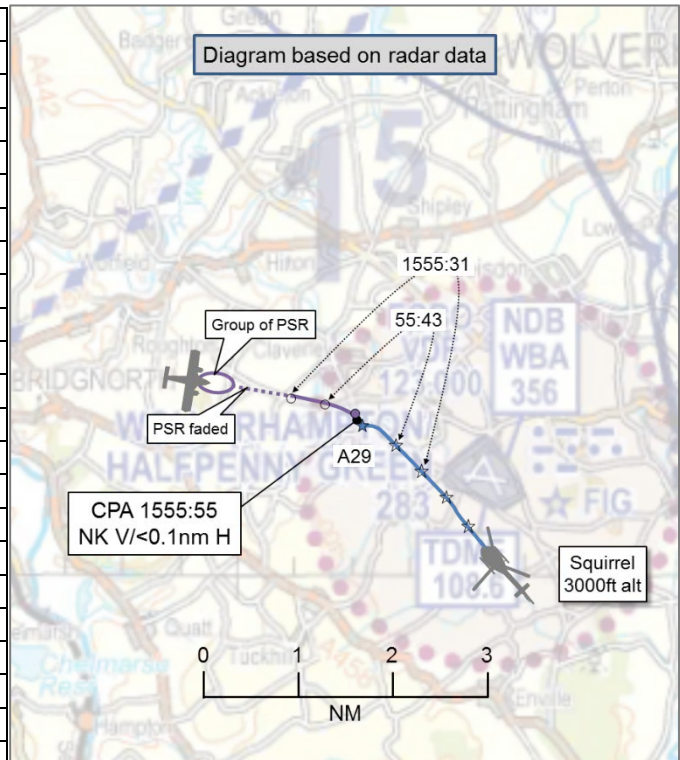


**AIRPROX REPORT No 2018025**

Date: 21 Feb 2018 Time: 1556Z Position: 5232N 00218W Location: 1.5nm W Halfpenny Green

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

Recorded	Aircraft 1	Aircraft 2
Aircraft	Squirrel	Light aircraft
Operator	HQ Air (Trg)	Unknown
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	NK
Service	None <sup>1</sup>	NK
Provider	(Brize LARS)	NK
Altitude/FL	2900ft	NK
Transponder	A, C, S	PSR only
<b>Reported</b>		Not reported
Colours	Yellow, black	
Lighting	NK	
Conditions	VMC	
Visibility	20km	
Altitude/FL	3000ft	
Altimeter	QNH (1026hPa)	
Heading	329°	
Speed	120kt	
ACAS/TAS	TAS	
Alert	None	
<b>Separation</b>		
Reported	50ft V/150ft H	NK
Recorded	NK V/<0.1nm H	



**THE SQUIRREL INSTRUCTOR** reports that he was seated in the left seat, giving IF instruction to an IF-visor equipped student in the right seat. The LHS QHI saw a white and blue low-wing twin-propeller aircraft in the 10:30 position at a range of about 300m on an approximately steady bearing. Control was immediately taken and, having observed no reaction from the other aircraft, a left descending turn commenced through approximately 40° and 50ft. A left turn was initiated because a right turn would have required a longer turn to achieve deconfliction and placed the conflicting aircraft into a blind spot. Shortly after commencing the left-turn, the other aircraft was seen to turn to the right briefly before levelling its wings and continuing on track. The Squirrel crew had been receiving a Traffic Service from Brize Radar and, although communication between Brize Radar and another aircraft had been heard shortly before, had unwittingly flown out of R/T coverage, thereby denying any form of Service. The QHI commented that rear-seat crew members were also looking out, primarily for 2 TAS contacts (not indicating as a threat) in the forward left and right quadrants. The late sighting of the conflicting aircraft was assumed to be due to a combination of constant relative bearing and its light colour scheme blending into the white cloud background and hazy visibility. Aggravating factors were a lack of TAS alert from the Airprox aircraft, unwittingly leaving Brize Radar R/T coverage and the instructional task delaying an earlier change of ATS provider.

He assessed the risk of collision as 'Medium'.

**THE LIGHT AIRCRAFT PILOT** could not be traced.

**THE BRIZE CONTROLLER** reports that he lost 2-way R/T communication with the Squirrel pilot and notified Shawbury ATC. The Shawbury controller advised him in turn when he had established R/T communication with the Squirrel pilot.

<sup>1</sup> The Squirrel pilot had agreed a Traffic Service with the Brize LARS controller but was not in 2-way R/T communication at the time of the Airprox, effectively resulting in no service.

## Factual Background

The weather at Cosford was recorded as follows:

METAR EGWC 211550Z 05003KT 9999 FEW020 BKN034 07/02 Q1027 BLU=

## Analysis and Investigation

### Military ATM

Data is taken from tape transcripts and radar replays from NATS radars, which are not available at Brize Norton ATC and therefore are not representative of the picture available to the controller.

At 15:47:53 (Figure 1), the Brize LARS Controller informed the Squirrel pilot that radar contact had been lost and he was now in receipt of Basic Service (BS). The Controller then attempted a radio check but received no response from the pilot.



Figure 1: Squirrel (3711) when Brize LARS Controller lost radar contact.

At 15:49:25 (Figure 2), the Brize LARS Controller instructed the Squirrel pilot to squawk 7000 and free-call Shawbury, the planned next agency.

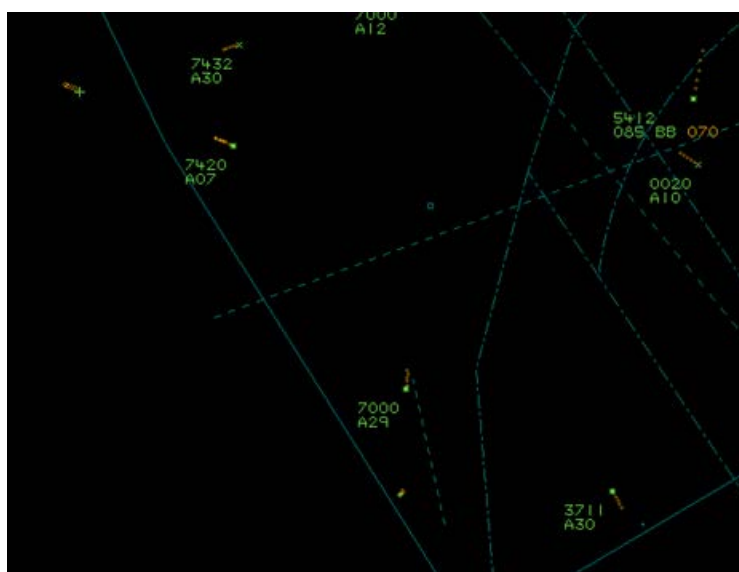


Figure 2: Squirrel (3711) at 15:49:25.

At 15:52:19 (Figure 3), the Squirrel was seen to change from transponder code 3711 to 7000. Shortly after, the Brize LARS Controller spoke to the Shawbury Approach Controller and established that the Squirrel pilot had not yet called on their frequency.

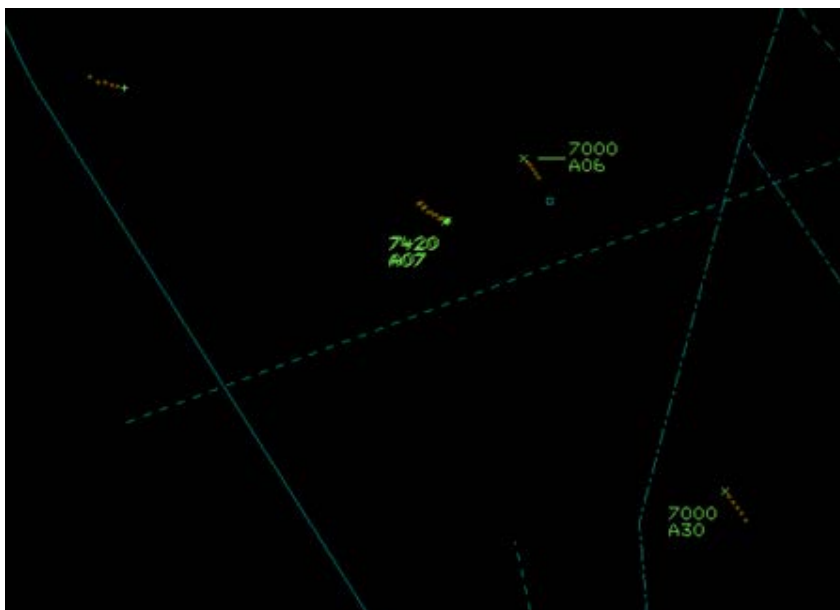


Figure 3: Squirrel (7000) at 15:52:19.

At 15:55:39 (Figure 4), the Squirrel and traffic believed to be the light aircraft had 1nm lateral separation.



Figure 4: Geometry at 15:55:39

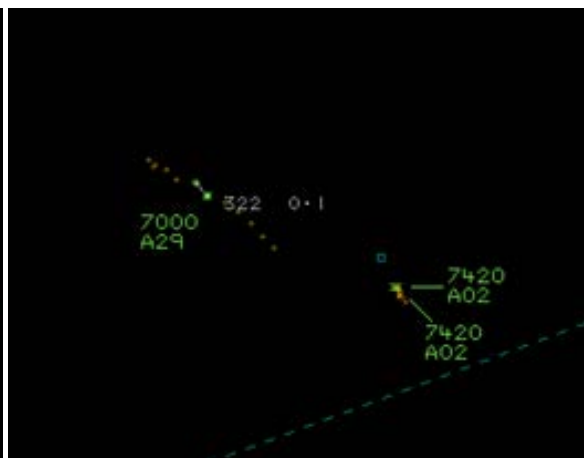


Figure 5: Geometry at 15:55:56

At 15:55:56 (Figure 5), the Squirrel and traffic believed to be the light aircraft were at their lateral CPA as the two tracks crossed. The Squirrel pilot was not in communication with Brize or Shawbury ATC at the time.

The Brize LARS Controller was under training, working with an OJTI. The OJTI remembered little about the time leading up to the Airprox, only that they lost radio contact with the Squirrel pilot and made a blind call to the pilot that he should change to his next en-route frequency.

The Squirrel pilot had been in receipt of Traffic Service from the Brize LARS Controller, but this had been downgraded to Basic Service when radar contact was lost. At that time, the Brize LARS Controller was not aware that the Squirrel pilot was not hearing transmissions and would not have known about the change in FIS provision. The lack of response prompted the Brize LARS Controller to carry out a radio check with the Squirrel pilot, to which there was no response. The Squirrel was 39nm from RAF Brize Norton at that time.

The area to the northwest of RAF Brize Norton is known to have poor radio coverage. Once radio contact had been lost, it was not possible for the Brize LARS Controller to provide Traffic Information to the Squirrel pilot, thereby denying the ATS barrier. The Squirrel was 53.5nm from RAF Brize Norton at the time of the Airprox and its pilot had still not attempted to establish communications with Shawbury ATC.

### **UKAB Secretariat**

The Squirrel and light aircraft pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard<sup>2</sup>. If the incident geometry is considered as converging then the light-aircraft pilot was required to give way to the Squirrel<sup>3</sup>.

When an aircraft carries a serviceable SSR transponder, the pilot shall operate the transponder at all times during flight, regardless of whether the aircraft is within or outside airspace where SSR is used for ATS purposes and, when not receiving air traffic services, select code 7000 in order to improve the detection of suitably equipped aircraft unless otherwise prescribed by the competent authority<sup>4</sup>. When the aircraft carries serviceable Mode C equipment, the pilot shall continuously operate this mode unless otherwise dictated by ATC<sup>5</sup>. Aircraft equipped with Mode S having an aircraft identification feature shall transmit the aircraft identification as specified in Item 7 of the ICAO flight plan or, when no flight plan has been filed, the aircraft registration<sup>6</sup>.

### **Comments**

#### **HQ Air Command**

In this Airprox, 2 of the barriers to MAC were denied to the Squirrel pilot as the unidentified aircraft was not squawking and so could not interact with the TAS on the Squirrel, neither did it provide a known track to the either the Brize or Shawbury controllers. That said, the Squirrel pilot had inadvertently flown out of radio coverage of the selected ATSU and so the controller would have been unable to pass Traffic Information had the unidentified aircraft been on the radar screen.

Controllers at Brize Norton are aware that the radio and radar coverage to the north-west of their location is unpredictable; however, and after having spoken to the Brize controller involved in this incident, there is a balance to be struck between maintaining radar and radio contact with the aircraft and ensuring that the next agency (in this case, Shawbury) will be able to provide a service. On this particular occasion, when the controller commenced the handover to Shawbury it was coincident with the loss of radio and radar contact from Brize Norton and not yet showing on the radar at Shawbury. The Brize controller stated that this was unexpected as she had been controlling aircraft in that area only recently without any problems; she suspected that the aircraft height may have had an effect on the radio range but that it did not occur to her at the time to perhaps ask the pilot to climb (in any case, it is likely that the pilot would have declined a climb due to the prevailing weather conditions). Brize controllers have been reminded of the unpredictability of the radar and radio coverage to the north east and a 'scrolling bulletin' screen in the control room has been implemented, suggesting other agencies that can be used to bridge the gap in coverage between Brize Norton and Shawbury.

The Squirrel pilot, by his own admission, was cognisant of the radio coverage issues and had intended to contact Shawbury earlier. However, other tasks precluded this and thus there was no likelihood of the ATS barrier being available. The final – and effective – barrier in this encounter was lookout. Despite the poor conditions for visual acquisition (light-coloured aircraft against a light background on a near constant relative bearing) the crew did not allow themselves to become overly

<sup>2</sup> SERA.3205 Proximity.

<sup>3</sup> SERA.3210 Right-of-way (c)(2) Converging.

<sup>4</sup> SERA.13001 Operation of an SSR transponder

<sup>5</sup> SERA.13010 Pressure-altitude-derived information

<sup>6</sup> SERA.13015 SSR transponder Mode S aircraft identification setting

focussed on the 2 other TAS contacts that they had and sighted the non-squawking conflicting aircraft in time to take avoiding action.

This incident again highlights the weaknesses in all of the most common barriers to MAC but, importantly, shows that a disciplined lookout scan must be maintained, even when there is a temptation to concentrate on spotting the aircraft displayed on the TAS/TCAS.

## Summary

An Airprox was reported when a Squirrel and an unidentified light aircraft flew into proximity at 1556hrs on Wednesday 21<sup>st</sup> February 2018. The Squirrel pilot was operating under VFR in VMC, previously in receipt of a Traffic Service from Brize Norton but effectively not in receipt of a FIS at the time of the Airprox; the light-aircraft pilot was not in receipt of a FIS from a local airfield.

## **PART B: SUMMARY OF THE BOARD'S DISCUSSIONS**

Information available consisted of a report from the Squirrel pilot, radar photographs/video recordings, a report from the air traffic controller involved and reports from the appropriate ATC and operating authorities.

The Board were further briefed by a military ATC advisor that a 'small overlap' normally existed in which radar and R/T coverage was maintained for handover of traffic between Brize Norton and Shawbury. It was unfortunate that on this occasion conditions were such that the Brize Controller lost R/T contact with the Squirrel pilot very shortly before the planned handover. Brize procedures have subsequently been changed to handover earlier to an 'intermediate' agency to ensure continued R/T and radar coverage.

Members first considered the effective barriers and noted that only the Squirrel pilot's lookout appeared to have resulted in action to avert collision. Although the twin-engine aircraft pilot had reportedly briefly turned right, members noted that this had occurred after the Squirrel pilot had commenced his avoiding action turn and would likely not have increased separation. The barrier of Traffic Information from a Traffic Service had been rendered ineffective by the Squirrel pilot unwittingly flying out of R/T contact with the Brize Radar controller and the Squirrel TAS barrier was rendered ineffective by the light-aircraft's lack of transponder output. Members considered it very unlikely that a light twin-engine aircraft would not be fitted with a transponder although the transponder may not have been serviceable. In the subsequent discussion it became apparent that there was a large body of anecdotal evidence which showed that a significant proportion of pilots and, more worryingly, instructors were not aware of the SERA requirement to ensure that transponders had to be selected on with all available Modes. In light of the failure of the TAS barrier and the significant proportion of pilots who were apparently not aware of the SERA Part C transponder requirements, the Board resolved to recommend that, '*The CAA consider further publicising the SERA Part C transponder requirements*'. Turning to the Airprox itself, members felt that the Squirrel pilot had seen the twin-engine aircraft in time to take emergency avoiding action but that the circumstances were such that the sighting had been at a late stage. It appeared from the Squirrel pilot's report that the twin-engine aircraft's pilot might also have seen the Squirrel, albeit even later than the Squirrel pilot. Consequently, it was agreed that separation had been reduced to a level where safety had been much reduced below the norm.

## **PART C: ASSESSMENT OF CAUSE AND RISK**

<u>Cause:</u>	A late sighting by the Squirrel pilot and probably a late sighting by the light aircraft pilot.
<u>Degree of Risk:</u>	B.
<u>Recommendations:</u>	The CAA consider further publicising the SERA Part C transponder requirements.

## Safety Barrier Assessment<sup>7</sup>

In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that the key factors had been that:

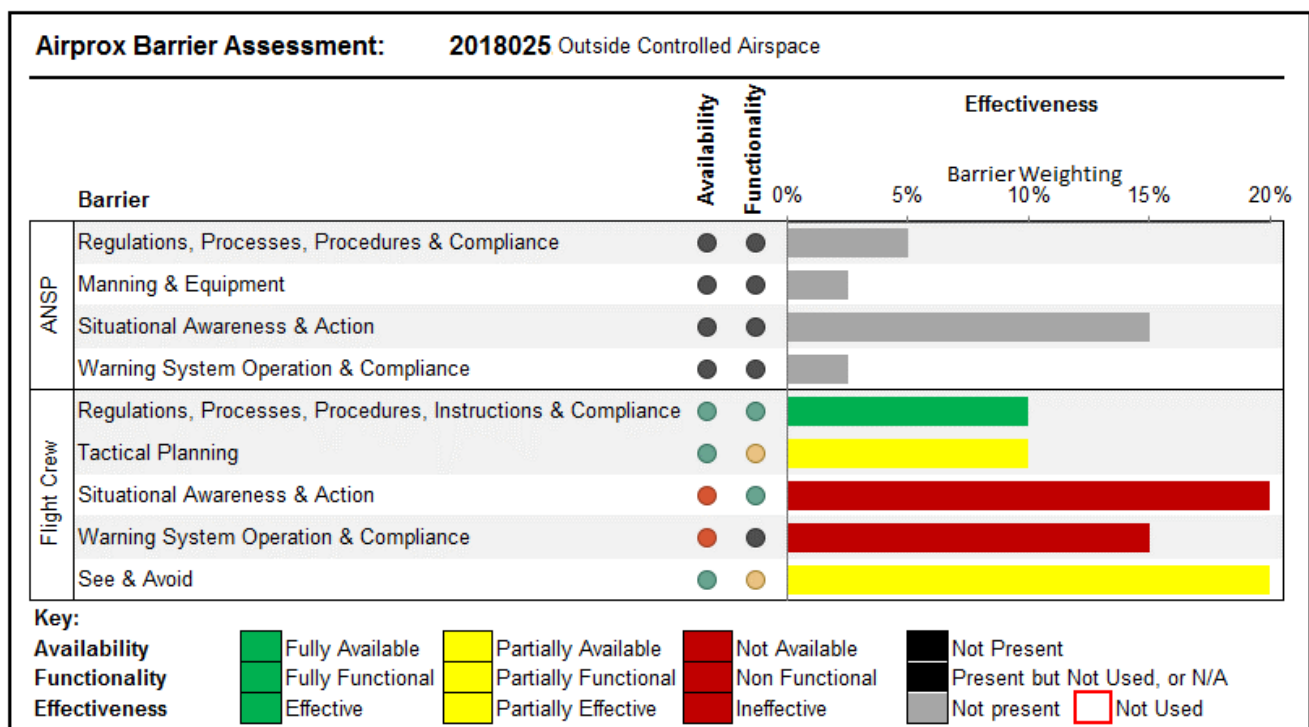
### Flight Crew:

**Tactical Planning** was assessed as **partially effective** because the collision mitigation provided by the Traffic Service was rendered ineffective by the Squirrel crew operating outside surveillance and R/T coverage of the Brize Radar controller.

**Situational Awareness and Action** were assessed as **ineffective** because the Squirrel crew were not aware of the converging light-aircraft.

**Warning System Operation and Compliance** were assessed as **ineffective** because the lack of SSR transponder squawk from the light-aircraft rendered the Squirrel's TAS ineffective.

**See and Avoid** were assessed as **partially effective** because although avoiding action was taken, the Squirrel Instructor saw the light-aircraft at a late stage, and the light-aircraft pilot saw the Squirrel even later, if at all.



<sup>7</sup> The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).