## AIRPROX REPORT No 2012138

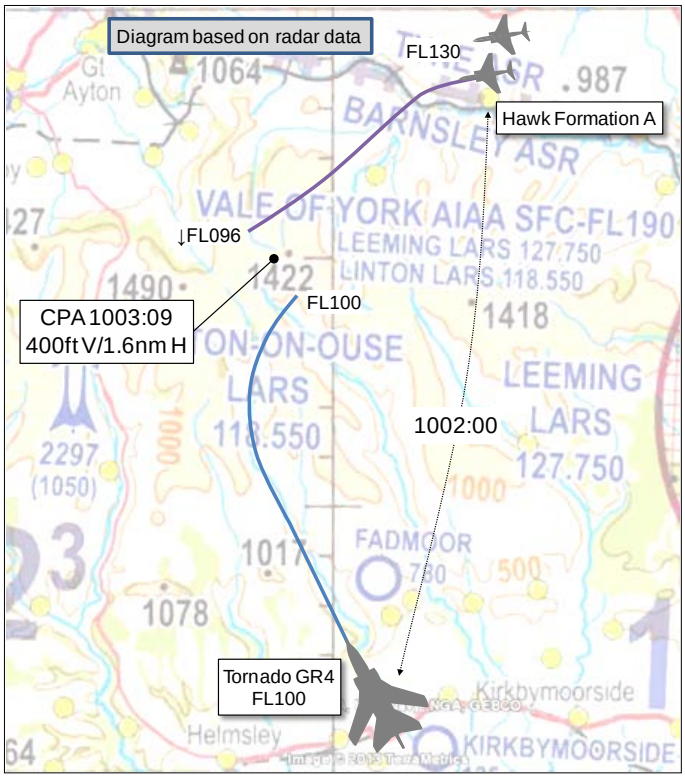
*Date/Time:* 29 Aug 2012 1003Z

*Position:* 5425N 00102W (19nm ENE Leeming)

*Airspace:* Vale of York AIAA (*Class: G*)

*Reporter:* ScATCC(Mil) Controller

| | *1st Ac* | *2nd Ac* |
|---|---|---|
| *Type:* | Tornado GR4 | BAE Hawk T1 |
| *Operator:* | HQ Air (Ops) | HQ Air (Ops) |
| *Alt/FL:* | FL100 | ↓FL100↓ |
| *Weather:* | IMC In Cloud | IMC In Cloud |
| *Visibility:* | 0km | 0km |
| *Reported Separation:* | NK | NK |
| *Recorded Separation:* | 0ft V/3.4nm H<br>400ft V/1.6nm H | |




## CONTROLLER REPORTED

## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE SCATCC(MIL) CONTROLLER** reports operating as Controller 2, working low level and high level transits through the Vale of York (VOY) area. He had been on console for approximately 1hr when he was controlling a pair of Leeming Hawks, operating on a discreet frequency in the confines of the inactive D323A. He was then handed 2 ac in fairly quick succession from LJAO(NE), the first of which was routeing N requesting FL 310 and the second, [Tornado GR4 C/S], routeing N under a DS at FL100 to go low level at Lossiemouth. Shortly after the handover of [Tornado GR4 C/S], he asked the pilot if he wished to climb or remain at FL100 and be handed over to Leeming as a LARS track. The pilot requested to remain at FL100 with ScATCC (Mil) and the Controller replied that he would be subject to the traffic situation in the VOY. He decided to 'keep' the ac through the VOY to prevent multiple frequency changes and then hand it over to Newcastle. Just after pre-noting the Newcastle Assistant, he noticed 2 ac inbound to Leeming from the E, the closest of which was approximately 20nm NE of [Tornado GR4 C/S] on a converging heading at FL130. Although at this point he had 3000ft separation, he knew these ac were shortly to descend inbound Leeming. He perceived there to be enough time to effect co-ordination without the need to avoid first, so he quickly called Leeming. The Leeming SUP answered the phone and he requested coordination, pointing out his traffic first because this was the easiest method. Her reply was, 'we're not working that traffic' to which he quickly responded, 'yes that's my traffic, maintaining FL 100' before pointing out the closest of the Leeming ac. By this point the Leeming ac had begun to descend and turn towards his aircraft. The SUP said that her aircraft had been, 'cleared all the way down to FL50' to which he asked, 'are you able to stop descent FL 110?' She replied, 'no it's been cleared down'. Without responding, he issued avoiding action when the ac were approximately 8nm apart. He gave the GR4 an avoiding action R turn to heading 090° to which the Tornado pilot replied, 'coming right north'. He corrected him and repeated the avoiding action. He monitored the situation and, because of the relative speeds and very slow rate of turn of [Tornado GR4 C/S], he decided to keep turning the ac onto heading 100°, being conscious of turning him into the Fylingdales HIRTA. He then hung up the phone in order

to concentrate on preventing a collision. In his opinion, the safety of both ac were unnecessarily compromised because he was unable to effect co-ordination with Leeming.

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

**THE SCATCC(MIL) SUPERVISOR** reports that she was positioned on the N consoles as that AOR was particularly busy at the time with control of AARA5, transits to the W Coast of Scotland and a calibrator ac in OTA E. She believed 3 consoles were open. Two standards checks were being carried out for Controllers returning from ATLAS (Olympic Games) duties and she had just had to break up training in the AC (Co-Ord) S position in order to open another console. She was also training a new Supervisor at the time. She did not witness the Airprox; however she heard the Controller on console 2 say 'avoiding action' and immediately went to see what was happening. She saw [Tornado GR4 C/S] at FL100 take a slow avoiding action R turn to a heading of 090°, which was then updated to 100°. It was apparent that the GR4 had got within 5nm of the [Hawk Formation A].

**THE LEEMING CONTROLLER** reports that he was the Screen Controller, instructing a UT Controller in the Director (DIR) position at RAF Leeming. At the time 2 formations of Stn-based Hawk ac were 'pre-noted from Scottish Mil', both requiring Instrument Recovery. They were handed over 30nm NE of RAF Leeming at FL130 under a DS. During the handover, the second formation, callsign [Formation B] free-called, approximately 30nm NNE of RAF Leeming at FL160, requesting a DS and a Radar to Visual recovery. The UT Controller was instructed to inform ScATCC(Mil) to 'standby' and to positively control [Formation B], which was subsequently identified and given instructions to descend to FL100 under a DS. The handover of [Formation A] was then completed and, once on frequency, they were identified, placed under a DS and shortly afterwards given instructions to descend to FL50 and turn L heading 230°, positioning for recovery. At this point the 2 formations were approx 20nm ENE of RAF Leeming 8nm apart on slowly converging tracks. The UT Controller then called Durham Tees Valley Airport (DTVA) Radar to co-ordinate a transit through DTVA Class D airspace in order to provide a more expeditious recovery to RW16; however, following a prompt, the UT Controller realised this would not be possible due to a conflicting DTVA RW23 departure. TI was passed to the DTVA Assistant on both formations and DTVA was informed that both formations would remain clear of DTVA Class D airspace. The liaison process with DTVA took longer than normally expected, following which the UT Controller was questioned as to his intentions and recovery plan for the 2 formations; however, he was unsure as to a recovery plan. At this point the 2 formations were steadily converging and, with the option of a descending profile through DTVA Class D airspace not available, he presented a number of possible courses of action to the UT Controller. The UT Controller chose to employ a stepped descent for [Formation B] in order to provide separation against [Formation A] until both formations were VMC below cloud and instructed [Formation B] to 'Stop descent FL120 for co-ordination'.

The UT Controller was further prompted to articulate the reason for the pause in descent and the plan for recovery to [Formation B]. This information was passed to [Formation B] along with an order of recovery. Shortly afterwards, the ATC Supervisor informed the Leeming Controller and the UT Controller of fast moving traffic under ScATCC(Mil) control at FL100, approximately 5nm S, heading N and conflicting with [Formation A]. The UT Controller was instructed to give immediate avoiding action and after a slight pause he instructed [Formation A] to turn R to heading 270°. At this point the conflicting ScATCC(Mil) traffic was 4nm to the S of [Formation A] and conducting avoiding action, turning R onto an E'ly track. The separation was estimated to have been 2nm and 500ft.

**THE TORNADO GR4 PILOT** reports transiting from RAF Marham to RAF Lossiemouth at FL100 under IFR in IMC and with a DS from London Mil [actually ScATCC(Mil)]. The grey camouflaged ac had navigation lights and HISLs selected on. The SSR transponder was selected on with Modes A and C; the ac is not fitted with an ACAS. Heading 350° at 0.75M in the Vale of York AIAA, avoiding action was given by ATC against a formation of Hawk ac and he turned R. A further R turn to E was then given by ATC. Due to the IMC flight conditions the Hawk ac were not seen. After the Hawk formation was clear, he was given a L turn to resume track.

He assessed the risk of collision as 'Low'.

**THE BAE HAWK T1 PILOT** reports leading [Formation A], a pair of Hawks on recovery to RAF Leeming under IFR in IMC with a DS from RAF Leeming. The black ac had navigation and landing lights selected on and strobe lights set to red. The formation leader had the SSR transponder selected on with Modes A and C; the ac were not fitted with ACAS. On handover to Leeming Director, heading 270° at 300kt, he became aware of another pair of ac also recovering from the NE. He was not aware of any further traffic in the region. In the descent from FL130 to FL50, he was given, 'Avoiding action, turn right 270°' with traffic L 11 o'clock 4nm tracking E at FL100. (He later understood this traffic to be the subject Tornado GR4). This was actioned and, having already passed FL100, he was unconcerned about the proximity of the GR4. The remainder of the recovery to RAF Leeming was flown without incident.

He assessed the risk of collision as 'Low'.

**BM SAFETY POLICY & ASSURANCE** reports that this Airprox occurred on 29 Aug 12 between a formation of Hawks [Formation A] recovering in IMC to RW16 at RAF Leeming, in receipt of a DS from Leeming DIR, and a Tornado GR4 in IMC, in receipt of a DS from ScATCC(Mil) Controller 2.

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

Information

Leeming DIR was manned by an ab-initio trainee and a screen controller. The screen described their workload and task complexity as moderate; however, whilst SATCO has stated that the scenario posed by the recovery should have been within the trainee's capacity, analysis of the incident and the trainee's reported responses suggests that they may have held a markedly different perception of the task complexity.

In addition to the incident Hawk formation, [Formation A], DIR was providing a DS to an additional formation of Hawks, [Formation B], being vectored for an IFR approach. Controller training was also being undertaken on the Leeming Zone position, with a controller examination underway on the Leeming APP position. Controller 2 described their workload as high-to-medium with moderate task complexity and, in addition to the GR4, was providing a RCS to an E3 transiting through the Vale of York towards UK Orbit Area 5.

The incident sequence commenced at 1000:44 as the Hawk formation [A] called DIR on handover (from CRC Boulmer, not ScATCC(Mil) as related by DIR) at FL130, tracking SW'ly. At this point, the formation was 31.7nm ENE of Leeming and 24.6nm NNE of the GR4; the GR4 was at FL100 which it maintained throughout the incident sequence, tracking NW'ly. Given that the GR4 was at FL100, Controller 2 had asked the GR4 pilot whether they were, '*looking for further climb*' and had planned to hand them to Leeming for the N'ly transit; however, the GR4 pilot stated that they were, "*happy Flight Level 100*" and asked to remain with Controller 2. During the exchange of R/T between the Hawk formation [A] and DIR and between 1000:42 and 1001:16, DIR was also involved in a landline exchange with the Durham Tees Valley ATSA to provide TI to them on the recovering Hawk formations.

Between 1000:41 and 1001:18, Controller 2 had been involved in a landline exchange with the Newcastle ATSA to prenote the GR4 to them; at the end of this exchange, the GR4 was 19.6nm SSW of the Hawk formation [A]. Controller 2 reported that it was following this exchange that they identified the conflict between the GR4 and the Hawk formation.

At 1001:24, DIR instructed the Hawk formation to, "*descend Flight Level 5-0*" which was acknowledged; at this point the GR4 was 19nm SSW of the Hawk formation (Figure 1 refers).

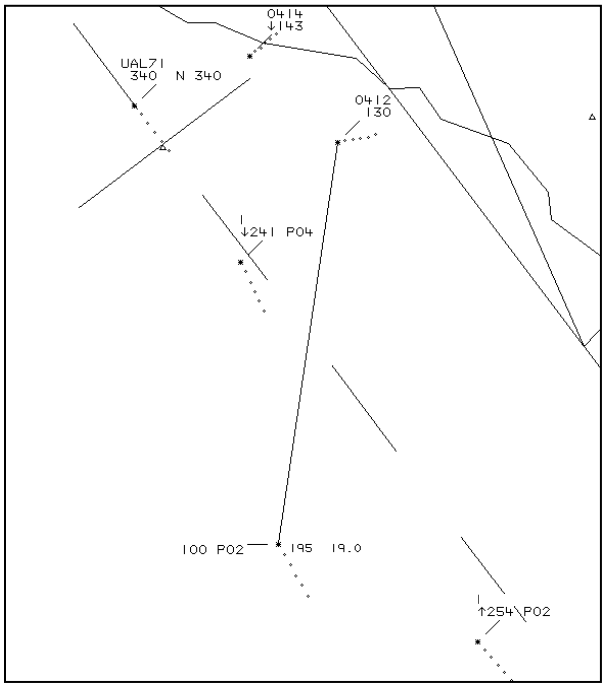



Figure 1: Radar Replay Screenshot at 1001:24

At 1001:51, DIR instructed the Hawk formation to, "*turn left heading 2-3-0 degrees*" which was acknowledged; at this point the GR4 was 15nm SSW of the Hawk formation (Figure 2 refers).

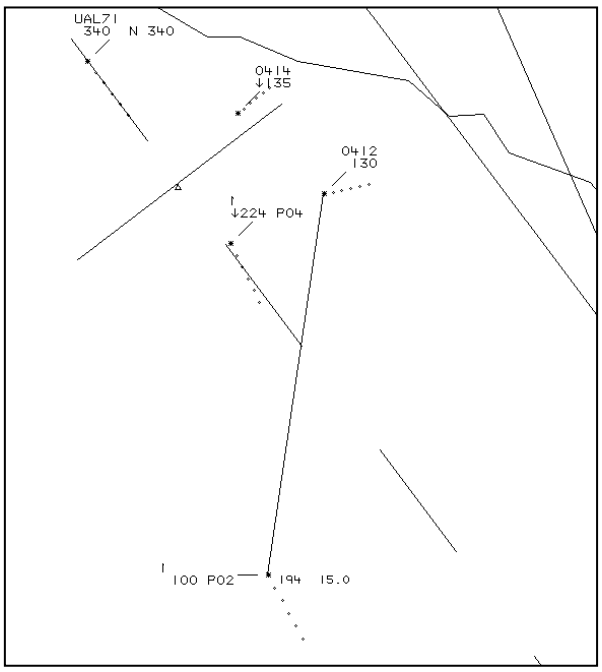



Figure 2: Radar Replay Screenshot at 1001:51

Between 1002:09 and 1002:51, DIR was involved in an RT exchange with the unrelated formation of Hawks to the N (SSR 3A 0414 in Figures 1, 2 and 3) [Formation B]. Based upon the DIR screen controller's report, this exchange was prompted by them, in order to encourage the trainee to formulate a recovery plan for the 2 formations.

At 1001:55, Controller 2 initiated coordination with Leeming SUP to agree a course of action between the GR4 and the 2 formations of Hawks being 'worked' by DIR; at this point the GR4 was 14.4nm SSW of the Hawk formation [A], which had just commenced descent and was indicating FL129.

Whilst neither causal nor contributory to the incident, the delay of 29 secs between the passing of the descent instruction (1001:24) and the initiation of the Hawk formation's descent, was an aggravating factor in the magnitude of the subsequent loss of separation. Controller 2 first identified their traffic to the Leeming SUP, who replied, "*Err, that's not our traffic*." Controller 2 continued, "*yeah, it's my traffic*" and Leeming SUP asked, "*what do you want coordination on*?" As STCA white activated on the Controller 2's surveillance display at 1002:10, they replied, "*he* [the GR4] *is maintaining Flight Level 100. Okay, your traffic, arr, 0-4-1-2, north-east of Leeming by 23 miles*?" Leeming SUP replied, "*roger, that traffic not above Flight Level 1-2-0*." Although a discrepancy can be expected between the NATS Radar replay and the information presented to the Leeming SUP, at this point, the SSR Mode C of the Hawk formation leader could be observed on the NATS radar replay to be indicating descent through FL119. The statement made by the Leeming SUP suggests that they were monitoring the Hawk formation's descent. At 1002:18, the Hawk formation can be observed on radar to have commenced the L turn instructed by DIR at 1001:51 (Figure 3 refers).

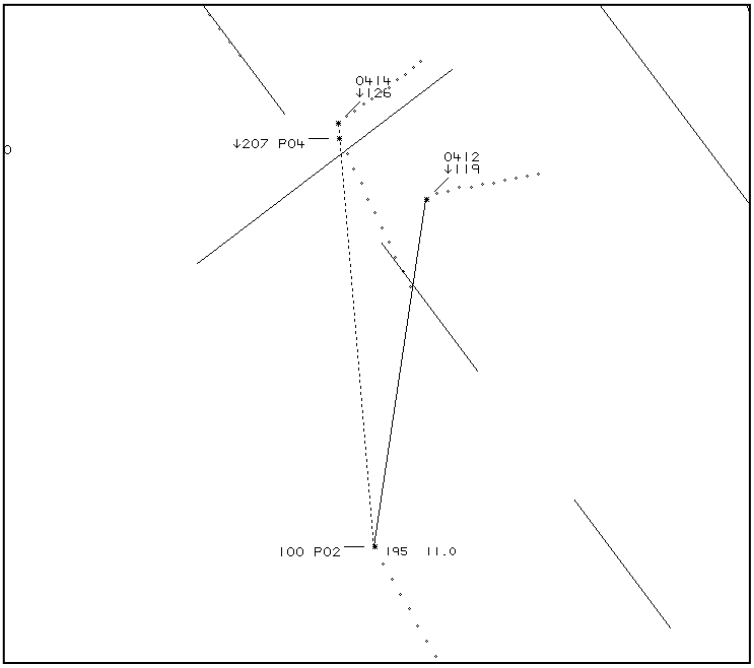



Figure 3: Radar Replay Screenshot at 1002:18

At 1002:22, Controller 2 asked whether Leeming was, "*able to stop his* [the Hawk formation's] *descent not below Flight Level 1-1-0*?" and the Leeming SUP replied, "*no, it's already in the descent to Flight Level 5-0 now*." At this point the SSR Mode C of the Hawk formation leader could be observed on the NATS radar replay to be indicating descent through FL115. This mirrors the report by the Leeming SUP who stated that their decision that 'there was not enough time available to instruct DIR to advise [Hawk Formation A] to stop descent at FL110' was based on observing the SSR Mode C of the formation indicating descent through FL115. This suggests that there was a good correlation between the SSR Mode C presented to the 2 units, potentially as a result of the Hawk formation's benign ROD (radar replay shows approximately 3000fpm, which is in-line with Hawk SOPs for a formation descent in IMC).

MAA RA 3010(1), supported by MMATM Chapter 10 Para 10, states that the initiating controller requiring coordination should 'Refer to his aircraft and the aircraft upon which coordination is requested in the order most appropriate to the situation'.

Controller 2 immediately (1002:28) issued the GR4 with, "*avoiding action, turn right immediately heading 0-9-0 degrees, traffic was right, 1 o'clock, 5 miles, crossing right-left, Flight Level 1-1-0 descending*." At this point the GR4 was 8.8nm SSW of the Hawk formation, which was indicating descent through FL112. The GR4 pilot acknowledged the instruction saying, "*right North* [GR4 c/s]" as STCA red activated on Controller 2's surveillance display. Whilst terminating the landline call to

Leeming, Controller 2 immediately corrected the GR4 pilot, re-iterating the avoiding action, which was correctly read-back by the GR4 pilot at 1002:44; the GR4 was now 5.9nm SSW of the Hawk formation, which was indicating descent through FL104.

At 1002:50 the turn by the GR4 becomes evident on radar and, at 1002:53, DIR issued avoiding action to the Hawk formation instructing them to, "*turn right heading 2-7-0 degrees, traffic was left 11 o'clock, 4 miles, tracking east, Flight Level 100*" which was acknowledged. The GR4 was 4.3nm SSW of the Hawk formation, turning through N; the SSR Mode C of the Hawk formation leader could be observed on the NATS radar replay to be indicating descent through FL101. At 1002:55, Controller 2 amended the avoiding action to the GR4 pilot, instructing them to, "*turn right immediately heading 1-0-0 degrees now, traffic was north, 3 miles, tracking south-east, Flight Level 100, descending*" which was correctly read-back. Whilst Controller 2 incorrectly described the Hawk formation's direction of travel as "*south-east*", this was neither a causal nor a contributory factor in this Airprox.

The CPA occurred at 1003:10 as the GR4 was turning through NE and passed 1.6nm SSE of the Hawk formation, which was indicating descent through FL96. At 1003:22, the avoiding action turn by the Hawk formation becomes evident on radar.

Analysis

Turning first to the Area ATM aspects of this incident, Controller 2 realised that the Hawk formation [A] were likely to commence descent and sought coordination from Leeming. However, given that 14.4nm existed when Controller 2 attempted to initiate coordination with Leeming, this represented the latest point by which a coordination agreement could reasonably be expected to have been successfully reached. ScATCC(Mil)'s investigation has stated that a more defensive controlling technique could have been employed, involving the application of an 'opening' heading prior to initiating the coordination. That said, at the point that the coordination was initiated, it was still possible for an agreement to have been reached. However, the response by Leeming's Supervisor was initially unhelpful and, given that the Hawk formation were descending, with the GR4 maintaining FL100, BM SPA agrees with the view expressed by ScATCC(Mil) that Controller 2's identification of their traffic first was the most appropriate to the situation. Moreover, given that the Supervisor's comment at 1002:19 suggests that they were monitoring the Hawk formation, a more pro-active response may have been to have first instructed DIR to stop the Hawk formation's descent and then to have continued the landline conversation with Controller 2. By reporting the Hawk formation's 'level not above', forcing Controller 2 to request a stopped descent, they ensured that the formation had descended to a point at which coordination could not be agreed. Whilst Controller 2 reacted immediately by issuing the GR4 pilot with avoiding action to break the confliction, as identified by the ScATCC(Mil) investigation, a turn to the L, perhaps allied with a climb, would have provided greater deconfliction.

A further aggravating factor to the magnitude of the loss of separation was the delay between the Leeming Supervisor hearing Controller 2 issue avoiding action to the GR4 and DIR issuing avoiding action at 1002:53. The Leeming Supervisor reported instructing DIR to issue avoiding action to the Hawk formation; however, the DIR screen controller related that the Supervisor informed both controllers in the position. The wording of his report suggests that they then prompted the trainee to issue avoiding action, hence the delay. This also indicates that the DIR team's scan had not previously detected the conflict between the GR4 and the Hawk formation. As the Leeming investigation determined, this reduced scan was as a result of the distraction caused to the DIR team by having to prompt the trainee through the decision making process of formulating a plan to recover the 2 Hawk formations. Indeed the language used by the DIR screen controller throughout their DASOR suggests that they were actively coaching the trainee throughout the incident sequence. Whilst conscious of the balance that must be sought in allowing trainees to undertake experiential learning, BM SPA contends that the trainee was not an active participant from an early stage of the incident sequence and thus would have expected the screen controller to intervene at an earlier stage. Critically, albeit that they had not detected the GR4 on their surveillance display and thus the

act was not 'wilful', DIR introduced the confliction by descending and turning the Hawk formation into conflict with the GR4.

Conclusion

This Airprox resulted from control instructions issued by Leeming DIR which introduced a conflict between a GR4 and a formation of Hawks [Formation A]. Given that the avoiding action issued by DIR did not take effect until after the CPA, the conflict was resolved by ScATCC(Mil) Controller 2. Contributory factors were the capacity, awareness and ability to successfully divide attention of the DIR controlling team and the supervision provided by the Leeming Supervisor. Aggravating factors in the subsequent magnitude of the loss of separation was Controller 2's decision to turn the GR4 to the R and the delay in the Hawk formation's commencement of the descent.

Outcomes

Following this incident, and RAF Leeming's subsequent thorough unit investigation, RAF ATM STANEVAL visited the unit to combine the training and examination of an additional unit ATM examiner, with a 'health check' of the unit's Safety Management, Training and Standards Systems.

Both units conducted in-depth incident investigations and made a number of recommendations which have been implemented. BM SPA will disseminate the lessons identified by this investigation throughout the RAF ATM and ASACS communities.

**HQ AIR (OPS)** comments that the aircrew involved in this incident could do little to affect the outcome. The lack of ACAS on both platforms is noteworthy; it would have provided additional warning to the crews of the emerging threat. Nevertheless, the Hawk crew reacted promptly to the avoiding action and had good SA on the other traffic in the area. Distractions, prioritisation and task saturation are factors which seem to have played a large part in this incident; they are all factors which the aircrew community is well aware of and which form the core of HF error management training; this is a bi-annual requirement for aircrew and ATM personnel. However, it is generic in nature and perhaps needs to be made more role-specific to maximise its relevance to key trades in the Air Safety chain.

## 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 air traffic controllers involved and reports from the appropriate ATC and operating authorities.

ATC Members first considered the actions of the ScATCC(Mil) controller, Controller 2, and agreed that in the normal course of events he had allowed just enough time to achieve coordination. Notwithstanding this viewpoint, it was also agreed that it would have been prudent to apply a degree of defensive controlling, prior to calling Leeming, in order to mitigate any potential failure to coordinate. Members also discussed area radar controllers' common practices and perceptions of their airspace. It was opined that most area radar controllers would be uncomfortable providing a service to traffic at FL100 in the VOY, due to the amount of traffic and hence attention required, which would adversely impact on their ability to provide a service to other traffic. Perhaps unsurprisingly, pilot Members did not have as acute an appreciation of this facet of airspace management and it was felt that greater awareness could have helped; for example, if the Tornado pilot had been aware and consequently accepted the offer of a handover to Leeming to transit the VOY the risk of confliction with other Leeming traffic would have been greatly diminished. Having not achieved coordination, Controller 2 then issued avoiding action. However, whilst mitigating the collision risk, deconfliction minima were not achieved, with the Tornado pilot's apparent slow reaction to the instruction exacerbating the situation. The majority of ATC Members were not critical of the direction of Controller 2's avoiding action turn.

Members then considered the actions of those in the control room at Leeming. It was agreed that the Leeming SUP's response to the ScATCC(Mil) controller's first statement was not helpful, but it was also recognised that she was supervising a control room with a U/T DIR controller with screen, training being undertaken on Zone position and a controller examination underway on APP. Some Members were surprised at the amount of training and standardisation being undertaken concurrently with normal ATC duties and questioned whether any SUP would be able to contend with that level of activity whilst maintaining effective supervision. Military ATC Members opined that the reported level of activity in the Leeming control room was by no means extraordinary; rather it emphasised the need to select highly experienced and capable individuals to take on the role. Whilst there was no evidence to support the contention that Leeming SUP was over-tasked, several Members expressed their concern. Turning to the actions of the DIR team, ATC Members were of the opinion that the U/T DIR controller had, to all intents and purposes, ceased controlling prior to CPA and was effectively acting as a mouthpiece for the screen controller. To that extent, it would have been prudent for the screen controller to take over the position; however, none of the Leeming controllers saw the approaching Tornado in time to effect deconfliction and the Board contended that this was primarily due to concentration on the U/T controller's performance at the expense of monitoring the wider area of responsibility.

As regards the Cause, some Members opined that Leeming DIR had descended Hawk Formation A into confliction with the Tornado. However, it was agreed that the confliction was not sighted sufficiently early and that a degree of responsibility rested with all the controllers. Therefore it was decided, on balance, that ATC had not taken timely action, with a subsequent loss of deconfliction minima. In terms of Risk, Members agreed that although safety margins were reduced somewhat, effective action had been taken to prevent ac collision.

## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: ATC did not take timely action and did not achieve deconfliction minima.

Degree of Risk: C.