telford, the Qualified Helicopter Crewman Instructor (QHCI), operating as crewman in the cabin, noticed an Airborne Collision Avoidance System (ACAS) contact showing as above and approximately 1km in front of the aircraft. Upon looking in the expected direction and not seeing the aircraft, they looked directly above through the perspex. Initially assessing the fixed-wing aircraft as being about 800-900ft above, and crossing from the Juno's 10-5 o'clock, they began to call 'continue'. Then, having realised that the other aircraft was in fact at the top of a loop and now descending directly towards them, the crewman called 'Break right!'. The handling pilot duly broke right during which an audio alert was heard from the warning unit for a loss of the backup Stability Augmentation System (SAS).

The crewman maintained eyes-on the fixed-wing aircraft which exited its descent at what the crewman believed to be about 400-500ft above the Juno and heading away into the 9 o'clock position for about 1NM where it proceeded to continue aerobatic manoeuvres. At the time, it had been the crewman's belief that, had they not called the avoiding action, there was a possibility of loss of safe separation. Their memory of the ACAS state was that the diamond icon on the ACAS display was initially not filled-in and therefore it is likely the initial height difference was greater than 1200ft.

With the aircraft now out of immediate danger, the crew of [the Juno] began to run through the WADFIR [emergency checklist actions] process relating to the audio tone triggered for the loss of the backup SAS. The student crewman in the front worked through the Flight Reference Cards (FRCs) with the handling pilot whilst the QHCI took over the navigation due to the proximity of Cosford, Telford and the active Lizard Hill [shooting grounds]. The backup SAS would not re-engage fully with AP1 system showing in red on the system page of the Vibration Management System (VMS). In accordance with the FRCs, and after checking all crew members were happy to continue, and that the route was heading back to Shawbury, the sortie was continued.

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

THE TUTOR PILOT reports that they had been flying their sixth Air Experience Flight sortie of the day in the deconfliction area to the south of Telford. They had no recollection of the event, or of a Juno operating in the area. [They explained that] had they been conducting aerobatics, then they would have been in VMC and operating to a base height of 3500ft AMSL (3000ft AGL) and would probably have been above that minimum.

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

THE SHAWBURY CONTROLLER reports that the LARS/Low Level controller and ATC Supervisor had no knowledge of an Airprox event taking place and could therefore offer no further information.

Factual Background

The weather at Shawbury was recorded as follows:

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EGOS 281550Z 13001KT 9999 MIFG FEW030 07/05 Q1009 TEMPO 700 BCFG RMK BLU TEMPO RED
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The weather at Cosford was recorded as follows:

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EGWC 281550Z 00000KT 9999 MIFG FEW030 08/07 Q1009 RMK BLU
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Analysis and Investigation

Military ATM

The Shawbury Lower Airspace Radar Service controller was band-boxed with Zone/Lower Airspace Radar Service, Low-Level and Low Flying Area 9 Quiet frequencies. The pilot of the Juno aircraft was in receipt of a Basic Service on the Low-Level frequency, conducting a navigational exercise, and the pilot of the Tutor was in receipt of a Traffic Service on the Zone/Lower Airspace Radar Service frequency.

Due to the unit's notification, which took place eight days post-Airprox, the Shawbury Lower Airspace Radar Service controller and Shawbury Supervisor could not recall the Airprox taking place.

Figures 1 and 2 show the position of the Juno and Tutor aircraft at relevant times during the Airprox. The first screenshot has been taken from the Shawbury Radar replay, and the second from a replay using the NATS radars, which are not available to the Shawbury controller therefore may not be entirely representative of the picture available. RAF Shawbury has provided radar replays, which show what the Shawbury controller was seeing/doing at the time, however full manipulation of ranges cannot be replicated.



Figure 1 - 1539:00. Traffic Information was passed to the pilot of the Tutor.

At 1539:00, the Shawbury Lower Airspace Radar Service controller provided Traffic Information on the Juno aircraft "Traffic southwest 4 miles, tracking northeast, Shawbury rotary indicating two thousand nine hundred feet below". The Tutor pilot reported "not sighted".

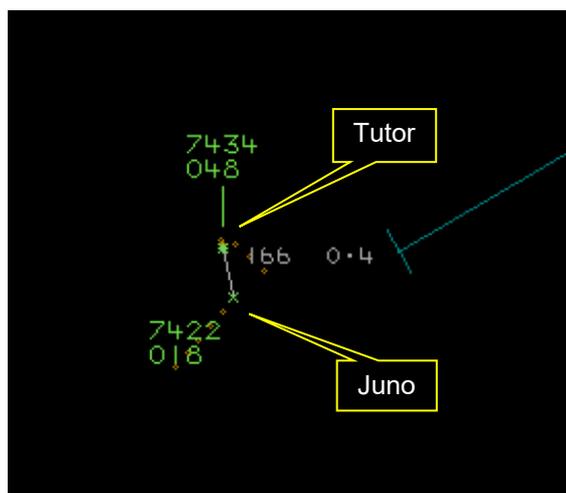


Figure 2 - 15:40.04. Separation was 0.4NM and 3000ft

Although the unit's investigation was limited due to late notification of the Airprox occurrence, the radar replay showed the controller's interaction with the Juno and Tutor aircraft. With Short Term Conflict Alert activated, the Lower Airspace Radar Service controller was seen to move the data blocks, indicating a continued scan throughout. The Tutor aircraft did not appear to change heights at any significant rate¹ to concern the controller and no Short-Term Conflict Alert was activated.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and both aircraft could be positively identified from Mode S data. The diagram was constructed and the separation measured from the radar data. The UKAB Secretariat determined that the CPA had been one radar sweep after that shown in Figure 2, at 1540:07, with a separation of 2800ft vertically and 0.4NM horizontally (see Figure 3).

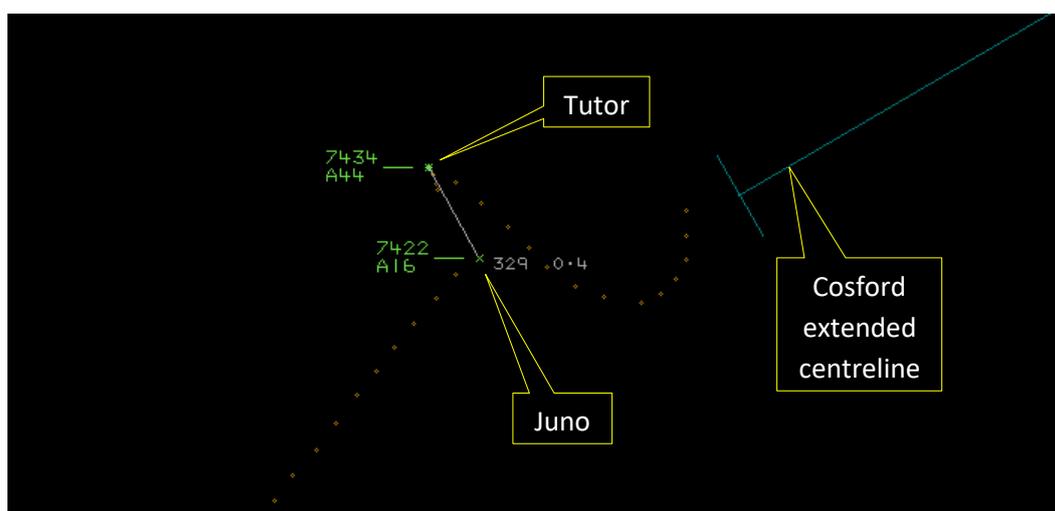


Figure 3 – CPA at 1540:07

The Juno and Tutor 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

¹ Co-operative Surveillance Radar update rate is once per second.

² (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

Comments

HQ Air Command

The ACAS TA provided suitable SA for the Juno crew to visually acquire the Tutor. Although there was no risk of collision and ample separation, the perception that the Tutor was at the top of a loop and would be shortly descending towards the Juno influenced the command to break right. It is not possible to predict what an aircraft doing aerobatics will do next and so the defensive action was the correct one. The Juno crew's lack of available time and viewpoint (looking vertically upwards through curved perspex) may have affected their ability to accurately gauge the separation between the aircraft. The Tutor's TAS did not alert but the pilot had generic SA on the Juno through the TI passed by Shawbury LARS. With the Juno reported 2900ft below and a base height of 3000ft for aerobatics, the Tutor pilot did not perceive any threat from or to the Juno.

Summary

An Airprox was reported when a Juno and a Tutor flew into proximity 6NM southwest of Cosford at 1540Z on Monday 28th November 2022. Both pilots were operating under VFR in VMC, the Juno pilot in receipt of a Basic Service and the Tutor pilot in receipt of a Traffic Service, both from the same Shawbury controller.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, a report from the air traffic controller 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 pilot of the Juno. Members noted that the pilot had received a 'traffic alert' from the ACAS system fitted to the Juno and that the pilot reported that they had not visually acquired the traffic in the direction that they had initially expected. Members agreed that the system had, therefore, provided information which had successfully alerted the pilot to the presence of the Tutor but had been somewhat generic in nature. Members noted that the pilot of the Juno had been in receipt of an ATS from the Shawbury Low Level controller, and wondered whether it would have been prudent for the pilot to have enquired if the controller had had knowledge of the Tutor pilot's intentions to further enhance their situational awareness. Acknowledging that the pilot of the Juno had been concerned by the proximity of the Tutor, members noted that positive action had been taken to increase separation.

Turning their attention to the actions of the pilot of the Tutor, members considered the Traffic Information which they had been passed. Noting that the relative altitude had been given as '2900ft below', and that it had been described as 'Shawbury rotary', members agreed that there would have been no immediate concern of a potential conflict with that traffic. However, as the Juno had not been visually acquired, members wondered whether it would have been prudent for the pilot of the Tutor to have requested further Traffic Information regarding the Juno in order to update their assessment of risk whilst the Juno had been in the vicinity.

The discussion turned to the actions of the Shawbury controller. The Shawbury controller had been 'band-boxed' with several frequencies and had been providing a service to both pilots, albeit on different frequencies. Members acknowledged that the pilot of the Juno had been in receipt of a Basic Service and that the controller had not been required to have monitored their flight. Notwithstanding, having passed Traffic Information on the Juno to the pilot of the Tutor, some members wondered why reciprocal Traffic Information had not been provided to the pilot of the Juno.

Members indicated that they had nothing further to add to the discussion and, in conclusion of their deliberations, agreed that there had been considerable separation between the aircraft and were satisfied that normal safety standards and parameters had pertained. As such, the Board assigned Risk

Category E to this event. Members agreed that the following factors (detailed in Part C) had contributed to this Airprox:

- CF1.** The Shawbury controller had not been required to have monitored the Juno pilot's flight under the terms of a Basic Service.
- CF2.** The pilot of the Juno had had generic situational awareness of the presence of the Tutor.
- CF3.** The EC system fitted to the Juno had provided a Traffic Alert to the presence of the Tutor.
- CF4.** The pilot of the Juno had been concerned by the proximity of the Tutor.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

2022267				
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
Ground Elements				
• Situational Awareness and Action				
1	Contextual	<ul style="list-style-type: none"> ANS Flight Information Provision 	Provision of ANS flight information	The ATCO/FISO was not required to monitor the flight under a Basic Service
Flight Elements				
• Situational Awareness of the Conflicting Aircraft and Action				
2	Contextual	<ul style="list-style-type: none"> 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				
3	Contextual	<ul style="list-style-type: none"> ACAS/TCAS TA 	An event involving a genuine airborne collision avoidance system/traffic alert and collision avoidance system traffic advisory warning triggered	
• See and Avoid				
4	Human Factors	<ul style="list-style-type: none"> Perception of Visual Information 	Events involving flight crew incorrectly perceiving a situation visually and then taking the wrong course of action or path of movement	Pilot was concerned by the proximity of the other aircraft

Degree of Risk: E.

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:

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because the pilot of the Juno had had generic situational awareness of the presence of the Tutor.

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: 2022267

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 Conflicition & 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	■	■	■	■	□			