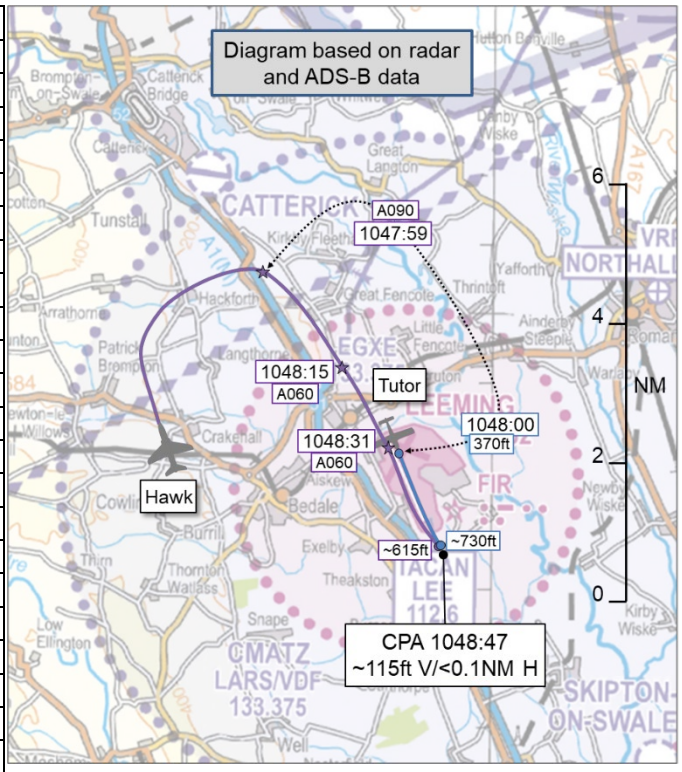
AIRPROX REPORT No 2025041

Date: 26 Mar 2025 Time: 1049Z Position: 5417N 00131W Location: RAF Leeming

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Tutor	Hawk
Operator	HQ Air (Trg)	HQ Air (Trg)
Airspace	Leeming ATZ	Leeming ATZ
Class	G	G
Rules	VFR	VFR
Service	ACS	ACS
Provider	Leeming Tower	Leeming Tower
Altitude/FL	~730ft	~615ft
Transponder	A, C, S	A, C, S
Reported		
Colours	White with blue trim	Black
Lighting	HISL nav, landing	HISL & anti-colls
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	500ft	500ft
Altimeter	QFE (1016hPa)	NK
Heading	156°	156°
Speed	100kt	NR
ACAS/TAS	TAS	TCAS I
Alert	None	TA
Separation at CPA		
Reported	0ft V/0.2NM H	1500ft V/NR H
Recorded	~115ft V/<0.1NM H	



THE TUTOR PILOT reports they were undertaking a standard departure - not above 500ft QFE - designed to give vertical separation on joining fast-jets. The fast-jet joiners are usually 'not below 1000ft' if a Tutor is in the circuit or departing. The Hawk was at 500ft for a simulated 'no R/T' join and ATC had assigned the callsign 'no R/T aircraft'. They, therefore, were unaware of the type, and their mental model was that it was probably another Tutor, but they had a passing thought that a Hawk may also join 'no R/T' at 500ft. In either case, they extended upwind to give what they had thought would be space for the aircraft to turn into the circuit behind them. Having failed to acquire the aircraft, which was in their true 6 o'clock, they began their right turn, level at 500ft, but quickly became visual. They understood that the Hawk [pilot] had been visual with them throughout, and they rolled out as they observed the Hawk moving right to pass, then climbing to circuit height.

They stated that vision in the Tutor's 6 o'clock position was limited by the canopy split and optical properties of the perspex, as well as physiology. The closure rate would have been 200-300kt, and would have increased if they had completed their departure turn. The [company named] Hawk aircraft were not displayed on the Tutor's ADS-B system, and in this case no TAS indication or alert appeared either. The TAS was selected 'on' in the after take-off checks, as per the Flight Reference Cards (FRC), but may not have had time to be fully operational.

ATC later informed them that the Hawk had not been informed of them departing VFR, nor had the join been restricted in height.

The pilot perceived the severity of the incident as 'Low'.

THE HAWK PILOT reports that, during an advanced flight training sortie, the aircraft was recovered for a simulated 'no R/T' join. They checked-in with ATC on the Approach frequency *"simulating squawking 7600, for no R/T join"*. ATC transmitted blind with the airfield details. It was CAVOK so the aircraft was self-positioned visually. Approaching initials, they checked-in with Tower with their Hawk callsign, and

they repeated the airfield details. At 1048 they were inside initials at 500ft as per the 'no R/T' procedure. Tower called *"no R/T aircraft, I see you flashing your lights, join, one Tutor downwind".* They were visual with the [uninvolved] Tutor downwind but also had TCAS contact with [the departing Tutor]. Approaching deadside at 1048:25, they were visual with the second Tutor maintaining runway heading, slightly below but climbing, still over the airfield. They remained deadside and overtook the departing Tutor on their right side. As they went past the departing Tutor it began a right turn, so they also turned right to remain clear. The Tutor pilot must have then seen them as it rolled out. At 1048:44 they overtook the Tutor, extended for 10sec, then turned downwind and climbed to circuit height. At 1049:05, the [pilot of the] departing Tutor called that they were changing to the Approach frequency.

The pilot stated that there was no risk of collision as they were taking visual separation from the departing Tutor, and that any aircraft joining the circuit must avoid those already established, especially for a 'no R/T' join when lookout was paramount. Tower had neglected to inform them of the departing Tutor, which was still on their frequency. Both Tutors had been restricted to 500ft as there was a fast-jet joining, but the SOP height for a 'no R/T' join is also 500ft. If they had known about the departing Tutor being restricted to 500ft, as soon as Tower had seen them flashing their lights, good airmanship would have been to climb to 1000ft to join the circuit.

The pilot perceived the severity of the incident as 'Low'.

THE LEEMING CONTROLLER reports that, at approximately 1045, they were the ADC when the Approach controller (APP) warned in [Hawk c/s] for a 'no RT join'. At this time they had [an uninvolved Tutor] conducting circuits and [Tutor c/s] nearly ready to go at D1. When [the uninvolved c/s] had completed their 'touch and go', [the Tutor pilot] reported ready for departure. They then gave [the Tutor pilot] a clearance for take-off. [The Hawk pilot] then called up for a simulated 'no R/T' join. They then gave them the join but said, *'simulated no RT join approved'* with the RW and QFE but no circuit state (1 in the circuit).

They did not receive a read-back from this as they thought they were conducting the procedure. [The uninvolved Tutor pilot] then called downwind to practise flapless to land. They did not restrict [the uninvolved Tutor pilot] to 500ft at this point as they did not think the Hawk would interact with them; they were to land and conducting a practise flapless procedure. [The Hawk pilot] then went through initials flashing their nose light, where they responded with, *'I can see you flashing your white light, surface wind and Tutor downwind.'* They then thought that [the Hawk] looked a bit lower than expected, not realising that the procedure was conducted at height 500ft. [The Hawk] extended upwind deadside to avoid [the Tutor] departing VFR west. [The Hawk] then turned downwind where they gave *'no RT aircraft turning downwind'* and then a flashing white light when they were downwind. [The uninvolved Tutor pilot] was then given a clearance to land. When [the Hawk] turned final, they gave *'on receipt of a green light and with your gear down you are cleared to land'.* This was whilst [the uninvolved Tutor] was still on the RW. They told the VCR ASOS to not give the green light until [the uninvolved Tutor] had vacated the RW. [The Hawk pilot] then stopped the procedure, called its gear down and requested a 'touch and go'. [The uninvolved Tutor] was then off the RW and a 'touch and go' was given with a green light from the VCR ASOS.

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

THE LEEMING ATC SUPERVISOR reports that they had just taken over the Watch (approximately 2min prior to the occurrence) as ATC Supervisor and therefore were supervising in the ACR. They were aware that a Hawk was conducting a practise emergency in the visual circuit. They received a call on the ATC Supervisor's phone line around this time which they were dealing with (if they recalled correctly). They were not made aware of any confliction in the visual circuit from the practise emergency Hawk until later in the afternoon, so they could not add any further information.

Factual Background

The weather at RAF Leeming was recorded as follows:

```
METAR EGXE 261050Z 25002KT 9999 FEW028 12/07 Q1023 NOSIG RMK BLU BLU
```

Analysis and Investigation

BM HQ 2Gp

Utilising occurrence reports and information from the local investigations, outlined below are the key events that preceded the Airprox. RAF Leeming is yet to receive a radar recording capability and the NATS radar recording only displayed the aircraft intermittently due to radar coverage. Therefore, there are no supporting radar screenshots available.

The Leeming Tower controller occurrence report was initially submitted not for the Airprox itself, but a failing in the application of the procedure regarding the no RT join. It subsequently transpired that the Airprox had occurred during that period. As a result of this unorthodox reporting timeline, the ATC report doesn't specifically reference the Airprox, however, it does accurately report the occurrence.

Sequence of events,

At approximately 1045, the Hawk pilot requested a simulated 'no R/T' visual recovery with the Leeming Approach controller who, in turn, approved the request and informed the Leeming Tower controller.

Within the Leeming visual circuit there was one Tutor (not involved in the Airprox) along with an additional Tutor (Airprox aircraft) on the runway cleared for departure.

As per local procedures, the Hawk pilot positioned for a visual join via initial, descending from 1000ft QFE to 500ft QFE once inside 5NM. The descent to 500ft QFE inside 5NM is mandated within local orders to provide vertical separation between the visual circuit Hawk traffic at 1000ft QFE and 'no R/T' joining traffic at 500ft QFE.

On approaching initial, the Hawk pilot established contact on the Leeming Tower frequency, and the Leeming Tower controller responded with *"simulated no RT join approved"* along with the RW in use and Aerodrome QFE. Incorrectly, they did not pass the circuit state of 1 in, referring to the Tutor downwind. As per the 'no R/T' procedure there was no readback from the Hawk pilot.

At approximately 1048, with the Hawk inside initial, at 500ft QFE and flashing lights, the Leeming Tower controller transmitted in the blind "*No R/T aircraft I see you flashing your lights, join, one Tutor downwind*". There was no information provided regarding the departing Tutor.

The Hawk pilot was visual with the Tutor downwind but also had a TCAS contact with another aircraft departing (the Airprox Tutor). At 1048:25, the Hawk pilot became visual with the departing Tutor which was maintaining runway heading and slightly below but climbing.

The Tutor was conducting a standard VFR departure profile for light aircraft (Tutors) climbing to and maintaining 500ft QFE until clear of the visual circuit. This departure profile is mandated within local orders to provide vertical separation between visual circuit Hawk traffic at 1000ft QFE and Tutor departures.

The Hawk pilot elected to remain deadside, overtaking the Tutor on their right-hand side. Unaware of the aircraft type of the joining Hawk, as it being referred to as *"No R/T aircraft"*, the Tutor [pilot] extended upwind on the runway track heading to provide adequate space behind for the joining aircraft to turn crosswind. Then, with the joining aircraft behind and not visual and expecting to be below the visual circuit traffic, the Tutor pilot commenced their intended right-hand turn. This resulted in the Hawk pilot also turning right to maintain horizontal separation as they were both at 500ft QFE, albeit with both the Hawk and Tutor pilots now visual with each other. At 1048:44 the Hawk overtook the Tutor, extended upwind and then turned crosswind climbing to circuit height of 1000ft QFE as per the 'no R/T' procedure.

Local BM Investigation(s)

A local investigation was conducted by Leeming following the event to identify the ATS-related causal/aggravating factors. The investigation found that, whilst both ATC and aircrew had acted in accordance with the local procedures, the procedure facilitated a loss of vertical separation between the two aircraft. Following the investigation, the 'no R/T' procedure has been amended as follows:

a. Simulated 'no R/T' procedures by Hawks are not permitted with mixed aircraft types. They are either conducted to an empty visual circuit or integrated with Hawk aircraft whose visual circuit is at 1000ft QFE and anything lower is on request and would therefore not be approved.

b. Real 'no R/T' procedures are facilitated through prioritisation of the emergency aircraft and the clearing of the visual circuit to negate the requirement for integration.

2 Gp BM Analysis

Whilst the Leeming Tower controller originally submitted the DASOR as a result of not providing the circuit state to the Hawk on joining, in practice this would have not altered the Airprox occurrence. On observing the Hawk passing initial, the Leeming Tower controller did provide the position of the downwind Tutor but not the departing Tutor. Whilst negated by the fact that the Hawk had a TCAS contact on the departing Tutor and subsequently gained visual, earlier situational awareness could have been provided. The Leeming Tower controller should have passed the circuit positions as "one downwind, one on the runway departing" as this would have given the Hawk pilot an awareness of the Tutor [pilot]'s intent to depart and not join the visual circuit, potentially leading the Hawk to turn crosswind behind the Tutor and not overtake. Aside from this, the Leeming Tower controller acted in accordance with the local procedures and hence their actions were justified.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and both aircraft were positively identified using Mode S data. The Hawk was seen joining through initial and reappeared upwind at 1049:11 (Figure 1). The uninvolved Tutor in the circuit was in a late left-hand downwind position and the departing Tutor had not yet appeared on radar.

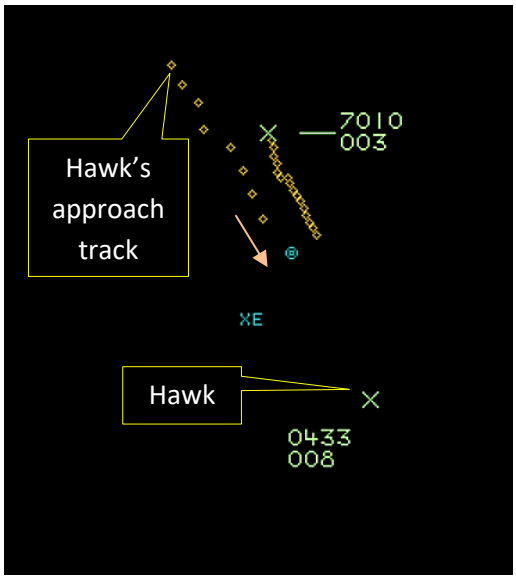


Figure 1 Time 1049:11

The departing Tutor first appeared on the radar replay at 1049:23 and the separation between the Hawk and Tutor was seen as 1.1NM laterally and 100ft vertically (Figure 2).

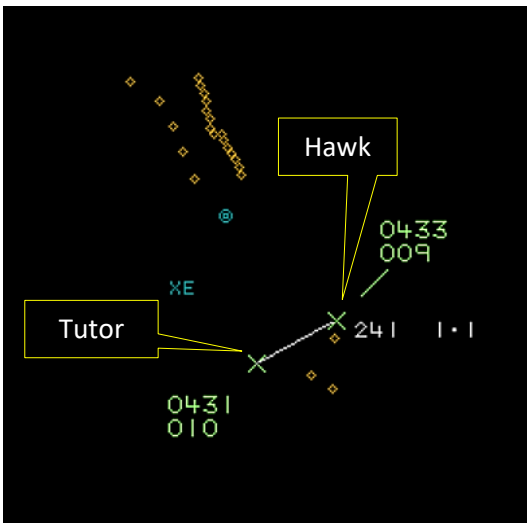


Figure 2 Time 1049:23

Further analysis of flight tracking software was undertaken and both aircraft were positively identified, the Tutor using ADS-B sources and the Hawk using MLAT. The departing Tutor was first seen on RW16 at Leeming at 1048:00 (Figure 3).

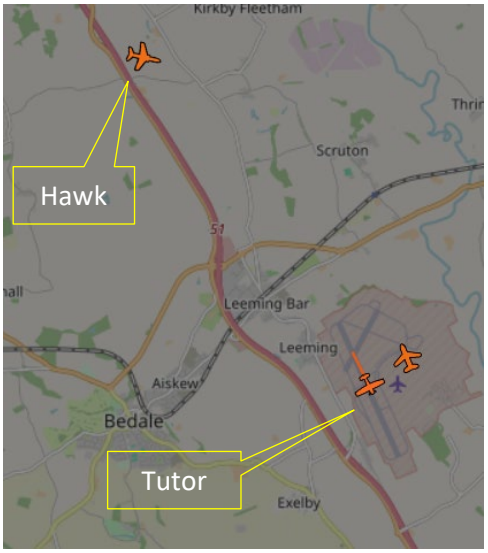


Figure 3 Time 1048:00

The Hawk was seen to have passed behind and beneath the Tutor at 1048:50 (Figure 4).

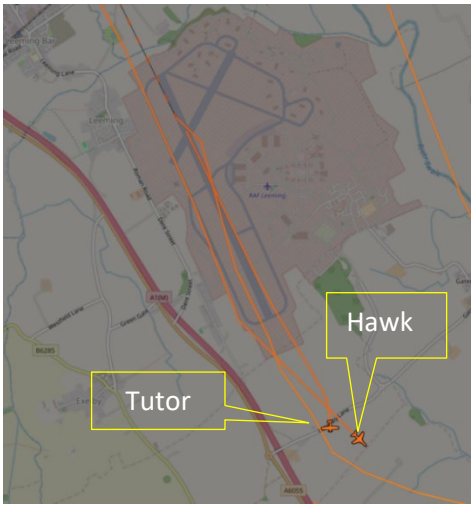


Figure 4 Time 1048:50

By interpolation of radar times and ADS-B sourced data, CPA was assessed to have occurred at 1048:47 with approximately 115ft vertical and less than 0.1NM lateral separation.

The Tutor and Hawk 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 Tutor pilot had right of way and the Hawk pilot was required to keep out of the way of the other aircraft by altering course to the right.[2] 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.[3]

Comments

HQ Air Command

Hawk and Tutor aircraft are separated in the visual circuit at Leeming through a height de-confliction of 500ft and restriction on the number of aircraft when mixing types. The R/T failure procedures for joining the circuit did not include these measures and have been reviewed to factor training for such an eventuality. The Leeming Flying Order Book now states "Practice Total R/T failures shall not be conducted with mixed traffic in the circuit."

It was fortunate that the Hawk pilot gained situational awareness on the departing Tutor through TCAS and was visual throughout, which provided the situational awareness that could have been passed by ATC. This allowed compliance with the Rules of the Air, specifically overtaking, and to conform with the pattern of traffic. From the Tutor pilot's perspective, it's easy to see why they would be startled by the presence of the Hawk, particularly given the Hawk crew were (deliberately) staying silent on the R/T to practise an emergency procedure. It can also be advantageous to clarify with other traffic that visual contact has been maintained, and thus remove any ambiguity over collision avoidance, accepting this could erode the quality of the emergency training.

Summary

An Airprox was reported when a Tutor and a Hawk flew into proximity in the RAF Leeming visual circuit at 1049Z on Wednesday 26th March 2025. Both the Tutor and Hawk pilots were operating under VFR in VMC in receipt of an ACS from Leeming Tower.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, ADS-B-sourced data, 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.

The Board first considered the actions of the Tutor pilot, and noted that the pilot had been ready to depart when a Hawk had begun a simulated 'no R/T' procedure into the circuit. Members noted that the pilot had become aware of the simulated 'no R/T' traffic and had extended their departure to allow separation for the following traffic to enter the circuit pattern. Members further noted that the pilot had not known the simulated 'no R/T' aircraft type and the significance of its relative speed and closure rate, having only briefly considered that it may have been a Hawk. The Board agreed, therefore, that the pilot's situational awareness had been inaccurate (**CF6**) and that the pilot could have requested the 'no R/T' aircraft type from ATC (**CF5**). Members also discussed the visibility from the Tutor's canopy, and the Board agreed that the construction of the canopy, coupled with the positioning of the Hawk almost directly behind the Tutor, had obscured the pilot's lookout to the aft of the aircraft (**CF10**). The Board

[1] MAA RA 2307 paragraphs 1 and 2.
[2] MAA RA 2307 paragraph 14.
[3] MAA RA 2307 paragraph 17.

further agreed that, on seeing the Hawk pass them, the Tutor pilot had been concerned by its proximity (**CF9**).

The Board then turned their attention to the actions of the Hawk pilot, and noted that the simulated 'no R/T' procedures that the pilot had been following had placed the Hawk at the same height as the Tutor's training in the circuit, and members agreed that the simulated 'no R/T' procedures had not adequately provided safe separation between mixed type traffic (**CF3**). The Board further noted that the pilot had had a Traffic Alert from the TCAS equipment fitted to the aircraft (**CF7**) which had alerted them to the departing Tutor, and members agreed that the pilot, at the point of becoming visual with the Tutor and despite their simulated 'no R/T' procedure, could have announced their aircraft type and that they were visual with the departing Tutor (**CF4**), thereby positively contributing to the Tutor pilot's situational awareness. The Board observed that, although the Hawk pilot had been visual with the Tutor throughout, during their join and as they had closed behind the Tutor from the deadside they had, most likely, not expected the Tutor to have turned away from the circuit and to the right, and members agreed that the Hawk pilot had flown close enough to the Tutor to have caused its pilot concern (**CF8**). Members further agreed that the Hawk pilot had only had generic situational awareness (**CF6**) on the Tutor from the information provided by their TCAS, but had not known the Tutor pilot's intentions to depart to the west.

The Board then considered the actions of the Leeming controller, and noted that they had been following procedures for a simulated 'no R/T' arrival. During their discussion the Board learned that, had the 'no R/T' arrival been a genuine situation, then the circuit would have been cleared but, as it was, the procedures had allowed the Hawk to join at the same level as training Tutor traffic. Members agreed that, in these circumstances, the procedures had not been sufficiently directive (**CF1**) so as to provide safety within the training circuit, and the Board was pleased to learn that the procedures at Leeming have since been altered so that there would be no mix of aircraft types in the circuit when practising subsequent simulated 'no R/T' procedures. However, the Board also noted that when the controller had passed Traffic Information to the Hawk pilot, they had omitted mentioning the departing Tutor, and while the Board recognised that the controller had not been required to pass that information, members agreed that it may have been prudent to have called 'one in the circuit and one departing', providing the Hawk pilot with pertinent Traffic Information (**CF2**).

In concluding their discussions, the Board noted that neither pilot had had full situational awareness of the other pilot's intentions, with the Tutor pilot not having known the Hawk pilot's aircraft type or intentions and the Hawk pilot not having known the Tutor pilot's intentions. Members agreed that safety had been degraded and that, although the Tutor pilot had been concerned by the proximity of the Hawk, the Hawk pilot had taken timely and effective action to have maintained separation from the Tutor. As such, the Board assigned a Risk Category C to this event.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2025041			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Regulations, Processes, Procedures and Compliance			
1	Organisational	• Aeronautical Information Services	An event involving the provision of Aeronautical Information	The Ground entity's regulations or procedures were inadequate
	• Situational Awareness and Action			
2	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
	Flight Elements			
	• Regulations, Processes, Procedures and Compliance			
3	Organisational	• Flight Operations Documentation and Publications	Flight Operations Documentation and Publications	Inadequate regulations or procedures
	• Tactical Planning and Execution			

4	Human Factors	• Accuracy of Communication	Events involving flight crew using inaccurate communication - wrong or incomplete information provided	Ineffective communication of intentions
	• Situational Awareness of the Conflicting Aircraft and Action			
5	Human Factors	• Lack of Communication	Events involving flight crew that did not communicate enough - not enough communication	Pilot did not request additional information
6	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			
7	Contextual	• ACAS/TCAS TA	An event involving a genuine airborne collision avoidance system/traffic alert and collision avoidance system traffic advisory warning triggered	
	• See and Avoid			
8	Human Factors	• Lack of Individual Risk Perception	Events involving flight crew not fully appreciating the risk of a particular course of action	Pilot flew close enough to cause concern
9	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
10	Contextual	• Visual Impairment	Events involving impairment due to an inability to see properly	One or both aircraft were obscured from the other

Degree of Risk: C.

Safety Barrier Assessment[4]

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 RAF Leeming Flying Order Book procedure allowed the fast-jet simulated 'no R/T' traffic to integrate with standard Tutor circuit traffic.

Situational Awareness of the Confliction and Action were assessed as **ineffective** because the Traffic Information passed to each pilot was incomplete.

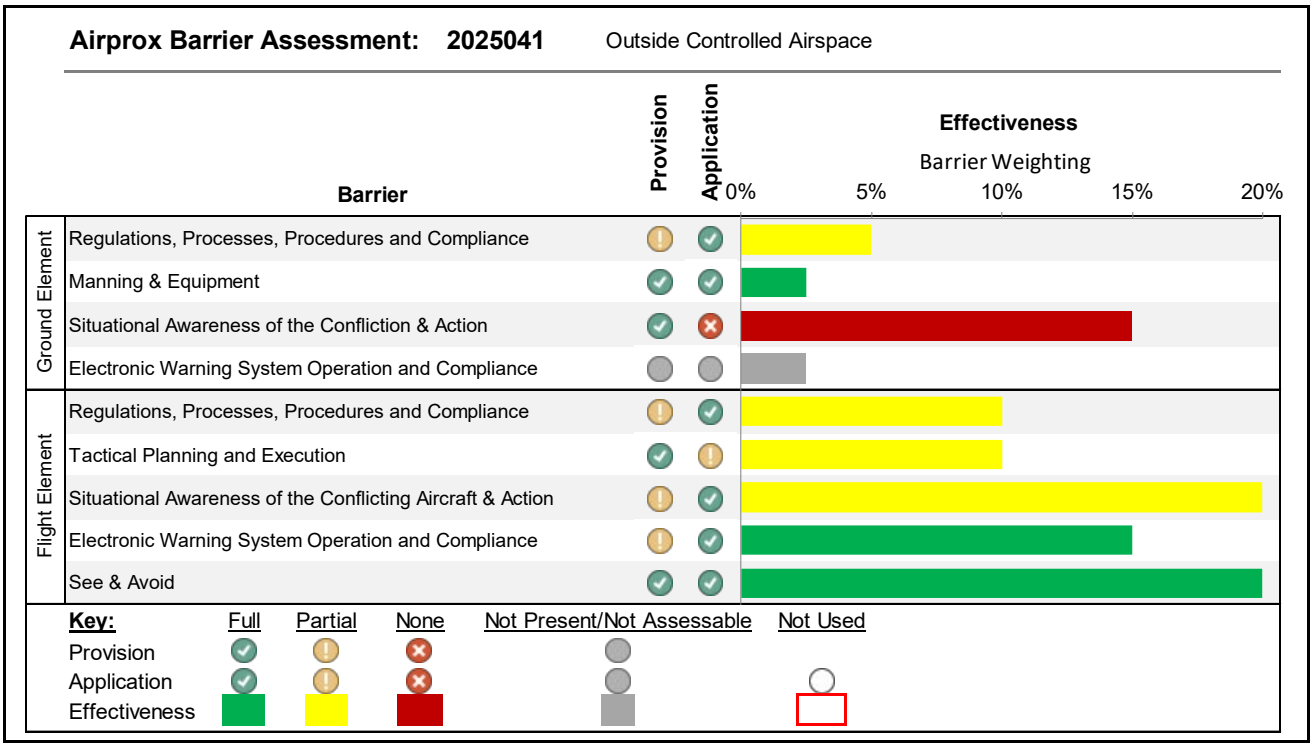
Flight Elements:

Regulations, Processes, Procedures and Compliance were assessed as **partially effective** because the Hawk pilot's published simulated 'no R/T' procedure placed them at the same level as Tutor circuit traffic.

Tactical Planning and Execution was assessed as **partially effective** because the Hawk pilot could have announced their type and visual acquisition of the departing Tutor.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because the Tutor pilot had inaccurate situational awareness of the position or type of the 'no R/T' traffic.

[4] 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: 2025041
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