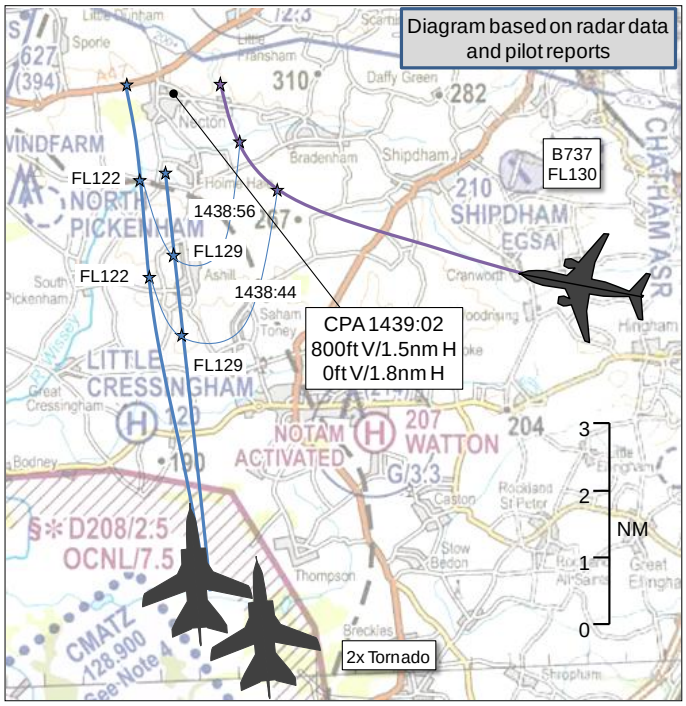
AIRPROX REPORT No 2014050

Date/Time: 30 Apr 2014 1440Z

Position: 5239N 00047E (9nm E Marham)

Airspace: Lon FIR (*Class*: G)

	Aircraft 1	*Aircraft 2*
Type:	B737-300	Tornado
Operator:	CAT	HQ Air (Ops)
Alt/FL:	FL130	FL125
Conditions:	VMC	VMC
Visibility:	NK	NK
Reported Separation:	0ft V/1nm H	NK
Recorded Separation:	800ft V/1.5nm H and 0ftV/1.8nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports flying a post-maintenance check in VMC conditions under a Traffic Service from Swanwick(Mil). He was flying straight-and-level on a heading of 270° at FL130. ATC advised that there was traffic to the south west also at FL130. Visual contact was gained with a pair of 'Typhoons', and it quickly became apparent that they were flying towards the B737. TCAS indicated two targets with "0 and -8" vertical separation, and he received a TA. He initiated an avoiding action turn of 40° right-hand bank onto a heading of 040°, and a climb to FL134. Visual contact was lost during the latter stages of the turn. Neither of the other aircraft were seen to alter level on TCAS. He then advised ATC of the turn and the new heading. He believed the same controller was in contact with the pair, and heard the controller query whether the formation had the Standard Pressure setting set, but he was unable to hear their transmissions as they were on a different frequency.

He perceived the severity of the incident as 'Medium'.

[UKAB NOTE: In fact, it was a different pair of fast-jets, not involved with this incident, that the B737 could hear were receiving a service from the Swanwick(Mil) controller.]

THE TORNADO PILOT reports flying in a formation of two grey aircraft with lights and anti-collision lights on, and transponder Modes 3A and C selected. The aircraft was not fitted with a TCAS. The crew were conducting a sortie on STANTA[1] and were receiving a Traffic Service from Lakenheath ATC. At the reported time of the incident, the aircraft were at FL125 and, he recalls, conducting simulated attack profiles. They were not informed of the incident until a few days afterwards, and had no recollection of the B737.

He perceived the severity of the incident as 'None'.

LAKENHEATH ATC report that the Tornados were working in and around D208 for approximately two hours and receiving a Traffic Service from Lakenheath's RAPCON. Both aircraft were given a discrete squawk to enable altitude readouts for both elements of the flight. This caused Lakenheath's ATC system to issue Conflict Alert (CA) audio and visual alarms because the system recognised that the two discrete squawks were in constant close proximity. These alarms were near continuous for

[1] Stanford Training Area D208.

two hours. Over time, this desensitized the controller to the audio alarms, so that when the CA sounded between the Tornados and the B737, it was also ignored. Additionally, the relative ATC picture was at a lull, and the watch supervisor used the opportunity to initiate a crew relief; in dividing her time between the crew swap and situational awareness of the approach position, she missed the impending conflict between the Tornados and the B737.

THE SWANWICK (MIL) CONTROLLER reports that he was not informed of the event until 2 months after it happened and therefore has no recollection of it.

Factual Background

The weather at Marham was recorded as:

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METAR EGYM 301350Z 22006KT 9999 FEW030 BKN050 17/09 Q1012 BLU NOSIG
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Analysis and Investigation

Military ATM

All heights/altitudes quoted are based upon SSR Mode C from the radar replay unless otherwise stated.

The incident was not thoroughly recalled by the Swanwick(Mil) controller or planner as no Airprox was declared on frequency and the controllers were not made aware of the incident until two months after. The tactical controller was an OJTI at the time and recalled the B737 because most aircraft of this type request a Deconfliction Service on air tests. The OJTI and planner do not recall anything of interest from the controlling session.

The radar replay at 1437:47 demonstrates the pair of Tornados tracking northbound and the B737 heading 270°, as per Figure 1.

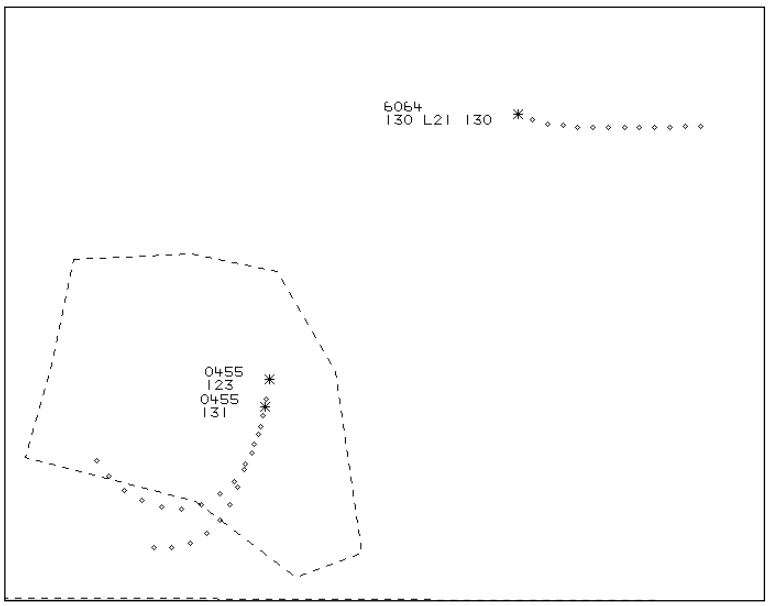

Figure 1: Aircraft geometry at 1437:47 (B737 squawking 6064; Tornados squawking 0455).

The Swanwick(Mil) controller passed Traffic Information at 1438:00 as "*traffic southwest 10 miles, manoeuvring, believed to be at FL125 and FL130*." The B737 reported visual at 1438:09. At 1438:29, as per Figure 2, the aircraft have 4nm horizontal separation with 800 feet separating the Tornado formation from the B737 which was initiating a right-hand turn.

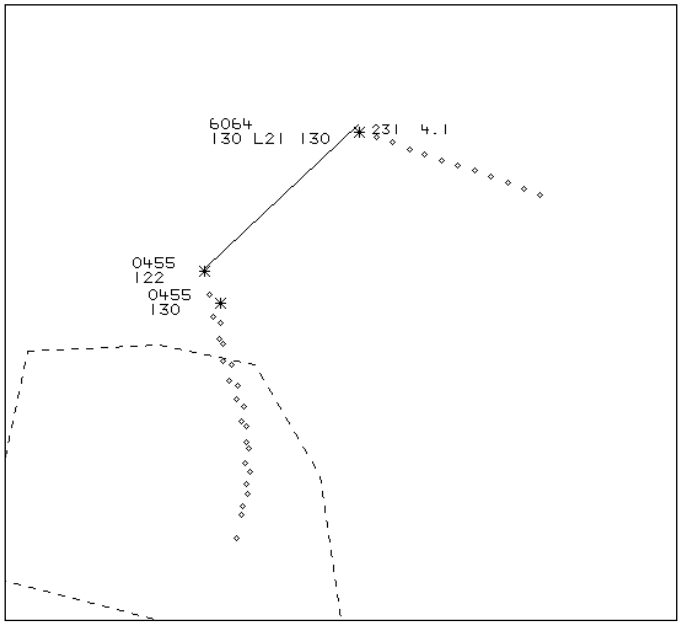

Figure 2: Aircraft geometry at 1438:29 with 4 nm horizontal separation.

At 1438:41, Traffic Information was updated to the B737 as, "*previously reported traffic now southwest 3 miles, tracking northwest, believed to be at FL122 and FL130*." As per Figure 3, at 1438:47, the B737 is in the right hand turn onto 040°.

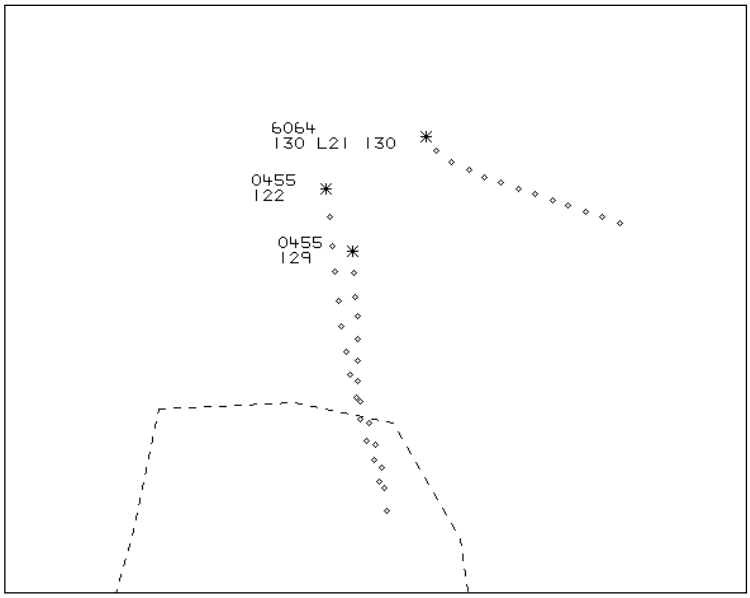

Figure 3: Aircraft geometry at 1438:47.

The Closest Point of Approach (CPA) horizontally is 1.5nm at 1439:02; Figure 4 demonstrates the geometry at CPA.

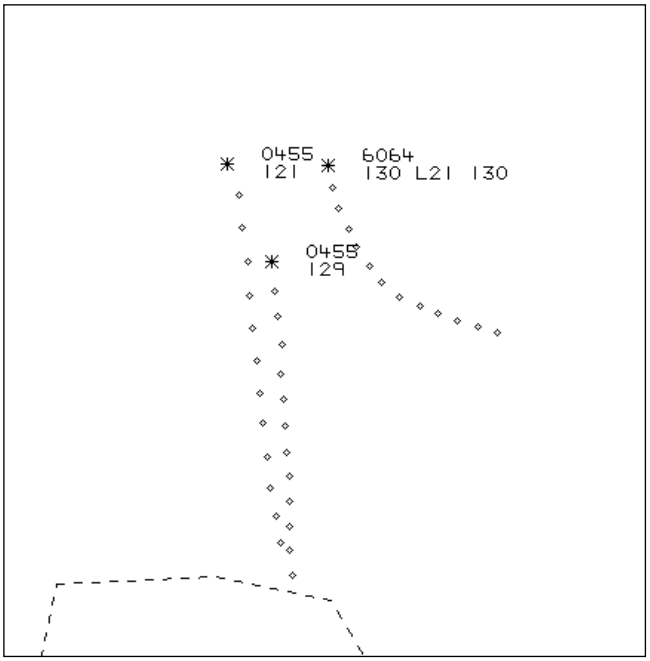

Figure 4: Aircraft geometry at CPA.

The B737 continued the right-hand turn and the Tornados tracked onto a northwesterly heading, as per Figure 5. At 1439:06, Lakenheath Approach called the Tornados, and at 1439:15 the controller transmitted, "[Tornado callsign] *I've got traffic about two miles north east of your position, altitude indicates flight level 133 and climbing."* The Tornados indicated that they were searching for the traffic.

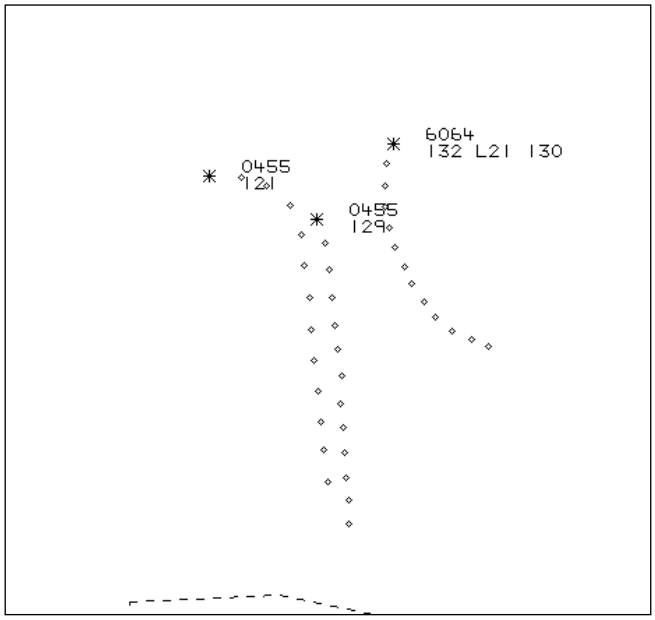

Figure 5: Aircraft geometry at 1439:19.

Both crews were operating in Class G airspace under a Traffic Service. The Tornados were not fitted with an Airborne Collision Avoidance System and they were not visual with the B737. The B737 had TCAS and this allowed the crew to become situationally aware of the Tornados and maintain a visual contact until the avoiding action had taken them clear. The Tornados were conducting pre-deployment training with ground callsigns, and their attention would have been split between the operational task on the ground, formation separation and separation with other airspace users.

The Lakenheath controller was late in providing Traffic Information, and this can be viewed in the context of a lull in traffic and the crew swap. Furthermore, following a Lakenheath investigation, it was found that the constant alerting of the ATC Collision Avoidance system would have de-sensitised the controllers to the alarm. The Collision Avoidance system is a control measure against controller attentional slips but, in this instance, it had become a distraction that had compromised the monitoring function. Swanwick(Mil) provided accurate Traffic Information enabling visual acquisition for the B737 and this was updated as the aircraft was in the right-hand turn.

Radar-based Traffic Information from Swanwick(Mil), TCAS and pilot lookout enabled the B737 to be aware of the Tornados and route clear. These barriers were not available for the Tornado crews, who were not aware of the B737.

UKAB Secretariat

Both pilots had an equal responsibility to avoid a collision[2], in addition the Tornados were required to give way to the B737.[3]

Comments

HQ Air Command

The late provision of Traffic Information to the Tornado formation compromised the time available for the Tornado crews to visually acquire and then deconflict with the B737. However, the B737 clearly had the higher SA (through Traffic Information passed by Swanwick(Mil), TCAS and having visually acquired the formation) and, although there was a slight delay between visual acquisition and initiation of a turn away, the pilot of the B737 is to be commended for his actions in preventing the conflict from developing further. Whilst both the Tornado formation and the B737 were operating in VMC in Class G airspace, only the B737 pilot was visual with the other aircraft and in a position to take early positive action to resolve the confliction.

USAFE

Little can be added to the foregoing Military ATM analysis. Following a thorough in-house investigation, Lakenheath have taken appropriate actions to minimise the likelihood of a similar occurrence.

Summary

An Airprox occurred at 1440 on 30 April 14, 9nm east of RAF Marham between a pair of Tornados, under a Traffic Service with Lakenheath, and a B737 under a Traffic Service with Swanwick(Mil). The B737 pilot received Traffic Information from ATC and a TCAS TA, saw the Tornados, and took avoiding action. The Tornados did not see the B737.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both aircraft, transcripts of the relevant RT frequencies, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

In looking at the actions of the B737 pilot, the Board recognised that he was on an Air Test and, as such, would be spending periods of time looking at his instruments and conducting in-cockpit tasks. Nevertheless, the Board commended him for his effective lookout borne from the information that he

[2] Rules of the Air 2007 (as amended), Rule 8 (Avoiding Aerial Collisions)
[3] Rules of the Air 2007 (as amended) Rule 9 (Converging)

had received from both the controller and his TCAS, and considered that his pro-active, timely and effective action had successfully diffused the situation despite the fact that it was for the Tornado pilots to give way to him.

The Board were disappointed that the Swanwick(Mil) controller had not been informed of the Airprox early enough to allow him to write a meaningful report; however, from the RT transcripts, it was clear that he had discharged his duty well by giving timely and accurate Traffic Information to the B737 pilot. Notwithstanding, the Board were informed by a Civil Air Transport pilot member that, in order to gain the required level of coordination, such air tests are required to give 24 hours notice to Swanwick(Mil), and provide full details of their profile; given that such air tests were a relatively unusual activity which would have obvious implications for other airspace users, some members of the Board wondered why, therefore, Swanwick(Mil) hadn't passed on this information to the Lakenheath controllers (and other local ATC units) beforehand as a matter of routine, and why they hadn't coordinated with Lakenheath at the time given that they could see that their B737 had traffic to affect that was wearing a Lakenheath squawk.

The Board then considered the actions of the Tornado crews. They were required to give way to the B737; however, it was apparent from their report that they were probably task-focused which meant that they did not see it at any point. It was recognised that the profile of their particular sortie probably entailed a high cockpit workload, with a need to focus both on the ground and on formation flying, but the Board opined that the B737 was there to be seen and was only 1.5nm/1.8nm at CPA. In some mitigation, the Board noted that, in requesting a Traffic Service, the crews might have been relying on the Lakenheath controller to supplement their look-out.

Turning to Lakenheath ATC, the Board noted that an internal investigation at Lakenheath had already highlighted many valuable lessons prior to the Board's assessment. Of particular note, the Board remarked that the constant audio conflict alert had been deemed to have desensitised the controller to the impending confliction, and that it was a new controller who, on taking over the position, had noticed the conflict. Members debated at some length the wisdom of accepting 2-hrs of desensitizing conflict alert warnings versus the expedient of asking one of the Tornados to deselect its SSR. Whilst it was recognised that there were benefits to be had from the conflict alert during times when the Tornados separated from each other, the overall effect of maintaining it active throughout the mission had been to reduce Air Safety, rather than enhance it, as demonstrated in this case.

In considering the cause and risk, the Board agreed that the root cause was a non-sighting by the Tornado crews, with two contributory factors: the first that Lakenheath did not pass Traffic Information to them; and the second that the continuous sounding of the Lakenheath conflict alert desensitized the Lakenheath APR. Notwithstanding a CPA of 1.5nm horizontally and 800ft vertically, with the B737 pilot visual with the Tornados and actively taking avoiding measures in what was Class G airspace, the risk was agreed as Cat E; normal safety standards and parameters were deemed to have pertained.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the Tornado crews.

Contributory Factor(s): 1. Lakenheath APR did not pass Traffic Information to the Tornado crews.
2. The continuous sounding of the Lakenheath conflict alert desensitized Lakenheath APR.

Degree of Risk: E.

ERC Score[4]: 10.

[4] Although the Event Risk Classification (ERC) trial had been formally terminated for future development at the time of the Board, for data continuity and consistency purposes, Director UKAB and the UKAB Secretariat provided a shadow assessment of ERC.