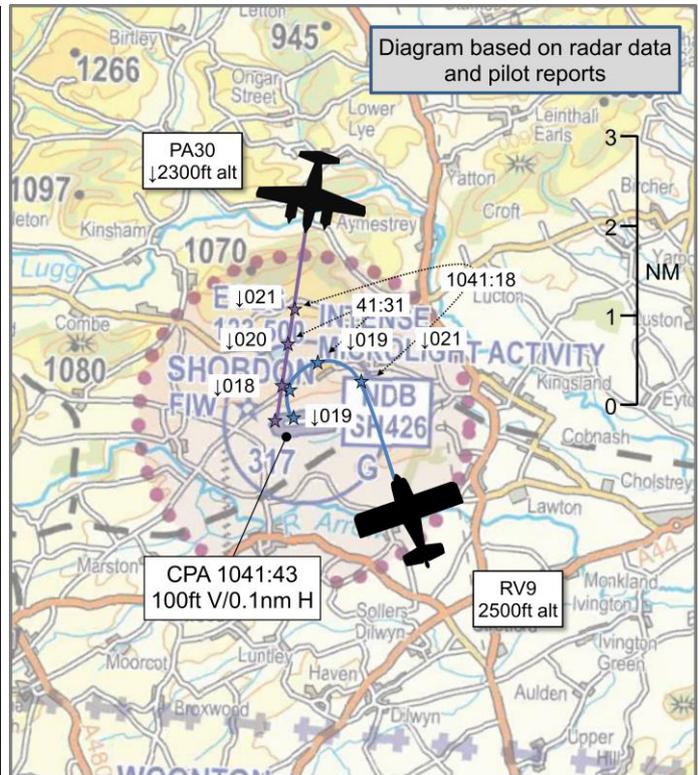


**AIRPROX REPORT No 2016210**

Date: 08 Sep 2016 Time: 1042Z Position: 5214N 00253W Location: Shobdon airfield

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

Recorded	Aircraft 1	Aircraft 2
Aircraft	RV9	PA30
Operator	Civ Pte	Civ Pte
Airspace	ATZ	ATZ
Class	G	G
Rules	VFR	VFR
Service	Information	Information
Provider	Shobdon FISO	Shobdon FISO
Altitude/FL	FL19	FL18
Transponder	A,C,S	A,C,S
<b>Reported</b>		
Colours	White/blue	White/red stripes
Lighting	Strobes	NK
Conditions	VMC	VMC
Visibility	10km	>10km
Altitude/FL	1500ft	1200ft
Altimeter	QFE	NK
Heading	180°	180°
Speed	140kt	130kt
ACAS/TAS	Not fitted	Not fitted
<b>Separation</b>		
Reported	Nil V/100m H	NK V/300m H
Recorded	100ft V/0.1nm H	



**THE VAN'S RV9 PILOT** reports that he heard the pilot of the other aircraft call Shobdon and report 10nm out to the north and ask for airfield information. He decided to do an overhead join for RW27L and called that he was 5nm south and going to join overhead. He was asked to report overhead. On reaching the overhead position just to the east of the RW27 threshold he called overhead descending for RW27L. As he commenced his descending turn the other pilot also called overhead. At this point there was no sign of the other aircraft. He continued his descending turn to level out at 1500ft just to the east of the RW09 threshold. He was asked by the FISO if he had the other aircraft in sight. He replied no, but changed that to yes when he saw the aircraft about 100 yards off the right wing but already turning away. The issue here is the use of the overhead join and position reporting. He called overhead when overhead the runway. The other pilot called overhead when he entered the ATZ. The other pilot performed a deadside descent while he carried out a standard overhead join. He could not see him at any time he was descending. He thought that, with hindsight, he should have abandoned the overhead join and left the area as the other pilot was a visitor and not familiar with Shobdon or its procedures.

He assessed the risk of collision as 'High'.

**THE PIPER PA30 TWIN COMANCHE PILOT** reports that he was inbound to Shobdon on an IFR flight plan, initially working Shawbury. They descended to 2500ft (now VFR he reported) and were vectored towards the airfield. They were handed over to Shobdon Radio who informed them that the runway was RW27, left-hand circuit. He stated that they were asked to report overhead descending on the downwind leg. At this time they heard another pilot call Shobdon reporting he was at 4nm, flying to the overhead. Shobdon informed them that there was an RV aircraft coming into the overhead at the same time as them and to keep a good look-out. The non-flying pilot, seated in the right-hand seat, spotted the RV to their left and behind their aircraft at approximately 8 o'clock about 300m away. The pilot was informed of its position. He informed Shobdon that they had the aircraft

visual and that they would extend to allow the pilot to come into the circuit and land ahead of them. This was acknowledged by Shobdon. They extended their overhead join to about 2-3nm, then turned left onto the downwind leg. This extension also allowed the RV pilot, who was now on final approach, to land. The RV was kept in visual contact at all times. They turned onto base leg and final after the RV had landed and proceeded to land. At no time did they think there was a critical lack of separation. On joining the overhead the RV was behind and to the left of their aircraft; they were faster than the RV.

He assessed the risk of collision as 'Low'.

## **Factual Background**

The weather at Shawbury was recorded as follows:

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EGOS 081050Z 23020KT 9999 FEW030 19/12 Q1008 BLU NOSIG
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The Shobdon circuit for powered aircraft (wide circuits) RW27 is left-hand. The local instructions for overhead joins:

*'Standard overhead join, not below 1500ft QFE deadside due gliding. Descend to circuit height south of runway.'*

## **Analysis and Investigation**

### **CAA ATSI**

After reviewing the area surveillance recordings in conjunction with the recorded R/T from Shobdon, it became apparent that there was a disparity between the two recordings suggesting that the Shobdon recorder's time source was incorrect. The recorder in use at Shobdon is also of the 'voice-activated' type; therefore, all references to times in this report refer solely to the time stamp on the area surveillance recordings. It was not possible to identify the RV9 using the area surveillance recordings; however, a radar contact transponding the general conspicuity code 7000 was observed to manoeuvre in a manner consistent with the written reports received from both pilots.

The RV9 pilot was re-joining the Shobdon circuit from the south after a local VFR sortie. He elected to join via the overhead for a standard overhead join and was in receipt of an Aerodrome Flight Information Service from Shobdon Information. The PA30 (code 7431) was on an IFR flight plan; however, at the time of the Airprox was flying in accordance with VFR. The PA30 pilot also elected to join overhead.

The PA30 pilot contacted Shobdon Information with 10nm to run to the aerodrome and advised the Shobdon AFISO that he would report downwind left-hand for RW27. The Shobdon AFISO then questioned the PA30 pilot with regard to how he intended to join the circuit. The PA30 pilot then reported that he would join overhead for a left-hand circuit on RW27, to which the AFISO requested that he report when overhead.

The RV9 pilot reported 5nm south of Shobdon at 2000ft, positioning for an overhead join for a left-hand circuit on RW27 and advised the Shobdon AFISO that he had copied the PA30 traffic. The AFISO then requested the RV9 pilot to report overhead.

The RV9 pilot reported overhead before the PA30. Figure 1 shows the traffic situation at 1041:07; at this time the radar contact believed to be the RV9 was overhead Shobdon Aerodrome indicating Flight Level (FL)025. The PA30 was opposite direction 1.9nm north-north-west of the RV9 indicating FL023.

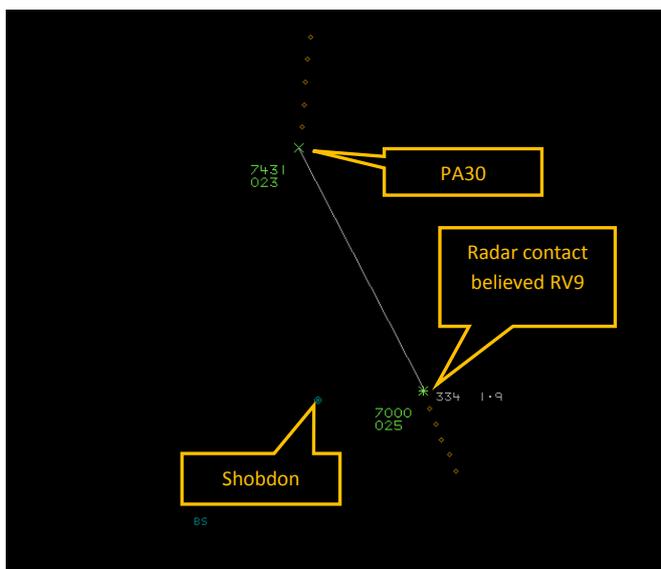


Figure 1 – 1041:07.

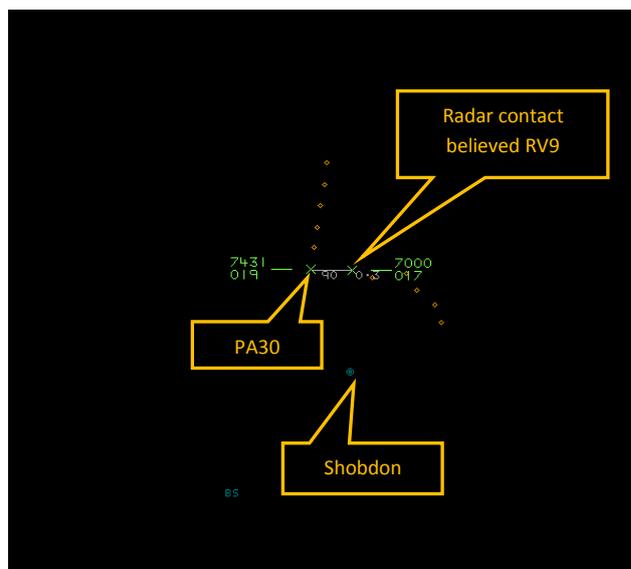


Figure 2 – 1041:35.

When the PA30 pilot reported overhead at 2000ft, the Shobdon AFISO requested that he descend not below 1500ft on the deadside for noise abatement reasons. The AFISO then passed Traffic Information on the RV9 to the PA30 pilot, describing the RV9 as being “ahead” and “also overhead”. The PA30 pilot reported to the AFISO that he was looking for the traffic. Figure 2 shows the traffic situation at 1041:35, with the PA30 pilot having descended deadside on a southerly track and the traffic believed to be the RV9 in a left-hand turn to the north of the aerodrome.

The Shobdon AFISO updated the Traffic Information to the RV9 pilot on the PA30. In response, the RV9 pilot reported that he was just about to cross the RW09 threshold at 1500ft and not being visual with the PA30. The PA30 pilot then reported visual with the RV9. In the PA30 pilot’s written report he stated that he “...spotted the RV to the left of our aircraft and behind at approximately our 8 o’clock and about 300 metres away”. CPA between the PA30 and the radar contact believed to be the RV9 occurred at 1041:44 (Figure 3) with a minimum horizontal distance of 0.1nm and a minimum vertical distance of 100ft.

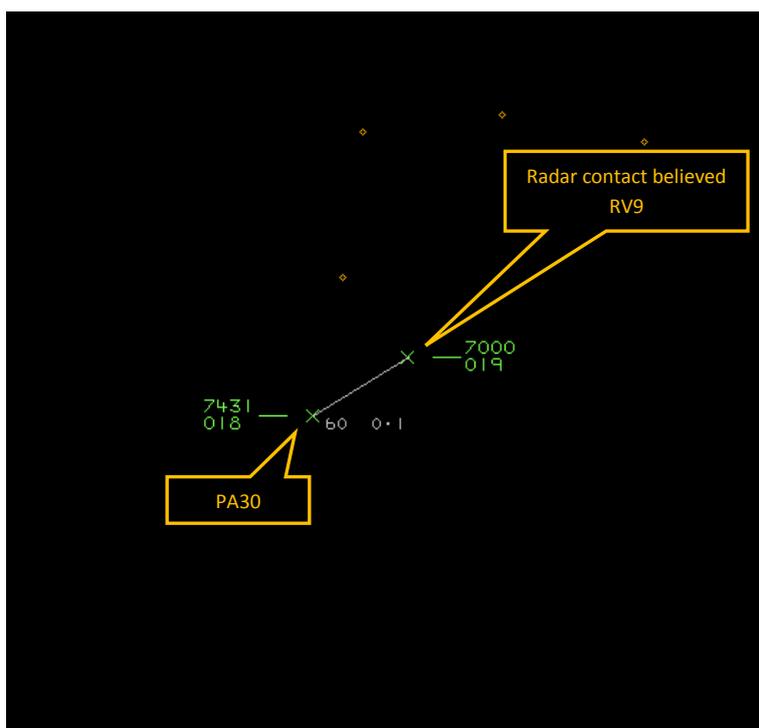


Figure 3 – 1041:44 (CPA).

The Shobdon AFISO passed timely and appropriate Traffic Information to both the PA30 and the RV9 pilots as they approached the aerodrome. The AFISO was providing an Aerodrome Flight Information Service within Class G (uncontrolled) airspace. AFISOs are not permitted to issue instructions to aircraft in the air<sup>1</sup>, pilots therefore are wholly responsible for collision avoidance in conformity with the Rules of the Air.

## UKAB Secretariat

The RV9 and PA30 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>. An aircraft operated on or in the vicinity of an aerodrome shall conform with or avoid the pattern of traffic formed by other aircraft in operation<sup>3</sup>.

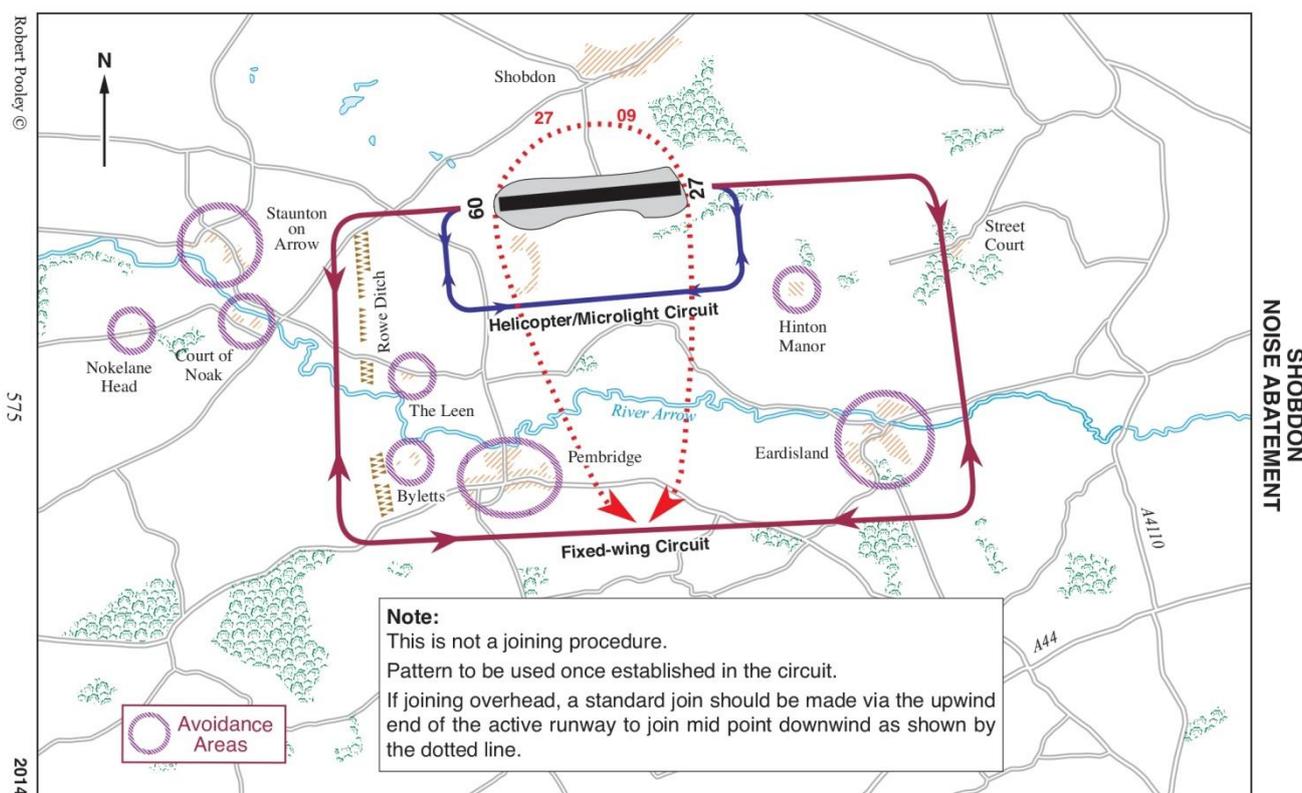


Figure 4 Shobdon Noise Abatement.

## Summary

An Airprox was reported when an RV9 and a PA30 flew into proximity at 1042 on Thursday 8<sup>th</sup> September 2016. Both pilots were inbound to Shobdon, to join overhead for RW27L, and were in receipt of an Aerodrome Flight Information Service from Shobdon: the RV9 pilot was on a local flight from Shobdon and was re-joining the circuit from the south; the PA30 pilot was inbound from the north. Traffic Information was issued to both pilots.

<sup>1</sup> CAP 797 Chapter 1.

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

<sup>3</sup> SERA.3225 Operation on and in the Vicinity of an Aerodrome.

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

Information available included reports from both pilots, area radar and RTF recordings and reports from the appropriate ATC and operating authorities.

The Board first looked at the actions of the RV9 pilot and noted that he had contacted the Aerodrome FISO when 5nm south of the airfield at 2000ft; he advised that he would join overhead and was aware of the PA30. He was requested to report overhead, which he did as he flew just to the east of the RW27 threshold at 2000ft. He then flew the standard overhead join procedure as he descended deadside to fly over the upwind end of RWY27. Knowing that the PA30 pilot had also been requested to join overhead before him, GA members commented that the RV9 pilot would now have been actively searching for the PA30 following the same procedure, and so would not have been expecting the PA30 to fly from the north, descending direct to the upwind end of RWY27.

For his part, the Board noted that the PA30 pilot had contacted the Aerodrome FISO when 10nm from the airfield, advising that he would report downwind left-hand for RW27. After the FISO queried his routeing, the PA30 pilot responded that he would join overhead and the FISO requested him to report overhead. The radar recordings show that when the RV9 pilot reported overhead, the PA30 was close to the northern boundary of the ATZ. When the PA30 pilot subsequently reported overhead he was requested by the FISO to descend not below 1500ft on the deadside and was informed about the RV9, which was ahead and also in the overhead. The radar recordings show that as the RV9 pilot was descending on the deadside, north of the airfield, the PA30 pilot was descending on what was effectively a southerly crosswind join ending up 0.3nm ahead of the RV9 and 200ft above. It was apparent to the Board that the PA30 pilot had not joined overhead. When updated Traffic Information was issued to the RV9 pilot on the PA30, the RV9 pilot reported that he was just about to cross the RW09 threshold at 1500ft and was not visual with the PA30, presumably because he had been looking towards the overhead. The PA30 pilot then reported that he was visual with the RV9 and stated in his report that he had sighted it in his 8 o'clock, about 300m away and informed the FISO that he would give way to the RV9. The RV9 pilot reported that he had then seen the PA30 about 100 yards off his right wing but the aircraft was then turning away.

Noting that FISOs are not permitted to issue instructions to pilots in the air, the Board commended the FISO for passing appropriate and timely Traffic Information to both pilots. As a result they were both aware of the other aircraft's arrival and intended routeing, and were cued to look for the other aircraft when events unfolded otherwise.

In assessing the safety barriers relevant to this incident, the Board considered that the following were the key factors:

- **Flight Crew Pre-Flight Planning** was assessed as only **partially effective** because the PA30 pilot did not appear to have a properly formed plan to join overhead.
- **Flight Crew Compliance With ATC Instructions** was considered **ineffective** because the PA30 pilot did not fly an overhead join as requested.
- **Flight Crew Situational Awareness** was considered to be **partially effective** because the RV9 pilot was not aware of the PA30's position as a result of its pilot not flying the standard overhead join.
- **See-and-Avoid** was assessed as **ineffective** because neither pilot saw the other until effectively after CPA.

Turning to the cause and risk of the incident, the Board agreed that the PA30 pilot had not called in the overhead correctly, and it seemed that instead the PA30 pilot had reverted to his original intention of positioning to the downwind without proceeding through the overhead as requested and stated he would. Members therefore quickly decided the cause of the Airprox was that the PA30 pilot did not fly an overhead join and flew into conflict with the RV9. The Board then considered the risk. Noting that

the radar recordings showed that at CPA the two aircraft were only 100ft vertically and 0.1nm horizontally apart, and that neither pilot had seen the other aircraft until after CPA, the Board agreed that it had only been chance that had prevented an actual collision. Accordingly the Board assessed the Airprox as risk Category A

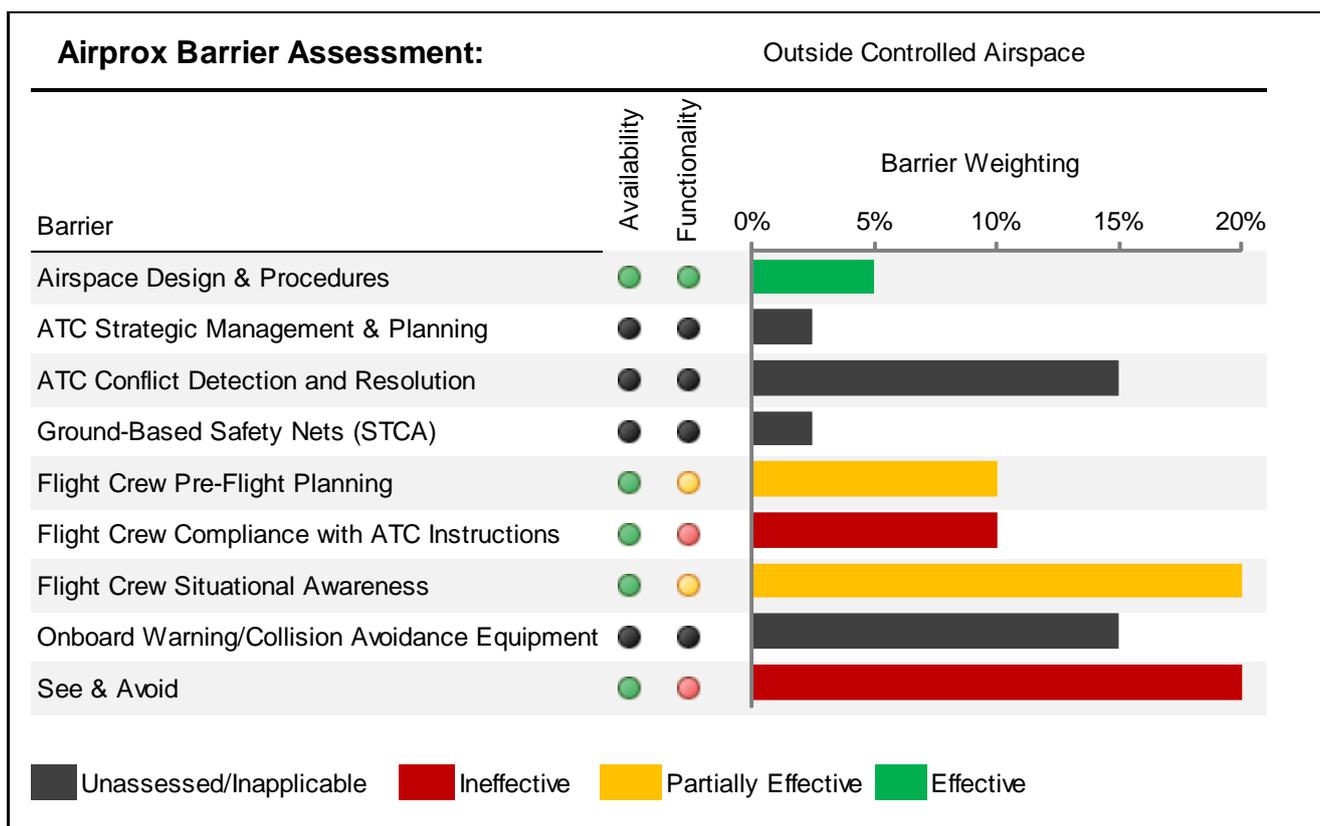
**PART C: ASSESSMENT OF CAUSE AND RISK**

Cause: The PA30 pilot did not fly an overhead join and flew into conflict with the RV9.

Degree of Risk: A.

Barrier assessment:

Modern safety management processes employ the concept of safety barriers that prevent contributory factors or human errors from developing into accidents. Based on work by EASA, CAA, MAA and UKAB, the following table depicts the barriers associated with preventing mid-air-collisions. The length of each bar represents the barrier's weighting or importance (out of a total of 100%) for the type of airspace in which the Airprox occurred (i.e. Controlled Airspace or Uncontrolled Airspace).<sup>4</sup> The colour of each bar represents the Board's assessment of the effectiveness of the associated barrier in this incident (either Fully Effective, Partially Effective, Ineffective, or Unassessed/Inapplicable). The chart thus illustrates which barriers were effective and how important they were in contributing to collision avoidance in this incident.



<sup>4</sup> Barrier weighting is subjective and is based on the judgement of a subject matter expert panel of aviators and air traffic controllers who conducted a workshop for the UKAB and CAA on barrier weighting in each designation of airspace.

Barrier Effectiveness		Consequence		
		Non-functional	Partially Functional	Functional
Availability		1	2	3
Completely Unavailable	1	1	2	3
Partially Available	2	2	4	6
Available	3	3	6	9

Key:

	Effective
	Partially Effective (If the system was partially available but fully functional score availability as 2.5)
	Ineffective
	Unassessed/Inapplicable

Barrier	Availability			Functionality			Unassessed / Absent
	Fully (3)	Partially (2)	Not Available (1)	Fully (3)	Partially (2)	Non Functional (1)	
<b>Airspace Design and Procedures</b>	Appropriate airspace design and/or procedures were available	Airspace design and/or procedures were lacking in some respects	Airspace design and/or procedures were not appropriate	Airspace design and procedures functioned as intended	Airspace design and/or procedures did not function as intended in some respects	Airspace design and/or procedures did not function as intended	<p>The Board either did not have sufficient information to assess the barrier or the barrier did not apply; e.g. TCAS not fitted to either aircraft or ATC Service not utilised.</p> <p>Note: The Board may comment on the benefits of this barrier if it had been available</p>
<b>ATC Strategic Management and Planning</b>	ATM were able to man and forward plan to fully anticipate the specific scenario	ATM were only able to man or forward plan on a generic basis	ATM were not realistically able to man for or anticipate the scenario	ATM planning and manning functioned as intended	ATM planning and manning resulted in a reduction in overall capacity (e.g. bandboxed sectors during peak times)	ATM planning and manning were not effective	
<b>ATC Conflict Detection and Resolution</b>	ATS had fully serviceable equipment to provide full capability	ATS had a reduction in serviceable equipment that resulted in a minor loss of capability	ATS had a reduction in serviceable equipment that resulted in a major loss of capability	The controller recognised and dealt with the conflict in a timely and effective manner	The controller recognised the conflict but only partially resolved the situation	The controller was not aware of the conflict or his actions did not resolve the situation	
<b>Ground-Based Safety Nets (STCA)</b>	Appropriate electronic warning systems were available	Electronic warning systems is not optimally configured (e.g. too few/many alerts)	No electronic warning systems were available	Electronic warning systems functioned as intended, including outside alerting parameters, and actions were appropriate	Electronic warning systems functioned as intended but actions were not optimal	Electronic warning systems did not function as intended or information was not acted upon	
<b>Flight Crew Pre-Flight Planning</b>	Appropriate pre-flight operational management and planning facilities were deemed available	Limited or rudimentary pre-flight operational management and planning facilities were deemed available	Pre-flight operational management and planning facilities were not deemed available	Pre-flight preparation and planning were deemed comprehensive and appropriate	Pre-flight preparation and/or planning were deemed lacking in some respects	Pre-flight preparation and/or planning were deemed either absent or inadequate	
<b>Flight Crew Compliance with Instructions</b>	Specific instructions and/or procedures pertinent to the scenario were fully available	Instructions and/or procedures pertinent to the scenario were only partially available or were generic only	Instructions and/or procedures pertinent to the scenario were not available	Flight crew complied fully with ATC instructions and procedures in a timely and effective manner	Flight crew complied later than desirable or partially with ATC instructions and/or procedures	Flight crew did not comply with ATC instructions and/or procedures	
<b>Flight Crew Situational Awareness</b>	Specific situational awareness from either external or onboard systems was available	Only generic situational awareness was available to the Flight Crew	No systems were present to provide the Flight Crew with situational awareness relevant to the scenario	Flight Crew had appropriate awareness of specific aircraft and/or airspace in their vicinity	Flight Crew had awareness of general aircraft and/or airspace in their vicinity	Flight Crew were unaware of aircraft and/or airspace in their vicinity	
<b>Onboard Warning/Collision Avoidance Equipment</b>	Both aircraft were equipped with ACAS/TAS systems that were selected and serviceable	One aircraft was equipped with ACAS/TAS that was selected and serviceable and able to detect the other aircraft	One aircraft was equipped with ACAS/TAS that was selected and serviceable but unable to detect the other aircraft (e.g. other aircraft not transponding)	Equipment functioned correctly and at least one Flight Crew acted appropriately in a timely and effective manner	ACAS/TAS alerted late/ambiguously or Flight Crew delayed acting until closer than desirable	ACAS/TAS did not alert as expected, or Flight Crew did not act appropriately or at all	
<b>See and Avoid</b>	Both pilots were able to see the other aircraft (e.g. both clear of cloud)	One pilots visibility was uninhibited, one pilots visibility was impaired (e.g. one in cloud one clear of cloud)	Both aircraft were unable to see the other aircraft (e.g. both in cloud)	At least one pilot takes timely action/inaction	Both pilots or one pilot sees the other late and one or both are only able to take emergency avoiding action	Neither pilot sees each other in time to take action that materially affects the outcome (i.e. the non-sighting scenario)	