

## **AIRPROX REPORT No 2014110**

Date/Time: 16 Jul 2014 1444Z

Position: 5453N 00124W  
(10nm S Newcastle)

Airspace: London FIR (Class: G)

Aircraft 1                      Aircraft 2

Type: Hawk                      Tornado

Operator: HQ Air (Ops)      HQ Air (Ops)

Alt/FL: FL190                      FL185

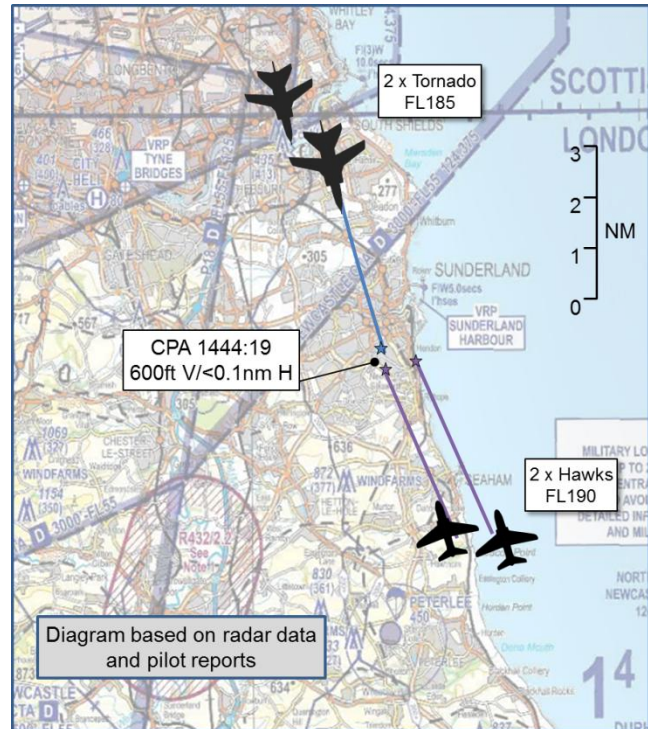
Conditions: VMC                      VMC

Visibility: >10K                      >10K

Reported Separation:

800ft V/0ft H                      500-600ft V/0ft H

Recorded Separation: 600ft V/<0.1nm H



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

**THE HAWK PILOT** reports flying in a formation of two black aircraft with strobes lights illuminated and transponder Modes 3A, C and S selected. The aircraft were not fitted with TCAS. They were in the cruise at FL190 following a handover from Leeming ATC to Hotspur (the RAF Boulmer Air Weapons Controller), and on a northerly heading flying towards Newcastle. They were given Traffic Information by Hotspur on traffic 12nm away, converging and climbing through FL140; shortly afterwards the lead Hawk pilot requested an update, and was told that the traffic was now through FL160 and climbing. The lead pilot was aware that the aircraft was on their nose crossing right to left; realising this was not co-ordinated (the controller told them he was trying to initiate co-ordination), the formation turned to the left to increase lateral separation. Shortly afterwards the lead aircraft passed over a formation of Tornados with an estimated separation of 800ft. The Tornados were seen by the No 2 Hawk pilot first, then by the lead, with sufficient time to avoid by climbing slightly, but less than ideal vertical separation.

He assessed the risk of collision as 'Low'.

**THE TORNADO PILOT** reports flying in a formation of two grey Tornados with all lights illuminated and transponder selected with Mode 3A, C and S. The aircraft were not fitted with TCAS. They had completed a training profile at Spadeadam and were cleared to climb to FL230 for their return to base. They were handed over to Swanwick (Mil) and were identified and given a Traffic Service. Traffic Information was passed as, "your 12 o'clock, 15nm at FL190 in a slow climb", on hearing this, the Tornados elected to level off at FL185. Further Traffic Information was requested and updates were given as the separation between the two formations reduced. They became visual with the Hawks at a range of 2-3nms and elected to "bunt"<sup>1</sup> to increase the vertical separation, the separation between the two formations was estimated at 500-600ft. The pilot reported that having been told that the Hawks were climbing, he had expected the separation between them to increase. He noted that under a Traffic Service the controllers were not required to achieve deconfliction minima and that separation was the pilots' responsibility, and that in this case, had he not elected to level off they would have climbed straight through the Hawk's level. He noted that the controller didn't offer any deconfliction advice, and, with the benefit of hindsight, he felt that the formation should have levelled off sooner, perhaps after the initial Traffic Information, or turned 20°. Furthermore, they could have asked for a Deconfliction Service, something which they did not consider at the time. He identified

<sup>1</sup> A pitch-down manoeuvre used to achieve increased levels of separation.

that, in his opinion, whilst nobody broke any rules in this instance, a pertinent lesson is, if in doubt take a Deconfliction Service early.

He assessed the risk of collision as 'Medium'.

**THE SWANWICK (MIL) CONTROLLER** reports being the NE Tac controller and had just called for a planner due to rising traffic levels. The Tornado formation was handed over in the climb to FL230 under a Traffic Service. He gave Traffic Information on conflicting traffic in the opposite direction at a range of 15nm, passing FL187 in a slow climb. As the aircraft got closer he updated the Traffic Information as "12 o'clock, 8nm opposite direction at FL190", to which the Tornado pilot replied that they would level off at FL185. As this would provide 500ft separation against the conflicting traffic, he considered this to be sufficient separation and that further advice was not warranted. Traffic Information was passed again at 3nm and again the level was given as FL 190. The aircraft passed each other with 500-600ft separation indicated on Mode C. Once clear of the traffic the lead Tornado pilot asked whether the conflicting traffic had been at FL190, this was confirmed and the Tornados continued their transit back to base.

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

**THE ASACS WEAPONS CONTROLLER** reports receiving a handover of the Hawks who were climbing to FL190 and tracking north. A pair of Tornados which were known to have just been operating on Spadeadam range were observed to change to a Swanwick(Mil) squawk and appeared to be climbing. He gave a "stranger warning" to the Hawks at 30nm, who acknowledged the call. He attempted to get Traffic Information from Swanwick (Mil) N, but was told to call Swanwick (Mil) NE instead. The Hawks then requested a left turn, and he cleared them on their own navigation. He gave "stranger warnings" at 12nm, 5nm and 1nm until the Hawk pilot called visual.

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

## Factual Background

The weather at RAF Leeming was reported as:

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METAR EGXE 161350Z 22014KT 9999 FEW030 BKN100 23/14 Q1017 BLU TEMPO 7000 SHRA WHT
METAR EGXE 161450Z 19010KT 9999 FEW035 BKN140 22/15 Q1016 BLU TEMPO 7000 -SHRA WHT
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## Analysis and Investigation

### Military ATM

At 1441:57, a pair of Tornados, callsign Spartan, was handed-over to Swanwick(Mil), under a Traffic Service, with traffic called to the south at 20 miles. At 1442:04, Hotspur pass information to the Hawk formation as, "*Savage, Hotspur, stranger BRAA 345/30, tracking south east, climbing through FL150. Pair of GR4s.*" Savage levelled at FL190 at 1442:28. Stranger denotes tactical label for an aircraft outside the sortie remit and BRAA is Bearing Range Altitude Aspect.

At 1443:00, information was passed, "*Spartan, Swanwick Mil identified, climbing FL230, traffic service. Traffic 12 o'clock, 1-5 miles opposite direction, passing flight level 190, slow climb, pair*" (Figure 1).

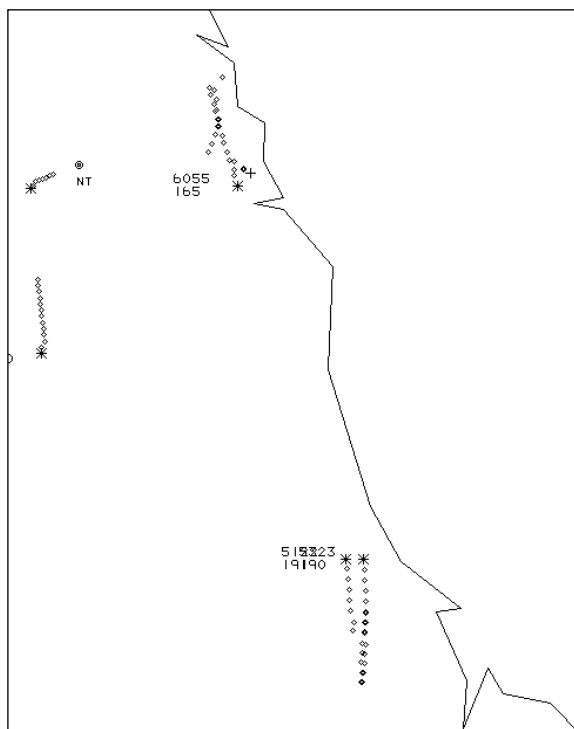


Figure 1: Traffic Information at 1443:00 (Tornado lead 6055; Hawks 5122/23)

At 1443:10, Savage informed Hotspur that they were turning left 30°; Hotspur confirmed that Savage was clear for own navigation. Hotspur updated information at 1443:24 (Figure 2), “Savage, Hotspur, update traffic BRAA 335/12, tracking south FL165.”

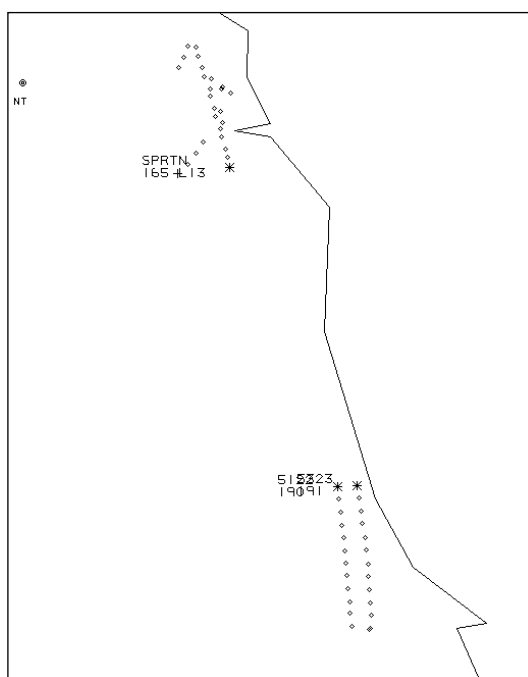


Figure 2: Traffic Information at 1443:24.

Spartan called levelling-off, FL185, at 1443:32. Swanwick(Mil) replied at 1443:36 with, “Spartan roger. Spartan previously reported traffic 12 o'clock, 8 miles, opposite direction, FL190.” Spartan replied that Swanwick(Mil) were unreadable and the information was updated at 1443:47 as, “Spartan previously reported traffic now 12 o'clock, 3 miles, opposite direction, flight level 190” (Figure 3) .

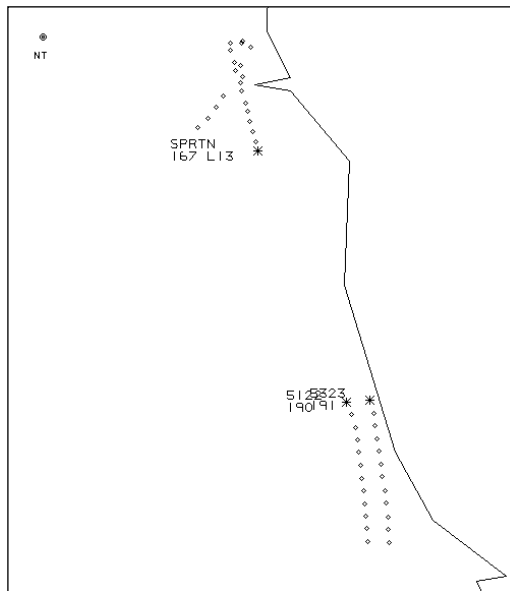


Figure 3: Traffic Information at 1443:32.

At 1443:59, information was updated as, “Savage, Hotspur, Update stranger BRAA 330/5 tracking south, climbing through FL180” (Figure 4).

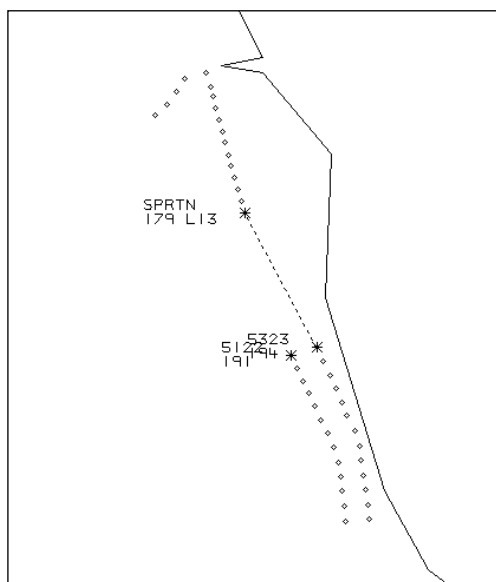


Figure 4: Traffic Information at 1443:59; Hawks post left turn.

Spartan called level at FL185 at 1444:00 and Hotspur updated at 1444:14, “Savage, Hotspur. Update traffic BRAA 305/1 tracking south, climbing through FL180.” (Figure 5)

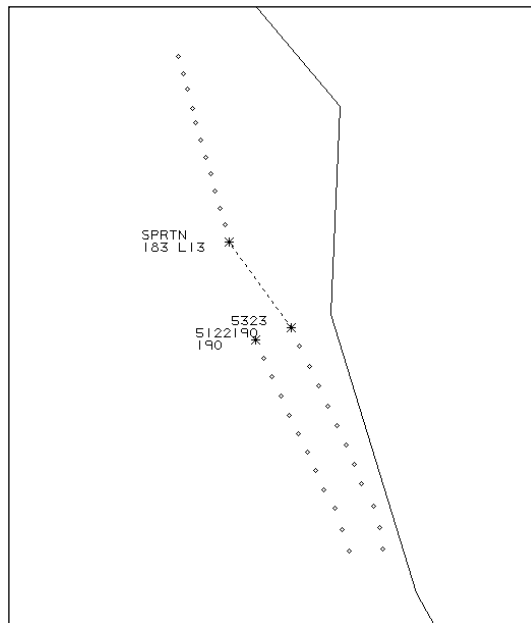


Figure 5: Traffic Information at 1444:14.

At 1444:18, Spartan transmitted, “Swanwick, Spartan, can you just confirm that traffic we’ve err just passed by was at 190 please?” Savage called visual at the CPA at 1444:19 (0.5nm lateral and 600ft vertical separation).

The Hotspur and Swanwick(Mil) controllers should be commended for providing accurate and persistent sets of Traffic Information to the respective formations. As per the CAP774, deconfliction is not provided under a Traffic Service but controllers should take into account traffic in the immediate vicinity so that a risk of collision is not knowingly introduced by the instructions passed. The respective formations were under their own navigation but the radar-derived information clearly demonstrated aircraft with the potential to conflict. Hotspur provided information at 30nm and Swanwick(Mil) at 15nm; Hotspur had attempted to coordinate but no agreement was obtained. Both controllers had spotted the potential conflict and had provided updates. The Swanwick(Mil) controller recognised that Spartan had levelled at FL185 and this provided 500ft separation vertically. Had the Tornados not provided a solution to the conflict, it would be expected that both controllers would have offered a solution, as duty of care. (Note that separation is not required under a Traffic Service but had coordination been required, 1000ft separation would be the norm between Swanwick(Mil) and the CRC controllers; in extremis, Swanwick(Mil) could provide 500ft vertical separation, on the agreement of both pilots).

The Tornado crews were initially informed of Hawks passing FL190 in a slow climb. The Hawks levelled at FL190 and on the basis of the first piece of Traffic Information, the aircrew may have anticipated more vertical separation with the Hawks. The Tornado crew had envisaged a conflict and they resolved it by stopping climb at FL185, building in height separation. The captain understood his responsibilities under a Traffic Service and acted to build in separation.

Despite the Traffic Information at 1442:04, the left turn 30° taken at 1443:10 had taken the Hawks onto a converging course with the Tornados. Following a further update, the Hawk crew considered the traffic to be passing right to left and not coordinated in height; a right-hand turn was initiated shortly before passing over the Tornados. The last piece of information from Hotspur indicated that Spartan were still climbing through FL180; the constant updates would have provided information to aid lookout and amplified the controller concern. The earlier left turn had actually placed the aircraft on a converging heading and this was maintained despite regular updates. The information passed in the BRAA format to the Hawks (in transit to the exercise area) may have been more difficult to assimilate than the information passed to the Tornados (in transit back to base), that traffic was 12 o’clock, converging.

Neither aircraft formation were fitted with an Airborne Collision Avoidance System. The barrier provided by the surveillance-derived Traffic Information assisted the crews in understanding the potential confliction and ultimately led to the Tornados capping their climb. The type of service put the onus for separation on the crews and this depended upon the scan and accuracy of the controller Traffic Information. The visibility on the day, and fact that both crews were VMC, allowed a sufficient lookout to avoid a collision, although the closing speeds did not afford a great deal of time see and avoid.

### **UKAB Secretariat**

Both pilots shared an equal responsibility to avoid a collision, and for not flying into such proximity as to create a danger of collision<sup>2</sup>, the geometry was head-on; therefore, if the pilots perceived there to be a risk of collision, both pilots were required to alter course to the right<sup>3</sup>.

## **Comments**

### **HQ Air Command**

This incident reinforces the need to assimilate and act upon the Traffic Information passed by controllers. The Tornados reacted appropriately to the information they had been given though, by their own admission, could have levelled sooner to build in more vertical separation. However, in the case of the Hawks the Traffic Information they received was timely and accurate but the fact that the tracks were converging on a collision course was not passed. Whilst this is entirely in accordance with current procedures, the lack of additional descriptors as to the relative motion of the tracks may have restricted the Hawk pilots' mental model of the situation; therefore, GCI controllers should be encouraged to use phrases such as "closing, converging, parallel, same direction, overtaking, crossing right to left" etc when not in the tactical portion of the mission.

## **Summary**

An Airprox was reported on 16 July 2014 between a formation of two Hawks at FL190, receiving a Traffic Service from ASACs at Boulmer and a formation of two Tornados climbing to FL230 receiving a Traffic Service from Swanwick (Mil). Both formations received Traffic Information on numerous occasions and the Tornados elected to level off at FL185. Once visual the Hawks avoided by "climbing slightly" and the Tornados by bunting down.

## **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.

The Board first looked at the actions of the Hawk pilots, they were transiting at FL190 and receiving a Traffic Service from the weapons controller at Boulmer. They received Traffic Information on the opposing traffic on 4 occasions; however, the situational awareness of the crews meant that they perceived that their turn to the left would deconflict them from the opposite direction traffic, when in fact it put them onto a reciprocal heading. One of the reasons for this was thought to be because the ASACs controller gave the range and bearing in BRAA format rather than the usual air traffic format, and that the phrase "converging" would have provided better situational awareness in this situation. The ASACs SME opined that the use of BRAA may have been because the Hawks had already been cleared to operate and that this led the controller to use the format normally associated with the tactical operation. However, it was clear from the radar picture that the Hawks had not yet commenced their manoeuvring and were still in the transit. The Board agreed that giving Traffic Information in the BRAA format in this case had left the Hawks pilots with an unclear picture of the

<sup>2</sup> Rules of the Air 2007 (as amended), Rule 8 (Avoiding Aerial Collisions)

<sup>3</sup> Ibid., Rule 10 (Approaching head-on)

position of the Tornados. Notwithstanding, if there had been any doubt in their minds then the Hawk pilots could have asked for clearer information. Ultimately, the Board felt that there had been a lack of positive action by the Hawk pilots, even though they had been given Traffic Information on numerous occasions by the controller.

Turning to the Tornados, the pilots believed that in levelling off at FL185 there would be sufficient clearance from the Hawks: in part, this decision was made on the basis of the Traffic Information they received which indicated that the Hawks were climbing. Although the controller initially gave Traffic Information on the Hawks as climbing, this was later updated as “at FL190”, however, it is possible that the crews did not receive or assimilate this information as they complained that the controller was unreadable during this time. Although 500ft vertical separation would be considered sufficient in many circumstances, the Board considered that because the Tornado crew were not expecting to see the Hawks only 500ft above them, they were probably startled by their proximity.

The Board wondered why neither controller coordinated, or even asked for Traffic Information from the other controller; although the ASACs controller initially tried to speak to Swanwick (Mil), once he was told to contact a different sector he appeared to give up. Although neither controller was required to achieve coordination under Traffic Service, the Board opined that had they spoken to each other and been able to pass positive information onto the crews, the pilots would have had a much fuller picture, and the Tornados may well have elected to stop their climb at FL180 instead once they knew the Hawks were level at FL190.

The Board discussed the cause of the Airprox at length and took into account the positive actions of the Tornado crews, the lack of positive action by the Hawk pilots, and the less than ideal format and content of the Traffic Information they were given. In the end, the Board decided that the circumstances and separation achieved could best be described as a conflict in Class G. However they decided that there were two contributory factors; firstly that the Hawk pilots had turned onto a confliction course, and secondly that the Tornado pilots had decided to level off only 500ft below the Hawk formation. Notwithstanding, the risk was determined to be C, effective action had been taken.

### **PART C: ASSESSMENT OF CAUSE AND RISK**

<u>Cause:</u>	A conflict in Class G.
<u>Contributory Factor(s):</u>	<ol style="list-style-type: none"> <li>1. The Hawk pilots turned onto a confliction course.</li> <li>2. The Tornado pilots decided to level off only 500ft below the Hawk formation.</li> </ol>
<u>Degree of Risk:</u>	C
<u>ERC Score<sup>4</sup>:</u>	10

<sup>4</sup> 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.