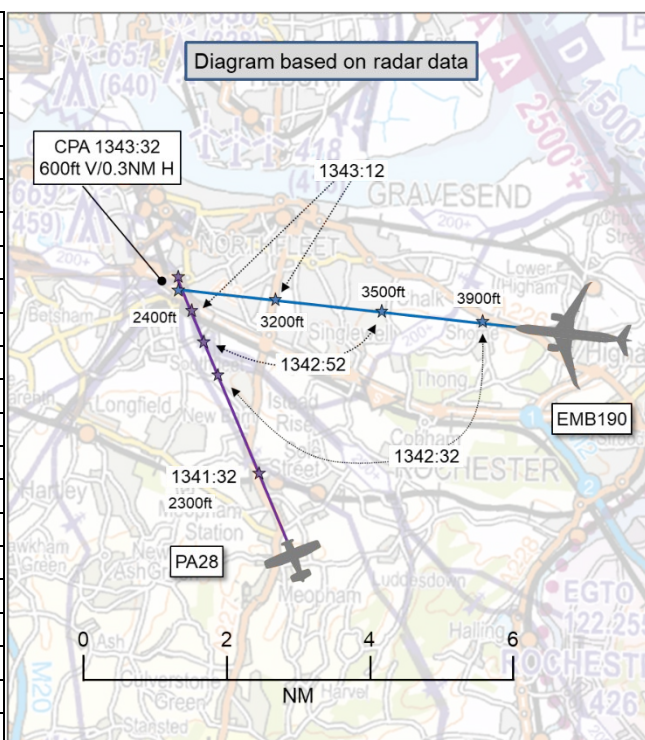


AIRPROX REPORT No 2025140

Date: 13 Jul 2025 Time: 1344Z Position: 5125N 00020E Location: Gravesend

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	EMB190	PA28
Operator	CAT	Civ FW
Airspace	London TMA	London FIR
Class	A	G
Rules	IFR	VFR
Service	Radar Control	Basic
Provider	City Director	Southend Radar
Altitude/FL	3000ft	2400ft
Transponder	A, C, S+	A, C, S
Reported		
Colours	White, blue, red	Red, white
Lighting	Full	Nil
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	3000ft	NK
Altimeter	QNH (1012hPa)	QNH
Heading	273°	NK
Speed	210kt	NK
ACAS/TAS	TCAS II	Not fitted
Alert	RA	N/A
Separation at CPA		
Reported	400ft V/0NM H	Not seen
Recorded	600ft V/0.3NM H	



THE EMB190 PILOT reports that on the arrival to [...] they had been level at 3000ft Baro Alt in ALT Hold at OSVEV at 210kt IAS. The crew identified an aircraft in proximity, closing from the forward-left showing erratic altitude indications on TCAS. The crew enquired with ATC and it was confirmed it was below the base of controlled airspace – 2500ft – and their visual assessment of the light-aircraft agreed with that. Alert to a possible conflict, the EMB190 crew was visual with the light-aircraft and monitored the vector. As the aircraft approached below, it started suddenly climbing and triggered a TCAS RA. This presented to the crew as -4 red diamond on the multi-functional display and a TCAS Avoidance Zone – preventative RA red trapezoid on the PFD. TCAS RA procedures and comms were carried out correctly, maintaining 3000ft Baro Altitude. The pilot monitoring was visual with the light-aircraft throughout the event. On the ground, Tower passed details of the light-aircraft involved [...].

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

THE PA28 PILOT reports that they were unaware of an Airprox that may have taken place during this flight. At the time outlined in the Airprox notification they were being provided with a Basic Service from Southend Radar, and they had kindly also provided them with some Traffic Information despite not having requested that service. Any traffic that they flagged, the pilot had let them know when it was then seen. However, there had definitely been no mention or sight of an Embraer close enough to result in an Airprox. Given the size of an EMB190, the pilot feels sure that it is something they would have seen.

THE LONDON CITY DIRECTOR CONTROLLER reports that the EMB190 had been inbound to [destination] and reported receiving a TCAS RA against traffic underneath the base of controlled airspace [the PA28]. The EMB190 had been at 3000ft with the PA28 observed at 2300ft. The EMB190 did not change their level at all and, shortly afterwards, reported clear of confliction and happy to proceed as planned.

THE SOUTHEND RADAR CONTROLLER reports that they had been informed of a TCAS report a month or so previously involving an aircraft that had been under their control. They were unaware that a TCAS event had been filed at the time, but the following is their recollection of the incident: They had been on duty as Southend Radar. They were working traffic (they believe to have been a PA28) that had been handed to them by the Southend Director. The [pilot of the] aircraft was under a Basic Service and was indicating below the base of Class A airspace. The controller saw a London City inbound indicating 3000ft in the vicinity of the traffic and double checked the level of the PA28 which was still indicating 2300ft.

Factual Background

The weather at London City airport was recorded as follows:

METAR EGLC 131320Z AUTO 12005KT 050V200 9999 NCD 24/15 Q1012=

Analysis and Investigation

NATS Safety Investigations

An EMB190 inbound to [destination] had been descending to 3000ft on track to OSVEV with the pilot established on the London City Director (LC DIR) frequency. A PA28 squawking 4575 (Southend Airport conspicuity) with Mode-C indicating 2300ft, was operating VFR below London TMA-1 (where the base was 2500ft) to the east of London City Airport tracking north. At 1343:10 the LC DIR instructed the EMB190 pilot to fly speed 210kt or less, the instruction was read back correctly with the pilot advising *“Traffic Alert, they seem to be climbing up towards us, this light-aircraft on the right-hand side just passing now”*. As the EMB190 pilot had completed their transmission of Traffic Alert information, the PA28 was observed to climb to a Mode-C indicated altitude of 2400ft at 1343:20. A low-level severity Short Term Conflict Alert (STCA) activated between the two aircraft at 1343:22. The LC DIR advised the EMB190 pilot at 1343:26 *“I see it yeah, the base there is two and a half, so I think he’s skirting right underneath, I’ve got two point four showing on my screen”*. The Closest Point of Approach occurred at 1343:28 and was recorded on the Multi-Track radar as 0.3NM and 600ft. The STCA deactivated at 1343:30. The EMB190 pilot replied at 1343:46 *“alright we’re going to have to report this now because he’s generated an RA”*, the LC DIR acknowledged the TCAS before the pilot replied they were clear of conflict and maintaining 3000ft. Analysis of NODE radar replay showed that the PA28 had maintained a maximum altitude of 2400ft, beneath the base of controlled airspace, and the EMB190 did not reverse their vertical profile from the previously cleared altitude of 3000ft as a result of the reported TCAS RA.

Safety Investigations was informed by the UK Airprox Board (UKAB) on 15th July 2025 that the event had subsequently been reported as an Airprox. In this event, all separation standards were maintained with all ATC procedures correctly complied with. The Airprox occurred when the PA28 pilot climbed to 2400ft, below the base of controlled airspace, in the vicinity of the EMB190 which had been descending to 3000ft on final approach to [destination]. The EMB190 pilot reported a TCAS RA due to the proximity of the aircraft.

Southend Airport Safety Investigation

An Airprox involving an EMB190 and a PA28 was notified to London Southend Airport ATC by UKAB. At the time, the Airprox occurred, the EMB190 had been inside Class A airspace (LTMA 1), was in communication with London Terminal Control and was squawking the Mode A SSR code 5340. The PA28 had been on a local VFR flight from [...] and was in receipt of a Basic Service from Southend Radar, squawking 4575. At the time of the Airprox, the Southend Radar controller was providing an Approach Control Service in split configuration. Traffic and RT loading were light to moderate. At time 1247:22, the pilot of the PA28 called Southend Radar and requested a Basic Service, they reported that they were a PA28, routeing from [...] and back to [...]. They reported that they were overhead Brentwood at 2500ft, VFR, on the Southend QNH (1012hPa). The Southend Radar controller instructed them to squawk 4575, a Basic Service was agreed, and they also

instructed them to remain outside the London TMA and to report overhead Chelmsford. At time 1256:26 the PA28 pilot reported overhead Chelmsford at altitude 2200ft. The Southend Radar controller instructed them to remain outside controlled airspace and to stand-by. [There had then been] a change of controller between these times.

[RT exchanges not relevant to the reported Airprox]

At time 1308:59, the Southend Radar controller commenced splitting the Southend Radar and Director functions. At time 1309:27, the Southend Radar controller instructed the PA28 pilot to contact them on the Southend Director frequency 128.965MHz. At time 1309:56, the PA28 pilot had checked-in on the Southend Director frequency.

[RT exchanges not relevant to the reported Airprox]

At 1325:40, the Southend Director controller instructed the PA28 pilot to contact Southend Radar on 130.780MHz with their callsign only.

At 1326:00, the PA28 pilot checked-in with Southend Radar and a Basic Service was agreed.

At 1342:21, according to the recorded surveillance data, the EMB190 had been 8NM east of the PA28, within Class A airspace, but on a converging track, and indicated level at altitude 4000ft. The PA28 had been in Class G airspace, on a northerly track, at an indicated altitude of 2200ft.

At 1342:45, according to the recorded surveillance data, the EMB190 had been 4NM east of the PA28, within Class A airspace, passing altitude 3700ft in the descent to 3000ft. The PA28 had still been tracking north in Class G airspace and indicated level at altitude of 2300ft.

At 1343:27, according to the recorded surveillance data, the EMB190 had been tracking to pass approximately 0.2NM astern of [the PA28], at an indicated altitude of 3000ft descending, within Class A airspace where the base of controlled airspace (LTMA 1) is 2500ft. At that time, the PA28 was continuing to track northbound, in Class G airspace, at an indicated altitude of 2400ft and climbing.

At 1343:31 the last visible Mode C altitude data from the PA28 before CPA indicated that the aircraft was level at altitude 2400ft.

At time 1343:36, according to the recorded surveillance data, the EMB190 indicated a TCAS climb Resolution Advisory (RA) coincident with Closest Point of Approach (CPA). At this time, the PA28's Mode C data-block was obscured by the Embraer 190's Mode S Enhanced Surveillance (EHS) TCAS climb data-block.

At time 1343:40, according to the recorded surveillance data, the EMB190's Mode S data indicated that they were clear of conflict.

At time 1349:32, the PA28 pilot reported overhead Junction 28 of the M25, and requested to leave the frequency for [destination]. The Southend Radar controller instructed them to squawk conspicuity, and to free-call [destination].

At the time of the Airprox, the PA28 had been operating in Class G airspace. The last observed Mode C data from the PA28 visible to the Southend Radar controller had been 5sec prior to CPA which indicated the aircraft was level at altitude 2400ft where the base of LTMA 1 is 2500ft. The PA28's Mode C read-out at the time of CPA was obscured by the EMB190's Mode S data-block. The EMB190 was within Class A airspace, specifically, LTMA 1, and its Mode C data indicated altitude 3000ft and descending. It is noteworthy, however, that according to the aircraft's Mode S EHS selected altitude data, 3000ft had been selected. The relative indicated altitudes between the subject aircraft at CPA activated the EMB190's TCAS and briefly triggered a 'Climb' RA. Very shortly after the RA, the Mode S data indicated that they were clear of conflict.

The CAP493 Manual of Air Traffic Services Part 1, Section 1: Chapter 6: Para 13A.4 states that:

‘...IFR flights within Class A-D airspace, and VFR flights within B/C airspace, are deemed to be separated from unknown aircraft flying in adjoining uncontrolled airspace...’.

The Airspace and Safety Initiative promotes the concept of ‘Take 2’ and encourages pilots operating in Class G (uncontrolled) airspace to plan their flight to stay at least 2NM from the boundary of controlled airspace and 200ft above or below controlled airspace. The Take 2 concept is, however, for ‘best practice’ guidance only. As the PA28’s Mode C read-out was not visible to the Southend Radar controller at the time CPA occurred, another recorded surveillance channel (Radar in the Tower (RiTT)) was reviewed as part of this investigation to ascertain the PA28’s proximity to the base of LTMA 1. That channel revealed the PA28’s Mode C indicated altitude was 2300ft descending, co-incident with CPA; therefore, at the time the Airprox occurred, the PA28 was operating legitimately within Class G (uncontrolled) airspace. The PA28 had been in receipt of a Basic Service from Southend Radar.

The CAP 774 UK Flight Information Services, Chapter 2: Para 2.1 states that:

‘A Basic Service is an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. This may include weather information, changes of serviceability of facilities, conditions at aerodromes, general airspace activity information, and any other information likely to affect safety. The avoidance of other traffic is solely the pilot’s responsibility. Basic Service relies on the pilot avoiding other traffic, unaided by controllers/FISOs. It is essential that a pilot receiving this ATS remains alert to the fact that, unlike a Traffic Service and a Deconfliction Service, the provider of a Basic Service is not required to monitor the flight.’

In conclusion, this occurrence was a TCAS RA event between two aircraft that were, from an ATC perspective at least, deemed to be separated.

CAA ATSI

With one aircraft inside controlled airspace and one outside, both working different units, with deemed separation existing and no airspace infringement, ATSI has nothing to add.

UKAB Secretariat

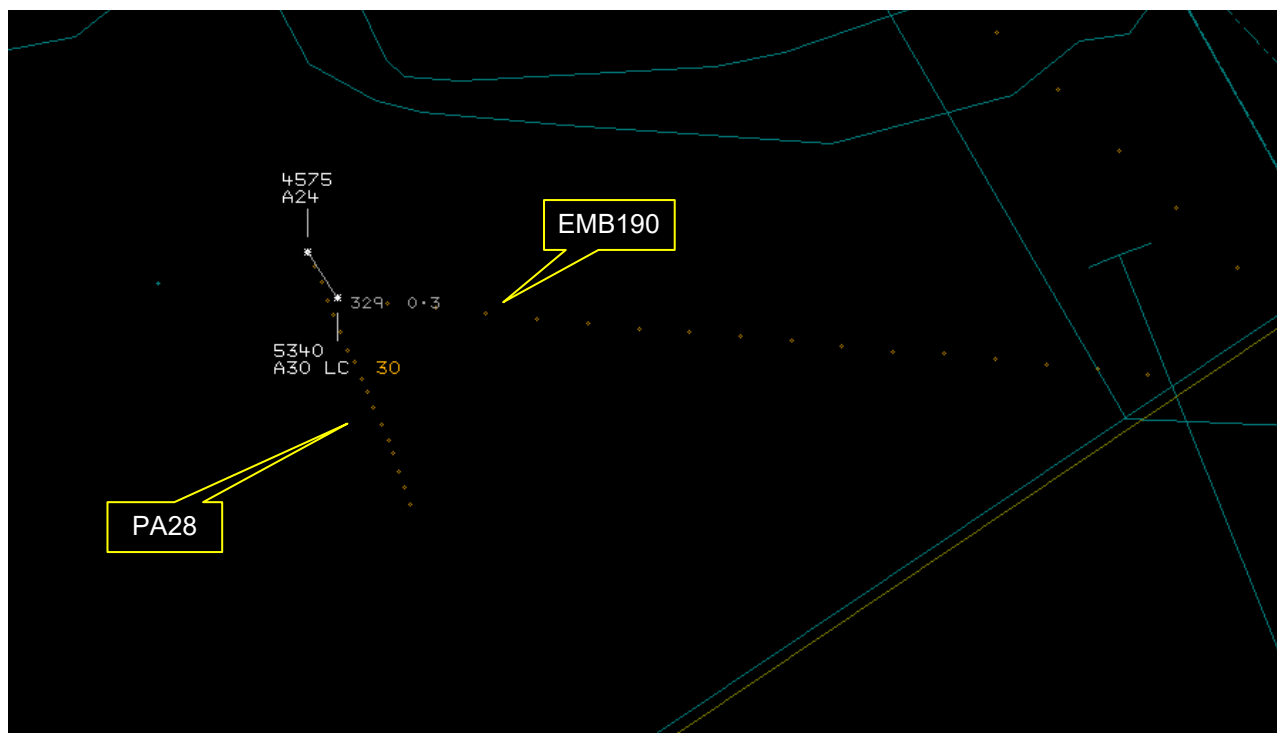


Figure 1: At 1343:30 (CPA minus 2sec)

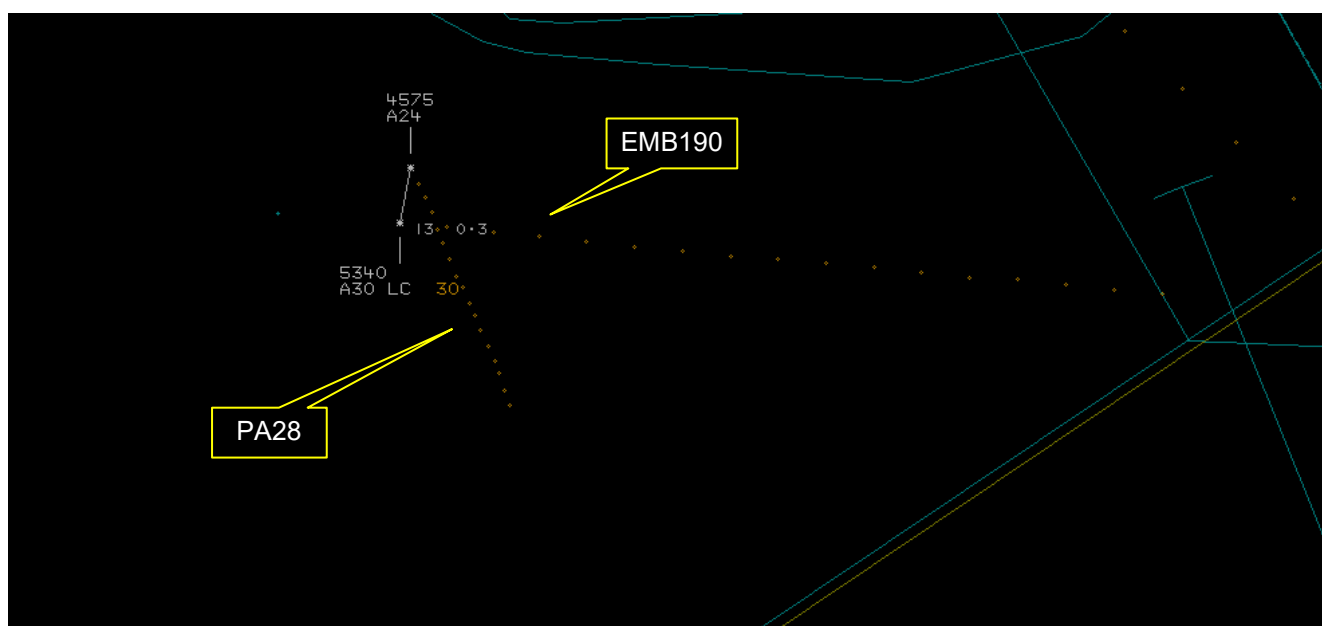


Figure 2: At 1343:34 (CPA plus 2sec)

Both aircraft were tracked via radar and identified through Mode S data.

The EMB190 and PA28 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.¹ If the incident geometry is considered as converging then the PA28 pilot was required to give way to the EMB190.²

Summary

An Airprox was reported when an EMB190 and a PA28 flew into proximity at Gravesend at 1344Z on Sunday 13th July 2025. The EMB190 pilot was operating under IFR in VMC in receipt of a Radar Control Service from Thames Radar, and the PA28 pilot was operating under VFR in VMC in receipt of a Basic Service from Southend Radar.

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.

Members firstly considered the actions of the EMB190 pilot, noting that they had been subject to a Radar Control Service from the City Director controller and had been preparing for landing. The pilot had visually acquired the PA28 and, having been concerned by its proximity (**CF4**), had noted through their TCAS variations in its altitude. As the 2 aircraft had neared, the TCAS RA had alerted (**CF5**) and the pilot had followed procedures, maintaining an altitude of 3000ft. In an RT exchange with the City Director controller, the pilot had agreed with the assessment of separation between the 2 aircraft. Members felt that the pilot had done all necessary in this case.

Turning to the actions of the PA28 pilot, members noted that they had been operating a local flight and had been in receipt of a Basic Service from Southend for the bulk of it. They had maintained a relatively constant altitude, which appeared on radar to have briefly climbed coincidentally with the CPA but had remained clear of controlled airspace. The Board acknowledged the Southend safety report comment regarding the 'Take 2' principle and stressed that this concept allows for slight variations in an aircraft's vertical or lateral tracking to ensure they remain clear of controlled airspace. Members believed the

¹ (UK) SERA.3205 Proximity.

² (UK) SERA.3210 Right-of-way (c)(2) Converging.

PA28 pilot to have been applying that principle in this case and demonstrated its worth. Although the PA28 pilot reported having not seen the EMB190 and had not carried electronic conspicuity equipment, they had sought and taken a valid Air Traffic Service but, in this case, the PA28 pilot had gained no situational awareness of the presence of the EMB190 (**CF3**). With a clear understanding of the limitations of a Basic Service, members stressed that where possible the highest level of service possible should be sought and, in this case, a Traffic Service may well have alerted the PA28 pilot to the presence of the EMB190.

Members reviewed the contribution from the City Director controller, noting that the EMB190 pilot had been in receipt of a Radar Control Service and had reported a TCAS RA alert which the pilot had called and had been coincident with a brief Short Term Conflict Alert for the controller (**CF2**). The pilot had acknowledged that the RA had then required the submission of an Airprox report, although they had remained visual with the PA28 throughout the event. The pilot and controller had exchanged calls with confirmation of the PA28 pilot's maximum altitude of 2400ft noted. The 2 aircraft had been deemed to have been operated in accordance with the appropriate rules for their local environment.

The Board noted that the PA28 pilot had been in receipt of a Basic Service from Southend for almost an hour before the event, and during which time the controller workload had been light-to-moderate. The PA28 pilot had been issued a squawk and, with 2 changes of controller in the period, had been provided with a Basic Service cognisant of the conditions that service carries and had not been required to monitor the flight (**CF1**). The Southend controller had no recollection of a reported 'RA' event. The Board acknowledged that the Southend controller had been aware of the 2 aircraft as their paths had crossed and had correctly judged that they had been operating as IFR in controlled airspace and VFR in uncontrolled airspace, respectively. Both had carried a squawk and both had been in receipt of a service and had been deemed to have been separated.

In concluding the discussion, the Board discussed the risk, with members agreeing that normal safety standards and parameters had pertained and there had been no risk of collision. The Board recorded the event as risk category E. Members agreed on the following contributory factors:

CF1: Under a Basic Service, the Southend Controller had not been required to monitor the flight of the PA28.

CF2: Proximity of the EMB190 and PA28 had briefly triggered a Short-Term Conflict Alert for the Thames Radar Controller.

CF3: The PA28 pilot had no situational awareness of the presence of the EMB190.

CF4: The EMB190 pilot had been concerned by the proximity of the PA28.

CF5: The EMB190 pilot had received a Resolution Advisory alert on their TCAS equipment.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2025140			
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
	• Electronic Warning System Operation and Compliance			
2	Technical	• STCA Warning	An event involving the triggering of a Short-Term Conflict Alert (STCA) Warning	
	Flight Elements			
	• 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
4	Human Factors	• Unnecessary Action	Events involving flight crew performing an action that was not required	Pilot was concerned by the proximity of the other aircraft
• Electronic Warning System Operation and Compliance				
5	Contextual	• ACAS/TCAS RA	An event involving a genuine airborne collision avoidance system/traffic alert and collision avoidance system resolution advisory warning triggered	

Degree of Risk: E.

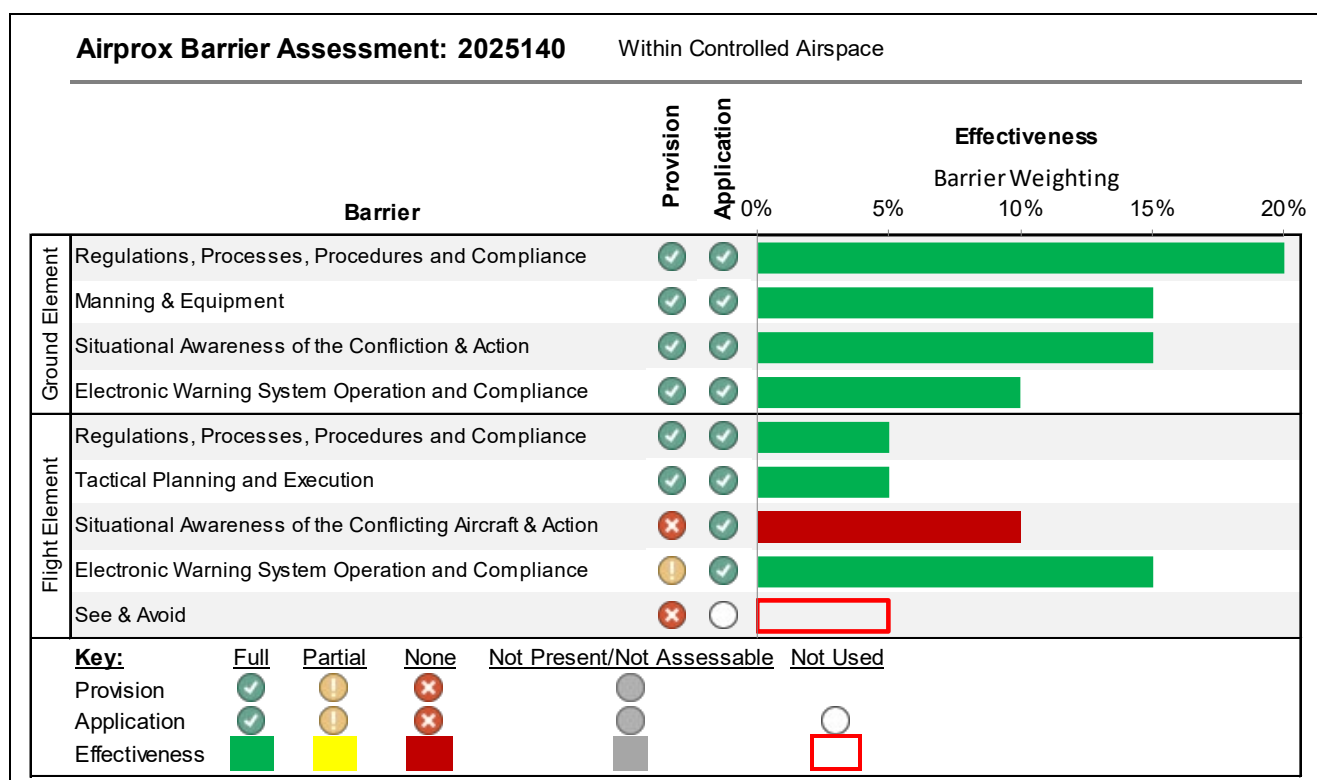
Safety Barrier Assessment³

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

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because the PA28 pilot had gained no situational awareness of the presence of the EMB190, and the EMB190 pilot had been concerned by the proximity of the PA28 as indicated on their TCAS display.

See and Avoid were assessed as **not used** because the two aircraft were procedurally separated.



³ The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).