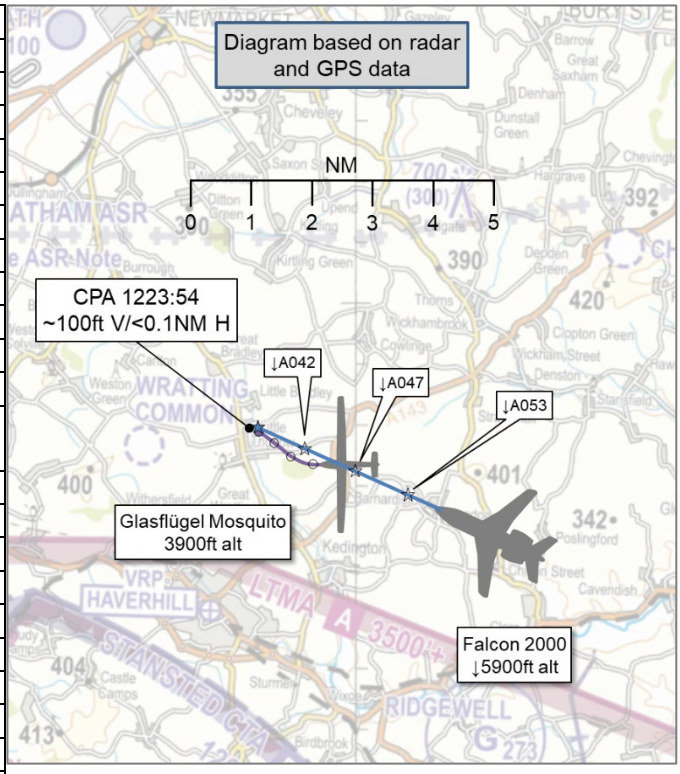
AIRPROX REPORT No 2020109

Date: 05 Sep 2020 Time: 1224Z Position: 5208N 00027E Location: 3NM N of Haverhill

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Falcon 2000	Glasflügel Mosquito
Operator	Civ Comm	Civ Gld
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	IFR[1]
Service	Procedural[2]	None
Provider	Cambridge	N/A
Altitude/FL	4000ft	3900ft
Transponder	A, C, S	Not fitted
Reported		
Colours	White	White/Red
Lighting	Strobes, nav, landing lights	Nil
Conditions	VMC[1]	VMC[1]
Visibility	20km	10km
Altitude/FL	4000ft	3500ft
Altimeter	QNH (1020hPa)	QFE
Heading	285°	300°
Speed	220kt	55kt
ACAS/TAS	TCAS II	Not fitted
Alert	None	N/A
Separation		
Reported	0ft V/100m H	0ft V/200m H
Recorded	~100ft V/<0.1NM H[3]	



THE FALCON 2000 PILOT reports being in the descent to 4000ft when they were handed over to Cambridge Approach from Essex Radar. They levelled at 4000ft, were just clear of cloud and were preparing to slow to 160KIAS and to fly configured with one 'notch' of flap; this had been briefed prior to approach as a mitigation for the glider threat in accordance with company policy. The Airprox happened just after levelling at 4000ft and also just after the handover to Cambridge. Unfortunately, the Cambridge controller was busy attempting to obtain a concise position report from a glider which had reported approaching the airfield. It was during this conversation that the Falcon pilot had an Airprox with another glider which was not working the Cambridge frequency and which did not appear to have any collision avoidance equipment (they had no TCAS alert). They spotted the glider in their left 10 o'clock on the same heading. The CPA was estimated to be 100m passing their left wing. There was no time, nor need, to take any avoiding action; their speed meant that the threat was gone within seconds.

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

THE GLASFLÜGEL MOSQUITO PILOT reports operating approximately 400ft below cloud, climbing in a weak climb and drifting downwind with it. At approximately 3500ft and on a heading of approximately 300° they spotted, in the corner of their eye, an aircraft passing to their right, coming from behind them and travelling very quickly. The other aircraft was at approximately the same height

[1] The glider pilot reported in VMC and operating under VFR. However, above 3000ft altitude and within 1000ft vertically of cloud, the pilot would have been flying in IMC and, therefore, operating under IFR. Similarly, the Falcon pilot would also have technically been flying in IMC.
[2] No Air Traffic Service was actually agreed between the Cambridge controller and the Falcon 2000 pilot. However, the controller was delivering, by inference, a Procedural Service.
[3] Recorded CPA measured by comparing radar data from the SSR responses of the Falcon 2000 with the GPS data supplied by the pilot of the Glasflügel Mosquito.

as their aircraft. It appeared to continue on the same track towards Cambridge Airport and was out of sight within circa 4-5sec.

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

THE CAMBRIDGE CONTROLLER reports being the duty Approach Procedural controller and working a [Falcon 2000] which was routing into Cambridge from controlled airspace to the east. The aircraft was cleared to the CAM descending to altitude 4000ft; at the time they were also working a glider that was approaching the overhead from the east, so they passed Traffic Information to the [Falcon 2000] pilot on this aircraft. The Falcon pilot responded with "I have just had an Airprox with that glider". They believe that the Falcon pilot was wrong as they were still out to the east of the field and the glider was nearly in the overhead and, at that time, the controller was not working any gliders out to the east of the field. As the Falcon approached the overhead the previously reported glider was still in the overhead, so they repeated the Traffic Information and the Falcon pilot reported visual and requested a visual join to Cambridge; this was coordinated with Tower and approved.

Factual Background

The weather at Cambridge was recorded as follows:

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METAR EGSC 051220Z 29012KT 9999 SCT038 17/07 Q1020=
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Analysis and Investigation

NATS and Cambridge Air Traffic Services

Both NATS and Cambridge Air Traffic Services supplied investigation reports to the UKAB, the details of which largely reflected the report from CAA ATSI. Therefore, in the interest of avoiding duplication, only the CAA ATSI investigation report is included.

CAA ATSI

An Airprox was reported by the pilot of a Falcon 2000 against a glider whilst inbound to Cambridge. The Falcon 2000 had previously been under a Radar Control Service with London Control. According to the NATS investigation report, at **1220:58** whilst passing FL80 in the descent, the pilot was given further descent to an altitude of 4000ft and advised the service would change to a Traffic Service on passing 5500ft. A number of primary-only contacts were visible on the radar replay, none of which corresponded to the glider involved in the Airprox, the radar contact for which did not appear until after CPA (Figure 1).

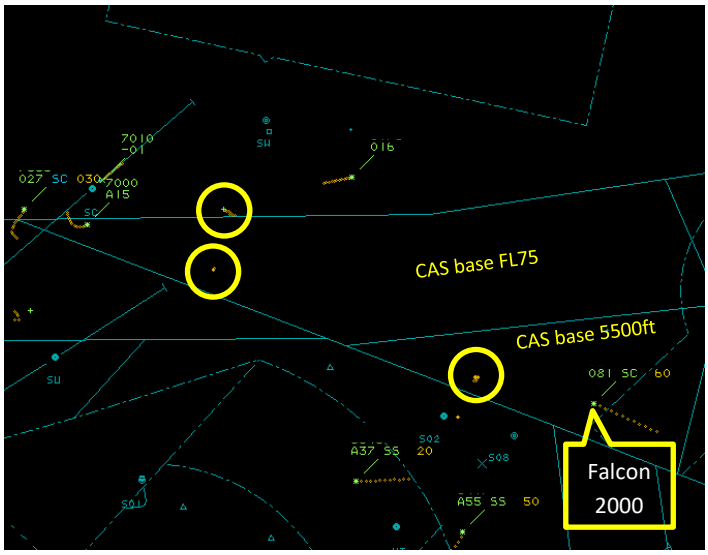


Figure 1 – 1220:58 – possible glider activity circled

At **1222:34**, the Falcon 2000 was still passing 6000ft and approaching the edge of controlled airspace. The London controller terminated the radar service, advising the pilot that they were about to leave controlled airspace and that "*I have nothing seen or known to affect, so my radar service terminates*". They instructed the pilot to contact Cambridge. The nearest visible contact according to the radar replay snapshots in the NATS investigation report and confirmed by ATSI, was still over 10.5NM away (circled on Figure 2). The Falcon 2000 pilot established contact with the Cambridge Approach controller at **1222:50**. The controller confirmed the descent clearance to 4000ft and a routing direct towards the Cambridge NDB. The Falcon 2000 pilot asked "*can we expect a full approach?*", to which the controller replied, "*affirm, expect a no delay approach for an ILS approach Runway Two Three*". At **1223:25** the controller asked the Falcon 2000 pilot if they wished to self-position, to which the pilot replied "*standby, we're still coming through the cloud sir, we'll let you know in just a little bit*". At **1223:50** the Cambridge controller contacted one of two gliders which were on the Cambridge Approach frequency and requested they report their position. The glider pilot reported their position as just north of Six Mile Bottom at 3000ft (Figure 3).

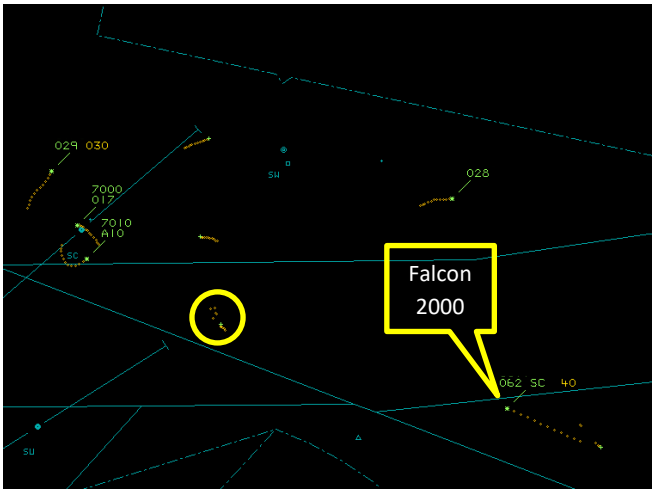


Figure 2 – 1222:34

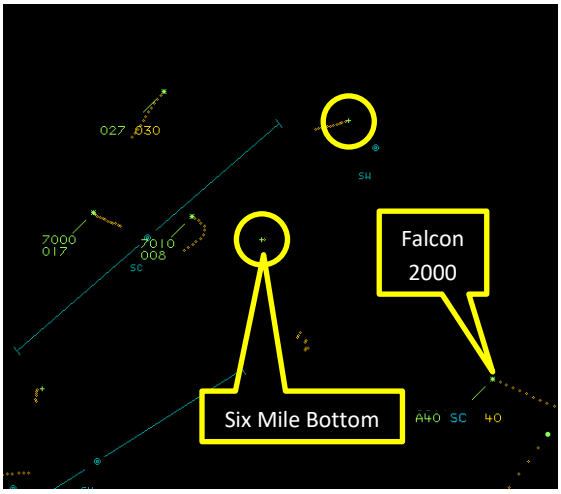


Figure 3 – 1223:50
Circled are the two gliders believed to be in contact with Cambridge

The controller acknowledged this and, at **1224:00,** passed Traffic Information "*traffic is a Falcon 2000 routing towards the Cambridge overhead descending initially to four thousand feet*". Before the glider pilot was able to acknowledge this, the pilot of the Falcon 2000 replied "*yep we've just passed him and we're reporting an Airprox*". CPA could not be determined as the glider involved in the Airprox was not visible on the radar replay. A contact believed to be that aircraft subsequently appeared at 1224:47 (Figures 4 and 5).

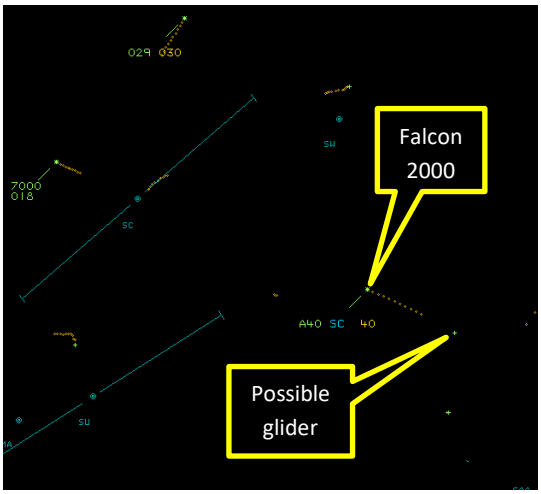


Figure 4 – 1224:47

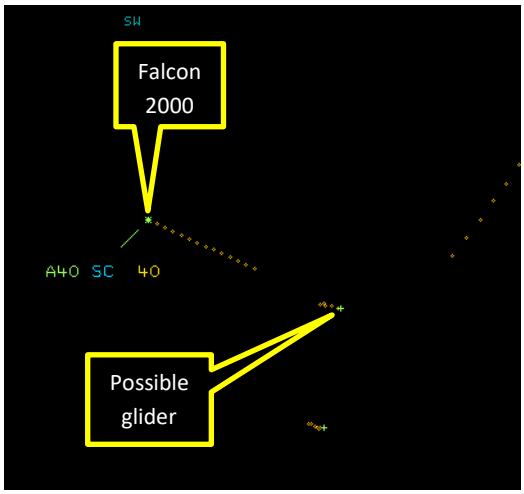


Figure 5 – 1225:06

At **1224:58** the second glider on the Cambridge Approach frequency advised that they were passing to the east and were leaving the frequency. Neither of these gliders was considered to be the one involved in the Airprox, and a report from a third glider has subsequently been received, confirming this.

In their written report, the pilot of the Falcon 2000 stated that the Cambridge controller had warned them of glider activity in the area (they had not). While listening to the conversation between the controller and one of the gliders which the Falcon 2000 crew believed was "*approaching the airfield at 4000ft*", the co-pilot spotted a glider "*at the same level as us, in our 10 o'clock, 100m away*". They did not feel that there was any requirement to take avoiding action as the glider was "*on a parallel course in the same direction as us*". They reported passing to the right of the glider by 100m. They reported that the Airprox had occurred just as they came out of the base of the cloud, reported as being 4200ft. They felt that they had been "*vectored to a collision with an aircraft that was invisible both to us and Essex Radar*". The crew of the Falcon 2000 has proposed a future solution of remaining at 6000ft to the Cambridge overhead to keep them inside controlled airspace. However, on that track, the base of controlled airspace, which ends about 1.3NM to the south-east of Cambridge, is FL75.

The pilot of the glider reported first seeing the Falcon 2000 as it came into the periphery of their vision, passing quickly to the right and at the same level as themselves, at an estimated range of 200m.

The London controller did not see any radar return which gave them concern before transferring the aircraft to Cambridge. The radar service was correctly terminated just as the aircraft was leaving controlled airspace 15NM to the east south-east of Cambridge.

The Cambridge controller stated in their written report that they were aware of the glider on their frequency approaching the overhead at 4000ft and that ultimately the Falcon 2000 pilot reported visual with it, but this was post Airprox CPA. They would not have been aware of the presence of the glider involved in the Airprox.

The Airprox took place in Class G airspace where, regardless of the type of ATS being provided, both pilots are ultimately responsible for their own collision avoidance.

ATSI has also identified the following points –

- The Cambridge controller did not use the full callsign "*Cambridge Approach*" – (this would have been the first indication to a pilot that no surveillance service was being provided).
- The Procedural Service was not mentioned by the controller.
- No generic Traffic Information was passed by the controller to the Falcon 2000 pilot on known glider activity in their area, (they had two on frequency), following the initial call by the Falcon 2000, and prior to the offering of a "self-position" approach to the Falcon 2000 pilot.

The (lack of) availability of radar at Cambridge has been ongoing for some time due to resourcing, with no likelihood of this changing in the immediate future. The unit has been unable to forecast dedicated times that a service might be available each day, and so it is not NOTAM'd. There is an entry in the UK AIS against Cambridge which states, "*Availability of radar services are subject to operational requirements. Pilots requiring a radar service should contact ATC prior to flight, to request service times on the day*".

It has been confirmed by the operator of the Falcon 2000 that no such request was made by the crew and further checks are still being made to see whether their Operations Department had made any such request. However, the crew did apparently brief for an arrival at Cambridge with a known "threat" of glider activity. Their planned mitigation was to reduce speed to 160kts "*once level*". They were subsequently seen on the radar replay to pass another contact, likely to have been a glider, by 1NM laterally (vertical distance unknown).

UKAB Secretariat

The Falcon 2000 and Glasflügel Mosquito glider pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[4] If the incident geometry is considered as overtaking then the Glasflügel Mosquito glider pilot had right of way and the Falcon 2000 pilot was required to keep out of the way of the other aircraft by altering course to the right.[5]

Comments

BGA

This happened some 11 miles from Cambridge and well away from the published IAPs, so it is unsurprising that the glider was not in contact with Cambridge. We are pleased to read of the Falcon operator's intention to take further positive measures to reduce the risk of encountering gliders in this very busy area. Compatible EC equipment would likely have averted this incident.

Summary

An Airprox was reported when a Falcon 2000 and a Glasflügel Mosquito glider flew into proximity 3NM north of Haverhill at 1224Z on Saturday 5th September 2020. Both pilots were operating under IFR in IMC; the Falcon 2000 pilot was in receipt of an 'inferred' Procedural Service from Cambridge and the Glasflügel Mosquito glider pilot was not in receipt of an Air Traffic Service.

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.

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 considered the actions of the Falcon 2000 pilot and noted that they had briefed the actions to be taken to mitigate the 'glider threat' in accordance with company policy. However, the glider was encountered by the Falcon 2000 before the crew had had the opportunity to complete those actions. Some members felt that, in Class G airspace, the Falcon 2000 pilot may have been better served by trying to find a gap in the clouds through which to descend, but a GA member highlighted that, for this type of operation, the pilot would have thought nothing of descending through cloud while operating under IFR. Members agreed that, at the time of release by the London controller, there had been no indication on the radar of any activity in the vicinity of the Airprox location. Furthermore, the glider had not been carrying any equipment that could have interacted with the TCAS II equipment fitted to the Falcon 2000 (**CF3**); these 2 factors had led to the pilot having had no situational awareness of the presence of the Mosquito glider (**CF2**). The Board also noted that the Mosquito pilot had been operating relatively close to the cloudbase, thus reducing the time available to the Falcon pilot to see and avoid the glider. The Board agreed that it had been unlikely that the pilot of the descending Falcon 2000 would have had much opportunity to sight an aircraft below them and that their best chance of seeing the Mosquito had been after they had levelled at 4000ft. In the event, the pilot only saw the glider as they passed down it's right-hand side and too late to make any manoeuvre to increase the separation between the two aircraft (**CF5**).

Turning to the actions of the glider pilot, the Board heard from a gliding member that it is quite common for glider pilots to operate relatively close to the cloudbase, and that a vertical distance from cloud in

[4] SERA.3205 Proximity.
[5] SERA.3210 Right-of-way (c)(3) Overtaking.

the region of 400ft was not unusual. Furthermore, they had been operating in Class G airspace and far enough away from any airfields to have been operating autonomously. However with no electronic conspicuity (EC) equipment on-board that could have detected the presence of the Falcon 2000, the pilot had not had any situational awareness of the presence of the other aircraft (**CF2**). There then followed a discussion around interoperable forms of EC, and members felt it worthwhile to highlight to pilots the current (5th October 2020 to 31st March 2021) availability of a DfT-funded rebate of up to 50% of the cost of a number of EC devices.[6] Returning to the event itself, the Board agreed that it would have been extremely difficult for the Mosquito glider pilot to have sighted the Falcon 2000 prior to CPA (**CF5**), given that it had been approaching from behind and slightly above them.

The Board then discussed the actions of the London and Cambridge controllers and quickly agreed that, with no radar returns apparent to the London controller when they released the Falcon 2000 pilot to free-call Cambridge, there was nothing more that they could have done to mitigate for the event. There then followed a lengthy discussion on the type of Air Traffic Service that was being delivered to the Falcon 2000 pilot. Members noted that no formal Service had been offered or agreed, that the Falcon 2000 pilot though that they had been under a Basic Service and that the Cambridge controller had, in fact, been acting under an assumption of a Procedural Service. Although ATC members felt that this had been an oversight on the part of the Cambridge controller, and the Board considered that regulations, processes and procedures had not been followed by the controller in this regard, members did not feel that this had been contributory to the Airprox. Furthermore, the Board also discussed the availability of surveillance-based Air Traffic Services at Cambridge; some members suggested that, had the radar been available with an appropriately qualified controller, then perhaps this would have permitted the Cambridge controller to issue Traffic Information on the glider to the pilot of the Falcon 2000. However, and given that there had been no visible return in the vicinity of the Mosquito glider on the NATS radar replay until after CPA, the Board agreed that the lack of surveillance capability had not been a contributory factor to this Airprox. As it was, the Cambridge controller had had no situational awareness of the proximity of the Mosquito glider to the Falcon 2000 (**CF1**), and so had not been in a position to provide Traffic Information to the pilot of the Falcon 2000.

Finally, members discussed the risk involved in this event. The Board was grateful to the Mosquito glider pilot for having supplied their GPS log file, as this had provided the means by which to compare the relative tracks and altitudes of the 2 aircraft. Although measured from 2 different data sources (which are independently subject to their own errors and tolerances), it was clear to the Board that this had been a very close encounter where the most viable barrier had been See and Avoid, which had ultimately been found to be ineffective. Members took into account that the Falcon 2000 and Mosquito glider pilots had assessed the risk of collision as 'high' and 'medium' respectively, and that the measured lateral separation had been less than 0.1NM with an approximate vertical separation of 100ft. Therefore, the Board concluded that a serious risk of collision had existed because the separation that had been present had been entirely serendipitous (**CF4**); consequently, members agreed to assign a Risk Category A to this event.

[6] Details available at https://www.caa.co.uk/General-aviation/Aircraft-ownership-and-maintenance/Electronic-Conspicuity-devices/

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2020109		
CF	**Factor**	**Description**	**Amplification**
	Ground Elements		
	• Situational Awareness and Action		
1	Contextual	• Situational Awareness and Sensory Events	The controller had only generic, late or no Situational Awareness
	Flight Elements		
	• Situational Awareness of the Conflicting Aircraft and Action		
2	Contextual	• Situational Awareness and Sensory Events	Pilot had no, late or only generic, Situational Awareness
	• Electronic Warning System Operation and Compliance		
3	Technical	• ACAS/TCAS System Failure	Incompatible CWS equipment
	• See and Avoid		
4	Contextual	• Near Airborne Collision with Aircraft, Balloon, Dirigible or Other Piloted Air Vehicle	Piloted air vehicle
5	Human Factors	• Monitoring of Other Aircraft	Non-sighting or effectively a non-sighting by one or both pilots

Degree of Risk: A

Safety Barrier Assessment[7]

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 Confliction and Action were assessed as **ineffective** because the Cambridge controller had no information of the presence of the Glasflügel Mosquito glider.

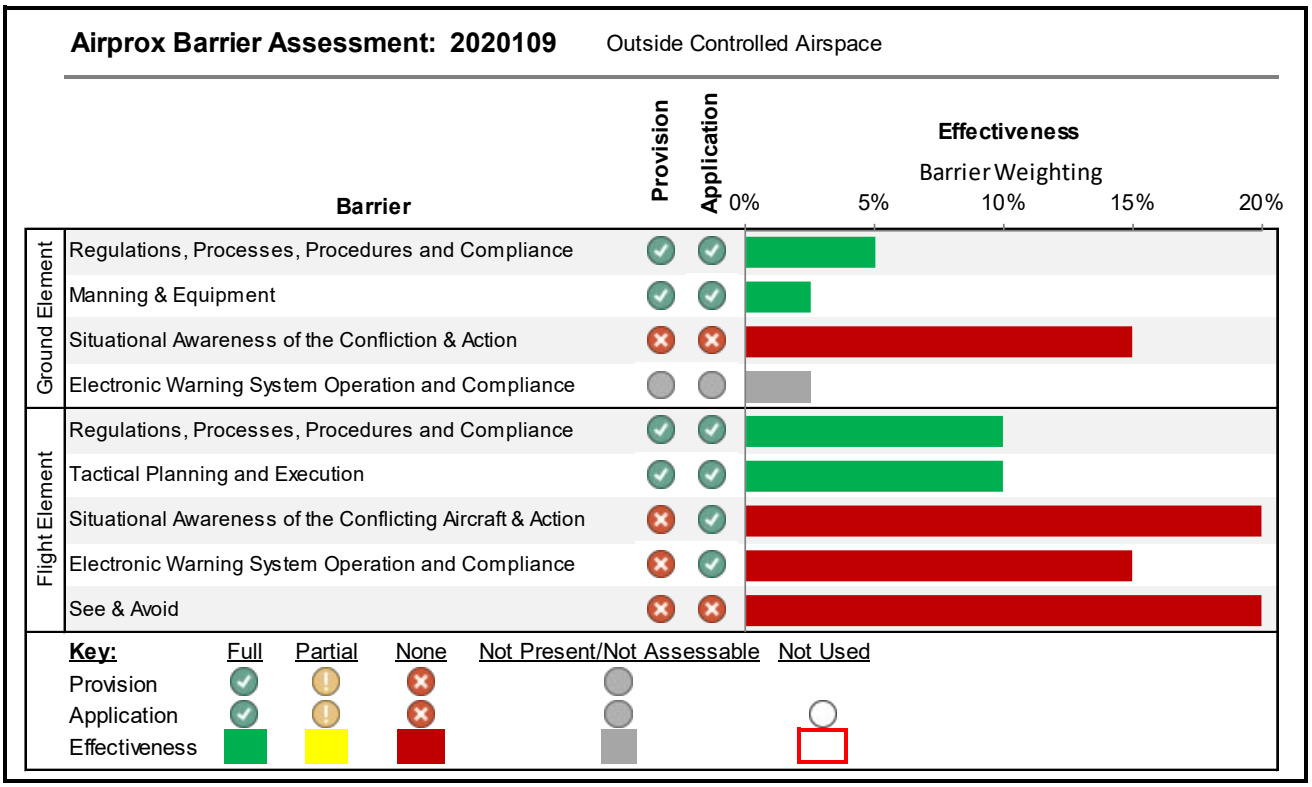
Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither pilot had any information regarding the presence of the other aircraft.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the TCAS equipment fitted to the Falcon 2000 was incapable of detecting the non-transponding glider.

See and Avoid were assessed as **ineffective** because neither pilot saw the other aircraft until such time as it was too late for either of them to manoeuvre to materially increase the separation.

[7] 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: 2020109
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
Key:
Full
Partial
None
Not Present/Not Assessable
Not Used
Provision
Application
Effectiveness