AIRPROX REPORT No 2014231

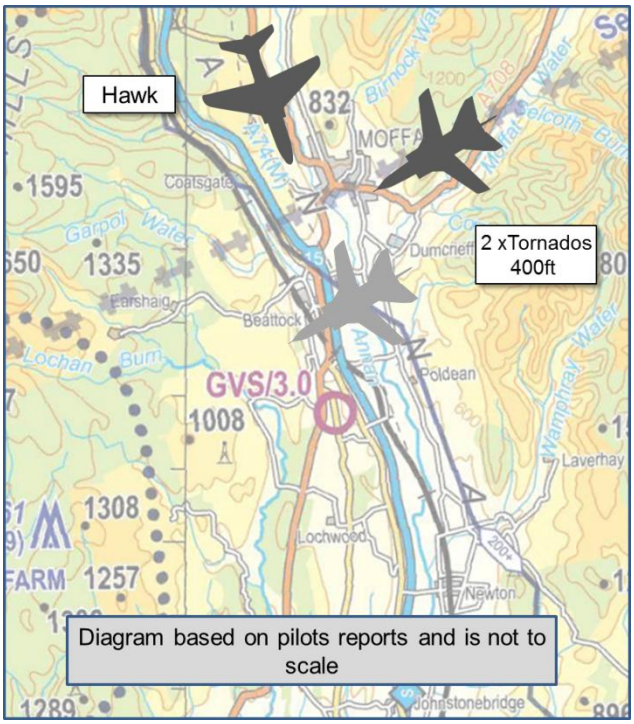
Date/Time: 16 Dec 2014 1351Z

Position: 5518N 00031W (Moffat Valley)

Airspace: SCO FIR (*Class*: G)

	Aircraft 1	*Aircraft 2*
Type:	Tornado	Hawk
Operator:	HQ Air (Ops)	HQ Air (Trg)
Alt/FL:	400ft QNH (1001hPa)	Low Level QNH (996hPa)
Conditions:	VMC	VMC
Visibility:	20km	30km
Reported Separation:	NK V/0.25nm H	400ft V/0.5nm H

Recorded Separation: NK



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO PILOT reports flying in a formation of two grey aircraft with HISLs and navigational lights illuminated and transponder selected with Mode 3A, C and S. The aircraft were not fitted with ACAS. They were in fighting-wing formation at 400ft agl, in a left turn exiting the Moffat Valley one-way flow in LFA 16, when the Weapons Systems Officer in the No2 aircraft called a Hawk aircraft in the 1 o'clock position crossing from right to left. The pilot applied full power, rolled wings level and pulled up. At approximately 1000ft the pilot rolled left and observed a Hawk heading away in a south easterly direction. At the same time, the formation leader had just commenced a routine radio call on the low-level common frequency; communication was established with the Hawk formation, who acknowledged the late sighting. The Tornado crew had been aware from the out-brief of the potential for confliction with the Hawk formation during the sortie. CADS[1] and the Duty Authoriser had highlighted the problem and liaison had taken place, but the Airprox took place 30nm further east than the expected area of confliction.

He assessed the risk of collision as 'Medium'.

THE HAWK PILOT reports flying in a formation of two black aircraft with white strobes, and flashing navigational lights illuminated. The transponder was selected with Mode 3A, C and S and the aircraft was fitted with TCAS. They were flying a simulated attack profile in LFA 16. In the latter stage of the attack the No2 aircraft received TCAS alerts and the pilot looked all around to try to spot the potential conflict. He finally saw a pair of Tornados, in his left 10 o'clock and, with a "small check on the stick", flew over the top of them. The Hawks had been giving regular information calls on the UK low-level frequency, and they heard the Tornado formation in the process of giving a safety call at the time of the incident. Further communication then took place, acknowledging the late spot. CADS was checked prior to outbrief, deconfliction had taken place with another Valley Hawk, the potential for confliction with the Tornados had been noted, and the Tornado Duty Authoriser had also phoned to discuss the confliction. The Hawk pilot noted that ultimately look-out prevented anything more serious happening.

He assessed the risk of collision as 'Low'.

[1] Centralised Aviation Data Service

Factual Background

The weather at Prestwick was reported as:

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METAR EGPK 161350Z 24005KT 9999 FEW030 06/02 Q1010
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Analysis and Investigation

UKAB Secretariat

Both pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard[2]. The incident did not show on the NATS radars so the exact geometry and separation is not known. Under SERA regulations when two aircraft are converging the aircraft that has the other on its right shall give way[3].

Comments

HQ Air Command

The standard barriers for this type of incident are sound pre-flight planning, Traffic Information (TI), Airborne Collision Avoidance System (ACAS) and the see-and-avoid principle. Each one of these factors played a part in this event.

Although opportunities existed prior to this point, the potential confliction between the 2 formations was identified at the pre-flight authorisation stage and steps were taken to mitigate the risk. That being said, the route planned and flown by the conflict Hawk had not been accurately depicted on the Centralised Aviation Data System (CADS) plan-to-avoid tool used by Defence aircraft to deconflict low-level flights operating below 2000ft, by day and night. As a result, the deconfliction plan agreed by both formations did not take into account the potential for confliction at the end of the Moffat Valley and reduced the situational awareness (SA) of the of the Tornado formation. Although the Hawk formation was aware of the potential conflict, they elected to maintain their low-level profile whilst conducting a simulated attack - a high workload part of the sortie. Hindsight would suggest that an alternative area to conduct the activity, or an increased altitude, could have been flown to mitigate the hazard posed.

Due to the profiles flown by both formations, it was not possible for either element to receive an ATS. Both formations adhered to the guidance in the Military Low Flying Handbook (UKMLFHB) and conducted regular broadcasts on the Low Flying Safety Frequency. However, the terrain in this area reduced the effectiveness of this barrier and prevented the broadcasts from being received by the other formation.

As ACAS was not fitted to the Tornado aircraft, they were unable to receive Traffic Information on the approaching Hawk. However, the Hawk did receive TCAS warning of the conflicting traffic as it approached the Moffat Valley. Once alerted; the pilot elected to remain at low-level until visual with the approaching traffic and did not elect to pass the information across the formation. Although this is not against current practices, this is something that crews have come to expect and may have improved SA across the formation. Given that the Hawk pilot was aware of the potential conflict in this area, an alternative choice of actions may have been more appropriate to mitigate the risk.

Thankfully, the final barrier of lookout proved effective and ensured that separation was maintained with both pilots taking action to avoid collision.

[2] SERA.3205 Proximity.
[3] SERA.3210 Right-of-way.

Summary

An Airprox was reported on 16th December 2014 at 1351 between a pair of Tornados in LFA 16 and a pair of Hawks also operating in LFA 16. Having checked CADS, both formations were aware that the other was likely to be in the area. Neither aircraft was receiving an ATC service; however, the Hawk pilot received Traffic Information from his TCAS, and both pilots took avoiding action.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both aircraft and reports from the operating authorities.

The Board noted that the one-way flow exit-point out of the Moffat valley was a well-known likely choke-point and conflict area in LFA16 and therefore questioned the wisdom of planning a nearby attack profile (with its attendant high workload and likely lookout-bias towards the front of the aircraft). The Board also noted that CADS had highlighted the possible conflict to both sets of crews but there was some doubt about whether CADS could give an accurate understanding of both elements of the Hawk routing because they had spilt for a time. Military advisors commented that this may have been why the Tornados were expecting the confliction point to be further east. This lead the Board to opine that CADS was not a panacea to avoiding confliction altogether; because of the nature of military low-flying operations, it should be considered more a planning tool for increasing awareness that other aircraft may be operating somewhere in the vicinity of any highlighted conflictions rather than a definitive prediction *per se*.

In the event, the value of TCAS in this situation was apparent. Despite an element of terrain screening, TCAS had provided the Hawk pilot with sufficiently timely Traffic Information to enable him to visually acquire the Tornados and take action. For their part, the Tornado crews had had to rely on radio calls for confliction alerting but terrain would have masked the Hawk's previous radio calls as they transited through the valley. Coupled with a lack of an ACAS, this meant that, in challenging terrain, the Tornado crews had had to rely solely on look-out to avoid the Hawks.

When determining the cause of this incident, the Board agreed that it was a late sighting by both crews. The risk was assessed as Category C; timely and effective avoiding action had been taken.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by both crews.

Degree of Risk: C.