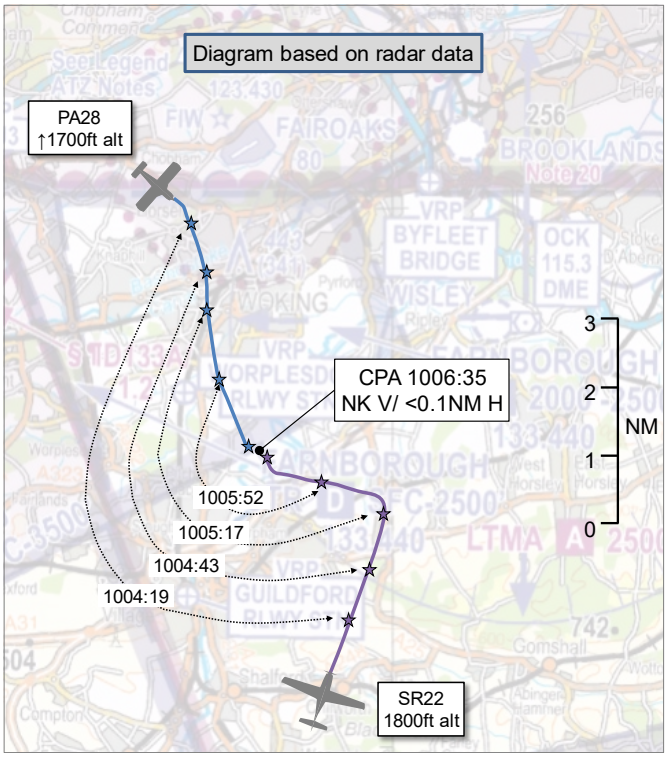
AIRPROX REPORT No 2023109

Date: 11 Jun 2023 Time: 1007Z Position: 5116N 00033W Location: 4NM south of Fairoaks

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	PA28	SR22
Operator	Civ FW	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Establishing contact	Establishing contact
Provider	Farnborough LARS	Heathrow SVFR
Altitude/FL	NK	1800ft
Transponder	None[1]	A, C, S
Reported		
Colours	Beige	Red and white
Lighting	Strobe, nav and landing light	Nav, strobe and landing
Conditions	VMC	VMC
Visibility	>10km	5-10km
Altitude/FL	↑1700ft	1800ft
Altimeter	QNH (1014hPa)	QNH
Heading	180°	360°
Speed	100kt	NK
ACAS/TAS	Not fitted	TAS
Alert	N/A	None
Separation at CPA		
Reported	400ft V/150m H	NK V/NK H
Recorded	NK V/<0.1NM H	



THE PA28 PILOT reports they took off from RW24 and took up a heading towards the east of Guildford, then approximately 180° or 185°. As they approached east of Guildford they were speaking with Farnborough and requested a Basic Service. They said that they were climbing up to 1700ft on a QNH of 1014hPa. Moments after setting their assigned squawk, they were warned about, and asked if visual with, another aircraft. They spotted [the aircraft] and reported visual and, as doing so, they noticed that [the other aircraft] was above and to the right so they banked left and slightly down. As they were doing so [the other pilot] was also banking right. The aircraft was mainly white (with a few red bits) which was hard to spot. Then overhead Bramley they were asked their position and to recycle their squawk. They recycled the squawk and the flight continued with no further events.

The pilot declared their workload and the belief that their transponder had a 'blip', as they were squawking and asked to recycle their squawk, as potential contributory factors.

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

THE SR22 PILOT reports they were on a VFR flight from and to [the same airfield]. They were operating under Farnborough Radar's Basic Service, with a Farnborough assigned squawk code set on their Mode S transponder and ADS-B out. After tracking from Midhurst (MID) to Ockham (OCK), upon request to Farnborough to arrange transit via the London control zone, Farnborough had advised that they descend below 1900ft and orbit between Woking and Ockham, retaining the Farnborough squawk and to call Heathrow to negotiate a transit via Burnham NDB. They were level at 1800ft before initiating a right-hand orbit between Guildford and Woking. The reported Airprox occurred at the time their aircraft was within the right-hand turn on an estimated heading of north to northeast. The Traffic Advisory System on the aircraft (which should display Traffic Advisory warnings for any intruding aircraft with

[1] Pilot reported transmitting Mode A, C and S, but this was not displayed on the radar replay at the time of the Airprox.

Mode A, C and S transponders) did not display any conflicting aircraft, nor did Farnborough Radar or subsequently Heathrow Radar advise of any conflict. In addition, as they were not visual with the other aircraft, they had no knowledge or information of this conflict.

THE FARNBOROUGH CONTROLLER reports they were working Farnborough West and Zone, band-boxed. They had been informed that an Airprox was since reported by the pilot of a PA28 while south of Fairoaks in the vicinity of Woking [and] this had occurred at 1009. They had no recollection of the incident and no pilot reported an Airprox to them on the RT at the time.

Factual Background

The weather at Farnborough was recorded as follows:

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METAR EGLF 110950Z AUTO 25008KT 9999 NCD 22/15 Q1014
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Analysis and Investigation

NATS Farnborough Investigation

Summary

The pilot of [the PA28] submitted an Airprox Report to the UK Airprox Board which stated that they came into close proximity with [the SR22] in the vicinity of Guildford (Class G airspace). The pilot of [the SR22] was in the process of establishing their routeing and Basic Service with the Heathrow Special VFR Controller at the time of the Airprox, and the pilot of [the PA28] had recently contacted Farnborough, establishing a Basic Service shortly after the occurrence. Neither pilot reported an Airprox on their respective frequencies.

Description and Investigation

Information available to the investigation included, [internal safety reports] from the Terminal Control Special VFR (TC SVFR) controller, the Farnborough LARS West Controller, and an initial watch management investigation report by Farnborough, [along with] radar and radiotelephony recordings provided by Farnborough and reports from [both] pilots.

The London Heathrow SVFR position was busy at the time of the event with VFR traffic in and out of Ascot Racecourse, and a Spitfire aircraft performing a flypast in the Ascot and Windsor areas increasing the controller's workload. All times in the report are UTC.

The initial watch management investigation report detailed, 'Prior to the Airprox at 1003 [the SR22 pilot] had been on [the] LARS West frequency on a Basic Service and squawking A0435 and was transferred to TC SVFR for crossing the London Heathrow Control Zone (CTR) after an unsuccessful attempt at a prenote to TC SVFR by LARS West. The aircraft was still wearing the squawk to aid the TC SVFR [controller] in identification'. The pilot of [the SR22] was instructed by the Farnborough LARS West controller to remain clear of controlled airspace, descend to 'not above' 1900ft and informed them that, if they needed to hold they should do so between Woking and Ockham before being transferred to the SVFR controller at 1003:30. At this time [the SR22] was 8.2NM south of Fairoaks at 1900ft.

At 1004:18 a primary-only radar contact (subsequently identified as [the PA28]) appeared 1.3NM southwest of Fairoaks, flying in a south-easterly direction. The pilot of [the SR22 was] 7NM southeast of Fairoaks and flying in a north-easterly direction, squawking 0435, reported onto the TC SVFR frequency at 1004:24, but transmitted over another aircraft, and so was told to standby.

The primary-only radar target of [the PA28] dropped out of multi-track radar coverage at 1004:39 as the aircraft was 5.4NM northwest of [the SR22]. The pilot of [the SR22] turned left at 1005:17 and, at 1005:49 [the PA28's] primary-only target re-appeared on radar 1.9NM northwest of [the SR22], as shown in Figure 1 and Figure 2 (Farnborough Radar screenshot).

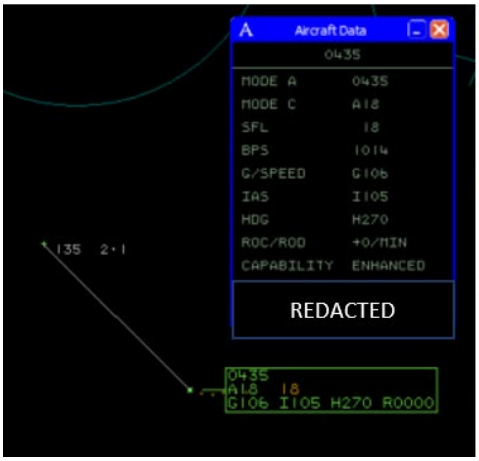


Figure 1 Traffic Control Node radar.

Figure 2 Farnborough Radar screenshot.

Both aircraft were in Class G airspace, and neither were in receipt of a service from an Air Traffic Service Unit (ATSU) at this point.

At 1006:09 the PA28 pilot reported onto the Farnborough LARS West frequency, reporting that they were "…climbing out over east of Guildford" to 1700ft and were requesting a Basic Service. Following dealing with other traffic, the SVFR controller returned to [the SR22] at 1006:16, issuing an SSR code of 7042 and asked the pilot to pass their message. The pilot stated they were routeing from and to [the same airfield] at 1800ft and requested to transit the zone via Burnham and Chilton.

The Farnborough LARS controller asked the PA28 pilot at 1006:25, "Are you visual with an aircraft straight ahead of you, left-to-right, similar altitude?" and the pilot replied that they were visual. The respective positions of each aircraft at this time are shown in Figure 3.

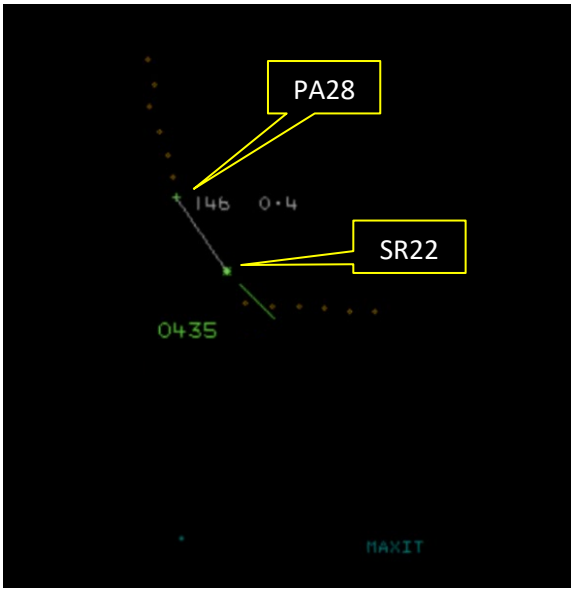


Figure 3 (1006:25) separation 0.4NM similar altitude

As the SVFR controller continued to establish [the SR22 pilot's] intentions, the closest point of approach between [the PA28] and [the SR22] occurred at 1006:33 and was recorded on multi-track radar as 0NM. Because no altitude information from [the PA28] was displayed, no assessment of the vertical proximity can be made from radar data. The relative trajectories of the aircraft at this time are shown in Figure 4. Coincident with this point of closest approach, the SSR code of [the SR22] changed to 7042 as issued by the SVFR controller.

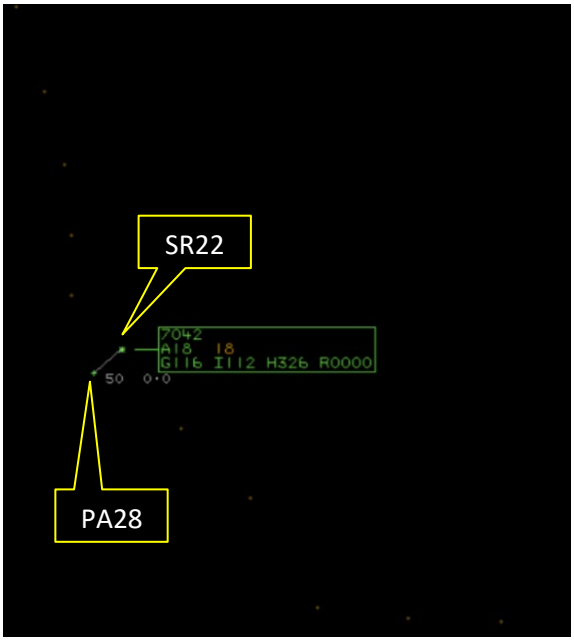


Figure 4 (1006:33) separation 0.0NM, altitude unknown

Farnborough agreed a Basic Service with the pilot of [the PA28] at 1006:36.

The SVFR controller at 1006:45 approved the [SR22] pilot's routeing and the pilot was cleared to enter the London CTR not above 1200ft VFR to avoid Fairoaks and to hold in the vicinity of Ascot.

The Traffic Advisory System (TAS) on the [SR22] (which should display TA warnings for any intruding aircraft with Mode A, C and S transponders) [was reported as not displaying] any conflicting aircraft nor did Farnborough Radar or subsequently Heathrow Radar advise of any conflict.

Safety Investigations Note: The proximity of [the PA28] to [the SR22] would potentially not have appeared on the latter's TAS as [the PA28's] transponder was not functioning at that time. After the closest point of approach, each aircraft continued on their respective tracks with [the PA28] routeing to the south and, after the clearance issued to the pilot of [the SR22] was amended at 1007:43, the pilot routed via the M25 and M3. At 1009:10 the Farnborough LARS controller asked the pilot of [the PA28] for their location (they were "halfway between Guildford and Dunsfold") and informed them that they were not transponding. The pilot had successfully recycled their transponder, and the primary target was identified via Mode S as being [the PA28] indicating 1800ft, at 1009:33. Neither pilot reported an Airprox on frequency to their respective controlling unit; both units were unaware that one had been reported until they were informed by the UK Airprox Board.

Conclusions and Assessment

The Airprox occurred when [2 aircraft], both in Class G airspace, flew into close proximity at around 1800ft, 4.5NM south of Fairoaks. [An SR22] was in the process of establishing their service and routeing with TC SVFR at the time of the Airprox, and a Basic Service was subsequently agreed shortly after the event with the pilot of [the PA28] by the Farnborough controller. The closest point of approach occurred at 1006:33 and was recorded on multi-track radar as 0.0NM. As [the PA28] was not transponding at the time, it is not possible to assess the vertical separation using radar data, but the pilot of [the PA28] reported that they were 'climbing to 1700ft' and [the SR22] was at 1800ft. The incident was resolved by each aircraft continuing their respective tracks.

UKAB Secretariat

An analysis of the radar systems depicted the PA28 as a primary target during the period in which the pilot had reported a climb to 1700ft. The aircraft was established as the PA28 by back tracking

from the point at which the pilot had recycled their transponder squawk and had been positively identified on radar at 1009:35, after the Airprox.

The SR22 pilot reports that they had made a right turn, and that this was the point at which they had believed the Airprox to have occurred. The radar return depicts the beginning of a right turn (Figure 5) and was after an initial left turn from their north-easterly track to heading approximately west.

No altitude was available due to the lack of Mode S from the PA28 at the time of the Airprox which was determined as 1006:35, but the horizontal separation at the closest point of contact was shown to be 0.1NM (Figure 5).

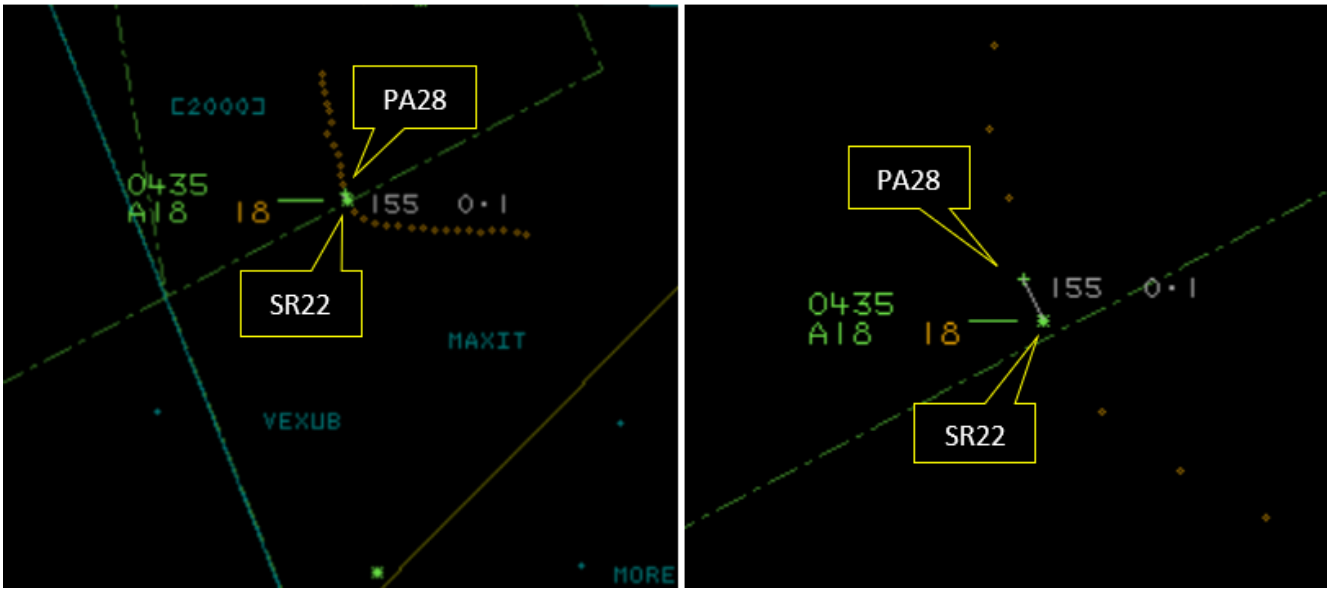


Figure 5 (1006:35) separation depicted as 0.1NM horizontally, vertical element unknown.

The PA28 and SR22 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 head-on or nearly so then both pilots were required to turn to the right.[3] If the incident geometry is considered as converging then the SR22 pilot was required to give way to the PA28.[4]

Summary

An Airprox was reported when a PA28 and a SR22 flew into proximity 4NM south of Fairoaks at 1007Z on Sunday 11th June 2023. Both pilots were operating under VFR in VMC, the PA28 pilot was in the process of establishing a Basic Service with Farnborough and the SR22 pilot was in the process of establishing a service from Heathrow SVFR.

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 a report from the appropriate 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.

The Board first considered the actions of the PA28 pilot who had called Farnborough Radar for a Basic Service during the climb-out from their departure airfield. It was noted that the pilot had reported that they were first given a squawk code and had also been asked if they had been visual with traffic which had been at a similar altitude to their reported stop-climb point. It was agreed that the passage of this Traffic Information had provided the PA28 pilot with sufficient situational awareness to enable them to

[2] (UK) SERA.3205 Proximity.
[3] (UK) SERA.3210 Right-of-way (c)(1).
[4] (UK) SERA.3210 Right-of-way (c)(2) Converging.

sight the SR22, albeit late (**CF5**) which had led them to manoeuvre the PA28 to the left and down, away from SR22.

The Board noted that the Farnborough Radar controller had been busy but had also been able to pass important, albeit late, Traffic Information to the PA28 pilot (**CF1**) before the Basic Service had been established. Expanding on the timing of the passage of the Traffic Information, the Board noted that it had been passed as soon as the controller had been able to, and therefore wished to highlight that 'late' was in the context of the encounter and there was no implication that the Farnborough controller could have passed the Traffic Information any earlier than they had. Members noted that the Farnborough controller had asked the PA28 pilot to recycle their transponder a short while after the closest point of approach because they had only seen a primary radar return and the PA28 could not have been positively identified until their squawk had been seen. Members wondered if the transponder had been correctly set up and concluded that it was important to check prior to departure that the transponder has all available modes selected and is positively switched on (**CF2**).

Turning their attention to the SR22 pilot, it was agreed that because they had been between services, having changed from Farnborough LARS to the Heathrow controller, it had not been possible for them to have received Traffic Information on the PA28 and they therefore had had no situational awareness of the PA28 traffic (**CF3**). Members agreed that the lack of situational awareness had been further compounded by having had no alert on the SR22 pilot's TAS from the effectively incompatible, non-transponding PA28 equipment (**CF4**) and that these factors, combined with the SR22 pilot initiating a right turn, although fortuitous, had contributed to the SR22 pilot's non-sighting of the PA28 (**CF6**).

When assessing the risk of the Airprox, the Board discussed the unfortunate timing, with both pilots in the process of agreeing a service with their respective controllers at the closest point of approach. Although the Board was disappointed at the initial lack of electronic conspicuity from the PA28, members were heartened that the controller had passed Traffic Information to the PA28 pilot as this had helped the PA28 pilot visually acquire and avoid the SR22. Some members assessed this event as 'no risk of collision', but the majority had thought that safety had not been assured and that the aircraft had been sufficiently close for their safety to have been compromised and a risk of collision to have been present; Risk Category B.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2023109			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Situational Awareness and Action			
1	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
	Flight Elements			
	• Tactical Planning and Execution			
2	Human Factors	• Transponder Selection and Usage	An event involving the selection and usage of transponders	
	• Situational Awareness of the Conflicting Aircraft and Action			
3	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late, inaccurate or only generic, Situational Awareness
	• Electronic Warning System Operation and Compliance			
4	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
	• See and Avoid			
5	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

6	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			
7	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: B.

Safety Barrier Assessment[5]

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 **partially effective** because the Farnborough LARS controller expeditiously passed late Traffic Information to the PA28 pilot before a service had been agreed.

Flight Elements:

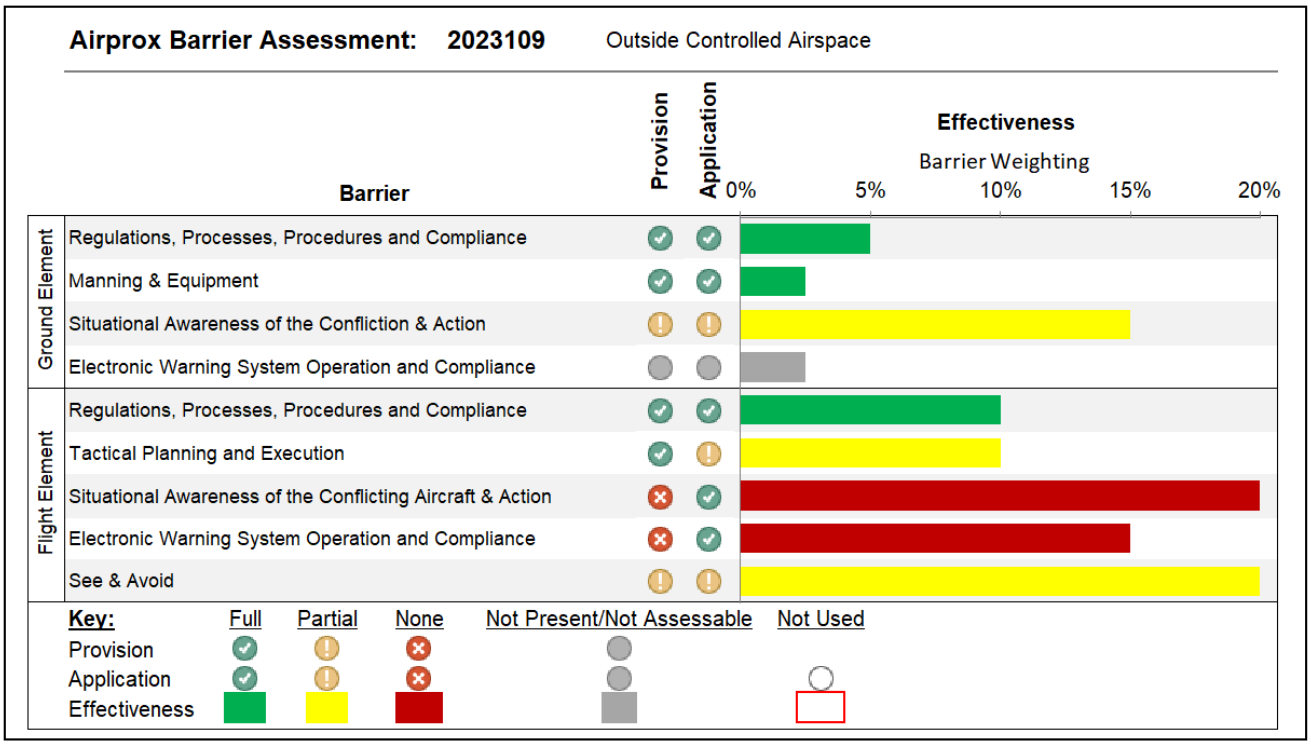
Tactical Planning and Execution was assessed as **partially effective** because the PA28's transponder had not been detected by the radar.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because the SR22 pilot was in the process of changing frequencies and had no Traffic Information and no traffic alert regarding the presence of the PA28.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the SR22's TAS was unable to detect the non-transponding PA28.

See and Avoid were assessed as **partially effective** because the PA28 pilot had sighted the SR22 at a late stage and had taken late avoiding action, and the SR22 pilot had remained unsighted on the PA28.

[5] 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: 2023109
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