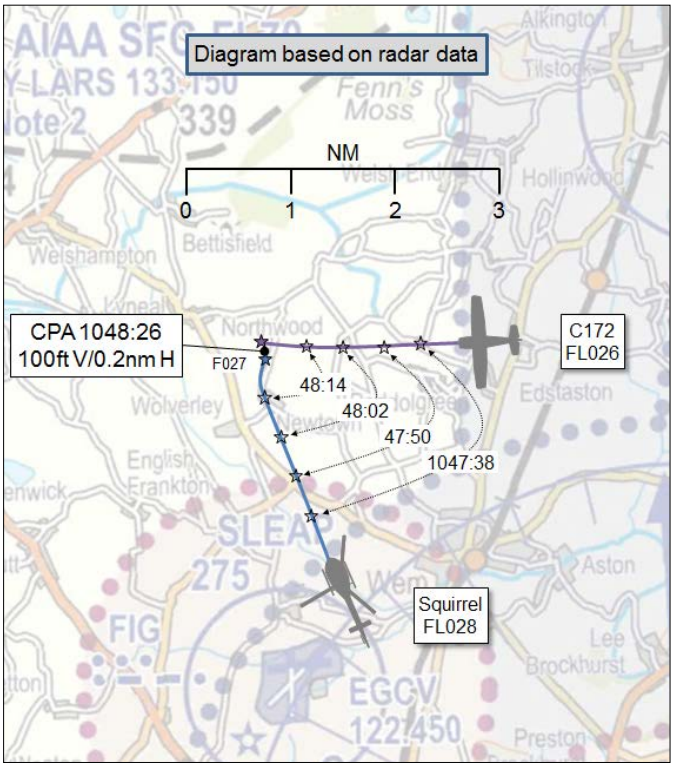
AIRPROX REPORT No 2017115

Date: 14 Jun 2017 Time: 1048Z Position: 5253N 00246W Location: 7nm NW Shawbury

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Squirrel	C172
Operator	HQ Air (Trg)	Civ Pte
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	VFR
Service	Traffic	Basic
Provider	Shawbury	Shawbury
Altitude/FL	FL027	FL026
Transponder	A, C, S	A, C
Reported		
Colours	Yellow, black	White, blue
Lighting	HISL, nav	Beacon
Conditions	VMC	VMC
Visibility	20km	10km
Altitude/FL	2500ft	2800ft
Altimeter	QFE (1007hPa)	QNH (NK hPa)
Heading	360°	270°
Speed	120kt	~108kt
ACAS/TAS	TAS	Not fitted
Alert	TA	N/A
Separation		
Reported	0ft V/300yd H	100ft V/800m H
Recorded	100ft V/0.2nm (405yd/370m) H	



THE SQUIRREL PILOT reports instructing an instrument flying sortie whilst being marshalled at 2500ft QFE between RAF Shawbury and Sleap ATZ. There were numerous traffic [information] calls from ATC that correlated with TAS indications although none required avoiding action due to differing heights or being too far away. Most went unsighted despite good visibility and good lookout by the non-handling pilot (LHS). At a position about 6nm north-northwest from RAF Shawbury, the non-handling pilot saw 'pop-up' traffic on the TAS within the 2nm range scale. At the same time, ATC gave a traffic call that correlated with the TAS. The non-handling pilot looked across the cockpit to the 2 o'clock position and, after a few seconds, saw a white Cessna heading west, on a collision course. The LHS pilot immediately took control and turned hard right to avoid the Cessna. The Squirrel pilot declared an Airprox on the radio.

He assessed the risk of collision as 'Very High'.

THE C172 PILOT reports that the Shawbury controller alerted him to the Squirrel's presence at about 2 miles to the southwest, which they saw slightly below them. As the Squirrel converged, he and the passenger discussed whether to turn right but as they did so, the Squirrel turned right and passed down his left side at a range of about 800m.

He assessed the risk of collision as 'None'.

THE SHAWBURY APPROACH CONTROLLER reports that the Shawbury SSR function was switched off because there had been a discrepancy during a recent flight check and clarification was being sought from HQ Air Command on whether it was useable or not. The Squirrel climbed out on the SID to operate in [an instrument flying training area (IFTA)] and was identified and placed under a Traffic Service (the requested service). The Squirrel was climbed to 2500ft QFE (1007hPa) and turned right onto 340° degrees for the IFTA. Traffic operating in the vicinity of Sleap was called and,

when updated, the Squirrel called visual. The Zone controller passed Traffic Information to the Approach controller on a Basic Service transit to the northeast of Shawbury, tracking west towards Llanbedr and last reported at 2100ft QFE (1007hPa). This traffic was called to the Squirrel pilot at ranges of 5nm and 3nm, both of which were acknowledged, and was called again at 1nm at which point the Squirrel pilot called visual and reported taking avoiding action to the right. The Squirrel pilot then reported an Airprox. The controller noted that he did not have SSR altitude available and made no mention of the reported height of the crossing C172 to the Squirrel pilot because he did not want to lead the pilot into a false sense of security. The controller stated that if SSR had been available he was confident the incident would not have occurred because more accurate traffic information could have been passed.

He perceived the severity of the incident as 'High'.

THE SHAWBURY ZONE CONTROLLER reports working a single frequency during a high intensity period in Blue weather conditions. The unit was working primary radar only, and he had between 7 and 10 Basic Service tracks on frequency (none of which had been formally identified) and 1-3 Traffic Service tracks. He had attempted to maintain track ident on the Basic Service tracks despite a lack of SSR information. He passed Traffic Information to a Basic Service Cessna on traffic south of its position by 3-4nm, tracking northbound and converging. The pilot did not call visual. After telling other free-calling callsigns to standby, the converging path of the 'conflictor' led him to call the track again to the Cessna. At this point the pilot responded with "Oh, I've got contact on that". The controller then continued with the Zone task. The Zone controller noted that the lack of supplementary information made the task of (informally) identifying Basic Service tracks very difficult and of maintaining track ident almost impossible. The Cessna he had been monitoring had remained within solid radar cover throughout.

THE SHAWBURY SUPERVISOR reports that he did not witness the incident. He stated that although traffic intensity was low to medium, it was of a high complexity due to the SSR being unavailable.

Factual Background

The weather at Shawbury was recorded as follows:

```
METAR EGOS 141050Z 15009KT 9999 FEW035 BKN250 22/13 Q1016 BLU NOSIG=
```

Analysis and Investigation

Military ATM

An Airprox occurred on 14 Jun 17 at approximately 1050hrs UTC, 7nm northwest of RAF Shawbury, between a Squirrel and a C172. The Squirrel pilot was receiving a Traffic Service from Shawbury Approach while conducting an IFR departure for general handling, and the C172 was receiving a Basic Service from Shawbury Zone while in transit to the northeast of Shawbury.

Figures 1-7 show the positions of the Squirrel and the C172 at relevant times in the lead up to and during the Airprox. The screen shots are taken from a replay using a NATS radar, which is not used by Shawbury ATC and therefore is not necessarily representative of the picture available to the Shawbury controllers. On the day of the incident, Shawbury ATC was operating primary radar only.

At 10:44:02 (Figure 1), the Shawbury Approach Controller passed Traffic Information to the Squirrel pilot, who was establishing onto heading 340°, "traffic 12 o'clock, in fact 11 o'clock right 1 o'clock, 5 miles, all manoeuvring, no height information".

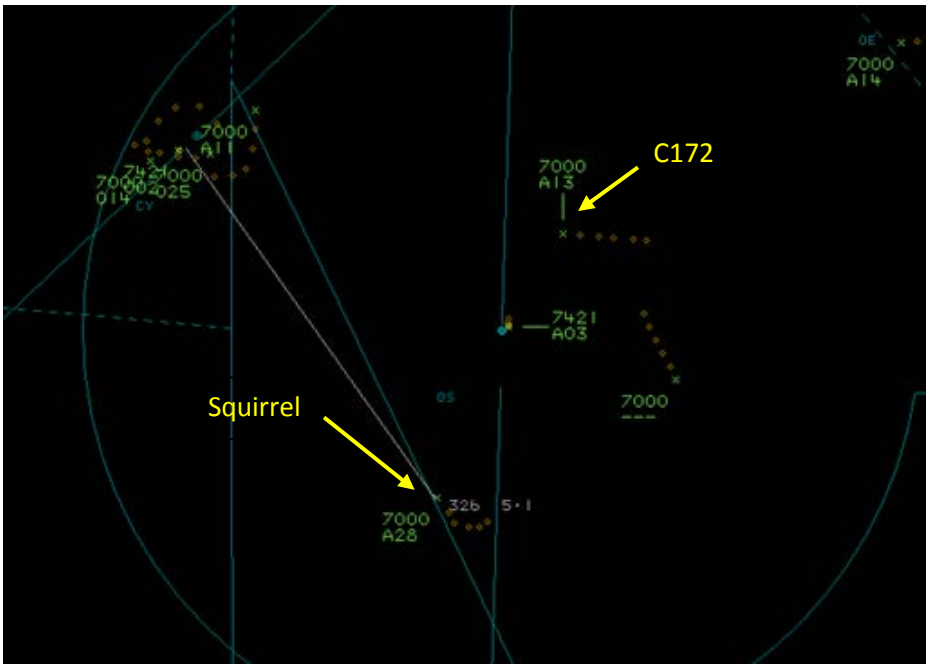


Figure 1: Geometry at 10:44:02

At 10:47:32 (Figure 2), the Shawbury Zone controller passed Traffic Information to the C172 pilot, "traffic believed to be you has traffic… south 2 miles, tracking north, no height information". The pilot responded that he was looking.

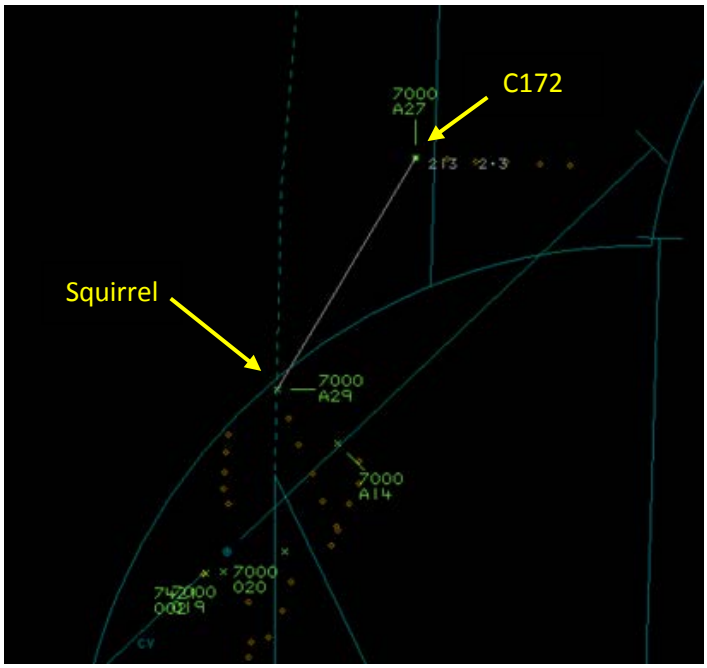


Figure 2: Geometry at 10:47:32

At 10:47:36 (Figure 3), the Shawbury Approach controller passed Traffic Information to the Squirrel for the second time on traffic "right, 1 o'clock, 2 miles, converging right left, no height information". The pilot acknowledged the call but did not call visual.

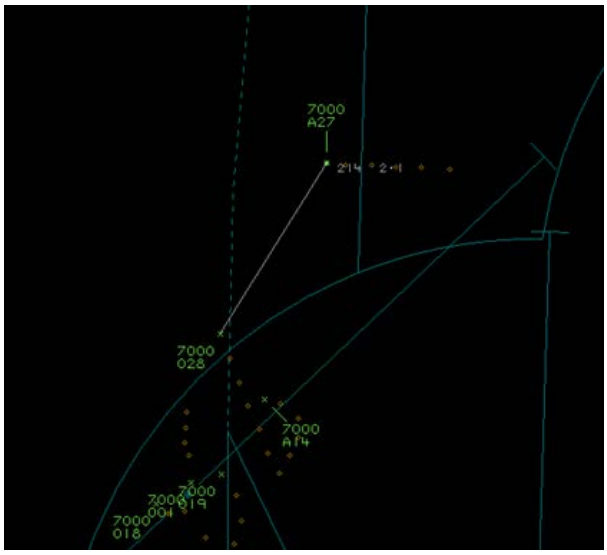


Figure 3: Geometry at 10:47:36

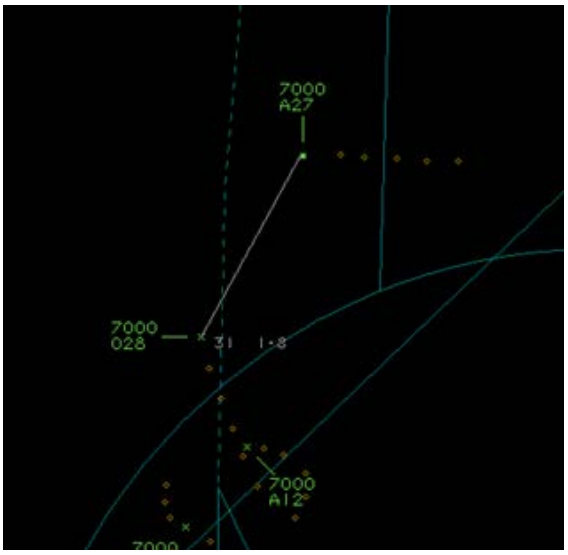


Figure 4: Geometry at 10:47:47

At 10:47:47 (Figure 4), the Shawbury Zone controller passed updated Traffic Information to the C172 pilot, "…traffic left 11 o'clock, one mile, crossing left to right ahead, no height information". The pilot responded that he had contact.

At 10:48:05 (Figure 5), the Shawbury Approach controller passed updated Traffic Information to the Squirrel pilot, "…traffic right, 1 o'clock, one mile, crossing right left". The pilot responded that he was taking an avoiding manoeuvre, having passed within half a mile at the same height.

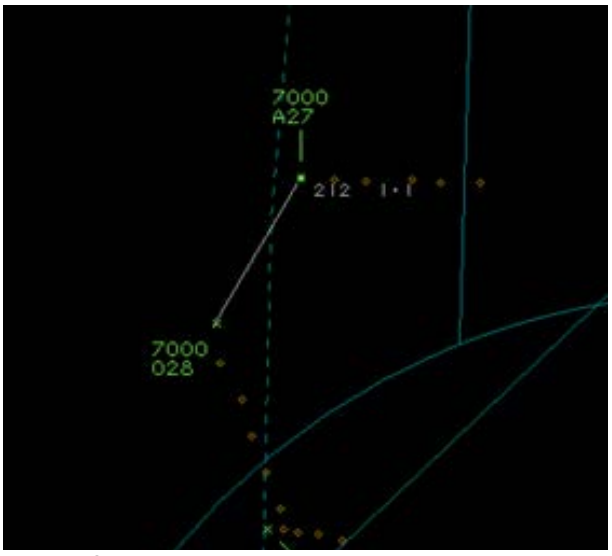


Figure 5: Geometry at 10:48:05

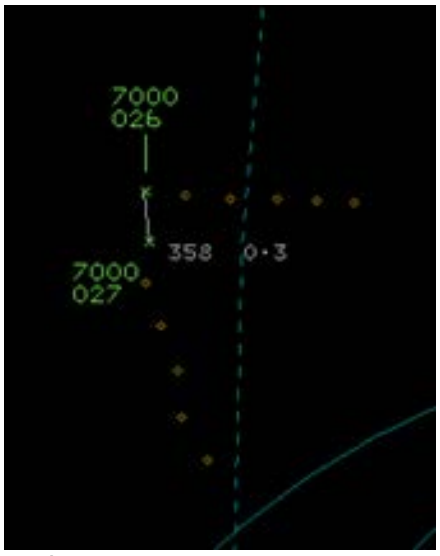


Figure 6: Geometry at 10:48:23

CPA occurred at 10:48:23 (Figure 6) with the Squirrel pilot altering course to the right to pass behind the C172[1].

On the day of the incident, the Shawbury SSR was not in use having failed a calibration check; therefore, Shawbury ATC was operating using primary radar derived information only.

The Shawbury Zone controller was providing Basic Services to between 7 and 10 aircraft around the time of the incident. Having attempted to identify and maintain track-ident on each aircraft, the Zone controller twice passed Traffic Information to the aircraft that he believed to be the C172, when the conflicting traffic was at a range of approximately 2nm and 1nm. The Zone controller informed the Approach controller of an aircraft (the C172) to the northeast of Shawbury, tracking

[1] The radar picture viewed by UKAB Secretariat indicated a horizontal separation of 0.2nm at CPA.

west, last reported at height 2100ft QFE. Although the Zone controller acted beyond the remit of a Basic Service, it did enable the C172 pilot to visually acquire the Squirrel.

The Shawbury Approach controller was providing the Squirrel pilot with a Traffic Service for his transit to an IFR general handling area. Traffic Information was passed to the Squirrel pilot on multiple aircraft working in the vicinity of Sleap, along with updates as the Squirrel transited closer. The Approach controller then passed Traffic Information on the C172 to the Squirrel pilot three times but because there was no mode C visible, and the Zone controller had been unable to recheck current height, only range and bearing information was included. On the third occasion, the Squirrel pilot stated that he was visual and taking an avoiding manoeuvre. The Approach controller fulfilled his responsibility iaw CAP 774.

The Squirrel pilot reported that the Traffic Information passed on traffic operating in the vicinity of Sleap had all correlated with indications on his TAS. The C172 'popped up' on TAS at a range of approximately 2nm and indicated at the same time as the Approach controller passed Traffic Information for the second time, after which it took a few seconds to visually acquire the aircraft.

UKAB Secretariat

The Squirrel and C172 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 converging then the Squirrel pilot was required to give way to the C172[3], which was obliged to maintain heading and speed[4], notwithstanding the overriding responsibility to avoid collision.

Occurrence Investigation

Additional information was obtained via telephone conversation with the non-handling pilot (NHP) and face-to-face interviews with the controllers involved. On the day of the event, the SSR was not in use, having failed a calibration check. The result was an increased number of Traffic Information calls, resulting in higher workloads for controllers and aircrew. During interview, the NHP expressed concern over not receiving deconfliction advice when the Cessna was converging. Additionally, he wondered why the Cessna pilot, having seen the Squirrel earlier, continued on track and did not manoeuvre to avoid. The Radar Approach controller did not have height information and therefore called the conflictor 3 times. Considering the meteorological conditions and assuming that the Squirrel crew had TAS, which would provide more information to the crew, the controller thought that, had the crew been concerned, they would have asked for more information or advice.

Comments

HQ Air Command

Recognising the busy picture developing, the RAF Shawbury Zone controller provided the pilot of the C172 with Traffic Information on the Squirrel even though he was in receipt of only a Basic Service and the controller was not obliged to keep track of the C172. Equally, the Approach controller informed the Squirrel pilot of the presence of multiple contacts at a range of 5 miles and subsequently refined the TI to specifically warn of the converging C172 at 4 miles, 2 miles and 1 mile range, which the Squirrel pilot acknowledged. The C172 pilot, having become visual with the Squirrel at a range of between 1 and 2 miles, appears to have initially been comfortable with the separation between the aircraft. Just as the C172 pilot considered manoeuvring, the Squirrel pilot became visual and took avoiding action. It is unclear why the Squirrel pilot continued on track when the controller was advising of a contact on a constant bearing at 2 miles and then 1 mile,

[2] SERA.3205 Proximity.
[3] SERA.3210 Right-of-way (c)(2) Converging, and as reflected in MAA RA 2307(1) paragraph 12.
[4] SERA.3210 Right-of-way (a).

though it is possible that he wished to maintain the heading that the controller had issued on climb-out. When the contact called by ATC correlated with a contact on TAS, the NHP was able to visually identify the Cessna and took avoiding action. Crews should use all available means to avoid aerial conflict – at times this could be prior to visual contact being achieved. Both the TAS and the TI indicated a contact that was closing on a constant bearing and so action could have been taken to break the conflict without waiting to actually see the other aircraft. It should also be noted that non-SSR operations increase the workload on controllers because 3-dimensional information of aircraft position is no longer available. During times of uncertainty or concern, it would be entirely appropriate to abandon the air exercise in order to maximise crew lookout.

Summary

An Airprox was reported when a Squirrel and a C172 flew into proximity at 1048 on Wednesday 14th June 2017. Both pilots were operating in VMC, the Squirrel pilot under IFR in receipt of a Traffic Service from Shawbury, and the C172 pilot under VFR in receipt of a Basic Service, also from Shawbury.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, transcripts of the relevant RT frequencies, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

Members first considered the actions of the controllers involved. It was apparent that without SSR they were operating in a very high-workload environment and members commented that although the Shawbury Zone controller was not required to pass Traffic Information to the C172 pilot in receipt of only a Basic Service, his doing so had materially improved the situation. The Shawbury Approach controller was also operating under a high workload but persisted in passing Traffic Information to the Squirrel pilot on a contact which had no altitude information but which he had been informed by the Zone controller had been at 2100ft. The Board agreed that the controllers' persistence and proactive conduct had significantly decreased the collision risk and commended them both for their actions. Some members questioned whether either or both controllers should have limited their service provision in order to mitigate the non-SSR high-workload. Neither chose to do so, and a military ATC member advised that a service would normally only be limited if surveillance was SSR-only, i.e. a lack of primary–only contact information. During the discussion, a comment was made regarding whether ATC had effectively issued the Squirrel with a vector that had taken it into conflict with the C172. However, the CAA Airspace advisor pointed out that, under the terms of a Traffic Service, CAP774 stated that:

'When providing headings/levels for the purpose of positioning and/or sequencing or as navigational assistance, the controller should take into account traffic in the immediate vicinity based on the aircraft's relative speeds and closure rates, so that a risk of collision is not knowingly introduced by the instructions passed. However, the controller is not required to achieve defined deconfliction minima and pilots remain responsible for collision avoidance even when being provided with headings/levels by ATC.'[5]

He went on to note that the ATC vector was issued at 1043, some 5½ minutes before CPA, and that the C172 would not be considered to be 'in the immediate vicinity' at that time.

Turning to the pilots, members noted that the C172 pilot had been passed Traffic Information on the Squirrel twice, was aware that the Squirrel pilot was required to give way, and reported visual with the Squirrel about 30 seconds before CPA. Under the requirements of collision avoidance, the C172 pilot was required to maintain course and speed, which he did, and was discussing a potential avoidance manoeuvre when the Squirrel pilot turned right and passed behind the C172, albeit at a range somewhat less than that reported. Members agreed that there was a fine dividing line between the requirements of SERA.3210 (maintain heading and speed) and SERA.3205 (avoid collision hazard),

[5] CAP 774 (UK Flight Information Services), Chapter 3 (Traffic Service), para 3.6 (Deconfliction).

and that the C172 pilot had correctly prioritised his actions. For his part, the Squirrel pilot had been given a vector to the 'IF Box A', and was then passed Traffic Information on the C172 on 3 occasions. Members were perplexed by the Squirrel crew's inaction given that they were required to give way to the C172, and wondered if the crew may have considered that the traffic was not likely to be at their level. If so, this assumption was considered ill-advised, especially in light of the second Traffic Information call, given at a separation range of 2nm and containing the word 'converging'. Members also wondered whether the Squirrel pilot was operating under the mistaken belief that he was in receipt of some form of radar control, having been issued with a height and heading. The Squirrel pilot had requested, and was in receipt of, a Traffic Service, and presumably would have been aware that deconfliction advice would not be issued; although, in a subsequent interview he seemed surprised that it had not been issued. Similarly, the Squirrel pilot had questioned the C172 pilot's lack of avoidance manoeuvre when he would presumably have been aware that it was he who was required to give way to the C172, (and who's pilot was required to maintain heading). Overall, the Board considered that the Squirrel crew had had ample information with which to discharge their responsibility to give way to the C172, yet had not done so until at a late stage, when avoiding action was required. It was self-evident that the Squirrel crew had not planned to fly into proximity with the C172, and members considered that the crew had therefore probably either been operating under an erroneous appreciation of their collision avoidance responsibilities or had not assimilated the conflict. As such, the Board agreed that the Squirrel pilot had flown into conflict with the C172, but were satisfied that both pilots' situational awareness was such that risk of collision was averted.

PART C: ASSESSMENT OF CAUSE, RISK AND SAFETY BARRIERS

Cause: The Squirrel pilot flew into conflict with the C172.

Degree of Risk: C.

Safety Barrier Assessment[6]

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

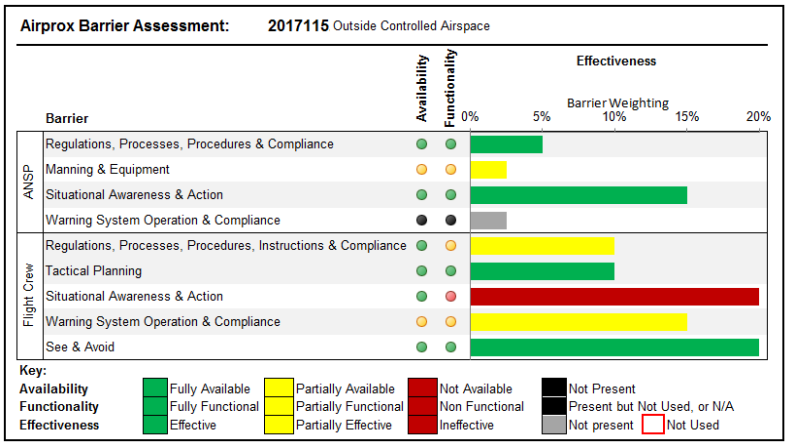
ANSP:

Manning and Equipment were assessed as **partially effective** because the Shawbury radar was operating without secondary surveillance information.

Flight Crew:

Regulations, Processes, Procedures, Compliance and Instructions were assessed as **partially effective** because the Squirrel crew did not give way to the C172.

Situational Awareness and Action were assessed as **ineffective** because the Squirrel crew were passed Traffic Information on the C172, converging from their right, yet maintained a constant track.



Warning System Operation and Compliance were assessed as **partially effective** because the Squirrel TAS did not indicate the converging C172 until within 2nm.

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