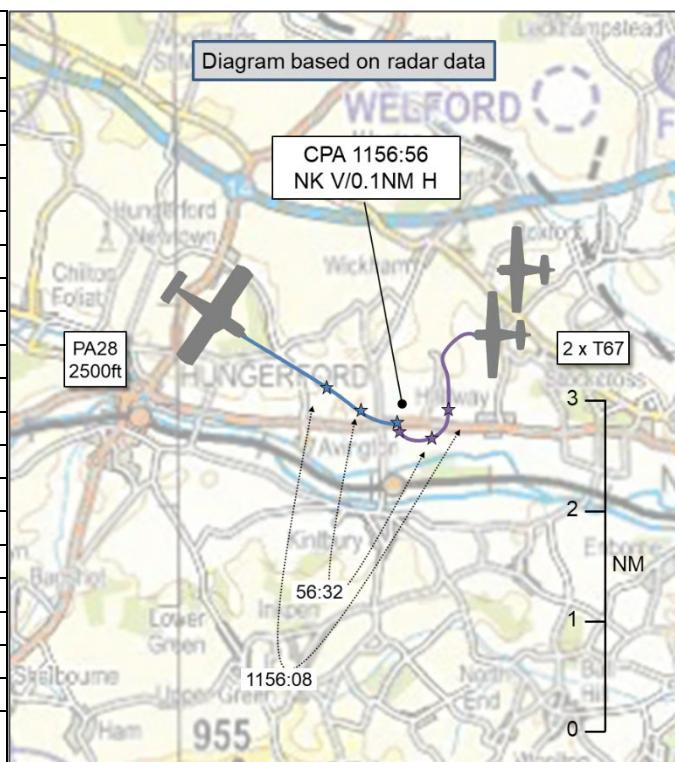


AIRPROX REPORT No 2021058

Date: 26 May 2021 Time: 1156Z Position: 5124N 00125W Location: 3.5NM W Newbury

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	PA28	T67 Firefly
Operator	Civ FW	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	None ¹	None
Altitude/FL	2500ft	NK
Transponder	A, C	A
Reported		
Colours	White, Blue	NK
Lighting	Landing, Anti-cols	NK
Conditions	VMC	VMC
Visibility	>10km	NR
Altitude/FL	2500ft	~3000ft
Altimeter	QNH (1014hPa)	NK
Heading	125°	West
Speed	NK	90kt
ACAS/TAS	SkyEcho2	Not fitted
Alert	None	N/A
Separation		
Reported	0-20ft V/<100m H	100-200ft V 0.25NM H
Recorded		NK V/0.1NM H



THE PA28 PILOT reports that after departure the radio frequency was changed to Farnborough LARS West, where they elected to use the allocated listening squawk (4572) because the Farnborough frequency was especially busy in that moment. The student and instructor simultaneously spotted 2 aircraft in formation to the west of Newbury, perhaps 1-2NM from their position flying on a southerly heading, in their 10 o'clock position, and approximately 100ft above. The instructor told the student to make a slight turn to the left in order to safely pass behind the aircraft in formation. The 2 aircraft then proceeded to make a right turn, and by this point were in their 1 o'clock position and at a similar altitude. The Instructor took control and briefly "waved" the wings to give the formation aircraft a good chance of seeing them, as the PA28 would have been on their right hand side. It appeared that the formation briefly stopped their turn, however they then continued with their right turn onto a conflicting course. It was at this time that the instructor took avoiding action, banking sharply (60°AoB) to the left. They believed that the other aircraft did not at any point change their course, or take avoiding action. Had they not taken avoiding action, the pilot believed that their aircraft would have collided with the aircraft on the right hand side of the formation. At their closest point, the 2 aircraft were less than 100m from the PA28. They identified the formation as Slingsby T67 Fireflies, both with yellow paintwork, were able to see pilots in the cockpits, and were able to read part of the registration.

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

THE T67 PILOT reports that they were the lead pilot in a formation of 2 x T67s. The PA28 was seen by the lead pilot at 12 o'clock relative to the formation's direction of travel, at some 1.5-2NM and at least 300-500ft below on a reciprocal heading, slightly displaced to their immediate right (to the wingman's side) by approximately 100m. The PA28 was called to the wingman as is normal procedure. They were travelling in a westerly direction at an altitude of approximately 3000ft, up to that point they had been gently manoeuvring practising formation flying. The formation was travelling at approximately 90kts IAS,

¹ Reported as listening out on Farnborough LARS, but the listening squawk was applied after the Airprox.

and assuming the PA28 was doing the same, although no immediate confliction existed it was prudent to manoeuvre the formation to their left (to a more southerly heading). At this point, inside 1NM it was clear the other pilot had now seen the formation. This clear sighting of the formation by the PA28 pilot was indicated by their subsequent indecisive directional changes – it manoeuvred left, right and then left again of their original track and appeared to climb a little. This meant that the PA28 passed down the right-hand side of the formation by about $\frac{1}{4}$ NM and approximately 100-200ft below. The lead of the formation was visual with the PA28 at all times and watched as it disappeared in their 6 o'clock returning to the original track that it was on prior to its erratic manoeuvring. Initially, as leader of the formation, they did not perceive a confliction to exist, regardless they manoeuvred away. However, as the PA28 manoeuvred unpredictably it became more of a concern. Thankfully, the other pilot chose a good direction to turn. What is highlighted by this event and subsequent submittal of a supposed Airprox is that the PA28 pilot is unaware of the laws of the air, in particular who is the more manoeuvrable and who must take action to avoid.

Factual Background

The weather at Benson was recorded as follows:

METAR EGUB 261150Z 30008KT 9999 FEW034 14/06 Q1014 NOSIG RMK BLU BLU=

Analysis and Investigation

UKAB Secretariat

Neither pilot was receiving an ATS, however, GPS data provided by the PA28 meant that the aircraft could be identified on the NATS area radars even though none of the aircraft were fitted with Mode S. At 1155:37 (Figure 1) the PA28 was squawking 7000 (the pilot did not change to a Farnborough listening squawk until after the Airprox) and indicated 2500ft. The lead T67 was squawking 7004, but Mode C was not displayed, and did not display for the duration of the Airprox.

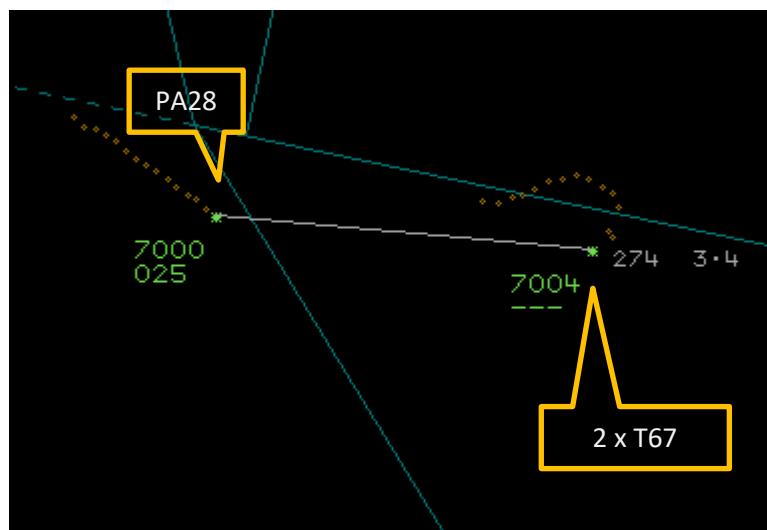


Figure 1:1155:37

By 1156:31 (Figure 2) the T67 formation had crossed in front of the PA28 at a range of 1NM, before turning onto a westerly heading. Figure 3 was generated using the single source Clee Hill radar and has less ‘smoothing’ of the PA28’s track. The two tracks closed to a separation of 0.1NM (Figure 4) when the T67 formation passed down the right-hand-side of the PA28. Due to the lack of Mode C data from the T67s, the vertical separation could not be ascertained.

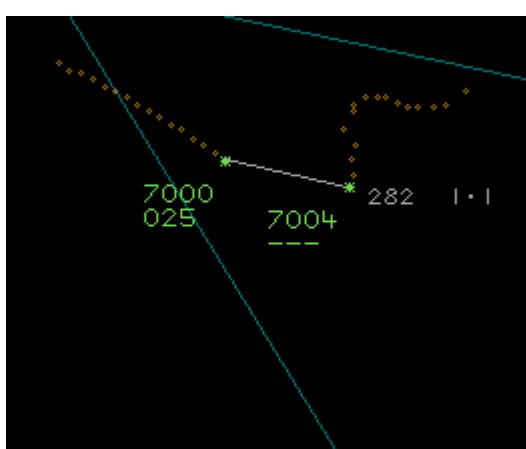


Figure 2: 1156:31



Figure 3: 1156:48 (Clee radar)



Figure 4: 1156:54, CPA

The PA28 and T67 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 T67 pilot was required to give way to the PA28.⁴

Summary

An Airprox was reported when a PA28 and a pair of T67 Fireflies flew into proximity 3.5NM west of Newbury at 1156Z on Wednesday 26th May 2021. Both pilots were operating under VFR in VMC, neither 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.

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.

Due to the exceptional circumstances presented by the coronavirus pandemic, this incident was assessed as part of a ‘virtual’ UK Airprox Board meeting where members provided a combination of written contributions and dial-in/VTC comments.

The Board first looked at the actions of the PA28 pilot. They were on an instructional sortie and reported listening out on the Farnborough frequency, although in fact the radar replay indicated that they did not change to the listening squawk until after the Airprox. Some members wondered whether they would have been better placed calling for an ATS with Farnborough, although it was acknowledged that Farnborough was generally busy and getting a service could be difficult. The SkyEcho2 on the PA28 could not detect the T67s which was not displaying Mode C (**CF3**) and so without an ATS, or electronic conspicuity, the PA28 pilot had no prior situational awareness that the T67s were operating in the vicinity (**CF2**). Both the instructor and student saw the T67s 1-2NM away, they made an early adjustment to their course to remain clear, but as they got closer the instructor became concerned about the proximity, because the T67s appeared to change direction and fly towards them. In the end the instructor took control and took avoiding action to remain clear.

Turning to the T67 pilots, the Board first discussed at length the fact that they were operating without Mode C and displaying a 7004 squawk. A member who also operated in the area told the Board that the airspace in that area was constricted and the T67s were probably operating up to the base of the controlled airspace above them. They opined that there were 3 different ATC units with overlapping coverage (Brize, Benson and Farnborough) consequently there was no best fit to call for an ATS and the 7004 squawk warned ATC units that the aircraft were conducting aerobatics and therefore manoeuvring. Controlling members countered that had the pilots called for an ATS, a unit squawk would be allocated and then other controllers in the area could call that unit for Traffic Information if needed, thus allowing other users the option of finding out the intentions of the aircraft, operating on a 7004 squawk meant that all 3 ATC units would have no way of knowing the intentions of the unknown traffic. Taking both views into consideration, the Board agreed that on balance the T67s would have been better placed with an ATS (**CF1**). Furthermore, without Mode C the T67s denied the CWS in other aircraft the chance of detecting them, as was the case for the PA28 (**CF3**). Some members opined that the T67 operating habits, whilst undoubtedly convenient to them, offered other airspace users and proximate ANSPs little chance of gaining specific situational awareness on their activities, also without an ATS or any CWS in their own aircraft the T67 pilots had no prior knowledge that the PA28 was approaching (**CF2**). They reported being visual with the PA28 at 1-2NM away and believed the PA28 to be 300-500ft below them. In fact, the radar replay indicated that the PA28 did not significantly climb enough to affect the Mode C readout, therefore either the T67 pilot was mistaken, or they themselves had descended because they reported the final vertical separation to be 100-200ft (and the PA28 pilot reported it to be even less). Furthermore, the radar indicated that at 1NM away, the T67s were in the 12 o’clock of the PA28, and then subsequently turned right towards it, closing to 0.1NM. Members wondered whether they believed they had right of way, but even if that was the case, thought that the pilots could have employed a more defensive flying stance and ensured the separation margin was greater, because in continuing they caused the PA28 pilot enough concern that an Airprox was reported (**CF4**). This led the Board to discuss the T67 pilots comments about the ‘laws of the air’, they thought the pilot was probably referring to *SERA 3210 Right of Way* in which it states that if a pilot is aware that another aircraft’s manoeuvrability is impaired they shall give way to that aircraft. However, members agreed that although a close formation as a whole may be considered to be less manoeuvrable than individual aircraft, this was by the choice of those taking part in the formation and that each aircraft’s manoeuvrability was in fact unaffected. Members agreed that this rule was written with a single aircraft in mind and that it could not be used as a means to obtain carte blanche right of way for a formation.

Finally, the Board discussed the risk of collision. In assessing the risk, they took into consideration both pilots’ reports and the separation as indicated on the radar. The radar separation indicated that the aircraft were only 0.1NM apart and this was between the lead aircraft in the T67 formation because, as is standard practise for formation flying, the No2 aircraft was not squawking. The PA28 pilot reported being closer to the No2 and had assessed the risk of collision as ‘high’. Still, members agreed that although the T67 pilots had flown closer to the PA28 than desirable, given that they had been visual with it, there had been no risk of collision. However, they agreed that safety had been degraded and therefore assigned a Risk Category C.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2021058			
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
Flight Elements				
• Tactical Planning and Execution				
1	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				
2	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late or only generic, Situational Awareness
• Electronic Warning System Operation and Compliance				
3	Technical	• ACAS/TCAS System Failure	An event involving the system which provides information to determine aircraft position and is primarily independent of ground installations	Incompatible CWS equipment
• See and Avoid				
4	Human Factors	• Incorrect Action Selection	Events involving flight crew performing or choosing the wrong course of action	Pilot flew close enough to cause concern

Degree of Risk: C.

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:

Flight Elements

Tactical Planning and Execution was assessed as **partially effective** because the T67 pilots did not request an ATS.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither pilot had prior situational awareness that the other was operating in the area.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the SkyEcho2 could not detect the T67s.

See and Avoid were assessed as **partially effective** because the T67 pilot flew close enough to cause the PA28 pilot concern.

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

