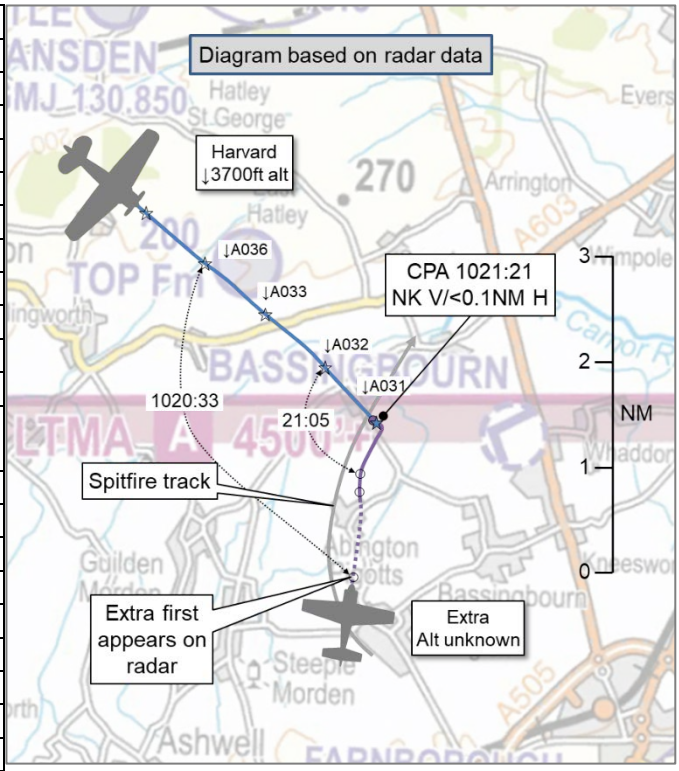
AIRPROX REPORT No 2021051

Date: 07 May 2021 Time: 1021Z Position: 5206N 00005W Location: 8NM W of Duxford

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	T6 Harvard	Extra EA300L
Operator	Civ FW	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Basic	AGCS
Provider	Cambridge App	Fowlmere Radio
Altitude/FL	3100ft	NR
Transponder	A, C, S	None[1]
Reported		
Colours	Yellow	Yellow, red, blue
Lighting	Nav, anti-colls, landing lights	Strobes, nav lights
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	3100ft	NK
Altimeter	RPS (1016hPa)	QNH
Heading	130°	NK
Speed	160kt	NK
ACAS/TAS	SkyEcho	Not fitted
Alert	None	N/A
Separation		
Reported	0ft V/100m H	400ft V/0m H
Recorded	NK V/<0.1NM H	



THE HARVARD PILOT reports being on a transit flight. The weather was fine with scattered cumulus at 4500ft and good visibility. They had flown the transit at between 3000ft and 3500ft to remain clear of the cloud, but aiming to be above some of the GA traffic. They had taken a Traffic Service with East Midlands, then Wittering and finally requested one with Cambridge. Cambridge was unable to offer a Traffic Service due to no radar and therefore provided a Basic Service. Of note, the Duxford flying orders 'strongly advise aircraft departing north to contact Cambridge approach'. As they routed to the west of Little Gransden and Grandsen Lodge, there was a lot of glider activity and they saw about 4 gliders in their vicinity. They selected their landing lights on at this point to enhance conspicuity. Just as they asked Cambridge if there was any further traffic to affect, both they and their passenger saw a Spitfire passing right-to-left about 1NM ahead and then, as they looked behind, they saw another aircraft (which looked like an Extra) pass close aboard in their 7 o'clock in the vertical, passing through their level. They did not declare an Airprox as they were getting close to Duxford and needed to coordinate their approach given the high level of activity. After landing, they telephoned Cambridge to discuss the incident and let them know that they would submit an Airprox. They suspect the other aircraft had not seen them before pulling up and, hence, they judge that there was a risk of collision.

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

THE EXTRA PILOT reports that, while practising aerobatics (HASELL[2] check performed beforehand) in an EA300L, they noticed a Spitfire in the same area. They decided to stop manoeuvring to keep the traffic in sight and ensure that it left the area in which they had been practising. They resumed their manoeuvring after a HELL[3] check and then noticed a yellow T6 Harvard flying towards them from a

[1] The Extra pilot reported transponder modes A, C and S; these were not detected by the NATS radars.
[2] Height, Airframe, Security, Engine, Location, Lookout.
[3] Abbreviated HASELL checks (Height, Engine, Location, Lookout).

northerly direction. They decided to turn left and then right to keep it in sight, all the while trying to remain within the area in which they had been practicing and providing the maximum level of safety as they assumed that the pilot of the Harvard had not seen them. After the Harvard departed, they made sure that there was nothing else that could be a threat to them, conducted another HELL check again and confirmed that the Harvard continued to fly away from them. They then resumed aerobatics.

The pilot assessed the risk of collision as 'None'.

THE CAMBRIDGE APPROACH CONTROLLER reports that they were unaware of the Airprox as they did not see anything at the time and it was not reported until after the event, later in the day.

Factual Background

The weather at Cambridge was recorded as follows:

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METAR EGSC 071020Z 30010KT 9999 BKN028 10/01 Q1016=
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Analysis and Investigation

Cambridge City Airport ATC

A telephone report of an Airprox was received from the pilot of [the Harvard], who reported they had had an Airprox with an Extra aircraft in the vicinity of Royston at 1021Z.

[The Harvard pilot] was receiving a Basic Service from Cambridge Approach, squawking 6177. The pilot came on frequency at 1016Z, requesting a Traffic Service but was informed that it was Cambridge Approach, non-radar and given a Basic Service. The pilot was informed of activity at Gransden Lodge Gliding site.

Prior to leaving the frequency, the pilot requested if there was "*any more traffic to affect*" and was informed of traffic inbound to Cambridge descending to 4000ft with no other Traffic Information given. Although not providing a surveillance service, the APP ATCO was in view of a surveillance display; however, at the time of asking, [the Harvard] was indicating 3400ft descending and the traffic with which he had the Airprox was indicating 400ft, giving 3000ft between them. The transponder of the conflicting traffic was then observed to either become unserviceable or be switched off as the aircraft entered high energy manoeuvres. The pilot of [the Harvard] changed frequency as the Airprox occurred and did not report it on the Cambridge frequency. The identity of the other aircraft is unknown, however it was followed on radar and observed to land at [a local airfield].

The pilot of [the Harvard] reported that they were flying from [departure airfield] to [destination airfield] and had received a radar service from both East Midlands and Wittering prior to transferring to Cambridge approach. They were aware of intense gliding activity along their route and had seen a few gliders but opted to fly at 3300ft for protection against low-level GA and to allow themselves height in the event of an engine failure of their aircraft. The pilot intended to call Duxford in the vicinity of Royston for joining and checked whether Cambridge Approach had any traffic to affect before leaving the frequency. The pilot reported that, before changing frequency, they observed an Extra aircraft in a vertical climb passing approximately 300ft to their left as it climbed from low level to high.

The Extra aircraft is believed to have been one of the aircraft from [a local airfield] which have started conducting aerobatics near Cambridge without receiving any service from the unit. The aircraft was observed to be conducting aerobatics whilst squawking 7000, rather than utilising the aerobatic 7004 squawk. Although not providing a surveillance service, the mode C indications of the aircraft involved were no closer than 3000ft at any time and, as such, any provision of a surveillance service as requested by the pilot would not have made any difference. The activities from [the local airfield] have been increasing and are impacting safety at Cambridge. Progress on a letter of agreement may be needed to ensure continued safe operations.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken which showed the Harvard tracking in a south-easterly direction and in a gradual descent from 3700ft. Initially, the only other track recorded was that of the Spitfire mentioned in the Harvard pilot's report (Figure 1). However, at 1020:57 a primary-only radar track appears in the vicinity of the Spitfire – this was assessed to be the Extra (Figure 2).

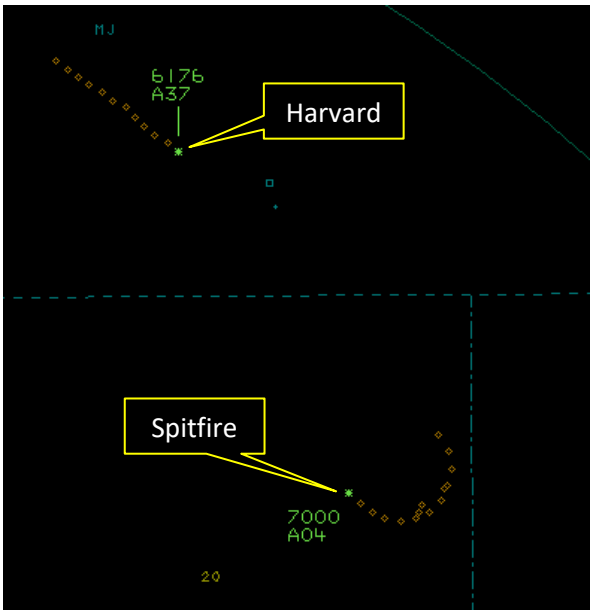


Figure 1 – 1020:17

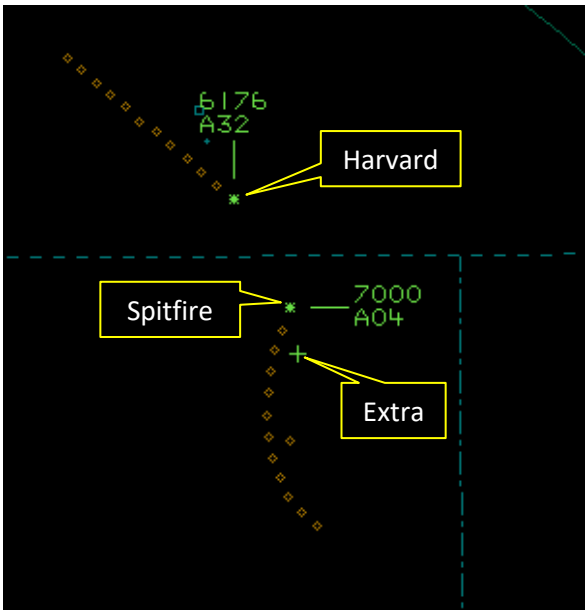


Figure 2 – 1020:57

The Spitfire crossed the Harvard's track at 1021:05 at a range of 0.6NM and with a vertical displacement of 2800ft (the Harvard having descended to 3200ft); at this time the Extra was approximately 0.6NM south of the Spitfire at an unknown altitude (Figure 3). CPA between the Harvard and the Extra occurred 16sec later at 1021:21 as the Harvard passed 3100ft and, with the altitude of the Extra unknown, was measured at <0.1NM horizontal separation (Figure 4); the radar tracks had already crossed at this point.

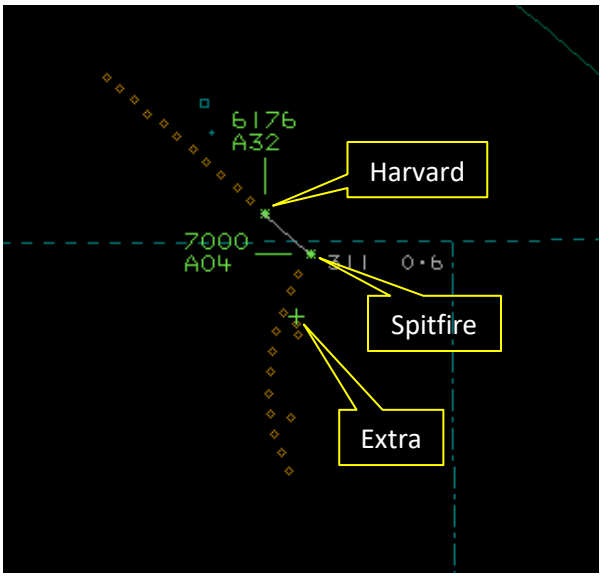


Figure 3 – 1021:05

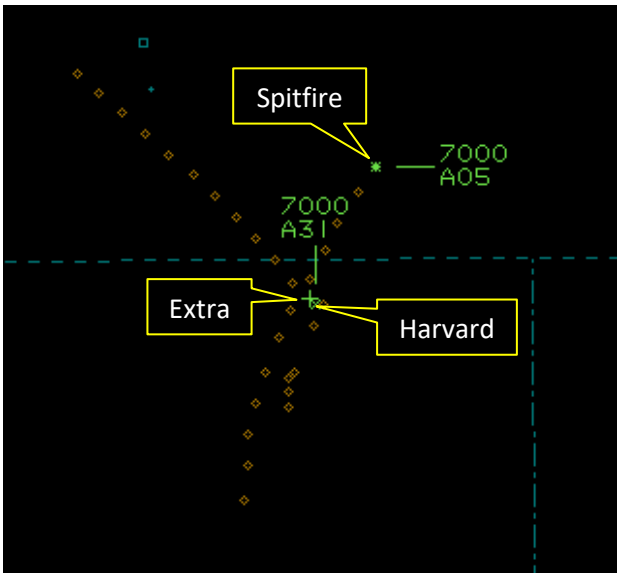


Figure 4 – 1021:21 – CPA

The Harvard and Extra 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 converging then the Harvard pilot was required to give way to the Extra.[5]

Summary

An Airprox was reported when a T6 Harvard and an Extra EA300L flew into proximity 8NM W of Duxford at 1021Z on Friday 7th May 2021. Both pilots were operating under VFR in VMC, the Harvard pilot in receipt of a Basic Service from Cambridge Approach and the Extra pilot in receipt of an Air/Ground Communications Service from Fowlmere Radio.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, a report from the air traffic controller involved and a report from the appropriate ATC/operating authority. 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 Harvard pilot and was heartened to hear that they had sought a surveillance-based Air Traffic Service throughout their flight, although the highest level of Service that the Cambridge controller could provide had been a Basic Service. It was apparent to the Board that the Harvard pilot had considered how they might augment their situational awareness as the pilot had also been carrying a SkyEcho device. Unfortunately the SkyEcho equipment had not detected the presence of the Extra (**CF5**), neither had the Cambridge controller been aware of the presence of the Extra and so had not been able to pass any Traffic Information to the Harvard pilot. This had led to the Harvard pilot having no situational awareness of the presence of the Extra (**CF4**) and so they had been relying on their lookout. The Board wondered if the sighting of the Spitfire moments before the Harvard pilot had seen the Extra had drawn their eyes into the area where the Extra had been operating. Notwithstanding, the Harvard pilot having only seen the Extra as it passed through their level in their 7 o'clock led the Board to conclude that this had been an effective non-sighting (i.e. too late to have materially affected the separation) on the part of the Harvard pilot (**CF8**).

Turning to the actions of the Extra pilot, the Board noted that the pilot had acknowledged their involvement in the Airprox soon after being informed of it by the UKAB Secretariat, but that it had taken a number of weeks for them to submit their report. Members wondered if this delay had perhaps led to a fading of their recall of the event, particularly concerning their transponder selections. Although the pilot reported that the transponder was 'on' with modes A, C, and S selected, there was no evidence of this on the NATS radar replay and the transponder responses had not been detected by the SkyEcho device in the Harvard. The Board acknowledged that this does not necessarily mean that the transponder had not been selected as reported, but wished to highlight the importance of including the transponder to 'on' in the pre-take-off checklist and verifying transponder functionality with a nearby ATC unit. This is particularly important when conducting aerobatics, as the code assigned for aerobatics (7004[6]) permits controllers to better understand the activity being undertaken and to route aircraft under their control accordingly. Members noted that the Extra pilot had remained on the Fowlmere Air/Ground frequency during their flight and, given the Extra pilot's planned activity, the Board felt that they would have been better served seeking an Air Traffic Service from Cambridge. This would have had the added benefit of being on the same frequency as the Harvard pilot whilst also providing situational awareness to the Cambridge controller regarding their activity. The fact that the Extra pilot had not been on a frequency with an ATSU had, the Board felt, been contributory to the Airprox (**CF3**). Furthermore, this had denied the Extra pilot the opportunity to gain situational awareness (from the controller) of the

[4] (UK) SERA.3205 Proximity.
[5] (UK) SERA.3210 Right-of-way (c)(2) Converging.
[6] UK AIP ENR 1.6, para 2.2.2.2.1

approaching Harvard – the Board agreed that, in the event, the Extra pilot had not had any situational awareness of the presence of the Harvard (**CF4**). This, like the Harvard pilot, had left them to rely on their lookout to detect any threats to their aircraft. Members agreed that the Extra pilot had sighted the Harvard as they recommenced their aerobatic manoeuvres, but they had sighted it late (**CF6**) and then had not allowed sufficient separation from the Harvard during their vertical manoeuvre (**CF7**).

The Board then considered the actions of the Cambridge controller, and quickly agreed that there was little that they could have done to prevent this Airprox. Members noted that the Harvard pilot had initially requested a surveillance-based Air Traffic Service but that the controller had been unable to provide this level of Service (**CF1**). Given that the controller had been providing a Basic Service to the Harvard pilot, and that they had therefore not been required to monitor the Harvard's flight (**CF2**), the Board agreed that the controller could not have passed any Traffic Information on the unknown Extra to the Harvard pilot. The Board heard from GA pilot member that there is a local agreement between Duxford and Cambridge regarding flight operations in the local area, but that Fowlmere-based aircraft are not part of this agreement. It was the Board's understanding that there is a local airspace users' working group that meets periodically to discuss operations in the local airspace for mutual benefit, but it was unclear to the Board whether Fowlmere representatives were invited to, or attended, these meetings. Furthermore, the Board heard from a military pilot member that there is also a Regional Airspace Users' Working Group (RAUWG) that is organised by staff at RAF Marham, but again it was unclear whether or not Fowlmere representatives are invited to this forum; the military member undertook to check with RAF Marham whether invitations to attend the RAUWG have been sent to Fowlmere and to ensure that invitations are sent in future.

Finally, the Board considered the risk involved in this Airprox. Although there were discrepancies in each pilot's reported estimation of separation, it was clear to the Board from the NATS radar replay that there had been very little horizontal separation. Additionally, whilst there was no altitude information from the Extra available to the Board, it was evident from both pilots' reports that the Extra had passed through the level of the Harvard in a vertical climb. This vertical climb was recorded on the NATS radar replay (as a lack of horizontal change of position) leading the Board to conclude that there had simultaneously been a lateral separation of <0.1NM with no vertical separation. Therefore, members agreed that separation had been reduced to the bare minimum and there had been a serious risk of collision between the 2 aircraft (**CF9**). Accordingly, the Board assigned a Risk Category A to this Airprox.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2021051			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Situational Awareness and Action			
1	Contextual	• ANS Flight Information Provision	Provision of ANS flight information	The ATCO/FISO was not required to monitor the flight under a Basic Service
2	Contextual	• ATM Service Effects	An event affecting Air Traffic Management operations.	Controller not able to provide requested ATS
	Flight Elements			
	• Tactical Planning and Execution			
3	Human Factors	• Communications by Flight Crew with ANS	An event related to the communications between the flight crew and the air navigation service.	Pilot did not request appropriate ATS service or communicate with appropriate provider
	• Situational Awareness of the Conflicting Aircraft and Action			
4	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
	• Electronic Warning System Operation and Compliance			
5	Human Factors	• Response to Warning System	An event involving the incorrect response of flight crew following	CWS misinterpreted, not optimally actioned or CWS alert expected but none reported

			the operation of an aircraft warning system	
	• See and Avoid			
6	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
7	Contextual	• Loss of Separation	An event involving a loss of separation between aircraft	Pilot flew into conflict
8	Human Factors	• Monitoring of Other Aircraft	Events involving flight crew not fully monitoring another aircraft	Non-sighting or effectively a non-sighting by one or both pilots
	• Outcome Events			
9	Contextual	• Near Airborne Collision with Aircraft	An event involving a near collision by an aircraft with an aircraft, balloon, dirigible or other piloted air vehicles	

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 **not used** because the Cambridge Approach controller was not required to monitor the aircraft under the terms of a Basic Service.

Flight Elements:

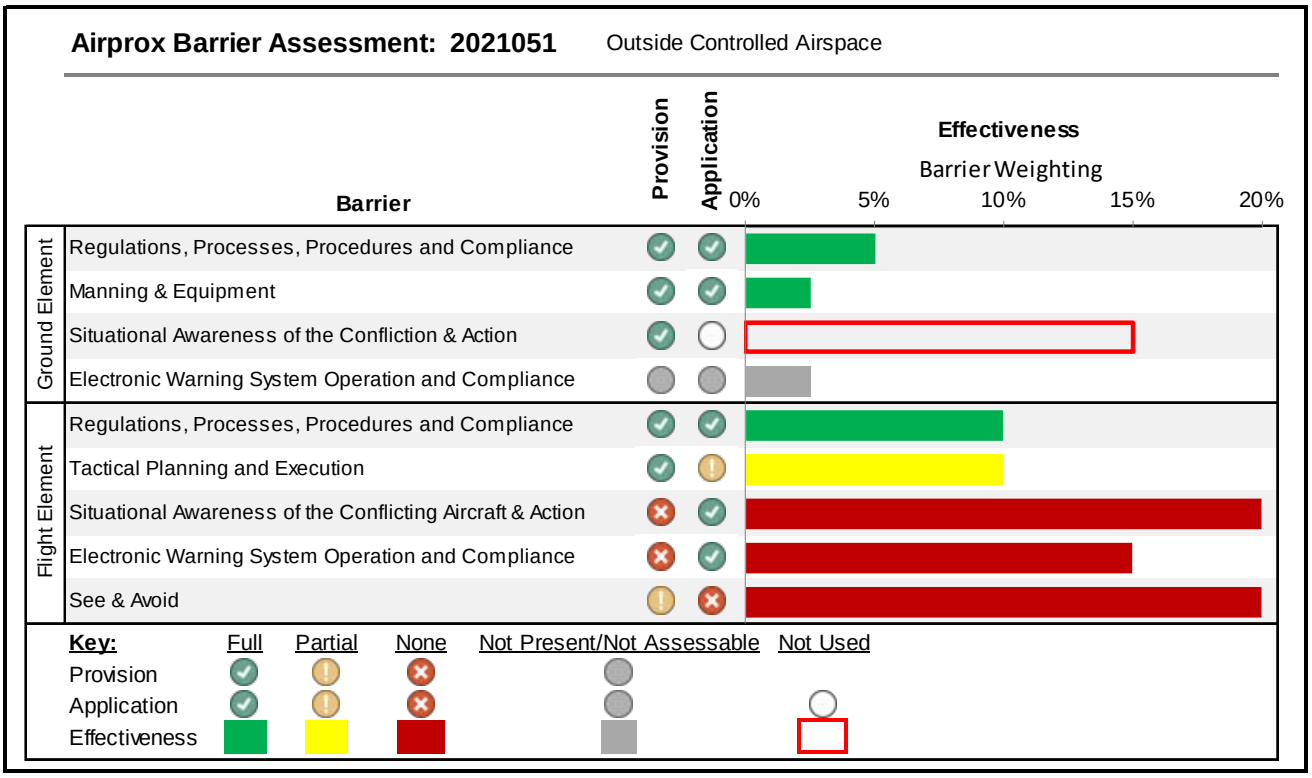
Tactical Planning and Execution was assessed as **partially effective** because the Extra pilot did not seek an Air Traffic Service from an appropriate agency.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither pilot had any situational awareness of the presence of the other aircraft until they sighted it.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the SkyEcho 2 device on the Harvard did not detect the presence of the Extra.

See and Avoid were assessed as **ineffective** because the Harvard pilot did not see the Extra in time to materially affect the separation, and the Extra pilot only saw the Harvard at a late stage, necessitating a late manoeuvre which resulted in minimal separation between the 2 aircraft.

[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: 2021051
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