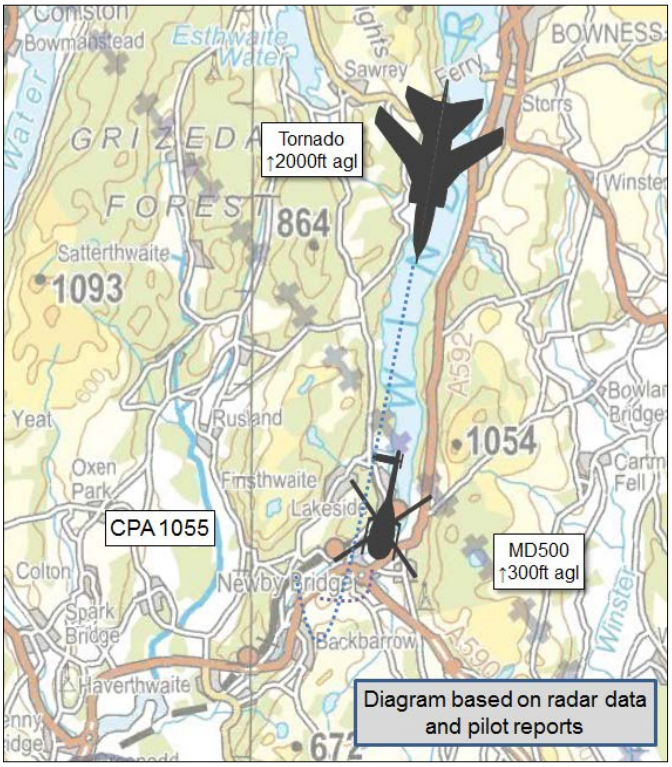
AIRPROX REPORT No 2016208

Date: 23 Sep 2016 Time: 1055Z Position: 5416N 00257W Location: Lake Windermere

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Tornado	MD500
Operator	HQ Air (Ops)	Civ Comm
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	None	Basic
Provider		London Flight Information
Altitude/FL	NK	NK
Transponder	A, C, S	A, C, S
Reported		
Colours	Grey	Red
Lighting	HISLs, Nav, Formation lights	Strobe, Nav
Conditions	VMC	VMC
Visibility	30km	10km
Altitude/FL	NK	300ft
Altimeter	RPS (1002hPa)	RPS
Heading	NK	260°
Speed	425kt	90kt
ACAS/TAS	TCAS II	Not fitted
Alert	TA	
Separation		
Reported	2-300ft V	200ft V/1000ft H
Recorded	NK	



THE TORNADO PILOT reports that he was low-level in the Lake Windermere area. Prior to the sortie, he had planned and entered his route into CADS[1] and there was no traffic forecast to affect at their predicted time. Just prior to entering the valley he had checked TCAS, which was clear at that time. Whilst descending towards the lake, his TCAS aurally alerted him to traffic in his proximity. On scanning the TCAS, it became apparent that the traffic was immediately beneath him and the height portion of the display was rapidly counting down from -09 to -05, he then took avoiding action by pulling up hard, away from the approaching traffic. At this stage, he hadn't seen the traffic visually. He climbed and maintained 2000ft whilst looking to see whether there was actually any traffic there. Whilst in a slower orbit he became visual with a red helicopter routing south-west from the southern end of the lake. He noted that without the TCAS warning he would have been a lot closer to the helicopter. He also commented that he had called on the UHF low-level common frequency one minute before the event, although he realised that a civilian helicopter was unlikely to be using UHF and would therefore be unlikely to have heard this call.

He assessed the risk of collision as 'Medium'.

THE MD500 PILOT reports that he was lifting from a private site. He flew on a heading of 180° until clear of the houses, then turned onto west. As he reached about 300ft he saw the Tornado appear out of the valley. He could clearly see the Tornado's heading so he reduced his climb to level off, then kept his turn a little steeper to go behind. The Tornado passed north to south very quickly, with a slight turn to the east. It came no closer than 1000ft horizontally and 200ft vertically so he did not feel it was close enough to warrant reporting it at the time. He spoke to the Tornado's Safety Officer

[1] CADS – Centralised Aviation Data Service, is a military planning tool for low-level deconfliction and alerting of other, mostly military, flights. CADS is not open for general access by civilian pilots.

afterwards, who informed him that the Tornado pulled up in a 4g climb; he didn't see this so assumed it was after he had taken his action. He noted that although he did not have a TAS fitted at the time, he was due to get one fitted in December when the aircraft had its annual service.

He assessed the risk of collision as 'None'.

Factual Background

The weather at Carlisle was recorded as follows:

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METAR EGNC 231050Z 20008KT 160V230 9999 FEW020 14/10 Q1020=
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Analysis and Investigation

UKAB Secretariat

The Tornado and MD500 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]. If the incident geometry is considered as converging then the MD500 pilot was required to give way to the Tornado[3], which he did. If the incident geometry is considered as overtaking then the Tornado was required to keep out of the way of the MD500 … and no subsequent change in the relative positions of the two aircraft shall absolve the overtaking aircraft from this obligation until it is entirely past and clear[4], which he also did.

Comments

HQ Air Command

Investigation into this incident by the unit concerned revealed that the Tornado crew had submitted their route onto CADS, had the TCAS and transponder selected on and were monitoring/transmitting on the UHF low level common frequency – all in accordance with current procedures. The Tornado pilot was first alerted to the presence of another aircraft by the TCAS, which indicated that the intruder aircraft was directly below with a decreasing height differential. Whilst no RA was issued (which would have been inhibited anyway at the height at which the Tornado was flying), the Tornado pilot elected to climb to increase vertical separation based on the TCAS indications. It is to be expected that TCAS acquisition, much as visual acquisition would be degraded at low-level when flying in a valley. The crew's actions were entirely appropriate given the circumstances and this incident shows the value of TCAS or comparable equipment interacting with another similarly-equipped aircraft. The only other barrier available in this encounter was see-and-avoid – which the helicopter pilot employed to good effect.

Summary

An Airprox was reported when a Tornado and an MD500 flew into proximity at 1055 on Friday 23rd September 2016. Both pilots were operating under VFR in VMC; neither pilot was in receipt of an ATS.

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both aircraft, radar photographs/video recordings, and reports from the appropriate operating authorities.

The Tornado pilot had planned his route using all of the tools available to him to deconflict from other users; unfortunately CADS is not available to civilian pilots in general and so they are unable to enter their details into the system. As a result, the Tornado pilot could not have known that the helicopter was going to get airborne when it did. Noting that his TCAS appeared to show the confliction beneath him, the Board thought that the pilot had reacted wisely in pulling up to get out of the way and provide a better view of the situation. Members noted that the Tornado pilot was operating on the UHF low-level common frequency, and the Board agreed with his statement that it was highly improbable that any GA traffic would be listening out on this frequency given that they were usually only equipped with VHF radios. As for a number of previous recent Airprox, the discussion turned to the establishment of a country-wide VHF low-level common frequency, akin to that trialled in Scotland; the Board considered this would have been useful in this scenario. Anecdotal evidence suggested that such a facility had had utility in Scotland, and the military members again reiterated that there was an intention to roll one out eventually in England and Wales subject to identifying a suitable frequency with the UK CAA.

For his part, the MD500 pilot reported that he had been visual with the Tornado fairly soon after he had got lifted, and certainly with enough time to stop his climb and take action to arrange to go behind it. Consequently, he was less concerned by the incident than the Tornado pilot was. The Board noted the MD500 pilot's comments about fitting a TAS in future, and wholeheartedly encouraged him to do so. Although he had managed to see the Tornado in plenty of time on this occasion, and that there was no substitute for good look-out, there was no doubt in the Board's mind that electronic conspicuity would increase his general situational awareness.

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

- **Flight Crew Situational Awareness** had been **ineffective**, because neither pilot was aware of the other aircraft until just before the incident.

- **Onboard Warning/Collision Avoidance Equipment** had been **effective**; the Tornado's TCAS had given the pilot a timely warning.

- **See and Avoid** had been **effective** in that the MD500 pilot had seen the Tornado at an early enough stage to take timely and effective avoiding action.

In determining the cause of the Airprox, the Board quickly agreed that the incident was best described as a sighting report (a visual sighting for the MD500 and a TCAS sighting for the Tornado pilot). The risk was assessed as Category C, no risk of collision due to timely and effective avoiding action being taken.

PART C: ASSESSMENT OF CAUSE AND RISK

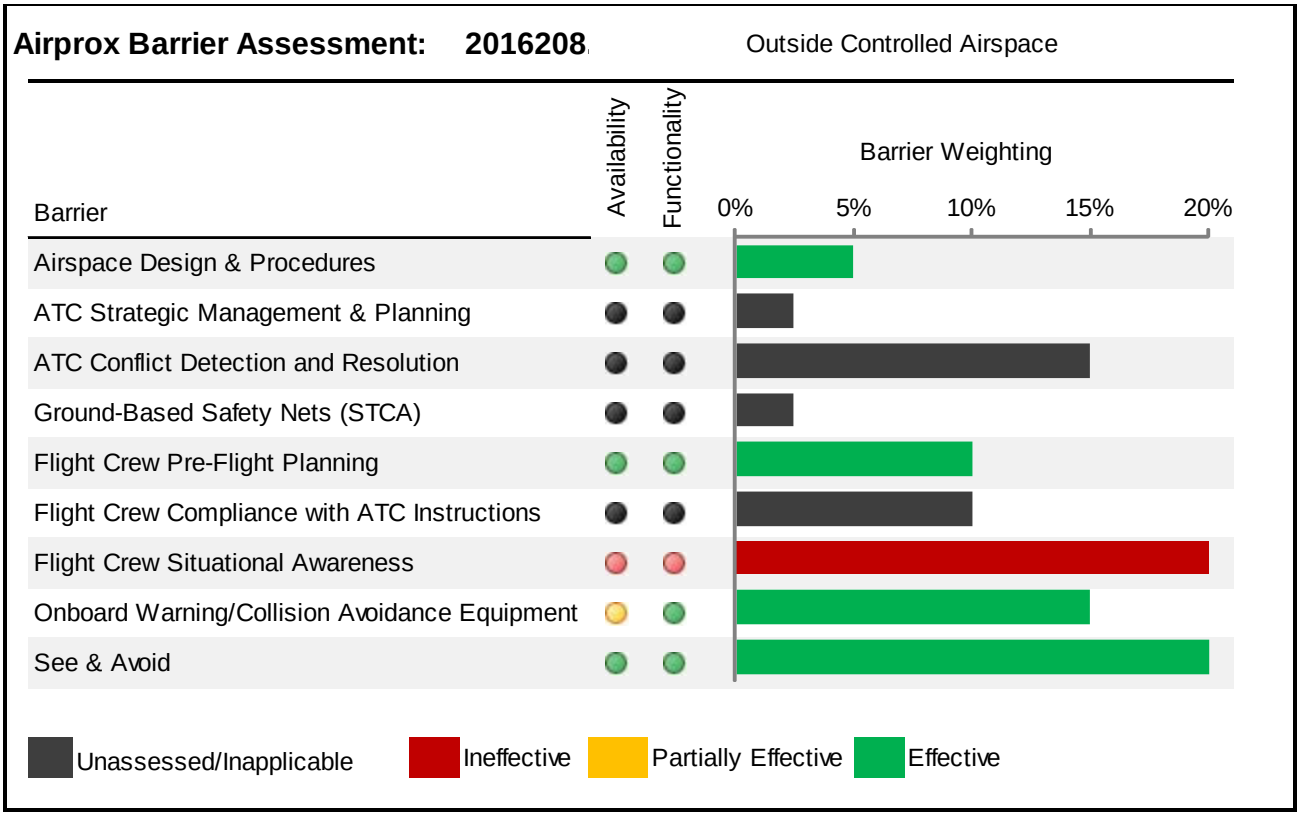
Cause: A sighting report.

Degree of Risk: C.

Barrier Assessment[5]: See overleaf.

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

Modern safety management processes employ the concept of safety barriers that prevent contributory factors or human errors from developing into accidents. Based on work by EASA, CAA, MAA and UKAB, the following table depicts the barriers associated with preventing mid-air-collisions. The length of each bar represents the barrier's weighting or importance (out of a total of 100%) for the type of airspace in which the Airprox occurred (i.e. Controlled Airspace or Uncontrolled Airspace).[6] The colour of each bar represents the Board's assessment of the effectiveness of the associated barrier in this incident (either Fully Effective, Partially Effective, Ineffective, or Unassessable/Absent). The chart thus illustrates which barriers were effective and how important they were in contributing to collision avoidance in this incident.



[6] Barrier weighting is subjective and is based on the judgement of a subject matter expert panel of aviators and air traffic controllers who conducted a workshop for the UKAB and CAA on barrier weighting in each designation of airspace.