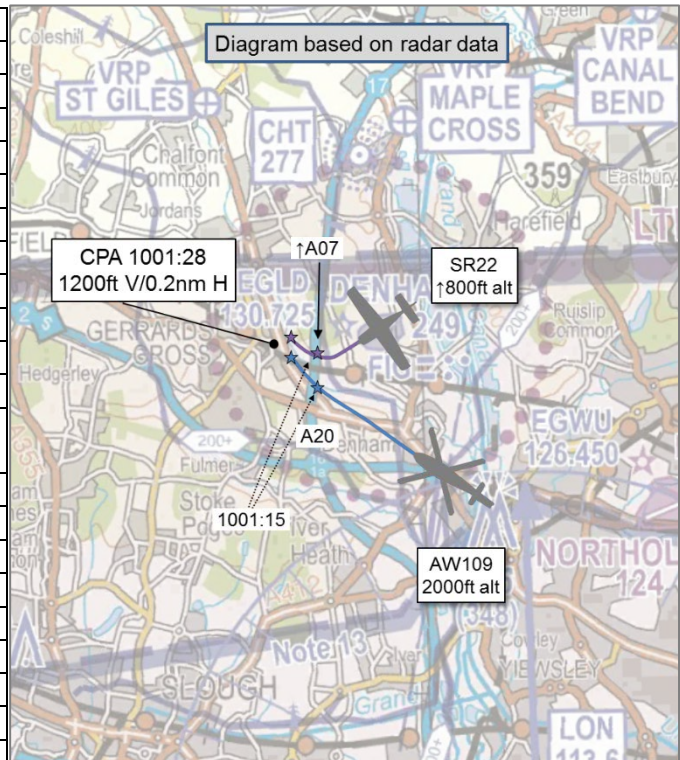


**AIRPROX REPORT No 2019019**

Date: 04 Feb 2019 Time: 1001Z Position: 5135N 00032W Location: 3nm NE Denham

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

| Recorded    | Aircraft 1                      | Aircraft 2           |
|-------------|---------------------------------|----------------------|
| Aircraft    | AW109                           | SR22                 |
| Operator    | HQ Air (Ops)                    | Civ FW               |
| Airspace    | London CTR                      | London CTR           |
| Class       | D                               | D                    |
| Rules       | IFR                             | VFR                  |
| Service     | Radar Control                   | AGCS                 |
| Provider    | Northolt                        | Denham               |
| Altitude/FL | 2000ft                          | 800ft                |
| Transponder | A, C, S                         | A, C, S              |
| Reported    |                                 |                      |
| Colours     | White                           | Blue                 |
| Lighting    | HISLs, Nav, Landing             | Nav, Strobe, Landing |
| Conditions  | IMC                             | VMC                  |
| Visibility  | 0m                              | 5km                  |
| Altitude/FL | 2000ft                          | NR                   |
| Altimeter   | QNH (1015hPa)                   | NK                   |
| Heading     | 359°                            | NR                   |
| Speed       | NK                              | NR                   |
| ACAS/TAS    | TAS                             | TCAS I               |
| Alert       | Information                     | None                 |
| Separation  |                                 |                      |
| Reported    | Not Seen<br>(TAS: 0ftV/0.25nmH) | Not seen             |
| Recorded    | 1200ft V/0.2nm H                |                      |



**THE AW109 PILOT** reports being cleared to climb to 2200ft QNH outside controlled airspace after having completed the published RAF Northolt Romeo non-airways departure with Northolt Radar. ATC updated previously called traffic out of Denham, which had been reported as at 600ft, 0.5nm away and was now climbing. Although on a Traffic Service, Northolt Radar advised the AW109 pilot to conduct a 20° turn to the left if not sighted. They informed ATC that they were IMC and took the turn, which was then increased to a 45° turn because the pilot noticed the TAS indicating that the other aircraft was still climbing at -200, -100 and then 0ft vertical separation. He was IMC and so could not see it. After the threat had gone the pilot asked ATC who was working the other aircraft, because he was IMC he assumed the other aircraft was too, and the reply was 'no one'.

He assessed the risk of collision as 'High'.

**THE SR22 PILOT** reports that he was not aware of the Airprox and he had no visual sighting of the other aircraft. There was no traffic warning on his TCAS. He was VFR but the weather was marginal, 900ft scattered and deteriorating from the west. After he left Denham he spoke briefly with Southend, but he was too far away from them so he called Farnborough LARS North for a Traffic Service prior to being handed over at a later stage.

**THE NORTHOLT RADAR CONTROLLER** reports that he was only informed about the Airprox 10 days after the event and so his recollection was not clear. He recalled that the AW109 departed from Northolt on a Romeo SID, which took him over the top of Denham ATZ at 2000ft. The controller noticed an aircraft departing Denham and indicating 700-1000ft; he called the traffic to the AW109 pilot, who reported that he was not visual. He continued to call the unknown contact because it was indicating that it was climbing and he thought that the situation required deconfliction advice if the AW109 pilot

was not visual. Once the two aircraft were separated and no conflict existed he advised the AW109 to continue on his own navigation.

He perceived the severity of the incident as 'Medium'.

**THE DENHAM AIR TO GROUND OPERATOR** reported that an inbound helicopter landed at Denham at 0936 and reported the cloud base as 1100ft with an in-flight visibility of 6000m. When the SR22 pilot taxied he was given this information. Before he departed the pilot was advised that the visibility and cloud-base had clearly deteriorated. The pilot elected to depart and reported the cloud-base as 900ft. He left the frequency and, shortly afterwards, Northolt Radar rang to say that the SR22 had been involved in an Airprox with an AW109.

## Factual Background

The weather at Northolt was recorded as follows:

```
METAR EGWU 040950Z 22011KT 8000 -RADZ BKN007 07/06 Q1016 GRN TEMPO 5000 BKN006 YL01=
```

## Analysis and Investigation

### Military ATM

The AW109 departed RAF Northolt on a ROMEO (non-airways) departure climbing to 2200ft and was in receipt of a Traffic Service from Northolt Approach. The SR22 departed Denham to land abroad. Traffic Information was passed to the AW109 on 3 occasions and the aircraft received a TAS warning. The SR22 reported not receiving any TCAS alerts.

On initial departure from Northolt, the AW109 was correctly identified and placed on a Radar Control Service. The ROMEO departure routes approximately 1nm west of Denham not below 1500ft (iaw a local agreement). Traffic Information was passed to the AW109 at 1001:17 (Figure 1) and noted that the SR22 was 1000ft below and 'had just departed Denham'.

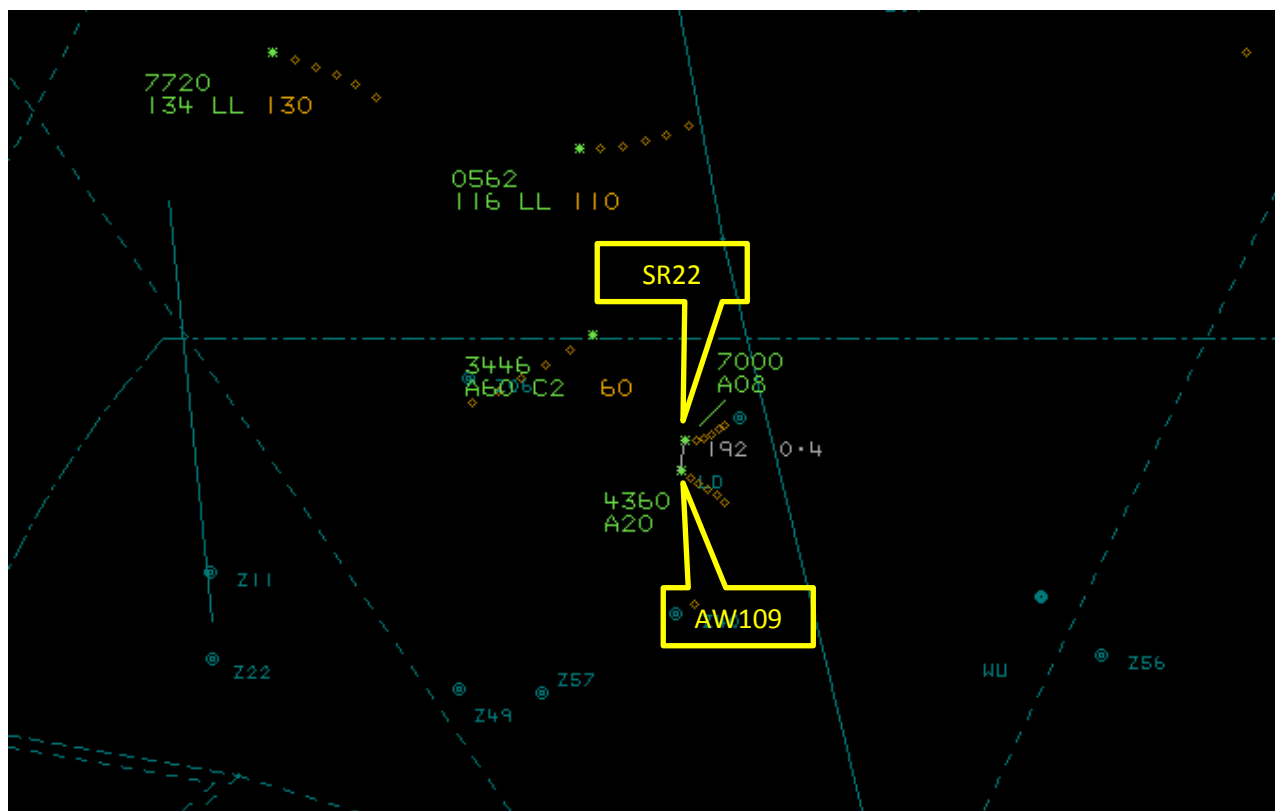


Figure 1

CPA occurred at 1001:28 (Figure 2), 10sec after the Traffic Information was passed by Northolt to the AW109 pilot. Separation was measured at 0.2nm and 1200ft.

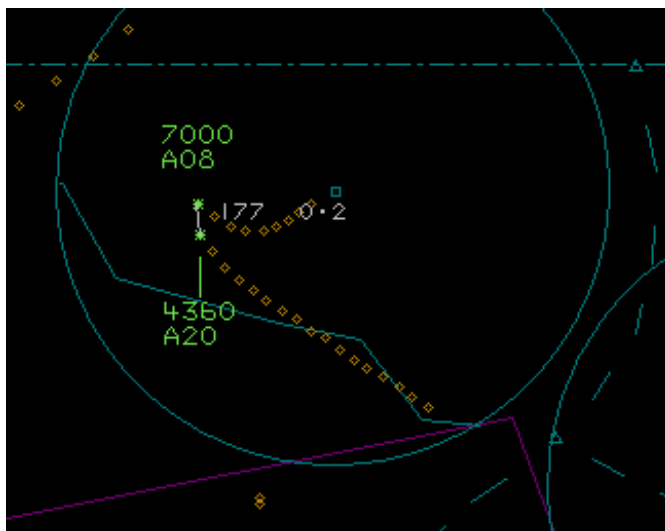


Figure 2 1001:28 CPA

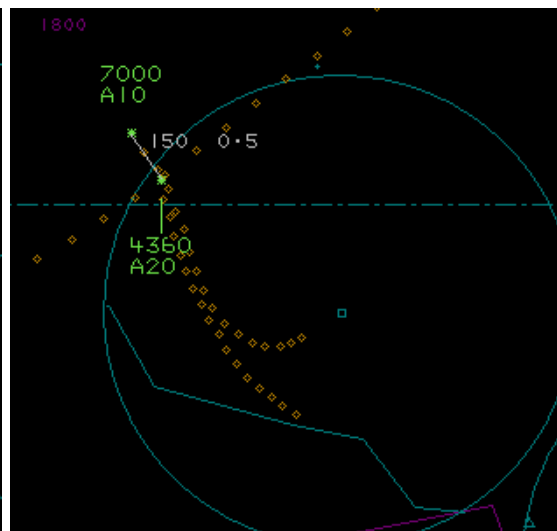


Figure 3 1002:08

Traffic Information was then updated by the Northolt Approach Controller who noted that the SR22 was still indicating 1000ft below. The controller stated that he would let the AW109 know if the SR22 began to climb. Shortly after this point, the AW109 left Controlled Airspace and was placed on a Traffic Service (Figure 3). Approximately 1min later, the Northolt Approach Controller passed Traffic Information for a third and final time as the SR22 had begun to climb. This Traffic Information was accompanied by a left turn of 20° and appears to be coincident with the AW109 receiving a TAS warning.

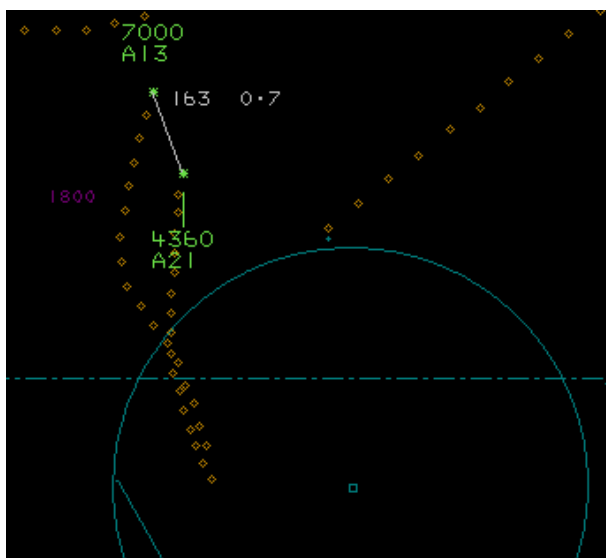


Figure 4 1002:44

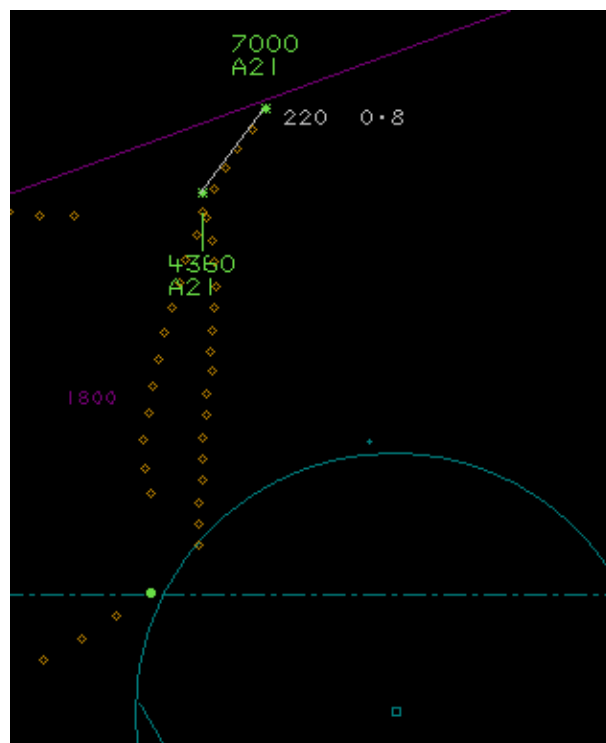


Figure 5:1003:17

As the tracks progress beyond the third instance of Traffic Information, the SR22 is accelerating ahead of the AW109 and the flight paths are diverging (Figure 4). Both aircraft are eventually indicating at the same level at 1003:17 (Figure 5) with a separation of 0.8nm.

The Northolt Approach Controller passed Traffic Information on three occasions and, although there was no requirement to do so, also passed an avoiding action turn to increase separation. As such, the Northolt Approach Controller discharged their duties appropriately.

## UKAB Secretariat

The AW109 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 converging then the AW109 pilot was required to give way to the SR22<sup>2</sup>.

## Comments

### HQ Air Command

Due to the nature of the tasking and planned routing of both aircraft, the plan to avoid barrier was not available.

Although a Deconfliction Service was available, the A109 pilot opted for a Traffic Service whilst operating outside of controlled airspace in IMC. This decision was made because the A109 was operating to a task timeline - the pilot had a perception that deconfliction instructions, if followed, would lead to a reduction in his ability to achieve his task timelines. Notwithstanding this, the Northolt Radar Controller called Traffic Information on the SR22 and advised the A109 pilot to turn to increase separation. The SR22 was initially not in receipt of an ATS and operating below the cloud base in VMC. He eventually spoke to Southend before calling Farnborough LARS North for a Traffic Service – this sequence of events was likely due to the weather being worse than expected. In any case, it would appear that the SR22 pilot was never aware of the proximity of the A109.

It is apparent that the A109 pilot received TAS information about the proximity of the SR22 which heightened his awareness of the threat of collision. Although he reported the closest separation as 'approximately 0.25nm horizontally, 0ft vertically, on TAS', the recorded CPA was 1200ft at 0.2nm. At the point where both aircraft were co-altitude, the horizontal separation was 0.8nm and increasing. It is not evident why this disparity should exist. The SR22, fitted with a TCAS 1, did not receive any indication of the presence of the A109 and could not have received Traffic Information on the A109 as he had yet to agree an ATS. The A109 pilot's belief that the SR22 was IMC and not being controlled by anyone is likely to have influenced his assessment of the risk of collision.

This Airprox serves as a stark reminder that building complete situational awareness when operating IMC in busy airspace can be a very difficult task. Despite the availability of TAS/TCAS, the selection an optimal ATS is fundamental to building SA and leads to better decision making - ultimately reducing the risk of MAC.

## Summary

An Airprox was reported when an AW109 and a SR22 flew into proximity whilst overhead Denham, at 1001hrs on Monday 4<sup>th</sup> February 2019. The AW109 pilot was operating under IFR in IMC, and in receipt of a Traffic Service from Northolt Radar. The SR22 was VFR in VMC and not in receipt of an ATS.

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

Information available consisted of reports from both pilots, transcripts of the relevant R/T frequencies, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and 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.

The Board first looked at the actions of the AW109 pilot. He was departing from Northolt, at first under Radar Control and, once clear of CAS, under a Traffic Service. Noting the HQ Air Command comments about perceived task pressures, the Board thought that, irrespective of time constraints, had the pilot

<sup>1</sup> SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

<sup>2</sup> SERA.3210 Right-of-way (c)(2) Converging. MAA RA 2307 paragraph 12.

requested a Deconfliction Service he would then have had the peace of mind in IMC that the controller could give deconfliction advice. As it was, he became increasingly concerned that he was IMC and couldn't see the other aircraft (**CF3**) which he could see from his TAS was climbing (**CF2**). In fact, although the SR22 was climbing once it had exited CAS, it was now well ahead of the AW109 and, being faster, was pulling away. Despite the Traffic Information from ATC, the AW109 pilot was still concerned that the SR22 was likely to be a factor (**CF1** and **CF4**) and helicopter members opined that this may have been because angle-of-arrival errors are often experienced with TAS information and this may have shown the SR22's position to be ambiguous.

For his part, the SR22 pilot departed from Denham and remained below 1000ft as per the local agreement. The pilot reported being VMC beneath the cloud (**CF3**) and was content to be without an ATS. Once clear of CAS and able to climb for a surveillance-based service, GA members were surprised that he first called Southend for an ATS; they commented that he was much too far away from Southend at that altitude and would have been better served by calling Farnborough first, as he subsequently did for a Traffic Service. The Board thought that despite this, the unproductive call to Southend had had no effect on the incident given that he was ahead of the AW109 at that point. The SR22 pilot had reported that his TCAS did not pick up the AW109, and members wondered whether this was because once he had turned north the AW109 was behind his aircraft and possibly off the bottom of his display. Neither could they categorically explain why his TCAS had not displayed the AW109 before the SR22 pilot turned northbound, although they noted that it appeared that the SR22 was below 800ft QNH (approx 550ft agl) at the point he turned north and that there were various logic structures within the system that may have inhibited display and aural alerts at that time<sup>3</sup>. As a result, without any TCAS indications the SR22 pilot had no situational awareness about the AW109, and therefore no perception that the AW109 pilot might be concerned by his proximity (**CF4**).

In briefly discussing the role of ATC, the Board thought that the Northolt Radar controller had discharged his duties correctly, giving Traffic Information and even offering a deconfliction turn which was not necessary under a Traffic Service. They therefore agreed that there was little more the controller could or should have done in the circumstances.

Finally, in assessing the risk, the Board briefly discussed whether safety had been reduced, but quickly agreed that there had been no risk of collision and thought that although the criteria for reporting the Airprox had been met, normal procedures and safety standards had pertained; risk Category E.

## **PART C: ASSESSMENT OF CAUSE AND RISK**

### Contributory Factors:

| CF | Factor  | Description   | Amplification  |
|----|---|---|--|
|    | <b>Flight Elements</b>  |   |  |
|    | <b>• Situational Awareness of the Conflicting Aircraft and Action</b> |   |  |
| 1  | Human Factors   | • Interpretation of Automation or Flight Deck Information | Pilot was concerned by the proximity of the other aircraft |
| 2  | Human Factors   | • Interpretation of Automation or Flight Deck Information | CWS sighting report  |
|    | <b>• See and Avoid</b>  |   |  |
| 3  | Contextual  | • Poor Visibility Encounter                               | One or both aircraft were obscured from the other          |
| 4  | Human Factors   | • Lack of Individual Risk Perception                      | Pilot flew close enough to cause the other pilot concern   |

<sup>3</sup> e.g. proximate aircraft indications are only generated when the other aircraft is within +/-1200ft of the host aircraft (the AW109 was only less than approximately 1200ft separation after the SR22 had climbed once it was well ahead); and aural alerts are inhibited when an aircraft is less than 400ft +/- 100ft - the SR22 was at about this height as it turned northwards.

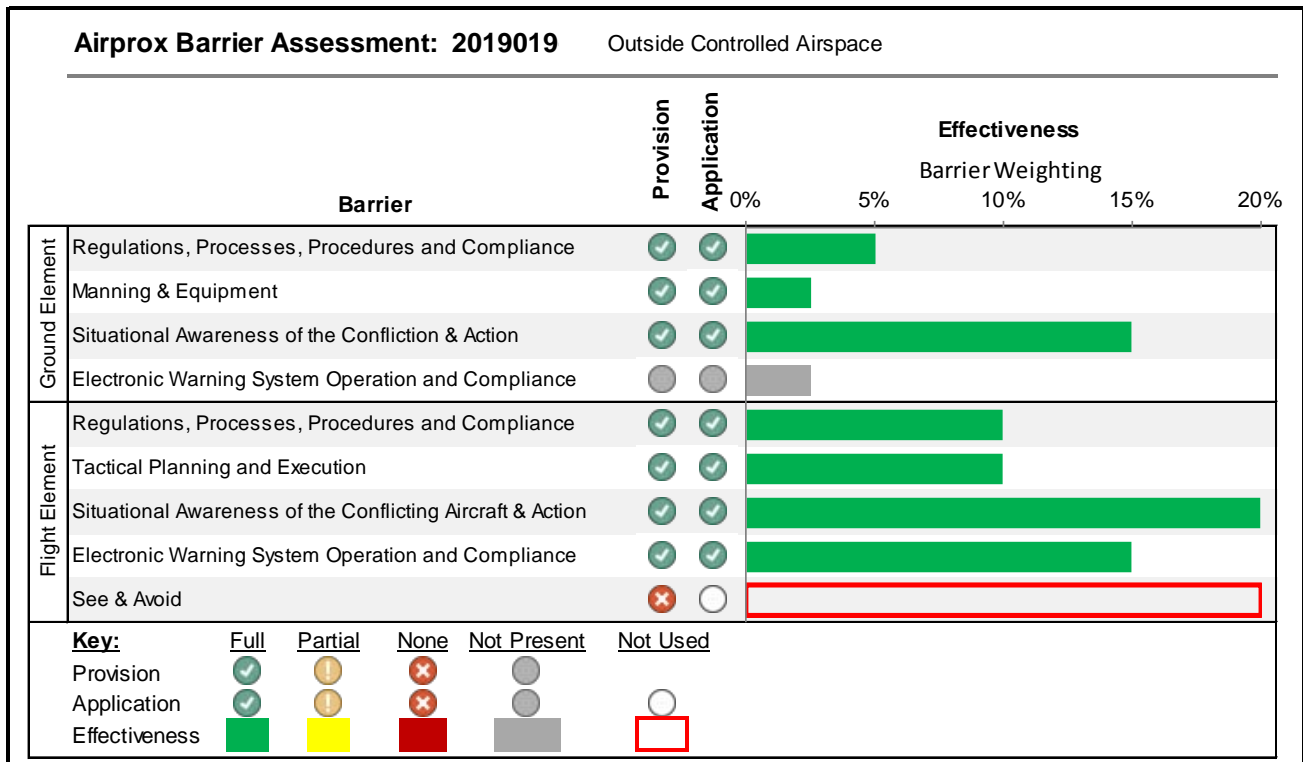
Degree of Risk: E.

Safety Barrier Assessment<sup>4</sup>

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

**Flight Elements:**

**See and Avoid** were assessed as **not used** because the AW109 pilot was IMC and therefore could not be seen by the SR22 pilot, nor could the AW109 pilot see the SR22.



<sup>4</sup> The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).