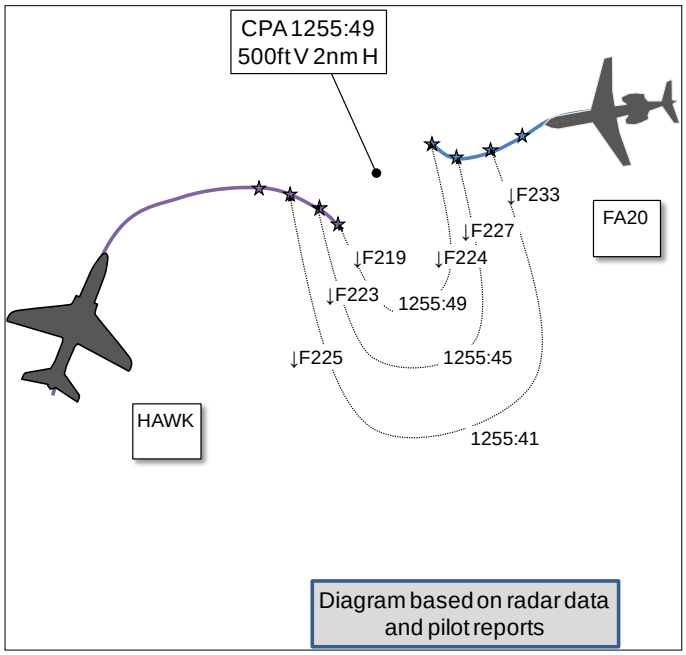
AIRPROX REPORT No 2014007

Date/Time: 27 Jan 2014 1256z

Position: 5536N 00125W (55 ne Newcastle)

Airspace: Lon FIR (*Class*: C)

	Aircraft 1	*Aircraft 2*
Type:	FA20	Hawk
Operator:	HQ Air (Ops)	HQ Air (Ops)
Alt/FL:	FL210	FL210
Conditions:	IMC	IMC
Visibility:	NK	NK
Reported Separation:	0ft /1.5nm H	NK/2.8nm H
Recorded Separation:	500ft V/2.0nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE FA20 PILOT reports flying as the number 2 in a formation of 2 FA20s, with nav lights and HISLs on and the transponder selected with 3A/C and S. The aircraft was fitted with TCAS2. He was on task operating in a block of airspace FL260-290 with multiple aircraft, including a pair of Hawks, all of whom were being controlled by "Blackdog" the ASACs controller. Shortly before they were due to commence their first training exercise the controller instructed all aircraft to descend to below FL240 due to the density of civil traffic in the upper air. He thought he heard the controller clear the Hawks to descend from FL260 to FL160 on current heading, so the FA20s spilt the formation, and the number 2 descended from FL280 to FL180, both aircraft entered cloud on descent. On passing FL210 he received a TCAS alert at 8nm and less than 1000ft separation, the pilot realised that he was in a head-to-head descent with the Hawks and started to raise the nose to break the collision risk. Very shortly afterwards the controller told him to turn right onto a heading of 270° but, because he was already in a left turn through 240°, the reversal meant it took longer to raise the nose. Eventually the FA20 pilot managed to get altitude above the Hawks and he estimated they passed 1.5nm left to left in IMC.

He assessed the risk of collision as 'Medium'.

THE HAWK PILOT reports flying in a formation of two Hawks, with all lights illuminated and transponder selected with Modes 3/A, C and S, the aircraft were not fitted with TCAS. The Hawks and the FA20 were to provide aggressor training for some Typhoons; however, due to the sea state the exercise was moved away from D613 to a position further south where previous conversations with Scampton had suggested that the Upper Air would still be available for use during the exercise. They were due to commence the training exercise in the upper air and had set up in a hold waiting when, just prior to starting, the controller advised that, due to the civil traffic, they would all need to descend. As they were at the bottom of the stack, the Hawks were cleared to descend to FL160, they were already in a right-hand turn as part of CAP timings, and a descending turn was commenced as the formation entered cloud at FL250; IMC was maintained throughout the descent. During the descent they heard the FA20 request descent to FL190, but they didn't see it and were unaware of the Airprox until after landing.

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

THE WEAPONS CONTROLLER (WC) reports controlling a 5v5 training mission with multiple aircraft. He described his workload as high. Prior to the sortie commencing the aircraft were in a hold between FL260 and FL370 and he had been extremely busy trying to co-ordinate, on eight occasions, his aircraft with the civil upper air traffic. He was reluctant to immediately descend all of the aircraft out of the upper air because he knew this would cause some of the crews a fuel issue later in the sortie. Although all of the GAT had been co-ordinated, an additional civil track was about to become a factor because it needed to descend from FL380 to FL250 through the airspace he was using. This was the deciding factor in descending all the aircraft to below FL245; however, the controller needed to delay the instruction to descend until one of the co-ordinated tracks had passed clear. He cleared a Typhoon to descend: the Hawks were south west of both the Typhoon and the FA20, but heading north, so he instructed them to turn onto a heading of 180° and descend. The FA20s were also given a descent as the controller perceived them to be steady on a heading of 270°. However, radar latency prevented him from seeing that the FA20s were in fact in a left-turn and passing 240°. They reversed their turn when instructed but their fast rate of descent compared to the Hawks slow rate meant that they came within 2nm and 400ft of each other at FL225. Throughout this time the controller recalls being distracted by both landline calls from the Fighter Allocator and monitoring the civil track that was also descending through the area.

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

THE FIGHTER ALLOCATOR (FA) reports that she was supervising a busy unit with the two 5v5 positions plus the fighter marshall; she also had a student with her and assessed the unit workload as high. She was aware that the WC was busy and had co-ordinated a lot but, due to listening to both frequencies, she couldn't keep up with exactly which tracks were co-ordinated against which aircraft. She could tell that the controller was speaking on the landline, but felt that not enough traffic information was being passed to the aircraft on the frequency. As soon as she saw the civil track descending from the east, she called the controller to tell him to descend all of his aircraft to below FL245. She had to make that phone call on two further occasions before the controller passed the instructions to the aircraft. Once the descent had begun, she reminded the controller to focus on flight safety and to keep his own aircraft separated as they descended; however she hadn't realised he had neglected to tell the Hawks and the FA20s about each other.

Factual Background

The weather at RAF Leeming was recorded as:

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METAR EGXE 271250Z 20008KT 9999 FEW018 BKN025 08/04 Q0981 BLU TEMPO SCT018 WHT
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Analysis and Investigation

Military ATM

This incident occurred between a formation of 2 Hawks and a Falcon FA20. All aircraft were under a Radar Control Service followed by a Traffic Service from the same WC. Due to the sea state, the exercise was moved from D613 to above D513, as per Figure 1. Levels required for deconfliction had been pre-briefed, and the SOP is for the crews to be cleared into a block and an operating area for the mission.

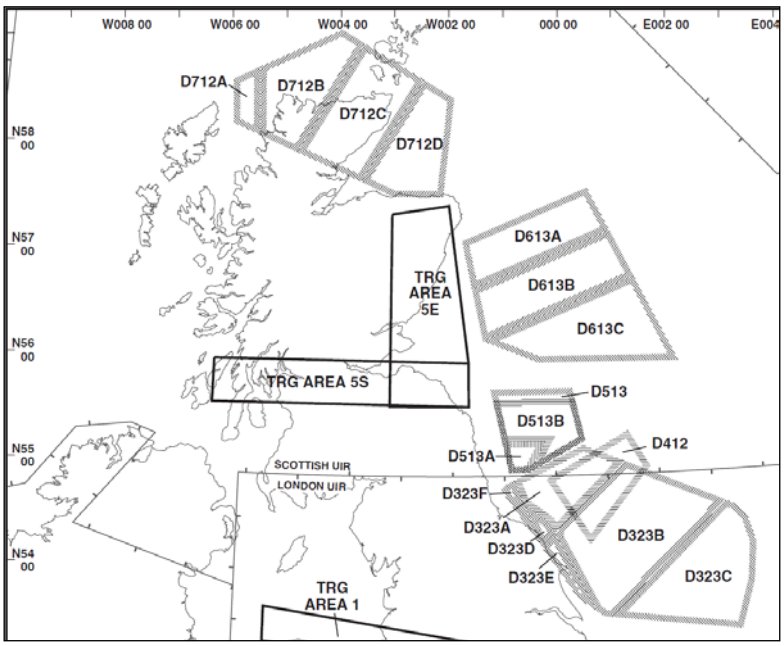

Figure 1: Managed Danger Areas.

At 1251:08 the FA informed the WC that there were many non-exercise aircraft to descend through the level of the aircraft in the stack and that all his aircraft should be out of the upper air. A landline call was initiated at 1252:28 to confirm that the WC had understood and that all aircraft were to be pushed into the 'lower air'. At 1253:51 the FA instructed the WC again to descend the aircraft out of the upper air.

At 1254:05, the WC transmits, "*All players,* [WC Callsign] *unfortunately the airspace is too congested and civil are asking us to fight below 245. You can descend below that now."* Following a Hawk request to descend to FL160, at 1254:34 the WC instructed "[Hawk formation callsign] *clear elevate 160 on this heading* [Typhoon callsign] *on your nose, 5 miles FL370*."

In a further landline call at 1254:42 the FA tells the WC, "...*just get your head into mutual flight safety. Make sure you know where each other are when they descend*." At 1255:02 the WC informs the Typhoon that the Hawks are descending through FL260 on a northbound heading.

At 1255:16, the Hawks declare that they are in a right-hand turn heading onto south descending through FL240, as per Figure 2.

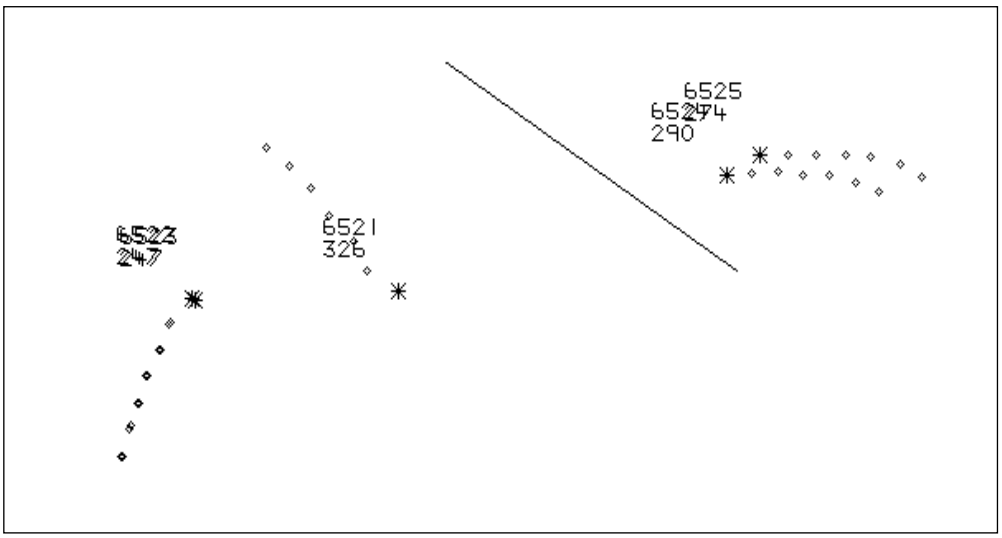

Figure 2: Aircraft geometry at 1255:16. (Typhoon 6521; Hawk 6523, FA20 6524/6525)

At 1255:21 the WC informs the Falcons, "*for your descent maintain [inaudible] a heading of 270 that will keep you clear of both other players*." The Falcon callsign confirms a heading of 270 degrees at 1255:28 and requests, "*maintaining heading of 270 and we're looking for the block 19…FL190, 180*." At 1255:34, the WC replies with "*Roger*", as the Hawks were indicating FL233 and the aircraft were on reciprocal headings with 6.5 nm separation. At this point the Falcon 2 aircraft (squawk 6525) had descended below Falcon 1 (squawk 6524) and the labels are just beginning to separate on the radar replay. As depicted in Figure 3, at 1255:57, the Falcon informs the Hawk, "passing above westbound."

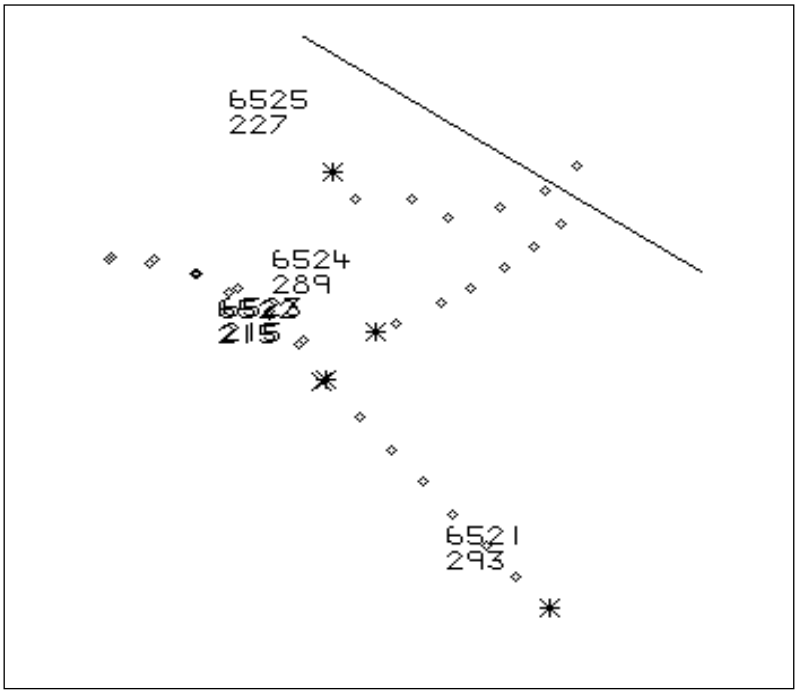

Figure 3: Aircraft geometry at 1255:57.

At 1256:49, the Falcons ask if they are clear to descend to FL190, which is approved by the WC who applies a Traffic Service.

The FA was concerned with the amount of coordination required to maintain the military tracks in the upper air; the plan to descend into Class G airspace was initiated after it was apparent that GAT traffic was getting busier and one track in particular would descend through the levels of the three formations, routing CUTEL to ROBEM from FL380 to FL250. The WC delayed the descent to ensure that traffic coordinated below was clear. The aircraft had been briefed on an operating block and services pertinent to that block at the beginning of the mission; it is SOP not to reiterate the pre-agreed type of service to an aircraft descending out of controlled airspace. The WC descended all aircraft to the pre-briefed operating block and chose to monitor separation tactically rather than provide stepped-descents; at this stage of the sortie, the aircraft were manoeuvring tactically to marshal for the mission. The Hawks requested descent to FL160 and the Falcons chose their block of FL180 to FL190, presumably to cater for split levels as they did not enter cloud as a formation. The Typhoon was asked if it was content with a Traffic Service and it elected to descend to FL170. There were no positive control instructions and Traffic Information was only passed to the Typhoon. The WC did issue a heading to the Falcons but no specific Traffic Information was attached. The UK MIL AIP (ENR 1-6-6) states that under a Radar Control Service (RCS), IFR separation need not be maintained for VFR/VFR operations; although controllers shall pass traffic information to VFR flights on other VFR flights and give traffic avoidance advice if requested. Upon leaving Class C for Class G airspace, UK FIS were available, as outlined in the CAP774.

At the time of passing the 270° heading to the falcons, 7nms existed between the Falcons and the Hawks, and the radius of the Hawk right-hand turn and closing speed meant that Falcon 2, who had descended 6000ft below Falcon 1, was on a course for the Hawks; the turn onto 270° meant a reversal of the left turn, and the Falcon pilot reports that this delayed the vertical avoiding action. Falcon 2 eventually took a NW Avoiding Action as Falcon 1's westerly heading took it toward the Hawk formation; Falcon 1's slower rate of descent kept it 7000ft above the Hawks.

The sortie required tactical freedom to allow crews to manoeuvre into position, and the plan to separate the aircraft as they descended was based on the pre-briefed sanctuaries, designed to provide deconfliction. Separation was left to the crews (who had a block and a 'play area') and monitored by the WC. The pressure was on the WC to get the aircraft in descent and this meant descending all the formations and monitoring their Mode C during concurrent descents. By descending all formations at the same time, rather than stepped descents to individual aircraft formations, the WC was susceptible to distraction or workload increases that could place demands on the monitoring function.

Where possible, the controller attempted to provide tactical freedom to the crews and the decision to allow the aircraft to manage their own descent profiles can be seen in this light. The WC witnessed a high workload and this was added to by frequent landline calls to and from the FA: the FA was in a different part of the control room which meant that landline calls were made for all liaison calls. If the FA had been on an adjacent console, liaison would have been quicker and less demanding on controller resources than a landline call. The FA had the 'bigger picture' and the WC would have benefitted from the FA being closer at hand. It was noted in the reports that additional in-briefing time may have aided the WC in fully understanding the complex tactical and airspace requirements. Furthermore, the WC was the subordinate controller and the lead controller had a lower workload. Better management of the tasking may have more evenly distributed the workload and prevented the WC from reaching capacity.

The Falcon 2 rate of descent was greater than that of the Hawks and the Falcon labels may have overlapped, possibly masking the quicker rate of descent of Falcon 2. The high workrate being experienced by the WC meant that he/she was acting reactively and the westerly heading given to the Falcons was not supported with Traffic Information. Although the WC initially felt the loading was within capacity, the dynamic nature of the task could change that position, and human capabilities and attention are susceptible to misjudgement of workload. The WC appeared to be working to capacity because of the increased landline liaison and high volume of conflicting GAT. The high workload, the positioning of the FA, the tasking allocation, the weather conditions in the new operating area, the complexity of the mission and the non-segregated airspace selected by the crews, add context to the situation.

TCAS did work as a barrier and it allowed the Falcon 2 to take avoiding action; other barriers were not present. The Hawks were not fitted with TCAS and were not aware of the Airprox; as the crews descended into IMC, they could not 'see and avoid'. The WC was not made aware of the in-flight Met conditions and the pre-briefed Traffic Service may not have been the most suitable for the conditions. Separation procedures and Traffic Information were absent as barriers and the Supervision provided assistance, but also distracted the WC because of the set up.

UKAB Secretariat

The MMATM Chapter 11.3 states:

> **In Class C Airspace.** In Class C airspace standard separation between aircraft operating under VFR need not be applied; pilots operating under VFR will be passed traffic information on other VFR flights and **should** be given traffic avoidance advice if they request it.

Notwithstanding whether the controller called the traffic, both pilots were equally responsible for collision avoidance and for not flying into such proximity as to create a danger of collision[1]. If the geometry is considered to be converging then the FA20 pilot was required to give way to the Hawk, which he did[2].

Comments

HQ Air Command

This incident is a perfect storm of airspace, weather and traffic all having an effect that was unforeseen in the planning stages. The decision to continue the training initially in the un-segregated Upper Air above D513 (after D613 was declared unfit) exposed the players to CAT that probably saturated the capacity of the WC. The subsequent decision to descend all players out of the Class A airspace and into the Lower Air, whilst intending to ensure deconfliction from further CAT, was executed without sufficient regard for the dynamic profiles of each player. It appears that the WC remained task-focussed to the detriment of Flight Safety at this stage, as each player attempted to carry out their own deconfliction during the descent. Furthermore, had the Hawks requested a Deconfliction Service as they descended towards IMC they may have been better-placed to avoid the FA20 approaching from the East (either due to receipt of the DS or, if the DS was denied, through a decision to remain VMC and preserve the ability to deconflict visually).

Summary

An Airprox was reported on 27th Jan 2014 between a FA20 and a pair of Hawks at FL210. Both aircraft were operating on a training exercise together and were under the control of the weapons controller when a decision was made to descend all of the exercise traffic below FL245. It was during this descent phase that the FA20 received a TCAS warning on the proximity of the Hawks and took action to break the collision geometry, shortly afterwards the controller issued a heading to keep clear. Both pilots were IMC and the Hawks were unaware of the incident until landing.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts of the relevant RT frequencies, radar photographs/video recordings, reports from the aerospace battle managers involved and reports from the appropriate ATC and operating authorities.

In discussing this incident the Board looked first at events prior to the sortie. The forecast sea-state should have been recognised as a factor that might have precluded holding the exercise in D613, as should have the fact that forecast weather might require coordinated flight through cloud. The Board wondered how thorough had been the pre-flight planning and briefing, and whether the aircraft package commander had fully assimilated that contingency plans might be required. It was evident to the Board that no robust plan of action had been devised for the aircraft to descend if the Upper Air was not available, and the WC was not aware of any formal plan for descending the aircraft to their sanctuary levels, let alone for the aircraft to be IMC in the descent. The Board opined that the aircraft package commander should have taken more control of the plan, and the conduct of the sortie, in order to avoid any risk that pressing on with the mission would be at the expense of flight safety.

When considering the actions of the pilots of the FA20 and the Hawks, the Board noted that neither party told the WC that they were descending IMC; furthermore, they had chosen a Traffic Service for the descent when they would have been better served by a Deconfliction Service given that they would be IMC. The Board were perplexed that the package's pilots seemed content to descend in IMC in proximity with each other without properly deconflicting their respective tracks; they appeared to assume that the WC would automatically deliver a degree of separation that he had not agreed

[1] Rules of the Air 2007 (as amended), Rule 8 (Avoiding aerial collisions).
[2] Ibid., Rule 9 (Converging)

and was not able to provide. In this respect, the Board noted that, similar to many other Airprox, the pilots seemed not to understand their individual responsibilities for collision avoidance when under a Traffic Service. There was also evidence of confusion between the WC and the FA20 pilot as to what heading he was on (which led to the FA20 needing to reverse his turn to achieve the heading eventually given by the WC). All of this pointed to a lack of information flow between the aircraft and the controller; perhaps exacerbated by a focus on completing the mission rather than the pilots mentally taking a step back and considering the implications of what was taking place.

Turning to the WC, it was clear to the Board that he was experiencing a high workload once the exercise had moved from segregated airspace. He was busy coordinating numerous civil tracks in the area where the exercise aircraft wanted to operate and was under considerable pressure to give the aircraft what he perceived they wanted (i.e. a quick descent and minimum disruption to the task). The WC was not helped by the FA who, in an understandable attempt to assimilate what her subordinate controller was doing, actually added to the WC's workload with numerous landline calls that offered little in the way of constructive help. Ultimately, the fact that the WC didn't have a plan for how he would descend the aircraft (albeit he wasn't aware that they were IMC), added to the likelihood of an incident, and the Board agreed that this had been a contributory factor.

In determining the cause and risk, the Board judged that the cause of the Airprox was that the FA20 and Hawk pilots had descended IMC and had flown into conflict. However, the Board also concluded that there were a number of contributory factors: the pilots did not tell the WC that they were IMC, did not have an appropriate ATS, and did not have a deconfliction plan; the WC also did not have a robust deconfliction plan, and was overloaded and under pressure from the FA. In the end it had been the TCAS that had alerted the FA20 pilot to the confliction and the Board considered that, although the FA20 pilot had taken avoiding action to prevent a collision, this had still resulted in safety margins being much reduced below the normal: Risk Category B, safety was not assured.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The FA20 and Hawk pilots descended IMC and flew into conflict.

Contributory Factor(s): 1. The Hawk and FA20 pilots did not tell the weapons Controller that they were IMC.

2. The pilots did not have an appropriate ATS or deconfliction plan.

3. The weapons controller did not have a robust deconfliction plan.

4. The Weapons Controller was overloaded and under pressure from the Fighter Allocator.

Degree of Risk: B

ERC Score[3]: 10

[3] 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.