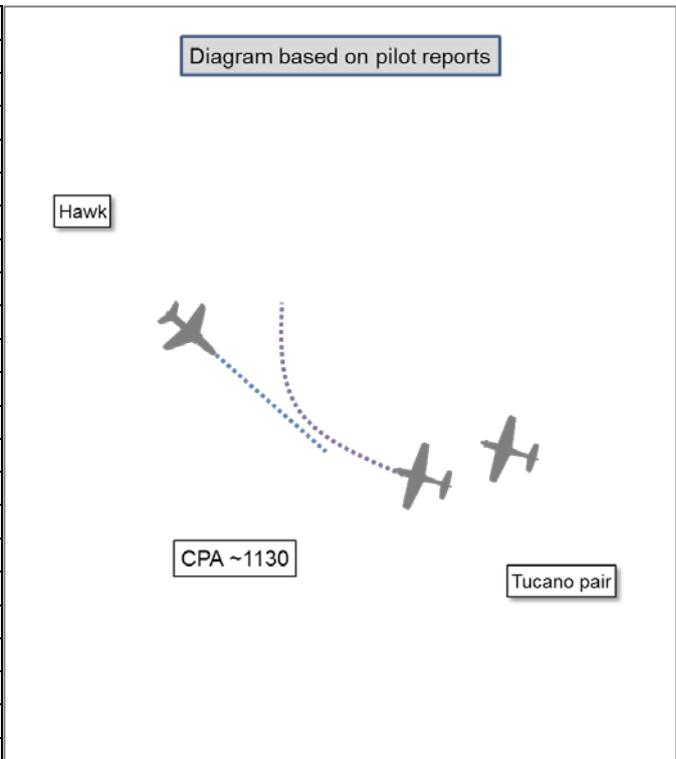


**AIRPROX REPORT No 2019300**

Date: 21 Oct 2019 Time: 1130Z Position: 5431N 00312W Location: Honister Pass

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

Recorded	Aircraft 1	Aircraft 2
Aircraft	Hawk T2	Tucano x 2
Operator	HQ Air (Trg)	HQ Air (Trg)
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Listening Out	Listening Out
Provider	LL Common	LL Common
Altitude/FL	NK	NK
Transponder	A, C, S	A, C, S
Reported		
Colours	Black	Black
Lighting	HISL, nav	HISL, nav, landing
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	NK	NK
Altimeter	RPS (1015hPa)	RPS (1015hPa)
Heading	150°	360°
Speed	420kt	210kt
ACAS/TAS	TCAS II	TCAS I
Alert	None	None
Separation		
Reported	'1000ft'	500ft V/100ft H
Recorded	NK	



**THE HAWK INSTRUCTOR** reports that he was conducting a 'Nav 1' sortie, introduction to low level. A formation of 2 x Tucano were operating in LFA 17 and had been acquired visually at the southern end of Lake Windermere. The Hawk crew cut ahead of them and transited up past Keswick, calling their intention to route southbound down the western lakes on the LL Common frequency. As they approached the saddle of the Honister Pass, he saw the formation cross the ridge southbound, he thought, in a right-hand turn. The Hawk pilot took immediate avoiding action, pulling up and passing above the Tucano pair. Due to this manoeuvre, and corresponding avoiding action from the formation, safe separation was maintained, but meeting another aircraft at that critical point demonstrated a significantly increased risk of loss of safe separation. The Hawk pilot noted that the crew had been engaged in a cockpit discussion based on the student training sortie and that had training not been occurring [he thought] they would have spotted the Tucano formation sooner.

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

**THE TUCANO FORMATION LEADER** reports that initial contact with the Hawk on the LL Common frequency had established that the Hawk would be operating in the Coniston/Windermere area for the next 15min. The Tucano pilot informed the Hawk pilot that they would call again for an update as they approached Windermere. Prior to arriving at Windermere, some 10min or so later, the formation gained a long-range sighting of the Hawk, aided by TCAS, and re-established comms. The Hawk pilot informed them he was departing northbound along Windermere. The Tucano pilot informed him they were visual and would be behind him. They then lost sight of the Hawk and continued to fly at low-level through the non-flow arrow valleys in a northerly direction. They heard no further radio transmissions and saw no further contacts on TCAS, perhaps due to blanking caused by terrain. As they crested over the Honister Pass he saw the Hawk and transmitted this information to his wingman. Whilst it had been a late spot they were already in a descending left turn and there had been just enough time for avoiding action to be effective. It did highlight, however, that had it occurred slightly further south, the outcome may have

been significantly worse. The Tucano pilot noted that there remain a significant number of valleys in the Low Flying System that present a risk of mid-air collision due to the nature of the terrain and a lack of further coordination. He noted that at the time of the Tucano formation's departure, the Hawk route had not been entered on CADS. Also, the Tucano formation were flying some 2-3NM west of their CADS route due to re-routing. The pilot stated that because there was time for avoiding action, he did not consider this event an Airprox but a late sighting, and so did not report it as such.

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

## **Factual Background**

The weather at Carlisle was recorded as follows:

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METAR COR EGNC 211120Z VRB02KT 9999 FEW026 11/05 Q1024=
METAR EGNC 211050Z VRB03KT 9999 FEW026 09/06 Q1024=
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## **Analysis and Investigation**

### **UKAB Secretariat**

The Hawk and Tucano 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 if that did not cross the flight path of the other aircraft<sup>2</sup>. If the incident geometry is considered as converging then the Hawk pilot was required to give way to the Tucano<sup>3</sup>.

### **RAF Valley Occurrence Investigation**

From OC STANAT:

The Ops team at Valley interrogated the routes in CADS to see what time [Hawk C/S]'s route appeared on CADS. Unfortunately the route record had been amended post flight and the exact time of entry could not be established.

CADS provides awareness to crews against LoSS [Loss of Safe Separation] and in this case it did not provide the full picture due to the Tucano formation not being aware of the potential confliction with [Hawk C/S] at [the] out-brief. Although [Hawk C/S] submitted the route in [a] timely fashion to the Ops Desk to enter into CADS, there remains the possibility that the route entry was delayed and as such was unavailable for the Tucano formation to assimilate at their out-brief.

The Ops team have reassured me that CADS route entry is prioritised and this incident has served as a timely reminder to all of the consequence of delayed submission or late route entry into CADS.

From Valley Stn Cdr (DDH):

The use of CADS is an excellent tool to aid deconfliction at low level but it is dependent on prompt submission and accurate adherence to the route. The latter is not always possible nor desirable and reinforces the importance of 'see and avoid' requiring good lookout, especially at low level and in particular in undulating terrain. On this occasion even with comms established and functioning TCAS, good lookout, and appropriate avoiding action was the most effective barrier; albeit lookout that was likely at a heightened sense of awareness due to effective use of ac systems. Regarding the former requirement to submit timely and accurate routes into CADS I have initiated a further review of procedures on Station in order to ensure maximise the utility of this important safety barrier.

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

<sup>2</sup> MAA RA 2307 paragraph 13.

<sup>3</sup> MAA RA 2307 paragraph 12.

## Comments

### HQ Air Command

Both aircraft types had TCAS on, but the displayed bearing accuracy of a TCAS advisory is reduced below 500ft and shouldn't be relied upon. Resolution Advisory (RA) cannot be selected below 1000ft agl and for the Hawk T2 there is no Traffic Advisory (TA) audio below 400ft agl. Even if there was an advisory on the display but with no audio, with the requirement to be predominantly heads out of the cockpit the chance of detecting a conflict is low. The radio was used on Low Level Common frequency by both aircraft types. This was effective in the early stages of each sortie in establishing the presence of the other aircraft and their generic routing. However, as the aircraft got further into the mountainous terrain, the chances of picking up other transmissions were remote. As the investigation by RAF Valley states, it is important to transmit accurate positional calls, especially when deviating from the planned route published on CADS. RT calls on Low Level Common should be updated frequently, even if there is no response as the call may be received by other low level users and could cause them to deviate from a potential conflict or choke point. CADS was used by both aircraft types. The Hawk was able to see the Tucano's route and acknowledged the conflict. At the time of the Tucano's out brief, the route of the Hawk was not on CADS for them to see, thus the conflict could not be acknowledged. From the investigation, the Ops staff at RAF Valley have been briefed on the importance of timely route information entry onto CADS, which remains one of their highest priorities. It is also worth noting that the route on CADS does not account for deviations from the 'black line' either for training, maintain a time line or weather avoidance. At the point this Airprox occurred, the Tucanos were approximately 3 miles from their planned route.

This Airprox demonstrates the number of tools and modern technology available for aircrew to build SA and a mental air picture. But it emphasises how they can't be relied upon in the low flying environment and how all these tools must be used in conjunction with a robust lookout scan.

### Summary

An Airprox was reported when a Hawk and a Tucano formation pair flew into proximity near the summit of the Honister Pass at about 1130Z on Monday 21<sup>st</sup> October 2019. All pilots were operating under VFR in VMC, not in receipt of a FIS but listening out on the LL Common frequency.

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

Information available consisted of reports from both pilots, radar photographs/video recordings 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.

Due to the exceptional circumstances presented by the coronavirus pandemic, this incident was assessed as part of a 'virtual' UK Airprox Board meeting where members provided a combination of written contributions and dial-in/VTC comments. Although not all Board members were present for the entirety of the meeting and, as a result, the usual wide-ranging discussions involving all Board members were more limited, sufficient engagement was achieved to enable a formal assessment to be agreed along with the following associated comments.

The Board first discussed the pilots' actions and noted that although they had been in communication previously, the Airprox occurred in hilly terrain such that the barriers of R/T and TCAS were ineffective (**CF3**) due to terrain masking. For the same reason, the crews were also denied the barrier of see-and-avoid until at a late stage (**CF4**). Members agreed that neither crews had had SA that the other would be transiting the Honister Pass (**CF2**) and the Board discussed use of the LL Common frequency and utilisation of CADS at length. It was noted that the Hawk routing was not available on CADS when the Tucano formation departed and that they were not aware of its presence until R/T communication was

established on LL Common. Members were briefed that entry of the Hawk route on CADS may have been delayed (**CF1**) but the Board noted that even if it had been entered in a timely fashion, and hence available for the Tucano formation, the Airprox occurred some 3NM to the west of the Tucano route. Nevertheless, it was pointed out that had the Tucano crews seen the Hawk routeing they could have delayed their sortie or amended the route such that potential conflict was avoided. Members were reminded that crews were not required to fly the CADS route line exactly and that CADS was not designed as a collision avoidance tool but rather as a means to plan to avoid areas of potential conflict. The Board was also heartened by the RAF Valley Station Commander's initiation of a review to ensure maximum utility of CADS for operations from RAF Valley. In the event, the pilots saw each other, albeit at a later stage than ideally (**CF5**) and were able to take avoiding action. The Board discussed the risk at length. Some members felt that the speed of closure was such that safety had been much reduced whilst others felt that the crews' description of the encounter and assessments of a low risk of collision indicated that any risk of collision had been averted. After further discussion the latter view prevailed.

The Board also discussed the nature of low flying in the hilly terrain of the Lake District. Low flying of itself is designed at least in part to decrease the likelihood of visual acquisition, degrading the barrier of see-and-avoid. Additionally, the vertical extent of the high ground masked aircraft from visual and electromagnetic detection, including R/T communication and TCAS alerting. Other than flying a prescribed route to a prescribed time, all the available barriers were degraded to a lesser or greater degree. Members acknowledged that the MoD recognised this issue with the use of flow arrows, in order to prevent opposite direction traffic, at high closing speeds, using the same funnel features. The Board felt that the geography of the Honister Pass was such that it also merited consideration and resolved to recommend that, 'MoD considers the introduction of a flow arrow for the Honister Pass'.

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

#### Contributory Factors:

2019300			
CF	Factor	Description	Amplification
<b>Flight Elements</b>			
<b>• Tactical Planning and Execution</b>			
1	Human Factors	• Action Performed Incorrectly	Incorrect or ineffective execution
<b>• Situational Awareness of the Conflicting Aircraft and Action</b>			
2	Contextual	• Situational Awareness and Sensory Events	Generic, late, no or incorrect Situational Awareness
<b>• Electronic Warning System Operation and Compliance</b>			
3		• Any other event	TCAS not able to alert due to terrain masking
<b>• See and Avoid</b>			
4	Contextual	• Poor Visibility Encounter	One or both aircraft were obscured from the other
5	Human Factors	• Monitoring of Other Aircraft	Late-sighting by one or both pilots

Degree of Risk: C.

Recommendation: MoD considers the introduction of a flow arrow for the Honister Pass.

### 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:

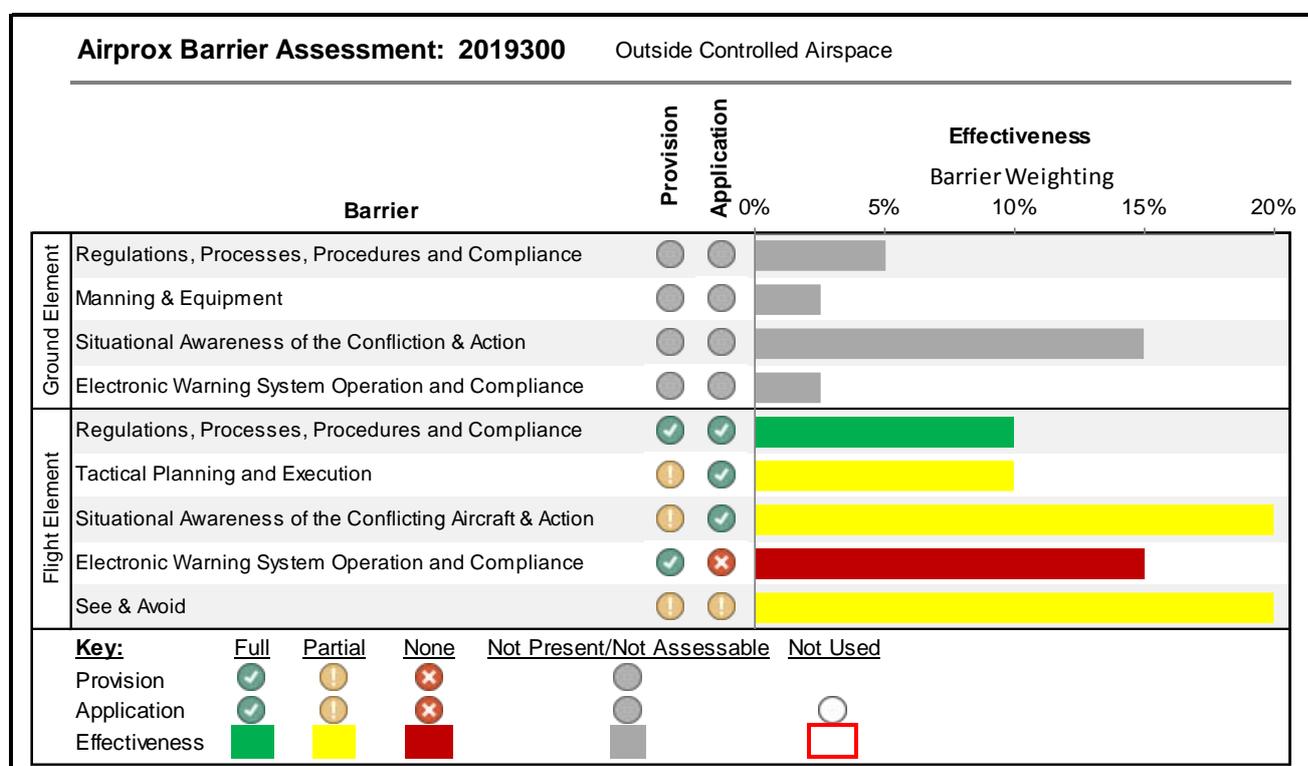
#### Flight Elements:

**Tactical Planning and Execution** was assessed as **partially effective** because the Hawk routing was not available on CADS and deconfliction at the Honister Pass was not discussed on the LL Common frequency.

**Situational Awareness of the Conflicting Aircraft and Action** were assessed as **partially effective** because neither crew were aware of the specific routing of the other aircraft.

**Electronic Warning System Operation and Compliance** were assessed as **ineffective** because the systems were masked from each other by terrain.

**See and Avoid** were assessed as **partially effective** because both crews saw the other aircraft at a late stage.



<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](#).