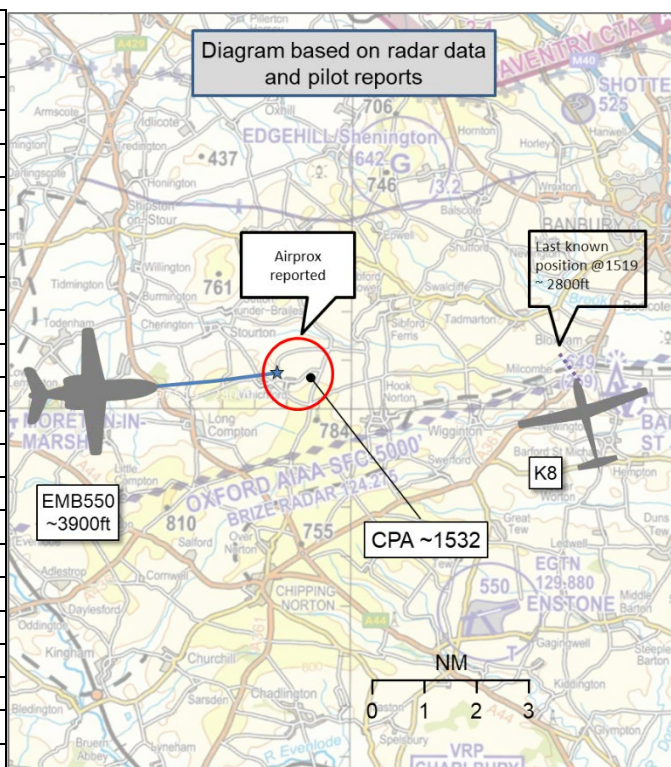


## AIRPROX REPORT No 2021143

Date: 03 Aug 2021 Time: 1532Z Position: 5159N 00131W Location: IVO Oxford

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

Recorded	Aircraft 1	Aircraft 2
Aircraft	EMB550	K8
Operator	CAT	Civ Gld
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	VFR
Service	Traffic	None
Provider	Oxford	
Altitude/FL	~3900ft	NK
Transponder	A, C, S	Not fitted
<b>Reported</b>		
Colours	NR	White, Blue
Lighting	NR	None
Conditions	IMC	VMC
Visibility	NR	>10km
Altitude/FL	2300ft	2500-3500ft
Altimeter	QNH (1012hPa)	QFE
Heading	East	Northerly
Speed	190kt	45-55kt
ACAS/TAS	TCAS II	Not fitted
Alert	TA	N/A
<b>Separation at CPA</b>		
Reported	200ft V	300ft V/150m H
Recorded	NK	



**THE EMB550 PILOT** reports that they were descending through 6000ft towards Oxford, Oxford radar made them aware of glider activity in the area. They were in IMC and cumulus clouds, when a target appeared on the TCAS in their 1 o'clock position with no height information. Oxford radar advised of this traffic but also had no height information. Slowing toward 190kts, as they popped out the bottom of the cloud a glider was seen to turn sharply away from them at no more than around 200ft above the right wing. Continuing the descent towards a platform of 1800ft on vectors to final, ATC suddenly commanded to stop descent at 2300ft as a further target, this time with height information, was detected at their level and to their 1 o'clock again. ATC commanded a hard left turn to avoid. The autopilot was disconnected and the Captain flew a tight left-hand turn maintaining 2300ft at 190kts to avoid. Visual contact with the glider<sup>1</sup> was never achieved. Vectors to final approach for RW19 were then given to a normal landing.

**THE K8 PILOT** reports that they were flying the club K8 in a straight line and the jet came from their right and passed about 150m in front and about 300ft below. They were unsure of their heading, but they thought northerly. Although they supplied a GPS trace from their personal device it unfortunately ran out of battery prior to the end of the flight. The flight lasted 1hr 23 min and the trace only records 1hr 5min.

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

**THE OXFORD CONTROLLER** reports that they were on duty in the Oxford radar position. It was a busy, and typically messy Oxford situation, [EMB550 C/S] was No4 for the ILS RW19 on a lovely summer's day with good gliding conditions. The controller stated the type of service (Traffic Service) to [the EMB550] after the pilot called on frequency, and warned them of gliding activity, probable late warning of gliders and to keep a very good lookout, and proceeded to vector towards the RW19

<sup>1</sup> This aircraft was not a glider, but believed by Oxford 2 to be an R44.

localiser. Amongst other things the controller called a non-transponding contact, probably a glider, in the EMB550's two o'clock, 4NM, north-east bound, and turned them left 10° to attempt to keep north of the unknown contact. Then they had to prioritise aircraft No3 inbound, an exec jet on a 6NM final which had a FIR squawk crossing through a 2.5 final west to east. After telephone co-ordination with the ADC controller, who said the FIR squawk looked like an R44 helicopter, the controllers agreed to continue the exec jet if the pilot was happy to continue, which they were. Sorting out this poor airmanship of the R44 did not give the controller the chance to update the Traffic Information to [EMB550 C/S], who made no mention of the glider until days later. Following that there was transponding, but unknown, traffic in its way and so, under duty of care, they broke the EMB550 off the base-leg to avoid it. The EMB550 eventually regained the approach and they were commended by the pilot.

## Factual Background

The weather at Oxford was recorded as follows:

METAR EGTK 031520Z 20006KT 130V240 9999 VCSH SCT045 SCT065TCU 21/10 Q1012=

## Analysis and Investigation

### Oxford Occurrence Investigation

[EMB550 C/S] was inbound to Oxford, IFR. An acceptance level of 6000ft was co-ordinated with London Control prior to the aircraft being transferred to Oxford Radar. The crew first made contact with Oxford Radar at time 1528. At 1531 the controller descended the EMB550 to 2500ft (See Figure 1, screenshot taken from the Oxford radar).



Figure 1: 1531:46

At 1532 the Oxford Radar controller initiated co-ordination with the Tower controller via the landline reference a contact observed to be working London Information (1177 squawk). The contact in question tracked eastbound, north of the Oxford ATZ and then south-easterly between the Oxford ATZ and D129, Mode C indicating 1300ft.

At around 1532 the track of the non-transponding aircraft (believed to be the glider involved in this Airprox<sup>2</sup>), altered track slightly on to a more northerly one and thus into further conflict with [EMB550 C/S], see Figure 2.

<sup>2</sup> The Oxford investigation believed this non-transponding primary contact to be the Airprox glider; in fact the contact was a Grob 109.



Figure 2

At the time of the CPA (1532, see Figure 3) the Oxford Radar controller was passing Traffic Information to inbound jet traffic on the ILS on the conflicting traffic crossing the final approach track just outside the Oxford ATZ.

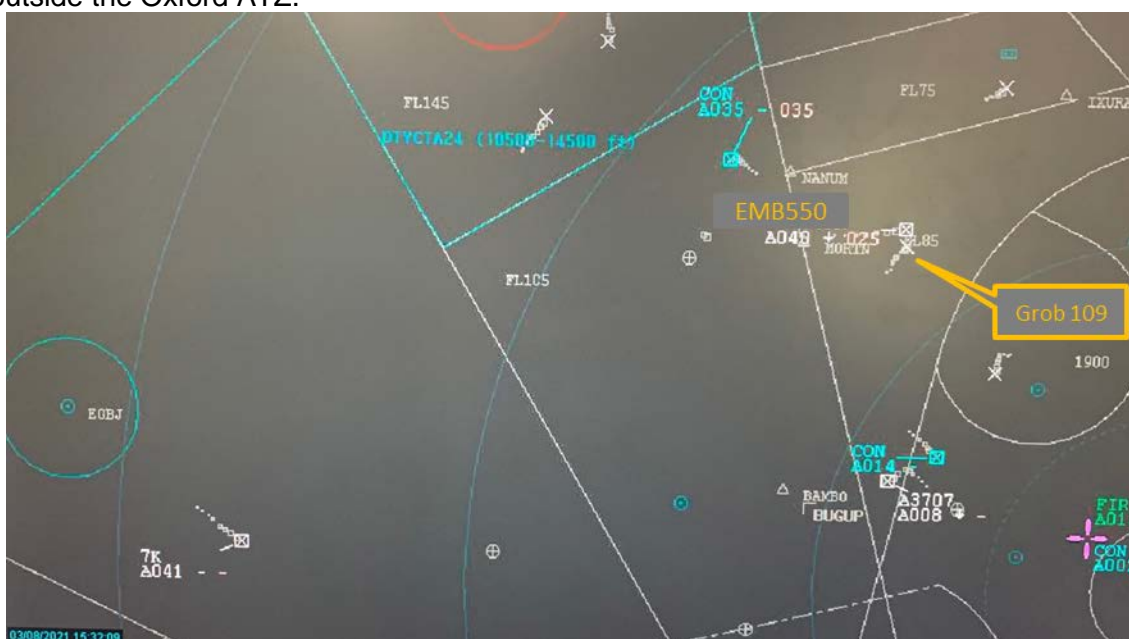


Figure 3: CPA 1532

The crew of [EMB550 C/S] made no mention of a confliction or Airprox via the RTF and the Oxford Radar controller continued to vector [EMB550 C/S] to the FAT. A further contact was observed to be operating approximately eight miles north of the aerodrome slightly west of the FAT. The controller passed Traffic Information on this aircraft and vectored [EMB550 C/S] clear (in what effectively became a left hand orbit). [EMB550 C/S] was then again vectored to the ILS for RW19 and completed a safe landing.

At the time of the Airprox, the Oxford Radar controller was operating in moderate traffic levels but the radar replay showed the FIR to be busy with numerous aircraft, many of which, being non-transponder equipped, added to the complexity. [EMB550 C/S] first came onto the Oxford frequency at time 1528. The pilot was informed they would be vectored for the ILS approach RW19 and to

reduce speed to 190kt. At 1529 the pilot was allocated a Traffic Service and the pilot was explicitly informed of glider activity and likewise of the limitations of the radar service as follows, “keep a good look out for gliders, I will try to call them under traffic service but I can’t always see them”. Both the type of service and Traffic Information were acknowledged by the pilot.

The controller vectored the aircraft onto a wide base leg, passing appropriate Traffic Information on an aircraft they were working that was operating not above 3500ft. Later the controller altered the EMB550’s heading by 10° to the left in an attempt to deconflict against a non-transponder equipped aircraft (believed to be the glider involved in this Airprox). “[EMB550 C/S], turn left heading Zero-Eight-Five, there’s non-transpondering traffic in your one o’clock at three miles, north eastbound, height unknown, probably a glider”.

From interview with the controller post event, they specified that the change of heading was in an attempt to avoid vectoring into conflict as per CAP774 as follows:

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.

Its noteworthy that as per the CAP774, deconfliction is not provided under a Traffic Service and that:

Pilots remain responsible for collision avoidance even when in receipt of ATC headings and shall advise the controller in the event that they need to deviate from a heading in order to comply with Rules of the Air with regard to collision avoidance.

The aircraft was on a heading that the controller believed would ensure they would pass north of the non-transponder equipped aircraft owing to its faster speed. At time 1532 the unknown aircraft was seen to commence a slight left turn in a more northerly direction thus putting it into further conflict with [EMB550 C/S]. At this time the Oxford Radar controller was engaged with a telephone conversation with the Oxford Tower controller informing them of traffic squawking 1177 north of the Oxford ATZ tracking east, see Figure 4.

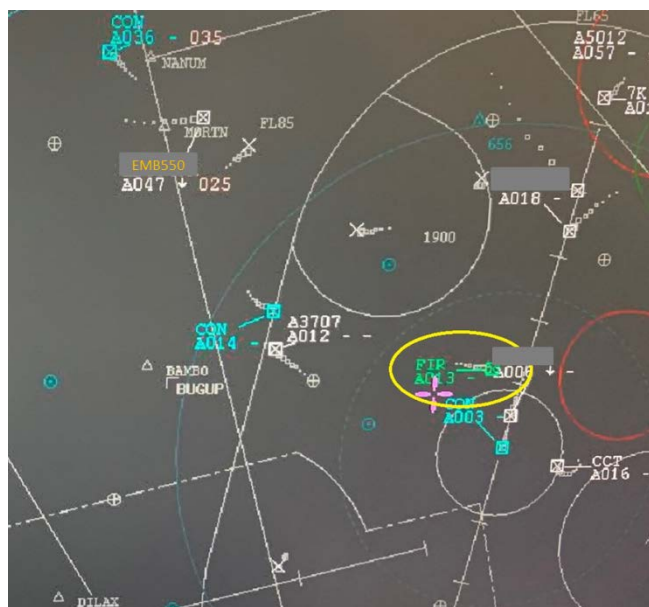


Figure 4: FIR squawk circled in yellow

The traffic was observed to be indicating 1300ft and as the Oxford circuit altitude is 1500ft (and was active), it became the controller’s priority at the time. The controller then passed this Traffic Information to an inbound jet on the ILS and ascertained the pilot’s intentions, who declared they were happy to continue with the approach. It was evident from the replay that by the time the

controller had achieved this, the CPA between [EMB550 C/S] and the non-transponder equipped aircraft had already occurred. During this event, the controller requested assistance from staff on duty to aid with phone calls. Primarily requesting that a call was made to London Information for them to transfer the pilot of the aircraft squawking 1177 to the Oxford Radar frequency so that at least relevant Traffic Information could be passed and the pilot's intentions sought. It was feedback to the controller that owing to the complexity of the emerging situation due to the levels of unknown traffic within the FIR that requesting a RAD2 controller would have been beneficial covering this period of time.

## Conclusion

On the 3rd August 2021 an Airprox occurred between a EMB550 and an unknown glider. The EMB550 was in receipt of a Traffic Service from Oxford Radar. The EMB550 was flying on a heading issued by Oxford Radar that they felt would ensure passed north of an unknown non-transponder equipped aircraft in the FIR (believed to be the glider reported in this Airprox). The controller became distracted owing to another confliction involving further unknown traffic in the vicinity of the Oxford ATZ/Oxford visual circuit and at this time the CPA between the EMB550 and non-transponder equipped aircraft (believed to be a glider) occurred.

This Airprox occurred in Class G airspace where ultimately, regardless of the ATS being provided, the pilots are responsible for collision avoidance. The EMB550 and glider pilot shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.

## UKAB Secretariat

The Oxford Investigation assumed the glider involved in the Airprox to be the radar contact seen to the south of the EMB550. However, this contact routed from the south and at its closest point was 0.5NM from the EMB550, see Figure 5 taken from the NATS radar, this aircraft has since been identified as a Grob 109.

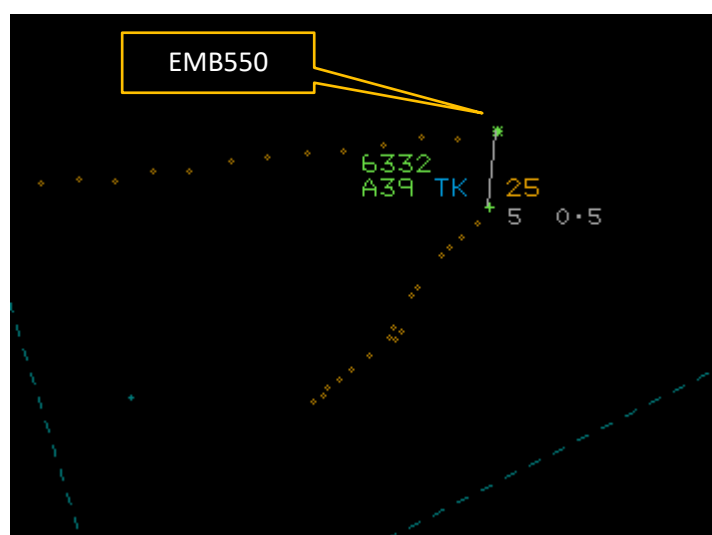


Figure 5: 1532:10 taken from the NATS radar

No other radar contacts can be seen in the vicinity. The K8 pilot provided a GPS file which unfortunately stopped at 1519:46. However, at this time the glider was in the vicinity of Barford St John, having routed south from the Banbury area. Unfortunately, due to the lack of GPS or radar data the separation between the two aircraft cannot be measured.

The subsequent incident described by the EMB550 pilot, for which the Oxford controller gave avoiding action, occurred at 1534:08. The EMB550 and a second unknown contact, this time squawking 7000, with Mode C indicating 2700ft, were 1.8NM apart, see Figure 6. This traffic cleared

to the north and the separation increased as the controller turned the EMB550 in a 360° turn onto final approach.

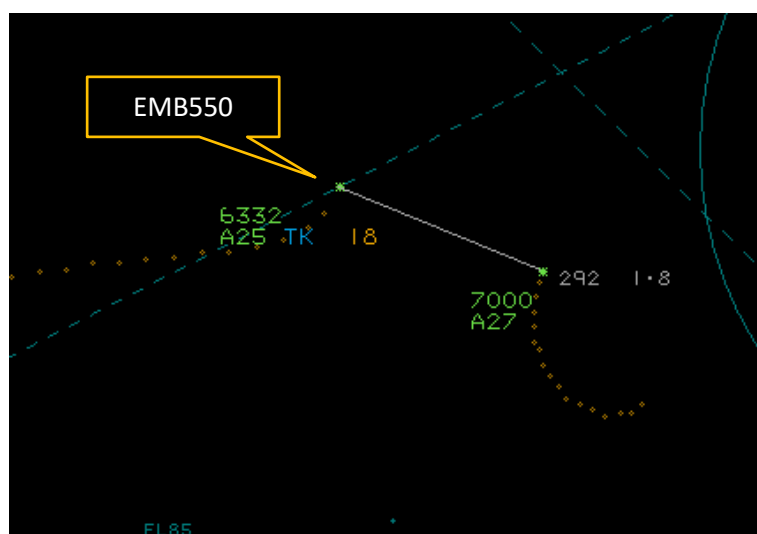


Figure 6: 1534:08

The EMB550 and K8 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>3</sup> If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right.<sup>4</sup> If the incident geometry is considered as converging then the EMB550 pilot was required to give way to the glider.<sup>5</sup>

## Comments

### BGA

Gliders will often be found under cumulus, as these can mark areas of lift. When descending through a cumulus layer, if at all possible arranging the descent to be between the clouds rather than through them would help in sighting/avoiding glider traffic or any other aircraft that happened to be underneath at the time.

## Summary

An Airprox was reported when a EMB550 and a K8 flew into proximity in the vicinity of Oxford at 1532Z on Tuesday 3<sup>rd</sup> August 2021. The EMB550 pilot was operating under IFR in IMC and was in receipt of a Traffic Service from Oxford and the K8 pilot was operating under VFR in VMC and was not 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 an investigation report from Oxford. 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.

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.

<sup>3</sup> (UK) SERA.3205 Proximity..

<sup>4</sup> (UK) SERA.3210 Right-of-way (c)(1) Approaching head-on.

<sup>5</sup> (UK) SERA.3210 Right-of-way (c)(2) Converging.

The Board first looked at the actions of the EMB550 pilot. They were inbound to Oxford and receiving a Traffic Service. When first on frequency, the controller advised that there were a lot of gliders in the area and that they may not be able to provide Traffic Information on all of them, due to gliders not always displaying on the radar. This generic Traffic Information on the presence of gliders was to be the only information the pilot would get, because the K8 did not display on the radar and so the controller could not provide more specific Traffic Information (**CF2**). Furthermore, the TCAS on the aircraft could not detect the non-transpondering glider (**CF3**) and so the pilot did not receive any information from that source either. Noting that the pilot had been instructed to slow to 190kts as they descended out of cloud in order to mitigate the risk, members thought there was little more they could have done in the circumstances, a Deconfliction Service would not have helped on this occasion because the K8 was not detected by the Oxford radar. Some members wondered whether the pilot could have avoided flying through the cloud, but this was quickly dismissed by controlling members who pointed out that this could have unforeseen consequences in Class G airspace and was not at all expeditious. The cloud obscured the glider from the pilot (**CF5**) which resulted in a late sighting (**CF4**).

When looking at the actions of the K8 pilot, gliding members told the Board that the K8 was an old and therefore basic, glider and as such was not equipped with any form of electronic conspicuity, and was generally used for local flying close to the departure gliding site, rather than long cross-country flights. Nevertheless, some members opined that it was a shame the glider didn't have a transponder, because as the radar could not detect it, the Oxford controllers had no knowledge that it was in the vicinity. Without an ATS or EWS the pilot did not have any situational awareness about the EMB550 (**CF2**) until they saw it coming out of the cloud below them (**CF4, CF5**).

The Board then turned to the role of the Oxford controller. It was noted that as the EMB550 came onto frequency the controller unilaterally provided a Traffic Service; it was not known whether it was in Oxford's SOPs that pilots were automatically provided with a Traffic Service, but members wished to highlight to pilots that even if that was the case, a Deconfliction Service could still be requested if required. However, controlling members noted that the Class G airspace around Oxford was so busy on this particular day, it was likely that the controller would have struggled to get the EMB550 onto the Approach without a large detour. Furthermore, the controller did subsequently provide deconfliction headings against an unknown aircraft on final, as well as a small turn to maintain some separation from the glider that they could see on the radar. They thought that the controller was doing their best under difficult circumstances and that because the K8 was not displaying on the radar and the controller had no situational awareness that it was there, it would have made no difference on this occasion (**CF1**).

**UKAB Secretariat Note:** Oxford ATC has subsequently confirmed that at the time of the Airprox their UK AIP entry stated that standard service provision at Oxford was a Traffic Service and that pilots requiring a Deconfliction Service should inform Oxford radar on first contact. This was subject to a review and the Oxford AIP entry now reads:

EGTK — OXFORD AD 2.23 EGTK ADDITIONAL INFORMATION 3 ATS SERVICE PROVISION

- c. Arriving aircraft should state on first contact what type of service they require (deconfliction, traffic, procedural or basic, as appropriate). Aircraft requiring a deconfliction service may incur delays during the promulgated radar hours due to intense GA and glider flying within the vicinity of the aerodrome.

When assessing the risk of collision, without any radar data to indicate the final separation, members could only take into consideration the pilots' reports. Both pilots assessed the separation as in the region of 200-300ft, with the EMB550 descending away from the glider. It was therefore agreed that although safety had been degraded, there had been no risk of collision; Risk Category C.

**PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK****Contributory Factors:**

	2021143			
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
<b>Ground Elements</b>				
<b>• Situational Awareness and Action</b>				
1	Contextual	• Traffic Management Information Action	An event involving traffic management information actions	The ground element had only generic, late or no Situational Awareness
<b>Flight Elements</b>				
<b>• Situational Awareness of the Conflicting Aircraft and Action</b>				
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
<b>• Electronic Warning System Operation and Compliance</b>				
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
<b>• See and Avoid</b>				
4	Human Factors	• Identification/Recognition	Events involving flight crew not fully identifying or recognising the reality of a situation	Late sighting by one or both pilots
5	Contextual	• Visual Impairment	Events involving impairment due to an inability to see properly	One or both aircraft were obscured from the other

**Degree of Risk:** C.

**Safety Barrier Assessment<sup>6</sup>**

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

**Ground Elements:**

**Situational Awareness of the Conflicting Aircraft and Action** were assessed as **ineffective** because the controller could not see the K8 glider on the radar.

**Flight Elements:**

**Situational Awareness of the Conflicting Aircraft and Action** were assessed as **partially effective** because the EMB550 pilot had only generic information about gliders in the area and the K8 pilot did not have any situational awareness about the EMB550.

**Electronic Warning System Operation and Compliance** were assessed as **ineffective** because the TCAS in the EMB550 could not detect the glider.

**See and Avoid** were assessed as **partially effective** because both pilots saw the other aircraft late.

<sup>6</sup> 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: 2021143		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 Confliction & 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	!	!				
<b>Key:</b>							
	Full	Partial	None	Not Present/Not Assessable	Not Used		
Provision	✓	!	✗	●			
Application	✓	!	✗	●	○		
Effectiveness	■	■	■	■	□		