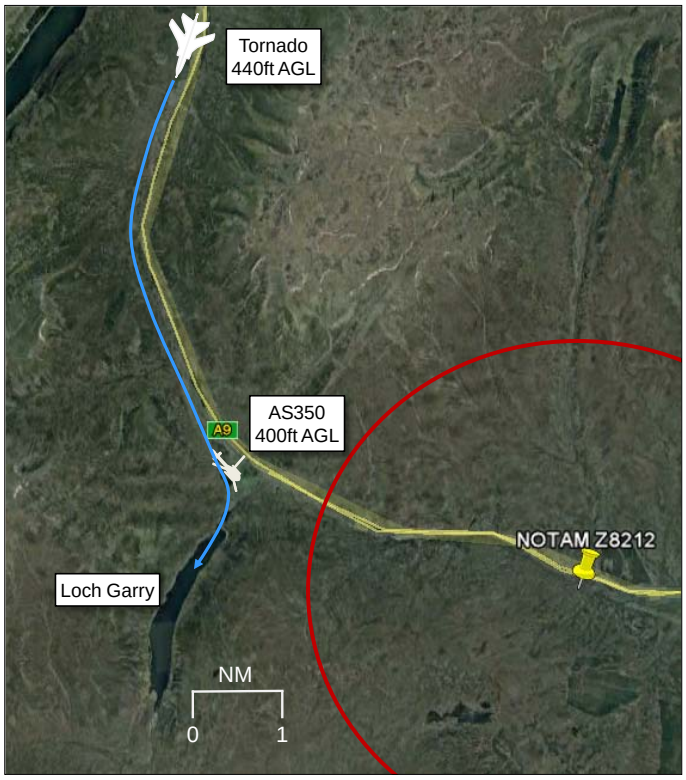
AIRPROX REPORT No 2013045

Date/Time: 22 May 2013 1326Z

Position: 56 49.6N 004 13.5W (1nm N of Loch Garry)

Airspace: LFA 14/Scottish FIR (*Class*: G)

	Reporting Ac	*Reported Ac*
Type:	AS350	Tornado GR4
Operator:	Civ Comm	HQ Air (Ops)
Alt/FL:	1780ft QNH (1016hPa)	440ft Rad Alt
Weather:	VMC CLBC	VMC CLBC
Visibility:	10+km	7km
Reported Separation:	0ftV/ 150ft H	Not seen
Recorded Separation:	NK V/NK H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AS350 PILOT reports flying a red and yellow helicopter at around 400ft AGL, hdg 150° at 120kt with anti-collision lights & HISLs switched on and his transponder turned off. The weather was VMC with greater than 10km visibility and the ac was 'about 1000 ft' below SCT to BKN clouds. He was flying from Dalwhinnie to Glen Garry to carry out under-slung load tasking with 3 additional POB; the pilot confirmed that a CANP had been filed for this activity. Whilst en-route to the tasking site he was positioning the ac to allow one of the passengers to photograph one of the working sites on the way. When he was around 500ft W of the A9 and N of Loch Garry he saw a Tornado pass him to his RH side coming from behind in an 80° degree bank to the R. He reports that the Tornado was at the same height approximately 100-120kt faster, he thought, and no more than 150ft away horizontally. He could not take any avoiding action due to the late sighting.

He assessed the risk of collision as 'High'.

[UKAB Note 1: NOTAM Z8212 was in force at the time of the Airprox: 'Mandatory CANP Avoidance. Underslung Loads. Underslung Loads will take place within 3nm radius of the following position: N56 48.437 W004 06.371']

THE TORNADO PILOT reports heading S at 423kt and 440ft AGL squawking Mode 3/A 7001 with Modes C and S selected and navigation and anti-collision lights turned on. The crew had originally been tasked as an element of a pair but due to unserviceabilities had been re-tasked to carry out low level flying training in LFA14; on reaching their low level entry point near Montrose they broadcast their intentions on the low level common frequency. The crew intended to navigate through the Cairngorms before heading S to rejoin the A9 at Pitlochry and then head E; the weather precluded this routeing so the crew turned back towards Dalwhinnie in an effort to navigate around the bad weather. They were aware of NOTAM Z8212 and elected to turn right along Loch Garry towards an area of better weather and to remain clear of the avoidance area. The crew did not see the AS350 at the time of the Airprox and used their on-board systems to assist with their report. The AS350 can be seen in the Forward Looking Infra-red (FLIR) and Head-up Display (HUD) recordings. The images below were provided from the FLIR recording:

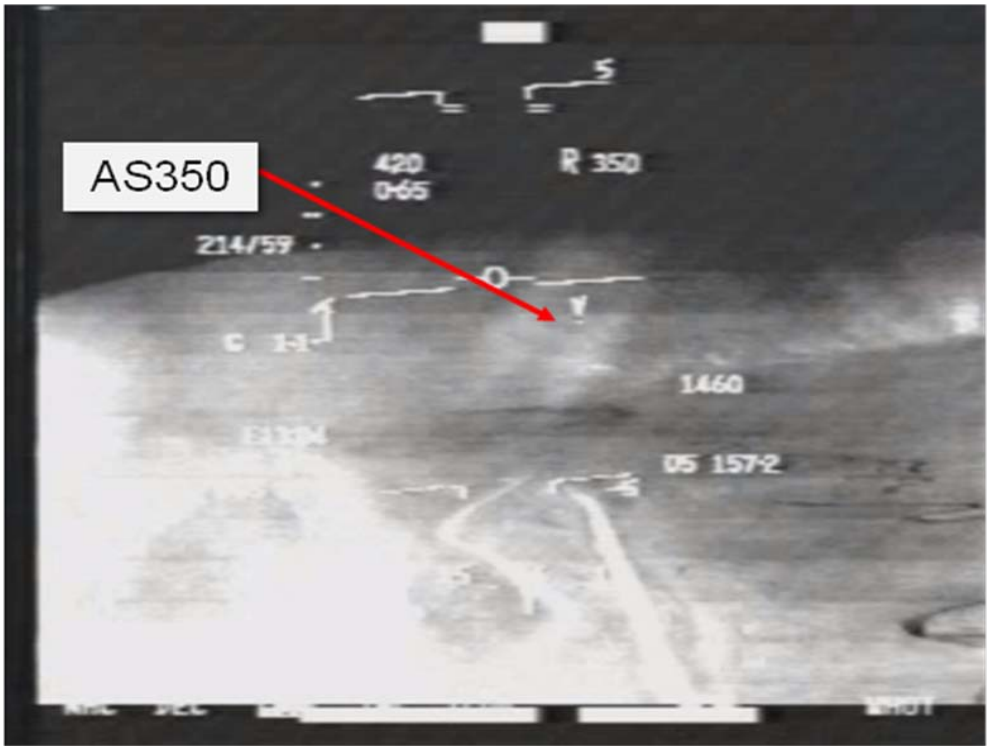


Figure 1

Figure 1 shows the image from the FLIR recording as it would have been displayed on the Weapons System Operator's (WSO's) TV1 display at 1326:03. The AS350 first appears as a Thermal Cue at an estimated range of 1050m with a closing speed of 300kt, 7sec prior to the estimated CPA.

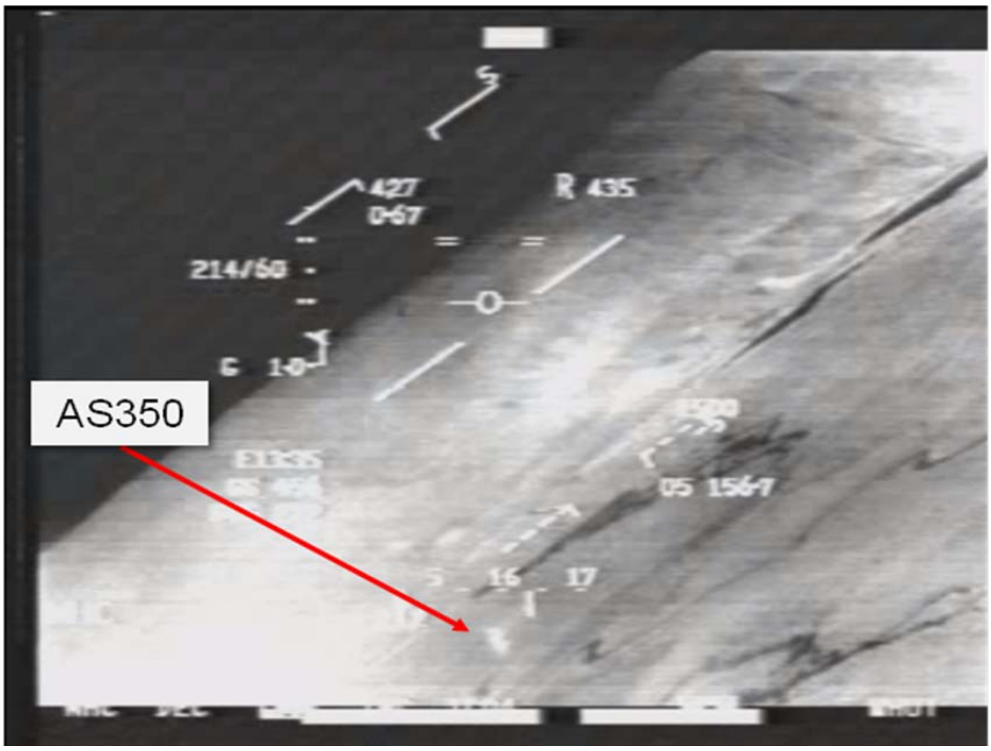


Figure 2

Figure 2 shows the image from the FLIR recording as it would have been displayed on the WSO's TV1 display at 1326:09

Figure 3

Figure 3 shows the image from the HUD recording at 1326:09 (the same time as Figure 2).

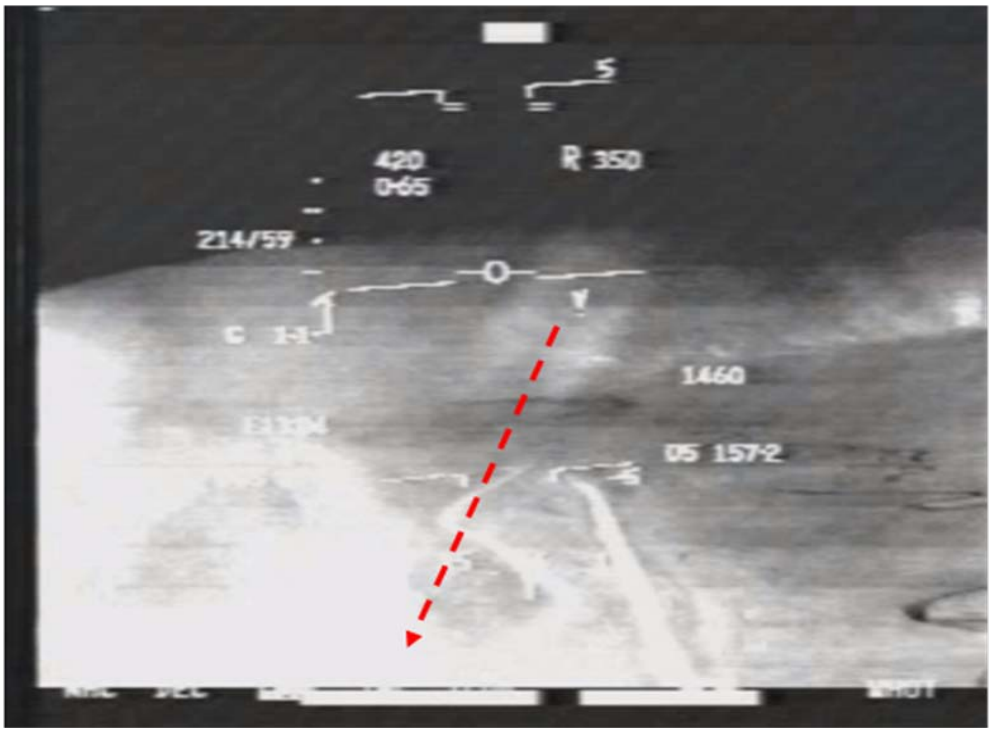


Figure 4

Figure 4 is the same FLIR image as Figure 1. The red arrow indicates the direction of lateral movement of the AS350 relative to the Tornado.

AN EYEWITNESS reports driving his car N on the A9 just after the Drumochter summit at 1326Z. He saw a red helicopter with, he thought, a gold band heading S flying at around 200m AGL to the W of the road. A Tornado heading S passed the helicopter, at what he assessed to be a similar height, and then turned right across the flight path of the AS350, he thought. [UKAB Note 2: It is unusual to have an unconnected eyewitness to an Airprox but in this case the evidence was clear and relevant and his vehicle was equipped with a tracking device, data from which proved valuable in tracing the ac]

HQ AIR(OPS) comments that the incident occurred clear of the area NOTAM'd for use by the AS350; the helicopter was not sighted by the crew. The AS350 is barely perceptible in the HUD and RAF FS requested the operators to review their HUD and windscreen cleanliness practices. In the event, the smearing evident in the lower portion of the HUD display is likely to be on the horizontal projecting glass rather than the HUD glass itself. The operating height of the Tornado was not unusual for low level operations and the 250-1000ft AGL level must be considered by other operators to be a relatively higher risk band. The ongoing programme to fit TCAS to Tornado might reduce the likelihood of a repeat of this type of incident in the near future. All military users of the Low Flying System are required to have a serviceable transponder, making them visible to TCAS-equipped operators.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of the reports from the pilots of both ac, a report and vehicle tracking data from an eye-witness as well as FLIR and HUD videos from the Tornado.

As the helicopter is shown in the FLIR video, a Board Member asked if this would have been easily seen by the Tornado crew. An Advisor answered that whilst the FLIR video can be displayed to both the pilot and the WSO, it would be normal and more effective for the crew to prioritise their external lookout over scanning internal cockpit displays. Although in this event the FLIR cueing indicated the position of the helicopter, it is frequently the case that the FLIR indicates multiple hotspots on the ground thereby disguising potential airborne conflicts. Many previous Airprox have highlighted the problems with prioritising the use of internal displays over visual scanning in the low-level flying environment and it was agreed that the crew were correct to concentrate on external lookout.

All of the Members with fast-jet experience agreed that the helicopter was barely visible in the HUD video and that the video picture was not clear in certain areas. It was likely that any distortion was a result of smearing on the recording equipment so this effect would not have affected the Tornado pilot's lookout. HQ Air is reviewing procedures to ensure that the HUD recording equipment is maintained to produce clearer recordings.

The Tornado pilot had broadcast his entry in to LFA14 on the Low Flying Frequency but as that is a UHF frequency it could not have been heard by the AS350 pilot. It was noted that a VHF frequency would make it easier for civilian traffic in the LFAs to improve their situational awareness but VHF frequencies are already in high demand and, in view of the distances involved in this event, it seemed unlikely that the AS350 pilot would have been able to hear the Tornado crew's call.

Discussion turned to the NOTAM in force regarding the under-slung load tasking of the AS350. It was clear that the Tornado crew had correctly understood and briefed regarding the NOTAM area and they had actively planned their routeing to avoid it. The AS350 was routeing towards the NOTAM area, but was outside it, and was also not engaged in under-slung load activity at the time of the Airprox. Some of the pilot Members felt that operators should include their ingress and exit routes in NOTAMs, as this would help military pilots to deconflict their routes or hone their lookout in the area. The Board agreed this would be good practice but noted that it would not always be practical. As the AS350 pilot was positioning for a photography task it was unlikely that he had much discretion regarding his routing and height selection; the Board agreed that he was as entitled as any other airspace user to be where he was but noted that a height of 440ft increased the likelihood of conflicting with military ac using the low flying system.

[UKAB Note 2: The UK AIP ENR 1.1 (General Rules) 1.1-32 dated 7 Mar 13 states:

'5.2.7 UK Military Low Flying System

5.2.7.1 Military low flying occurs in most parts of the United Kingdom at any height up to 2000 ft above the surface. However, the greatest concentration is between 250 ft and 500 ft and civil pilots are advised to avoid flying in that height band whenever possible.']

The AS350 pilot reported that his transponder was turned off; as the Tornado is not currently fitted with a TCAS this was not a factor in this Airprox but many Board members pointed out that this is not good practice as a functioning transponder with Mode C provides improved safety margins for other TCAS equipped ac and ATC.

Initially the Board felt that the cause of this Airprox was a 'non-sighting' by the Tornado crew and, effectively, a non-sighting by the AS350 pilot. However, the geometry of the incident meant that it was impossible for the AS350 pilot to see the Tornado overtaking rapidly from his rear quarter so it was agreed that the cause was a non-sighting by the Tornado crew. In light of this cause and the estimated miss distance, the Board unanimously agreed that there had been a risk of collision.

The Board agreed that the safety barriers pertinent to this Airprox were aircrew rules and procedures, visual sighting, aircrew action and situational awareness gained from on-board systems. None of these barriers proved effective so the Airprox was allocated a score of 500 on the Event Risk Classification Matrix.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the Tornado Crew.

Degree of Risk: A.

ERC Score: 500.