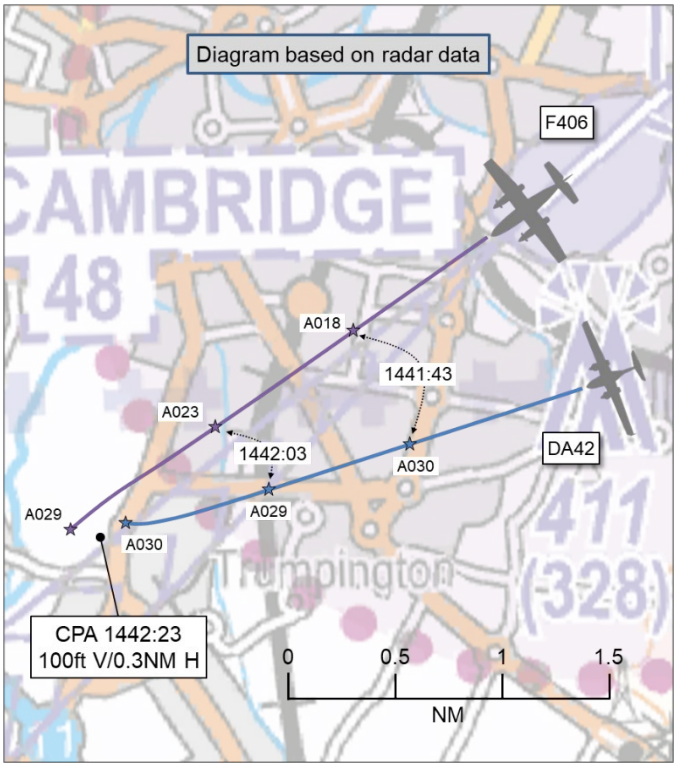
AIRPROX REPORT No 2024299

Date: 28 Nov 2024 Time: 1442Z Position: 5211N 00007E Location: IVO Cambridge ATZ

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	DA42	F406
Operator	Civ FW	Civ Comm
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	VFR
Service	Traffic	Traffic
Provider	Cambridge Appr.	Cambridge Appr.
Altitude/FL	3000ft	2900ft
Transponder	A, C, S+	A, C, S
Reported		
Colours	White	White, purple
Lighting	Landing, taxy, nav, strobes	Nav, strobes
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	NK	4000ft
Altimeter	QNH (1023hPa)	QNH
Heading	"*turning*"	230°
Speed	120kt	140kt
ACAS/TAS	TAS	SkyEcho
Alert	TA	None
Separation at CPA		
Reported	150ft V/0m H	NK
Recorded	100ft V/0.3NM H	



THE CAMBRIDGE APPROACH CONTROLLER (APS) reports that [the pilot of the F406] went around on RW23 VFR with no restriction [placed] on their altitude (although VFR was restricted). [The pilot of the DA42] was about to go outbound for the ILS approach for RW23. [The pilot of the F406] climbed through the level of [the DA42]. [The Cambridge Approach controller] realised their error and called the traffic to [the pilot of the DA42] who reported [the F406] in sight. [The pilot of the DA42] stated shortly afterwards that [the F406] had passed within 100m of them.

The controller perceived the severity of the incident as 'Medium'.

THE DA42 PILOT reports that a Traffic Service was requested and given. It was not a busy frequency at that time. An initial Instrument Rating test was being conducted. The licence applicant was flying the published NDB hold procedure under agreement with Cambridge Approach. The NDB pattern join, followed by the NDB pattern hold, were flown prior to a procedural ILS approach. Two altitudes were flown in the holding pattern, a join at 4000ft, followed by a descent in the holding pattern to 3000ft, under ATC instruction. The incident occurred either at 4000ft or at 3000ft during the subsequent pattern. They cannot recall whether the Airprox occurred during the first or during the second pattern, although they were in level flight, thus, the altitude being flown was either 4000ft or 3000ft.

During the inbound turn of the holding pattern, they briefly saw the subject aircraft pass below. The Examiner warned the exam candidate not to react to it if they caught a glimpse from the periphery of their instrument flying hood. The [F406] was flying in a straight line and [the pilot of the DA42] was turning right and would clearly remain above it, whilst at the same time the current turn would provide increasing separation. They considered that there would be no actual conflict provided both aircraft continued current modes of flight. They observed the subject aircraft as long as their current right-hand turn allowed. Given that both aircraft were in level flight, and that their turn was providing greater separation, they considered it unnecessary to instruct any changes of direction to their exam candidate.

They reported to ATC 'for the record' that they had seen another aircraft and that they had considered it unnecessary to make a formal report. ATC acknowledged.

They could not have stated at that time whether either of the aircraft was within the horizontal confines of the Cambridge ATZ. It appears, from their SkyDemon trace, that the point of maximum closure would have been within such diameter, notwithstanding the vertical position having been above said airspace. The SkyDemon trace had breaks in the recorded tracks but this does not alter its value in this particular case.

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

THE F406 PILOT reports that they had just completed an approach to Cambridge and were on a climbout to carry out general handling on the transit to [their destination]. They were advised of traffic, which they believe had been in the hold at CAM NDB. The other pilot was notified of [the F406] and responded that they were visual with it, although [the pilot of the F406] could not see the [DA42].

They were given 'own navigation' and they advised that they were climbing to 4000ft [they recall]. They had electronic conspicuity running but the other aircraft did not show up on their SkyDemon display, even though other aircraft were. The aircraft was never spotted, but they heard them call ATC to state they had passed within 100ft of 'an aircraft'. [The pilot of the F406] did not know if that had been with them or not.

The Cambridge Approach frequency was given as they had just completed an approach and go-around at the airfield. The frequency was busy but not overly busy. They were advised of other traffic and had maintained a good lookout but could not see the other aircraft. They cannot recall whether they were advised of its height.

[The pilot of the F406 opined that] they were not aware that they were involved in the Airprox and thought that ATC would have advised them if that had been the case.

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

Factual Background

The entry for Cambridge Airport in the UK AIP provides the following diagram:

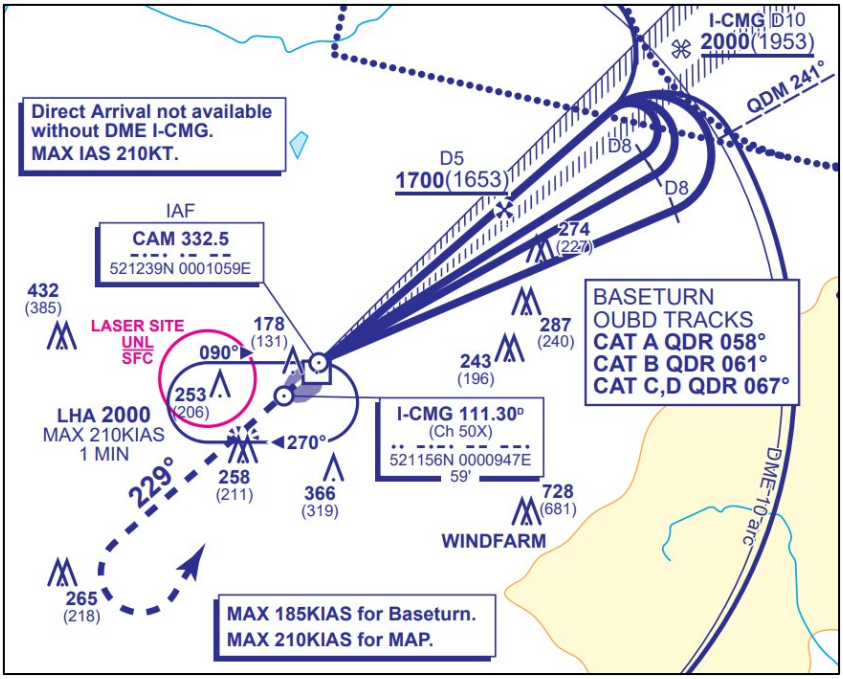


Figure 1 - An excerpt from the Cambridge ILS/DME/NDB(L) RW23 approach plate showing the NBD hold.

The weather at Cambridge was recorded as follows:

METAR EGSC 281450Z VRB02KT CAVOK 04/01 Q1029

Analysis and Investigation

CAA ATSI

ATSI notes that the Radar controller issued the following go-around instructions to the pilot of the F406 at 1430:20, "*after the missed approach, its own navigation VFR ??? standard noise abatement*". The pilot just read back "*own navigation VFR*". ATSI has been unable to identify the word replaced with '???'. The pilot of the DA42 was not yet on frequency but was believed to be known traffic and their intention to enter the hold was also known. The pilot of the DA42 did then immediately come on frequency and was provided with a Traffic Service – reduced due to "limited surveillance performance". The pilot was instructed to report entering the hold which they did at 1435:21.

As the pilot of the F406 had been issued a VFR clearance by the Radar controller, the 'not above 2000ft' restriction should have been applied by them, not the Tower controller. Also, the Radar controller did not pass Traffic Information to the pilot of the DA42 on the F406 prior to the go-around by the pilot of the F406.

Cambridge Airport Unit Investigation

Incident Summary:

[The pilot of the F406] was conducting IFR training and [the pilot of the DA42] was coordinated inbound with Luton on track to CAM descending to 4000ft. Tower (ADI) was informed by APS that [the DA42] was active, and 'VFR restricted' was put in place. [The pilot of the F406] was asked their intentions following the missed approach and they confirmed that they wished to depart VFR [to their destination]. "*Standard noise abatement VFR*" was given by the APS ATCO as the missed approach instructions, but no level restriction was passed.

Once [the pilot of the F406] had commenced the missed approach and returned to the APS frequency, both aircraft were proximate. Traffic Information was passed in a generic format due to the timing and proximity of the contacts. [The pilot of the DA42] reported the traffic in sight. The instructor on board [the DA42] said a short while later "*not a complaint, but just for the record for the tapes, er, aircraft that did go past us was within 100m of us*".

Sequence of Events:

1429:50	APS called ADI to place 'VFR restricted' and advised that [the DA42] was active.
1430:07	[The pilot of the F406] was cleared for the RNP approach and was told to report passing GOPOD.
1430:19	Radar confirmed with [the pilot of the F406] that their intention after the RNP was to depart VFR [to their destination], which the pilot confirmed.
1430:32	[The pilot of the F406] was given missed approach instructions "[F406 C/S], *thanks then after your missed approach it's own navigation VFR, standard noise abatement*". Pilot read back "*own navigation VFR* [F406 C/S]".
1430:36	[The pilot of the DA42], on frequency, was identified and given a Traffic Service and was told to report entering the hold.
1431-1432	An exchange took place with Traffic Information for [the pilot of the F406] on an unknown contact. Further traffic was passed to [an uninvolved pilot] who was also on frequency to the north-west. Coordination with Lakenheath also took place for MATZ penetration for [the pilot of the F406] which was approved.

1435:24 [The pilot of the DA42] entered the CAM hold. [The pilot of the F406] had passed GOPOD and was told to "*report established on the final approach track*". (Figure 2).

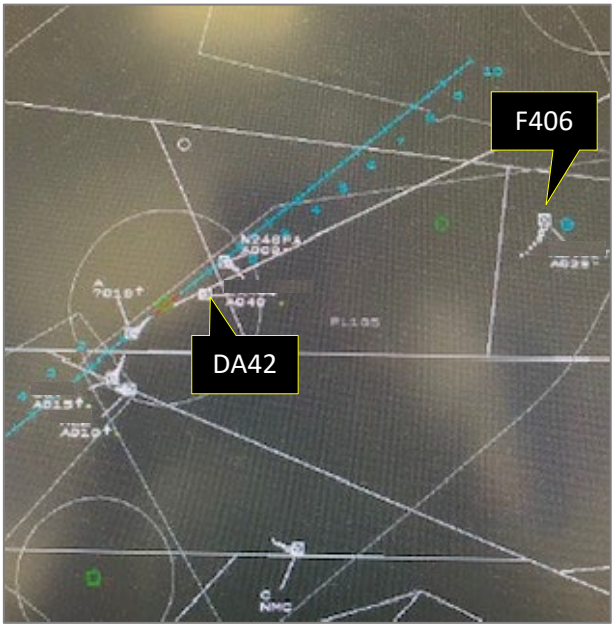


Figure 2 - 1435:24.

1436:32 [An uninvolved aircraft] departed and its pilot placed under Traffic Service.

1437:44 [The pilot of the F406] established on the final approach track and was told to contact Tower. The pilot was advised that the circuit was busy ahead. [The F406 pilot] left the Radar frequency. (Figure 3).

Figure 3 – 1437:44.

1438:07 [The pilot of the DA42] was told to descend to 3000ft which the pilot read back.

1440:44 Luton Radar called and coordinated [an uninvolved aircraft] inbound. They were given a descent to 4000ft to the CAM. (Figure 3).

1442:07 A garbled transmission by [the uninvolved pilot] and [the pilot of the F406] who transmitted at the same time. [The pilot of the F406] reported they were "*……on a heading of 230° and climbing to 4000ft*".

1442:20 [The pilot of the F406] was identified and the type of service required was requested. The [F406] pilot requested a Traffic Service which was issued (Figure 4).

Figure 4 - 1442:20.

[UKAB Secretariat note: CPA was assessed to have occurred at 1442:23]

Traffic Information was then provided "[F406 C/S] *roger, traffic in your vicinity just off your right-hand side is* […] *in the CAM hold at 4000ft, correction 3000ft*".

The F406 pilot responded with "*looking for traffic, not sighted*".

[The pilot of the DA42] was provided with Traffic Information: "[DA42 C/S] *that traffic to the south of you just turning away from you is a C406 just gone around Runway 23 climbing through your level*".

1442:38 [The pilot of the DA42] reported "*traffic in sight and next time over the beacon ready for the procedure for ILS 23*".

[The pilot of the DA42] was cleared for the approach and was told to report "*CAM outbound*".

The DA42 pilot acknowledged.

1442:59 APS confirmed the type of service that [the pilot of the F406] had required and subsequently placed them under a Traffic Service.

1443:15 [The pilot of an uninvolved aircraft] on frequency, was identified, cleared to the CAM and was told to report in the hold.

1444:15 A message was passed from the instructor on board [the DA42]: "*Approach,* [DA42 C/S]. *Not a compliant but, just for the records, for the tapes, er the aircraft did go past us was within 100m of us*".

Radar "*That's understood thanks*".

[The pilot of the DA42] reported CAM outbound.

Initiating Event:

An aircraft in the CAM hold maintaining 3000ft was proximate with an aircraft carrying out a missed approach to depart VFR. [The pilot of the F406] had not been restricted to 'not above 2000ft' despite the Radar ATCO having placed 'VFR restricted' with the Tower. The pilot of [the DA42] reported that the aircraft were within 100m.

The initial investigation was conducted by the Unit Training Officer who reported that "*It is worth looking into the purpose of VFR restricted, and whether this practice could be amended or changed and whether the screen size and label orientation played a factor in the incident*."

Examination of the initiating event factors:

The APS ATCO admitted they forgot to put 'VFR restricted' on [the F406] when conducting a missed approach. The ATCO stated that they were late getting the aircraft from ADI and it was congested in the centre of the display. They called the pertinent traffic as soon as they realised there was a potential confliction. Although they had placed 'VFR restricted' with the Tower controller, they had not placed it on [the F406 pilot]. It was an error. The display was cluttered, however, they realised as soon as they saw the aircraft climbing that they had forgotten to place the restriction on.

Identification of recovery factors:

Once [the F406] had gone-around, and the APS ATCO had realised the potential confliction, Traffic Information was provided to both pilots and [the pilot of the DA42] reported that they were visual with [the F406].

Failure of recovery factors:

The Cambridge Airport MATS Part 2 states:

> Actions to be taken by the APS ATCO: Whenever the CAM hold becomes active, or when the APS ATCO deems a potential conflict may arise, the following actions shall be taken:
>
> - Inform the ADI ATCO that the "RESTRICT VFR" procedure is in operation.
> - The ADI ATCO will then instruct all VFR departures to climb not above altitude 2000ft using the phraseology "climb not above altitude 2000ft, Radar has traffic to affect".
> - Positively identify the VFR departure if able, pass Traffic Information to the departing aircraft on the conflicting aircraft and offer further climb when safe to do so.
> - The APS ATCO may also tactically request coordination with the ADI ATCO to offer further protection to inbound aircraft that may be under radar vectors.
> - Pass Traffic Information to the holding / inbound traffic on the departing traffic in accordance with the service being provided.
> - Inform the ADI ATCO when the "RESTRICT VFR" procedure is no longer active.

The APS ATCO confirmed that the omission of VFR restricted was an error.

Other factors:

During the incident, the ATCO had two aircraft conducting approaches, a release on a 3rd trainer from Luton and two pilots on a Basic Service. ADI was moderately busy with two in the circuit, a CAT A departure and [the F406] going around. The traffic complexity for the APS ATCO was moderate with moderate-to-heavy RT loading.

Flight Progress Strip (FPS):

[The F406] departure was a handwritten FPS which was annotated with VFR and a climbing arrow to A4.0. This should be annotated with either; VFR with a line above or A2.0 with a line above to ensure the restriction had been placed on the aircraft.

Conclusion:

'VFR restricted' had been coordinated with ADI. However, on this occasion, the APS ATCO confirmed that the omission of 'VFR restricted' to [the pilot of the F406] was an error.

The ATCO passed Traffic Information to both [the pilot of the F406] and [the pilot of the DA42] on climbout from their missed approach, making sure they were both fully aware of each other's location and level. [The pilot of the DA42] subsequently reported [the F406] in sight.

Traffic levels and ATC workload were manageable in APS, although complexity was moderate with moderate to heavy RT loading.

The ATCO involved has been reminded about ensuring 'VFR restricted' is placed-on for aircraft commencing a VFR missed approach whilst traffic is in the CAM hold. This will also be used for future learning. Flight Progress Strip management has also been noted and the ATCO has been reminded to ensure the strip is annotated correctly. It was highlighted during the initial investigation that the radar screen size and label orientation may have played a factor in the incident. However, after reviewing the RT recordings and interviewing the APS ATCO, this has not been a contributing factor.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and both aircraft could be positively identified from Mode S data (Figure 5). The diagram was constructed and the separation at CPA was determined from the radar data.

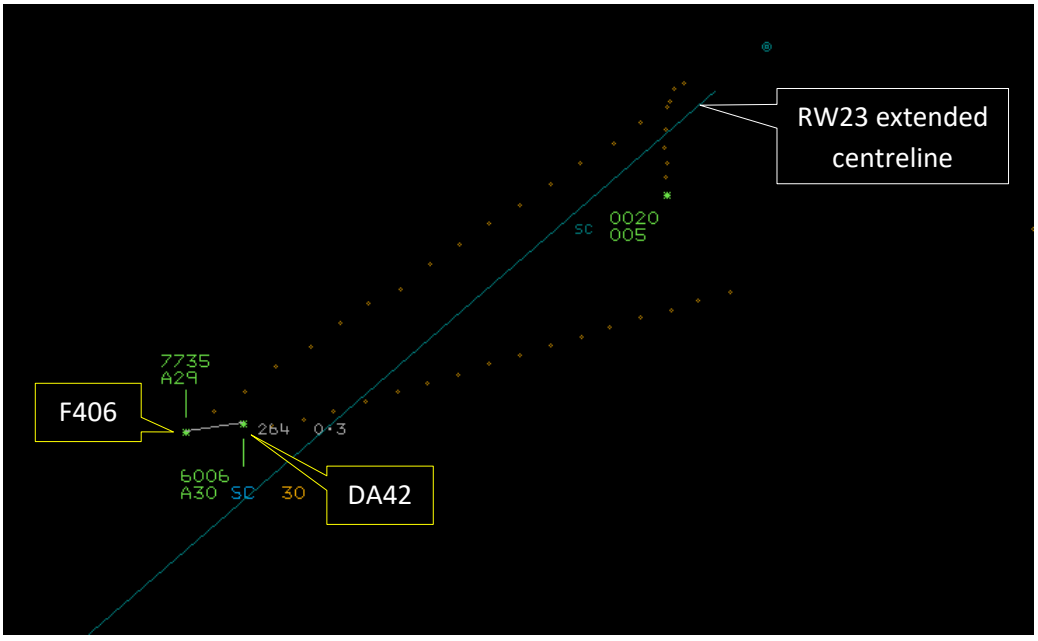


Figure 5 – CPA at 1442:23

The DA42 and F406 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 overtaking then the F406 pilot had right of way and the DA42 pilot was required to keep out of the way of the other aircraft by altering course to the right.[2]

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

Summary

An Airprox was reported when a DA42 and an F406 flew into proximity in the vicinity of Cambridge ATZ at 1442Z on Thursday 28th December 2024. The DA42 pilot was operating under IFR in VMC and the F406 pilot was operating under VFR in VMC. Both pilots had been in receipt of a Traffic Service from Cambridge Approach.

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 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 F406 and members noted that they had been issued a clearance by the Cambridge Approach controller for an RNP approach to RW23. The clearance had specified that "*after your missed approach its own navigation VFR, standard noise abatement*". Members noted that there had not been an instruction regarding a restriction to their altitude. Approximately 5min later, the pilot of the DA42 had entered the CAM hold and, 2min after that, the pilot of the F406 had been requested to contact the Cambridge Tower controller. The Cambridge Tower controller had provided a caution that the "*circuit was busy ahead*" and, approximately 4min later, after the missed approach, had requested the F406 pilot to re-contact the Cambridge Approach controller. Members agreed that the EC equipment fitted to the F406 would have been expected to have detected the presence of the DA42 but no alert had been reported (**CF6**). Additionally, members noted that Traffic Information pertaining to the DA42 had not been passed to the pilot of the F406 until after CPA. Consequently, members agreed that the pilot of the F406 had not had situational awareness of the DA42 (**CF4**) and had not visually acquired it at any point during the encounter (**CF7**).

Members next turned their attention to the actions of the pilot of the DA42 who had been conducting a test flight for the issuance of an initial Instrument Rating. Members agreed that the TAS equipment fitted to the DA42 had alerted to the presence of the F406 (**CF5**). It was noted that the pilot of the DA42 had warned their exam candidate not to react if they were to glimpse an aircraft in close proximity. Members noted that they had developed a good mental model of the traffic situation despite not having received Traffic Information on the F406 from the Cambridge Approach controller.

Members next turned their attention to the actions of the Cambridge Approach controller and applauded their honest account of the event. Members noted that the Cambridge Airport MATS Part 2 had stated that, whenever the CAM hold becomes active, or when the Approach controller deems that a potential conflict may arise, they shall inform the Tower controller that the 'Restrict VFR' procedure is in operation. Whilst the procedure also stated that the Tower controller would subsequently instruct all VFR departures to climb to 'not above altitude 2000ft', members agreed that it had been the clearance issued by the Approach controller that should have included the restriction. Members therefore agreed that the Cambridge Approach controller had not fully complied with the 'Restrict VFR' procedure (**CF1**) and had issued a clearance that had, inappropriately, omitted the altitude restriction (**CF3**).

Members also noted that the 'VFR Restricted' procedure had required the Cambridge Approach controller to have passed Traffic Information to the pilot of the DA42 on the F406 but noted that such information had not been passed until after CPA when the tracks of the aircraft had already crossed (**CF2**).

Members concluded their discussion and summarised their thoughts. It was agreed that the Cambridge Approach controller had omitted the altitude restriction from the clearance issued to the F406 pilot and had not passed Traffic Information on the F406 to the pilot of the DA42. However, members agreed that the pilot of the DA42 had situational awareness of the F406, had visually acquired it and had assessed that avoiding action had not been necessary. Members concluded that safety margins had been reduced but, ultimately, there had not been a risk of collision. As such, the Board assigned Risk Category C to this event.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2024299			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Regulations, Processes, Procedures and Compliance			
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
	• Situational Awareness and Action			
2	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
3	Human Factors	• Inappropriate Clearance	An event involving the provision of an inappropriate clearance that led to an unsafe situation	
	Flight Elements			
	• 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, inaccurate or only generic, Situational Awareness
	• Electronic Warning System Operation and Compliance			
5	Contextual	• Other warning system operation	An event involving a genuine warning from an airborne system other than TCAS.	
6	Human Factors	• Response to Warning System	An event involving the incorrect response of flight crew following the operation of an aircraft warning system	CWS misinterpreted, not optimally actioned or CWS alert expected but none reported
	• See and Avoid			
7	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

Degree of Risk: C.

Safety Barrier Assessment[3]

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

Ground Elements:

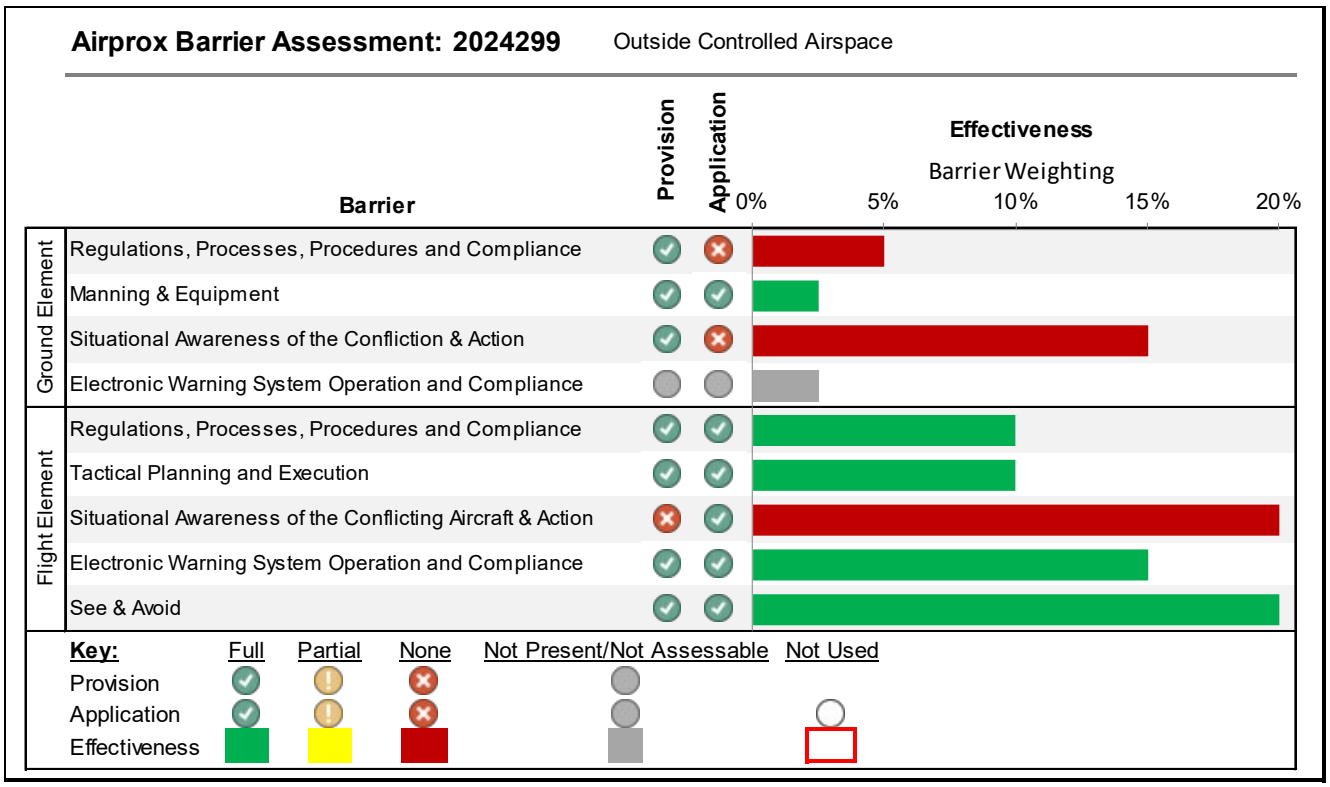
Regulations, Processes, Procedures and Compliance were assessed as **ineffective** because the Cambridge Radar controller had not followed the procedure to have passed a climbout restriction to the pilot of the F406 when the CAM hold had been active.

Situational Awareness of the Confliction and Action were assessed as **ineffective** because the clearance issued to the pilot of the F406 had not included a climbout restriction or Traffic Information on the DA42.

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because the pilot of the F406 had not had situational awareness of the presence of the DA42.

[3] 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: 2024299
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