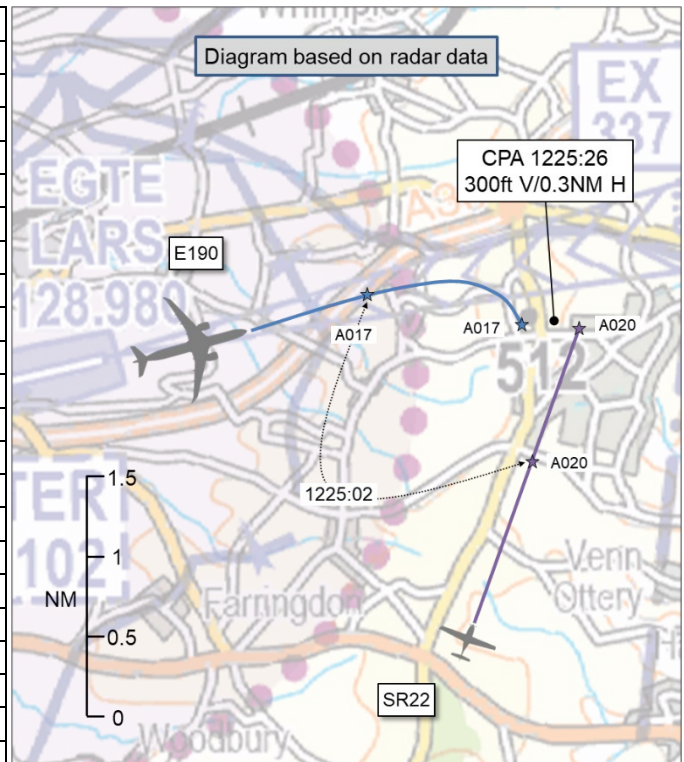


**AIRPROX REPORT No 2024076**

Date: 04 May 2024 Time: 1225Z Position: 5044N 00319W Location: ivo Exeter ATZ

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

Recorded	Aircraft 1	Aircraft 2
Aircraft	E190	SR22
Operator	CAT	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	ACS	Basic
Provider	Exeter Tower	Exeter Radar
Altitude/FL	1700ft	2000ft
Transponder	A, C, S+	A, C, S
<b>Reported</b>		
Colours	Company colours	White
Lighting	"standard"	Strobe
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	1500ft AGL	2000ft
Altimeter	QNH (1010hPa)	QNH
Heading	170°	019°
Speed	180kt	140kt
ACAS/TAS	TCAS II	TAS
Alert	RA	Information
<b>Separation at CPA</b>		
Reported	300ft V/0.5NM H	1000ft V/5NM H
Recorded	300ft V/0.3NM H	



**THE E190 PILOT** reports that, during a training flight, they were level at 1500ft AGL, midway through a crosswind turn onto downwind for RW08 at Exeter, VFR.

They identified a light-aircraft, indicating 300ft above their height, travelling right-to-left at an estimated 0.5NM. Shortly afterwards, a TCAS RA 'monitor vertical rate' was presented. They retained visual with the traffic as it continued to clear left as their right turn continued.

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

**THE SR22 PILOT** reports that [they were routeing] from [the south-west] towards Dunkeswell, tuned to Exeter Radar 128.980MHz. They are not sure which transponder code was set but, for the whole trip, they used the code as requested by the FIS. As they were approaching Dunkeswell they asked to switch to Dunkeswell Radio. This was not approved. They stayed tuned to [the Exeter Radar] frequency. They were flying outside the Exeter zone and had an airliner in sight. Keeping their heading and altitude, [they were] ready to make corrective action if needed. They saw the airliner make a turn to the right. One minute later, they were cleared to switch to Dunkeswell.

[The SR22 pilot opined that] it was obvious that they had to stay tuned because of the activity on the Exeter [frequency] so it was a bit of a surprise that the departing pilot was not aware of their presence.

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

**THE EXETER TOWER CONTROLLER** reports that [the pilot of the E190] was conducting right-hand circuits at 1700ft on RW08. As they watched the aircraft climb away, and they turned back towards the airfield, they noticed a return on the ATM at 2000ft about 2.5NM ESE about 1 mile ahead of the [E190] crossing from right-to-left around 300ft above. The aircraft was on an Exeter squawk. They couldn't see [this] other aircraft from the tower.

**THE EXETER RADAR CONTROLLER** did not submit a report.

## **Factual Background**

The weather at Exeter was recorded as follows:

METAR EGTE 041220Z 14009KT 110V170 9999 FEW020 15/07 Q1010

## **Analysis and Investigation**

### **CAA ATSI**

Where an Airprox is reported to an ATS unit, all controllers involved are required to submit an MOR within 72 hours of being made aware of the event. The initial report and follow-up investigation subject titles, and the action taken by Exeter ATC for this event, indicate that the event was initially reported to them as a TCAS RA event, with a subsequent notification being received from UKAB that it had been reported to them as an Airprox event. The ATS reporting requirements for a TCAS RA event differ from those for an Airprox event in that the responsibility for reporting a TCAS RA rests with the controller providing the ATC service to the aircraft in receipt of the TCAS RA; in this case, the Tower controller. This may explain the absence of an MOR from the Exeter Radar controller for this event. Exeter has, however, confirmed that the Radar controller has provided input to the Unit investigation.

### **Exeter Airport Unit Investigation**

#### **Executive Summary**

[The pilot of the] E190 received a TCAS Resolution Advisory (RA) whilst crosswind in the visual circuit due to a transiting SR22 on a converging track outside the ATZ. The distance between the two aircraft reduced to 300ft vertically, 0.4NM laterally.

#### **Findings**

The Radar controller was under a heavy workload (six or more active Flight Progress Strips) providing seven aircraft with a service, and had been in position for 25min. The Tower controller was under a moderate workload (between three and five active Flight Progress Strips) controlling five aircraft/vehicles, and had been in position for 54min. Both controllers were operating in compliance with the requirements of the ATCO Rostering System.

[The pilot of the] E190 commenced visual-circuit training at 1151. [The pilot of the] SR22 was on a flight from [take-off airfield] to [destination airfield] and made contact with Exeter Radar (128.980Mhz) at 1217 in the vicinity of Berry Head.

[The pilot of the] E190 remained on the Tower frequency (119.805Mhz). [The pilot of the] SR22 remained on the Radar frequency and was on a steady track towards the Exmouth VRP, although the pilot did not report their intended routing other than point of departure and destination. On passing the Exmouth VRP, the aircraft continued the same track which, if extended, would pass within 0.5NM of the Exeter ATZ. The SR22's groundspeed was approximately 148kts (50% greater than most other aircraft whose pilots were receiving a Basic Service at the time).

Exeter's MATS Part 2 requires Radar controllers to coordinate aircraft which route through or close to the ATZ (i.e. within 5NM of the ARP at or below 2500ft) with the Tower controller. The Radar controller did not effect such coordination.

Radar recordings show that at approximately 1224:20, the E190 got airborne from RW08 following a touch-and-go. The SR22 was 4.5NM south-east of Exeter Airport at 2000ft altitude on a track of approximately 017°(M).

At 1225:05, the pilot of the E190 was 2.5NM east-northeast of the airport on the extended centreline of RW08 and commenced the right turn for the crosswind leg, and levelled-off at 1700ft altitude. The SR22 was then 3NM east of the airport, maintaining track and altitude. The lateral distance between the aircraft was 1.1NM. At that point, the Tower controller started to pass Traffic Information to [the pilot of the] E190 about the unknown traffic (unknown to the controller). [The pilot of the] E190 replied “*Visual*, [E190 callsign]”. The TCAS RA annunciation ‘maintain present altitude’ was heard in the background of that transmission and the distance between the aircraft at the end of that statement was 0.9NM.

The Closest Point of Approach (CPA) occurred at 1225:25. The E190 was 3.3NM east of the airport, in a right turn maintaining altitude 1700ft. The SR22 was 3.7NM east of the airport, still tracking approximately 017°M maintaining altitude 2000ft. The distance between the two aircraft reduced to 300ft vertically and 0.4NM laterally.



Figure 1: CPA between E190 (7010) and SR22 (0416), as seen on the ATM.

Two minutes before the RA, the Radar controller had advised the Tower controller of another aircraft making an instrument approach. In the last minute prior to the event, the Radar controller transferred one aircraft to an en-route frequency and established communications with another pilot who had requested a Basic Service.

It is likely that a lapse meant that the Radar controller did not coordinate with the Tower controller the close proximity of SR22's track to the ATZ. Multiple opportunities to have done so had arisen. Four and a half minutes before the RA, [the pilot of the] SR22, then 10NM south of Exeter Airport, requested to change frequency to Dunkeswell Radio. The Radar controller instructed the pilot to remain on the Exeter Radar frequency for “*another 10 miles or so*”. The Radar controller's scan of the area in which SR22 was flying shortly before the RA occurred did not trigger a realisation that the Tower controller was unaware of the traffic. The coordination would normally have been achieved at that point. The Radar controller was aware that the E190 had been operating in the circuit but, during their last scan of that area, the 7010 squawk was accompanied by a Mode C altitude indication of less than 1100ft (the normal circuit altitude) because the aircraft was still climbing. This ‘normal’ situation therefore also did not prompt the controller to realise they had not yet achieved the coordination. The representation on the radar display was, at that point, similar to a normal circuit. The function that automatically rotates position indication labels to minimise ‘garbling’ was seemingly not active. The label accompanying the SR22's position indication overlapped with another label for short periods of time. If that overlap had coincided with the Radar controller's scan of the area, it could have prevented the Radar controller from noticing the impending conflict. The Tower controller did not notice the position indication of the SR22 on the ATM until just before the TCAS RA occurred, and they did not see the aircraft out of the window before, or after, the event.

The Tower controller was primarily engaged in other aerodrome control operations in the minute leading up to the RA, including clearing an aircraft for pushback with a subsequent cross-bleed start, and clearing a wildlife control vehicle onto the runway for a bird inspection. The SR22's position indication appeared on the ATM 6min before the RA, and had passed the Exmouth VRP 3min before the RA.

The E190 pilot did not immediately inform the controller that they had encountered a TCAS RA. The Captain made a phone call to the Tower assistant at 1248 (after they had landed) stating they had a TCAS RA, and that *"it was a bit closer than we might have expected, I was surprised"*.

The Radar controller was unaware of the occurrence until some hours later when they noticed 'TCAS RA' written on a notepad in the Tower and they asked the Tower assistant to what that had related.

### Conclusion

A lapse by the Radar controller meant Traffic Information regarding the SR22's projected proximity to the ATZ was not passed to the Tower controller, and coordination was not effected. The Tower controller did not notice the conflicting track of the position indication on the ATM in time to have provided instructions to avoid the conflict. However, when they became aware, they immediately provided Traffic Information to avoid a collision using the ATM. The position and altitude accompanying the 7010 squawk at the time the Radar controller last scanned the area was similar to a 'normal' circuit. That did not prompt the Radar controller to realise their traffic was in conflict with the circuit traffic and, thus, coordination with the Tower controller had in fact not yet been achieved. Those events led to the E190 pilot encountering a TCAS RA with the SR22. The pilot of the E190 obtained visual contact with the SR22 when the distance between the aircraft was at least 0.9NM and, at that point, both aircraft were maintaining their respective altitudes. The Closest Point of Approach was 300ft vertically and 0.4NM laterally.

### UKAB Secretariat

An analysis of the NATS radar replay was undertaken and both aircraft could be positively identified from Mode S data (Figure 2). Due to limitations of the radar system, the returns from the E190 were not precise in the moments leading up to CPA. CPA was assessed to have occurred between the radar sweeps at 1225:22 and 1225:26 (Figures 3 and 4).

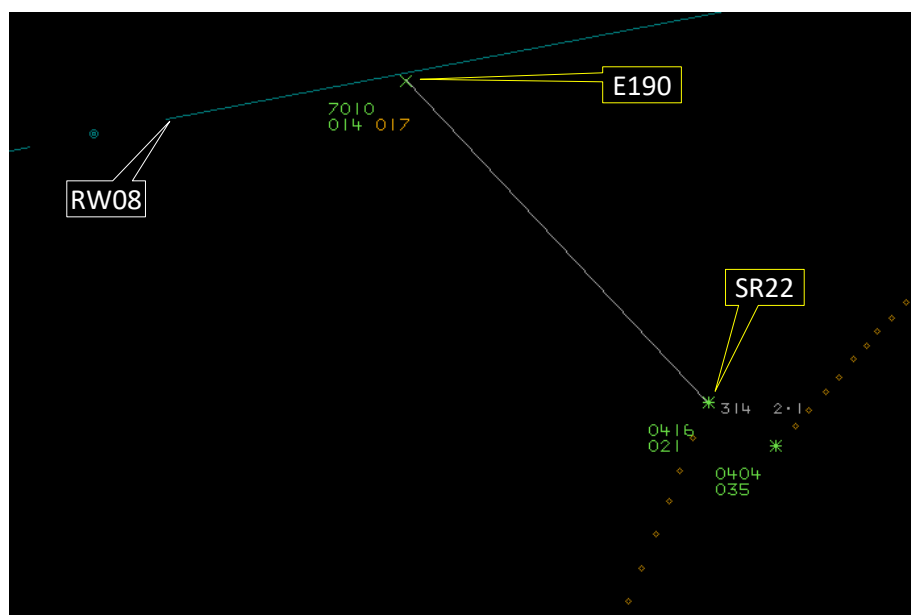


Figure 2 - The E190 first appeared on the radar replay at 1224:46

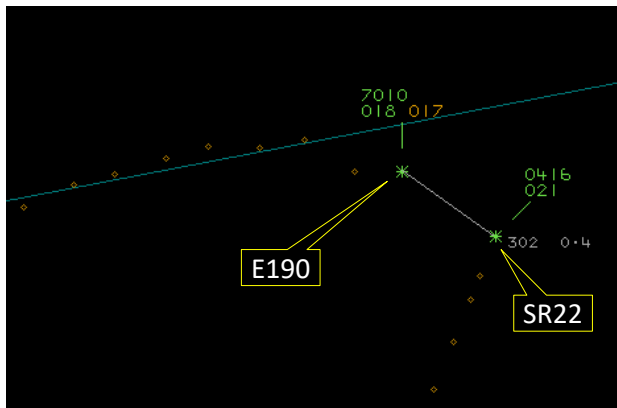


Figure 3 - 1225:22

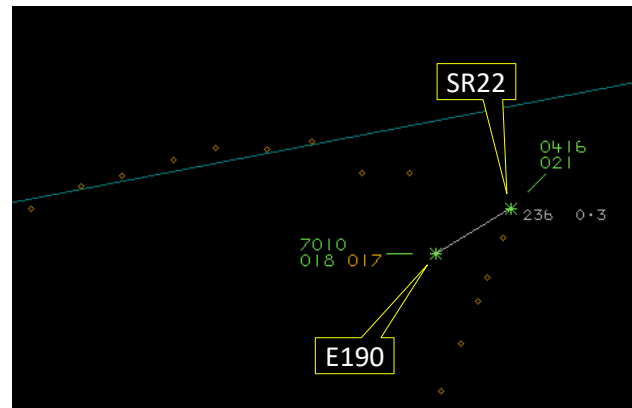


Figure 4 - 1225:26

The E190 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.<sup>1</sup> If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right.<sup>2</sup> If the incident geometry is considered as converging then the E190 pilot was required to give way to the SR22.<sup>3</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>4</sup>

## Summary

An Airprox was reported when an E190 and an SR22 flew into proximity in the vicinity of Exeter ATZ at 1225Z on Saturday 4<sup>th</sup> May 2024. Both pilots were operating under VFR in VMC, the E190 pilot in receipt of an Aerodrome Control Service from Exeter Tower and the SR22 pilot in receipt of a Basic Service from Exeter Radar.

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

Information available consisted of reports from both pilots, radar photographs/video recordings, a report from one of 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 pilot of the E190. A member with particular knowledge of airline operations explained that the workload in the cockpit of the E190 would have been high, particularly due to the nature of the training flight being undertaken. Members agreed that to have received Traffic Information on an 'unknown' contact and to have visually acquired the SR22 in close proximity would have caused concern (**CF8**). Members agreed that it would also have been a surprise to have received a Resolution Advisory (RA) from the TCAS (**CF6**). However, it was noted that the RA had been 'passive' in that it had not required an immediate manoeuvre for a resolution. In consideration of the time from the passage of Traffic Information and the receipt of a TCAS RA to the moment of CPA, members assessed that the pilot of the E190 had acquired late situational awareness of the presence of the SR22 (**CF5**).

Members next turned their attention to the actions of the pilot of the SR22. By reference to the narrative report of their encounter, members surmised that they had not had situational awareness of the presence of the E190 until it had been visually acquired (**CF5**), but had subsequently received information from their TAS concerning its presence (**CF7**). Members noted that the SR22 pilot had been ready to have taken avoiding action but had assessed that no action had been necessary.

<sup>1</sup> (UK) SERA.3205 Proximity.

<sup>2</sup> (UK) SERA.3210 Right-of-way (c)(1) Approaching head-on.

<sup>3</sup> (UK) SERA.3210 Right-of-way (c)(2) Converging.

<sup>4</sup> (UK) SERA.3225 Operation on and in the Vicinity of an Aerodrome.



Although disappointed that the Exeter Radar controller had not submitted a report of the occurrence, members agreed that the Exeter Airport Unit Investigation had described their actions sufficiently to be able to make an assessment. Members noted that they had had generic situational awareness of the E190 in the circuit at Exeter, but had not passed Traffic Information on the E190 to the pilot of the SR22 (CF2). It was agreed by members that the Exeter Radar controller had not co-ordinated the passage of the SR22 with the Tower controller (CF3) and had therefore not followed the correct procedure as prescribed in the Exeter Unit MATS Part 2 (CF1). Members pondered the track of the SR22 and its proximity to the Exeter ATZ. Some members suggested that it may have been prudent for the Exeter Radar controller to have requested that the SR22 pilot transit through the area with greater separation from the ATZ (given that the E190 had been in a circuit pattern that had extended outside the ATZ). Similarly, some members suggested that it would have been reasonable for the pilot of the SR22 to have anticipated that they may have encountered traffic close to the ATZ, and to have considered altering their course to pass-by further to the east.

Turning their attention to the actions of the Exeter Tower controller, members noted that they had noticed the presence of the SR22 on their ATM and had provided Traffic Information on that contact to the pilot of the E190. However, given that the separation between the E190 and SR22 had been approximately 0.9NM at that moment, members were in agreement that the Tower controller's situational awareness of the presence of the SR22 in the vicinity had been acquired late (CF4) and, consequently, Traffic Information had been passed to the E190 pilot late (CF2).

Concluding their discussion, members agreed that the Exeter Radar controller had not coordinated the flight of the SR22 with the Exeter Tower controller and, as a consequence, safety margins had been reduced. However, the pilot of the E190 had been passed Traffic Information on the presence of the SR22 (albeit relatively late) and had received a TCAS RA. Additionally, the pilot of the SR22 had received information from their TAS. Members agreed that, ultimately, both pilots had visually acquired the other aircraft in time to have assessed the geometry of the encounter and to have considered the safest course of action. No avoidance manoeuvres had been necessary and members were in agreement that the separation at CPA had been such that no risk of collision had existed. The Board assigned Risk Category C to this event.

## **PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK**

### Contributory Factors:

	2024076			
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
	<b>Ground Elements</b>			
	<b>• Regulations, Processes, Procedures and Compliance</b>			
1	Human Factors	• ATM Regulatory Deviation	An event involving a deviation from an Air Traffic Management Regulation.	Regulations and/or procedures not fully complied with
	<b>• Situational Awareness and Action</b>			
2	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
3	Human Factors	• ATM Coordination	Coordination related issues (external as well as internal)	
4	Contextual	• Traffic Management Information Action	An event involving traffic management information actions	The ground element had only generic, late, no or inaccurate Situational Awareness
	<b>Flight Elements</b>			
	<b>• Situational Awareness of the Conflicting Aircraft and Action</b>			
5	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
	<b>• Electronic Warning System Operation and Compliance</b>			
6	Contextual	• ACAS/TCAS RA	An event involving a genuine airborne collision avoidance system/traffic alert and collision avoidance system resolution advisory warning triggered	

7	Contextual	• Other warning system operation	An event involving a genuine warning from an airborne system other than TCAS.	
• See and Avoid				
8	Human Factors	• Perception of Visual Information	Events involving flight crew incorrectly perceiving a situation visually and then taking the wrong course of action or path of movement	Pilot was concerned by the proximity of the other aircraft

Degree of Risk: C.

Safety Barrier Assessment<sup>5</sup>

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

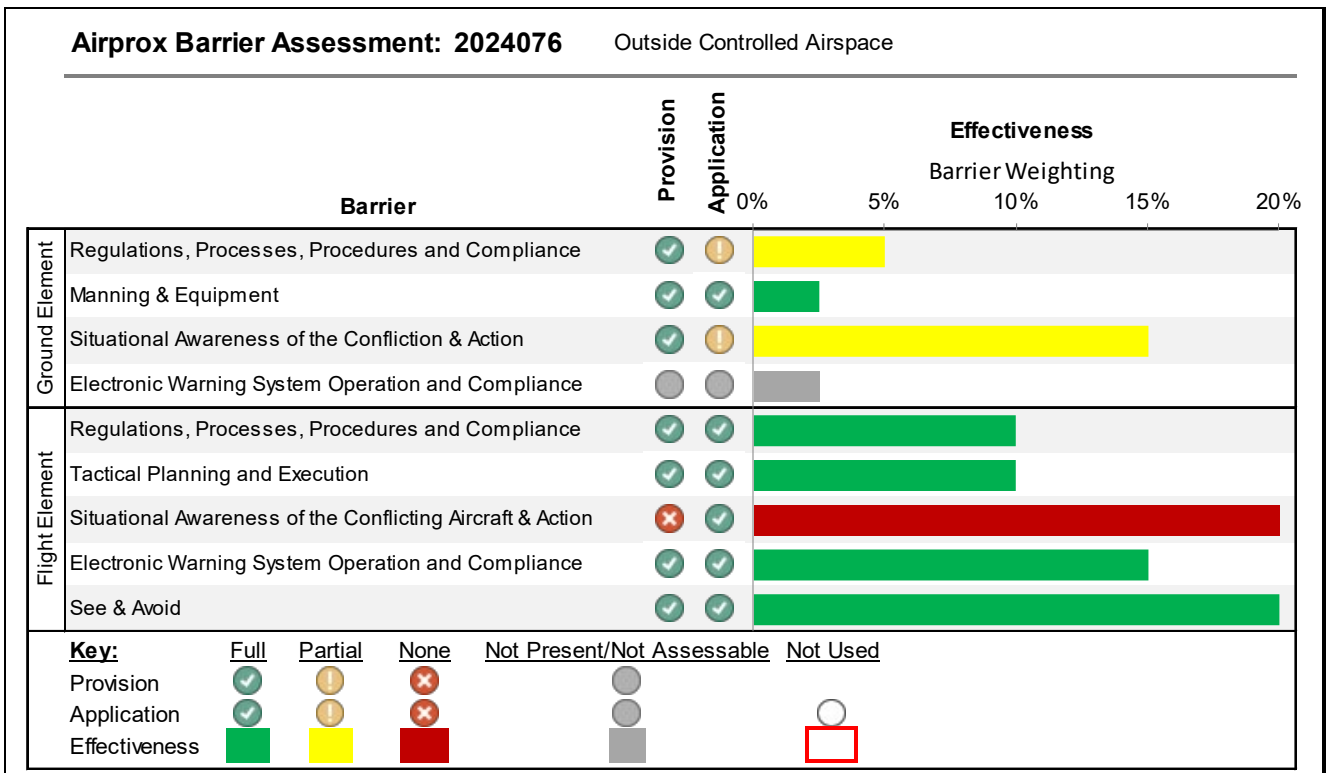
**Ground Elements:**

**Regulations, Processes, Procedures and Compliance** were assessed as **partially effective** because the Exeter Radar controller had not complied with the procedure to have coordinated the passage of the SR22 with the Exeter Tower controller.

**Situational Awareness of the Confliction and Action** were assessed as **partially effective** because the Exeter Tower controller had late situational awareness of the presence of the SR22.

**Flight Elements:**

**Situational Awareness of the Conflicting Aircraft and Action** were assessed as **ineffective** because the pilot of the SR22 had not had situational awareness of the presence of the E190 until it had been visually acquired.



<sup>5</sup> The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).