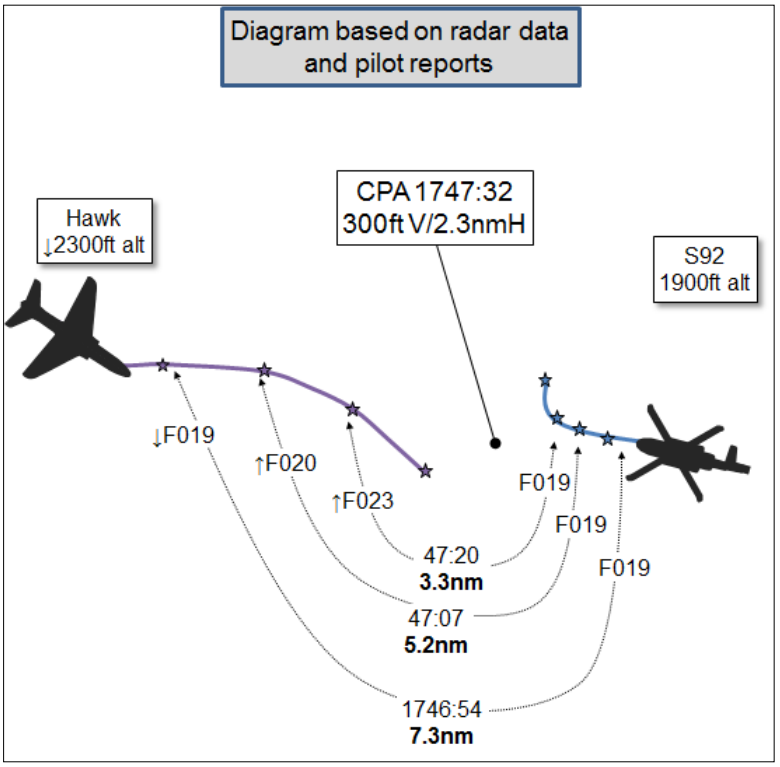
AIRPROX REPORT No 2016237

Date: 14 Nov 2016 Time: 1747Z Position: 5701N 00024E Location: 60nm ESE Aberdeen

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	S92	Hawk
Operator	Civ Comm	HQ Air (Ops)
Airspace	Scottish FIR	Scottish FIR
Class	G	G
Rules	IFR	VFR
Service	Offshore Deconfliction Service	Traffic/Basic
Provider	Aberdeen	Blackdog
Altitude/FL	FL023	FL019
Transponder	A,C,S	A, C, S
Reported		
Colours	Red, White, Blue	Black
Lighting	Nav, Landing	Strobes, Nav
Conditions	VMC	VMC
Visibility	20km	
Altitude/FL	2000ft	
Altimeter	QNH (1018hPa)	NK
Heading	284°	110°
Speed	140kt	NR
ACAS/TAS	TCAS II	Not fitted
Alert	TA	NA
Separation		
Reported	0ft V/1.75nm H	2.5nm
Recorded	300ft V/2.3nm H	



THE S92 PILOT reports that he was in level cruise at a standard inbound altitude of 2000ft, routing back to Aberdeen from a rig at night. ATC alerted the crew to a fast-jet descending out of 10,000ft in their 12 o'clock at a range of 7nm. This was updated by ATC to say the fast-jet was now at 2000ft, heading directly towards them and they issued an avoiding action turn to the north. Whilst in the turn, they observed the fast-jet's nav lights, and the cockpit TCAS issued a 20 second TA alert. From the TCAS display it appeared that the other aircraft was just under 2nm away, at the same level. The threat passed beyond and ATC cleared them to continue on their inbound track.

He assessed the risk of collision as 'Medium'.

THE HAWK PILOT reports that he was operating in D613 on an exercise down to a level of 250ft; this level was briefed to him in all the exercise documentation and briefs. He was tasked to go from a specific point, action a deception manoeuvre, and descend to low-level in order to hit one of three targets at low-level. As he descended for this task, he became visual with a helicopter approximately 10nm on the nose. Avoiding action was taken by flying south. He was receiving a Traffic Service above 5000ft and a Basic Service below, due to standard radar and comms limitations. Traffic Information was not passed until he requested it when abeam and visual with the helicopter. He queried the co-ordination between GCI and Aberdeen. It became apparent that although the exercise documentation had stated there would be no low-level traffic north of the ABN 119 radial, both his start point and two of his three target points were north of this radial, and that traffic north of this line had not been coordinated before he commenced his descent. On returning to base he was informed that the helicopter pilot would be filing an Airprox.

He assessed the risk of collision as 'Low'.

THE ASACS WEAPONS CONTROLLER (BLACKDOG) reports that during an exercise he was controlling, amongst other aircraft, a Hawk on a Basic Service. The Basic Service was applied because the Hawk was below 5000ft, and the controller would expect to augment this service with Traffic Information if able. Whilst manoeuvring, the Hawk came into close proximity with an Aberdeen helicopter, but at that time the Hawk was further north than the rest of the aircraft on the exercise.

THE ASACS SUPERVISOR reports that the Basic Service was being applied due to controller workload and because the Hawk was below 5000ft. Although subsequent review of the radar showed that the helicopter was showing on the radar, the controller and instructor were concentrating on the aircraft involved in the exercise at the time, and the Supervisor and Fighter Marshall were concentrating on including multiple transits in and out of the exercise area. He opined that the Hawk was entitled to go into Class G airspace under a Basic Service but separation was his responsibility, although the controllers endeavoured to pass Traffic Information, the multiple aircraft spread across the exercise area meant that the controllers focused on the tactical picture [rather than low-level traffic]. Information was passed to Aberdeen so they were aware of the exercise traffic, but co-ordination was refused by the aircrew in the planning phase because they knew they wanted to go to low-level; this was passed to Aberdeen. In his opinion, the controller did nothing wrong and did not mis-apply any service.

THE ABERDEEN CONTROLLER reports the S92 was returning to Aberdeen and receiving a Deconfliction Service. Several (approx 16) military aircraft were operating in the D613 complex and had stated that they would be operating low-level and would be unwilling to co-ordinate a base level. Military squawks were showing that the aircraft were working Scampton Blackdog and were observed at medium/high level, but the Mode C on the conflicting aircraft was indicating FL120 and became corrupt for a few sweeps showing as '?'. He called the Blackdog controllers to try and get co-ordination, either vertically or laterally, but failed to get put through to the correct controller in time. The conflicting traffic settled on an opposite direction track to the S92, in its 12 o'clock, and appeared to be still descending. He called the traffic to the S92 at 12nm, descending through FL50 and gave the instruction 'if not sighted turn right heading north'. The S92 pilot stated that he thought he was visual with the traffic because he could see a single navigational light in his 12 o'clock. This took some time, and the conflicting aircraft continued to descend whilst in the opposite direction to the S92. As soon as the pilot finished transmitting, he instructed him to 'turn right heading north'. The S92 pilot acknowledged this and turned, and the other aircraft passed behind indicating the same level. The S92 pilot stated that his TCAS showed the aircraft to have come within 300ft and 2nm with a closing speed of 700kts and within 20-48 seconds of a collision; he said he would be filing an Airprox. The controller then called the ASACs to advise them about the Airprox and to see if he could get co-ordination for the other helicopters still to return to Aberdeen, but they confirmed they were under a Basic Service, going low-level and would not accept co-ordination.

Factual Background

The weather at Aberdeen was recorded as follows:

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EGPD 141720Z VRB03KT CAVOK 13/11 Q1016 NOSIG
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Portions of the tape transcripts between the Blackdog controller and Hawk are below:

To	From	Speech Transcription	Time	Remarks
Blackdog	Hawk	{Hawk C/S} descending low level	17:45:33	Not acknowledged by Blackdog
Blackdog	Unknown	Picture	17:46:35	
All	Blackdog	Blackdog, all groups cold	17:46:37	
All	Blackdog	Nearest group 113/86, 23 thousand, hostile	17:46:44	
Blackdog	Hawk	[Clipped] I'm at low level; got a helicopter approximately 5 miles to my north, confirm similar altitude.	17:47:23	

To	From	Speech Transcription	Time	Remarks
Hawk	Blackdog	Affirm	17:47:32	
Hawk	Blackdog	Confirm visual	17:47:34	
Hawk	Blackdog	Blackdog, that helicopter is on a heading of north at this time	17:47:42	
Blackdog	Hawk	Copied Visual	17:47:47	

Analysis and Investigation

CAA ATSI

ATSI had access to reports from the pilot of the S92 and the Hawk, the Aberdeen Offshore controller, the area radar recordings and transcript of the Aberdeen Offshore frequency. ATSI also had access to the unit investigation report and the Airspace Coordination Notice (ACN) covering the exercise activity which the Hawk was participating in. Screenshots in the report are taken from the area radar recording. All times UTC

The S92 had contacted Aberdeen Offshore Radar at 1739:50 and reported being at 80 miles. An Offshore Deconfliction Service was agreed.

The prevailing traffic situation is shown in Figure 1 at 1745:29. The Hawk, (code 2413), was 22nm west north-west of the S92, (code 7051), in a descent passing FL191. The Hawk continued the descent but between 1745:37 and 1746:09, no altitude information was observed until, at 1746:09, the Mode C of the Hawk registered FL95, and with the aircraft now on a converging heading with the S92 which was 16.1nm east south-east of the Hawk (Figure 2).

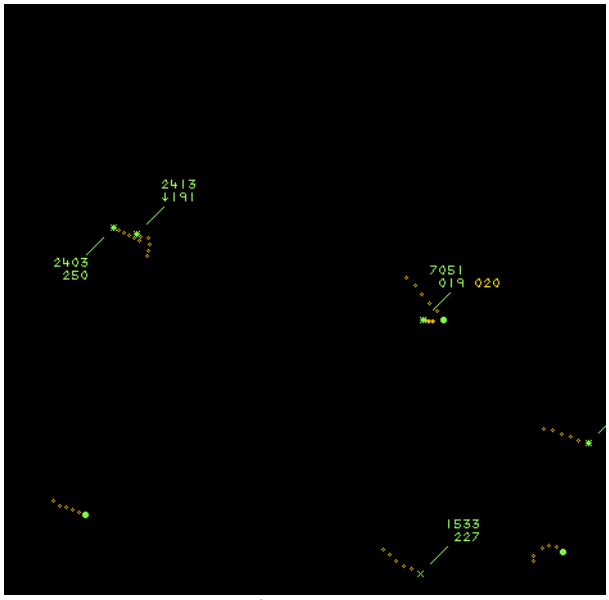


Figure 1 – 1745:29

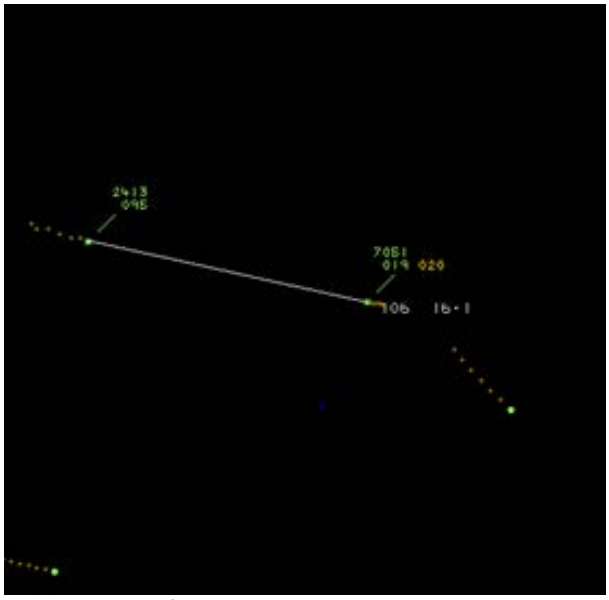


Figure 2 – 1746:09

At 1746:33 the Aberdeen controller passed Traffic Information to the S92 on the Hawk *"fast jet traffic 12 o' clock 10 miles opposite direction, descending through FL50. If not sighted turn right heading north*". (Figure 3). The S92 pilot reported *"visual with one navigation light - standby".* At 1746:55 the Aberdeen controller updated the Traffic Information *"your traffic is in your 12 o' clock 7 miles, 2400ft, correction 2000ft now. Turn right heading north please"*, which was acknowledged by the pilot who confirmed they were turning north (Figure 4).

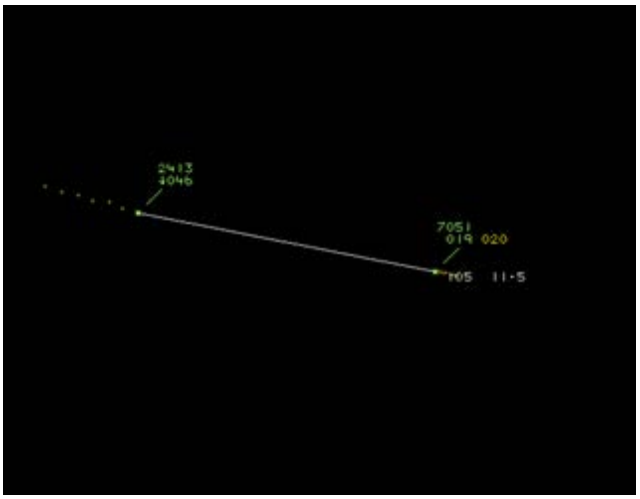


Figure 3 – 1746:33

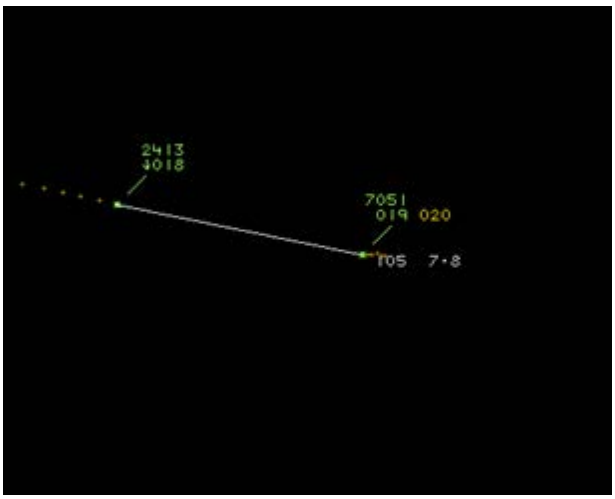


Figure 4 – 1746:55

At 1747:08 the Aberdeen controller gave a further update on the Hawk: *"that traffic's in your 12 o'clock opposite direction, same level as yourself"* (Figure 5). The S92 pilot reported *"we are visual, and turning to the right and north*". At 1747:22 the radar replay showed both aircraft turning right (Figure 6).

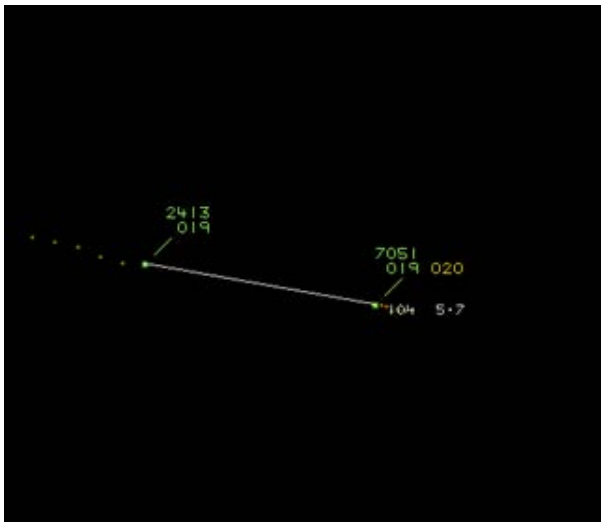


Figure 5 – 1747:08

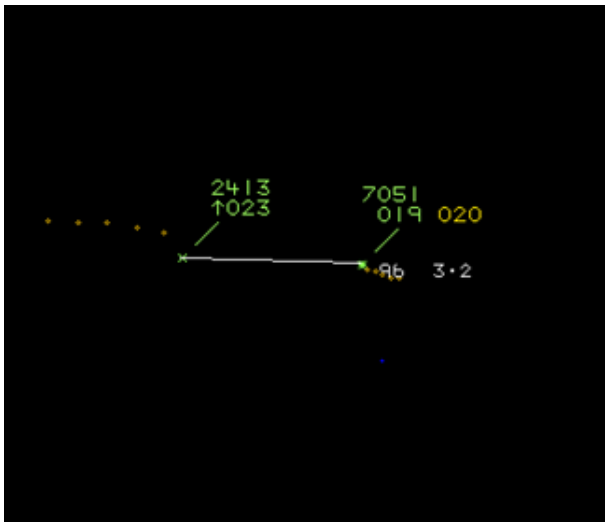


Figure 6 – 1747:22

CPA took place at 1747:32 with the aircraft separated by 2.2nm laterally and 500ft vertically (Figure 7).

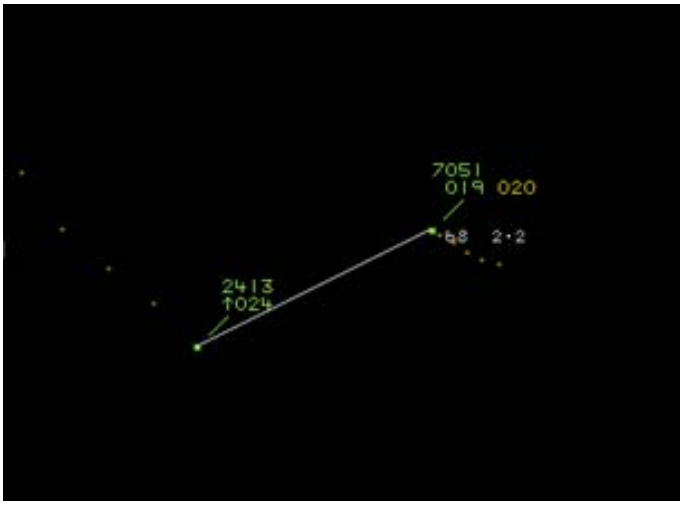


Figure 7 – 1747:32

A major military exercise had been notified as taking place, with up to 30 fast jet aircraft operating around the EGD613 and EGD513 danger area complexes to the east of Aberdeen and Newcastle. The activity was expected to extend into the low-flying areas in both SE Scotland and NE England. According to the ACN, the military aircraft were expected to operate at all levels from the surface to above FL245. Various lateral and horizontal restrictions were specified including the requirement for the exercise aircraft to remain at or above 5000ft until south of the ADN VOR 119 radial unless in contact with ADN. This was to provide a form of separation against the Aberdeen Helicopter Main Routes (HMRs). The Airprox took place at 2000ft and in the vicinity of the ADN 104 radial.

According to the NATS unit investigation report, an hour or so earlier the previous Aberdeen controller had contacted the ASACS controller to discuss the military traffic activity they could see at that time. The Aberdeen controller had requested that the ASACS controller contact them again when the bulk of the exercise aircraft moved north with a view to both controllers effecting coordination. However the ASACS controller (a different one to the one involved subsequently) advised that coordination would not be possible as the aircraft required full autonomy. The ASACS controller, (according to the NATS report), advised that although the ADN radials were not displayed on their map, they were not anticipating the exercise aircraft would be any further north than the (ADN VOR) 115 radial.

A change of controller at Aberdeen took place 18 minutes before the Airprox, and although the oncoming controller stated at a subsequent interview for the unit investigation, that they thought they had been aware of the information about coordination, in their own report, in response to the descent of the Hawk they stated that they had initiated a call to the ASACS controller with the intention of attempting coordination, but the call connection was unsuccessful.

The Aberdeen controller passed timely Traffic Information together with effective deconfliction advice. However the advice was not initially taken by the pilot of the S92 as they apparently attempted to acquire full visual contact with the Hawk. When the Traffic Information and deconfliction advice was repeated 22 seconds later with the Hawk still 7nm away, the S92 pilot confirmed they were taking the deconfliction advice. With a further update on the traffic being passed a further 13 seconds later, the pilot of the S92 reported being visual with the traffic. They also reported receiving a TCAS TA but no RA.

The pilot of the Hawk reported descending to low level, in receipt of a Basic Service below 5000ft from the ASACS controller. They reported that they *"became tally with a helicopter approximately 10NM on the nose".* They reported taking avoiding action by turning to the south. The Hawk pilot's report suggests that they were unaware of the requirement to be south of the ADN 119 radial for descent to low level unless in contact with ADN.

In conclusion, the pilot of the S92 reported the Airprox as a result of being concerned about the proximity of the Hawk. The Hawk pilot had descended below 5000ft in the area where it was specified that they should coordinate with ADN first in order to comply with the ACN. Effective Traffic Information and deconfliction advice had been passed by the Aberdeen controller, although there was an apparent delay in it being actioned by the pilot of the S92. Both pilots were visual with each other.

Military ATM

Figures 8-13 depict the relative positions of the Hawk and S92 at relevant times leading up to the Airprox. The screenshots do not necessarily represent what the controllers could see at the time.

At 17:45:33 (Figure 8), the Hawk stated that he was descending to low level. The transmission was not acknowledged by the Blackdog controller.

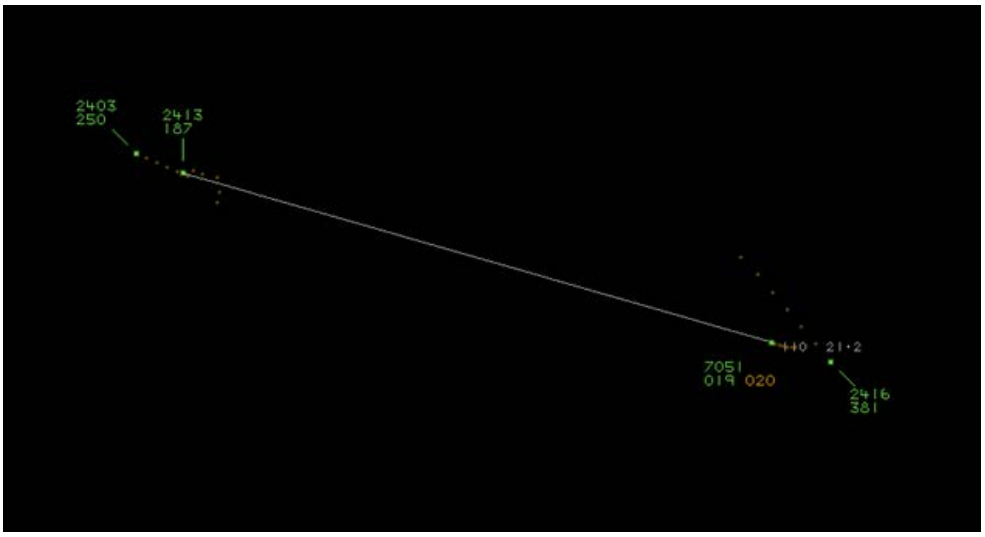


Figure 8: Geometry at 17:45:33 (Hawk SSR 2413; S92 SSR 7051)

As the Hawk turned and initiated a descent, the mode C dropped out in the radar replay. At 17:46:11 (Figure 9), the Hawk, now steady tracking SE, regained mode C.

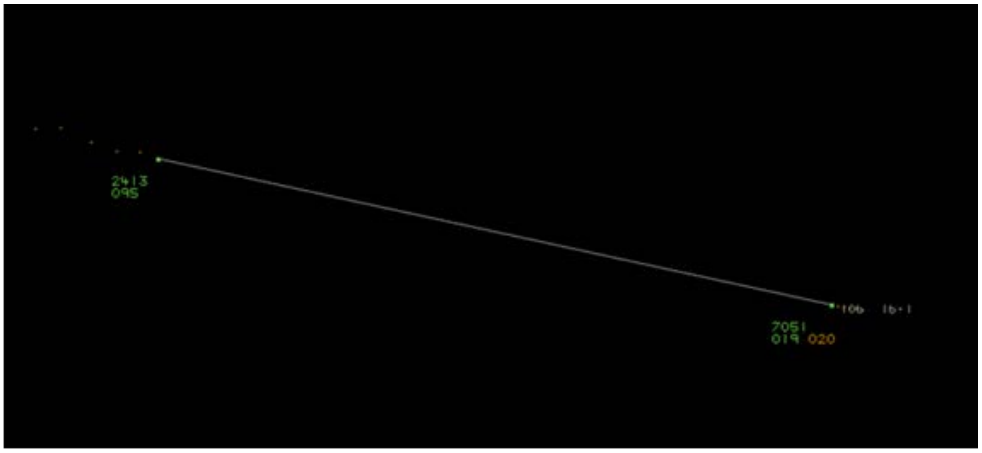


Figure 9: Geometry at 10:28:37 (Hawk SSR 2413; S92 SSR 7051)

At 17:46:37 (Figure 10), the Blackdog controller made a tactical, all stations broadcast. The Aberdeen controller had passed Traffic Information to the S92 when the 2 aircraft were 12nm apart, with the Hawk descending through FL50, with an instruction to the S92 to turn right onto North if the conflicting traffic was not in sight.

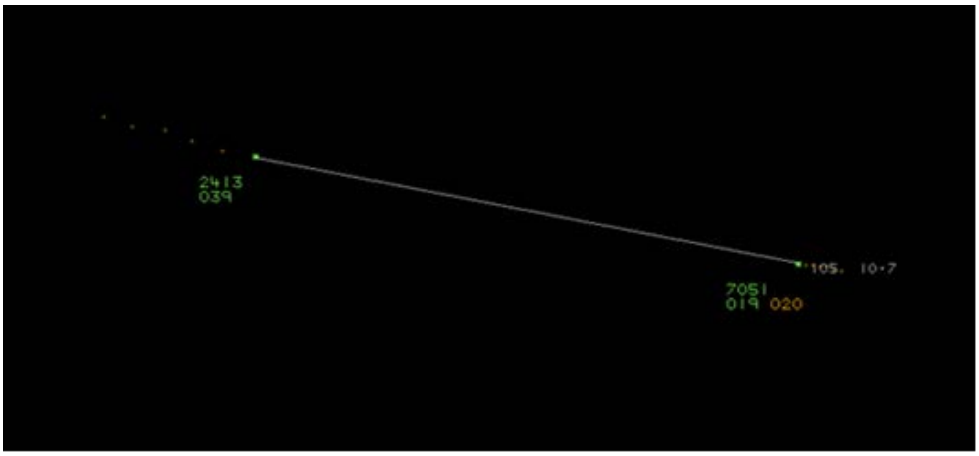


Figure 10: Geometry at 17:46:37 (Hawk SSR 2413; S92 SSR 7051

At 17:47:07 (Figure 11), the two aircraft were at the same altitude and 5.8nm apart, on a reciprocal heading with a reported closing speed of 700kts. The Aberdeen controller gave the S92 a further instruction (though not avoiding action) to turn right onto North.

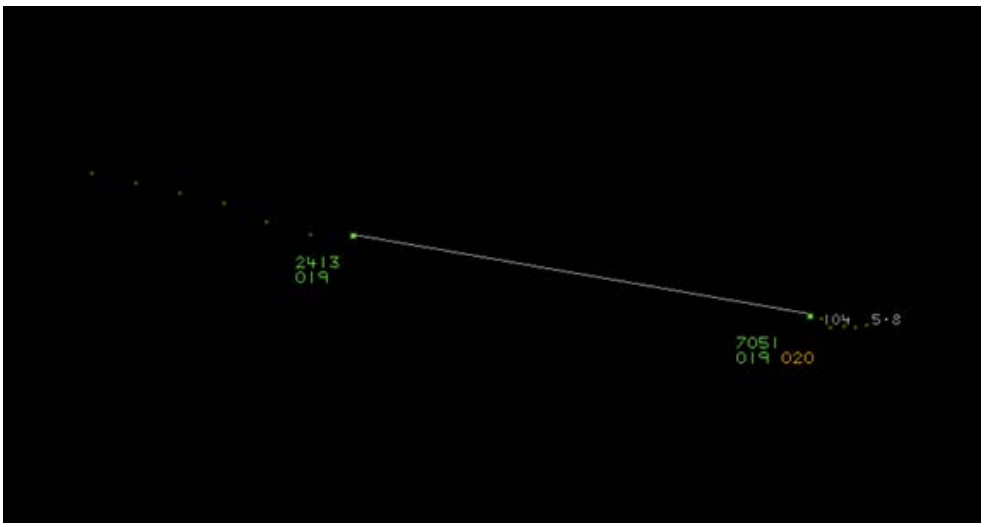


Figure 11: Geometry at 17:47:04 (Hawk SSR 2413; S92 SSR 7051)

At 17:47:23 (Figure 12), the Hawk reported being at low level and visual with a helicopter approx. 5nm to the North (possibly meaning 12 o'clock), then asked for confirmation that they were at similar altitude. The Blackdog controller replied in the affirmative, indicating that both aircraft were displayed on the radar screen.

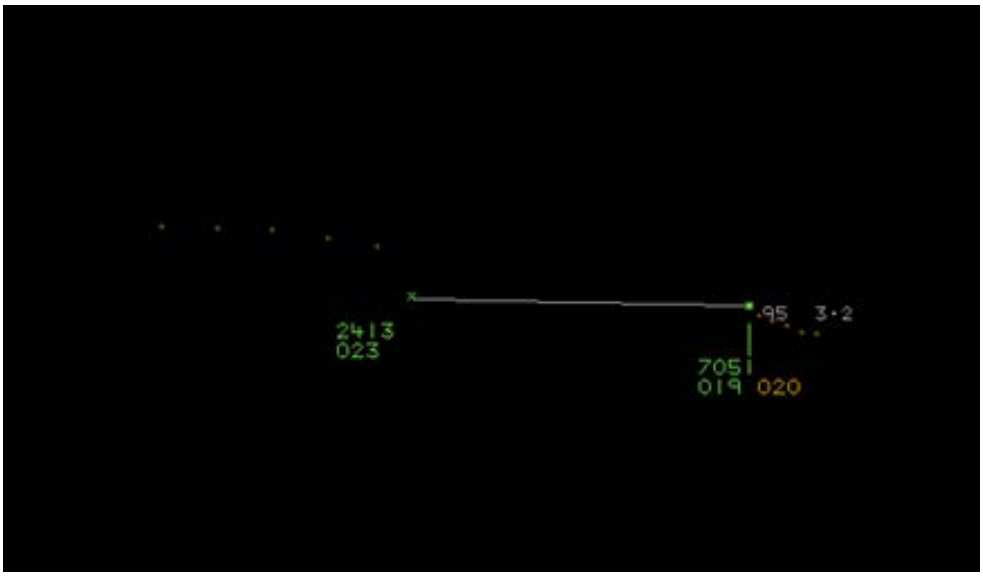


Figure 12: Geometry at 17:47:23 (Hawk SSR 2413; S92 SSR 7051)

At 17:47:42 (Figure 13), the Blackdog controller states that the helicopter is now heading North and the Hawk pilot responds that he is visual. At this stage, both aircraft had taken avoiding action, having reached a CPA of 2.3nm and 300ft.

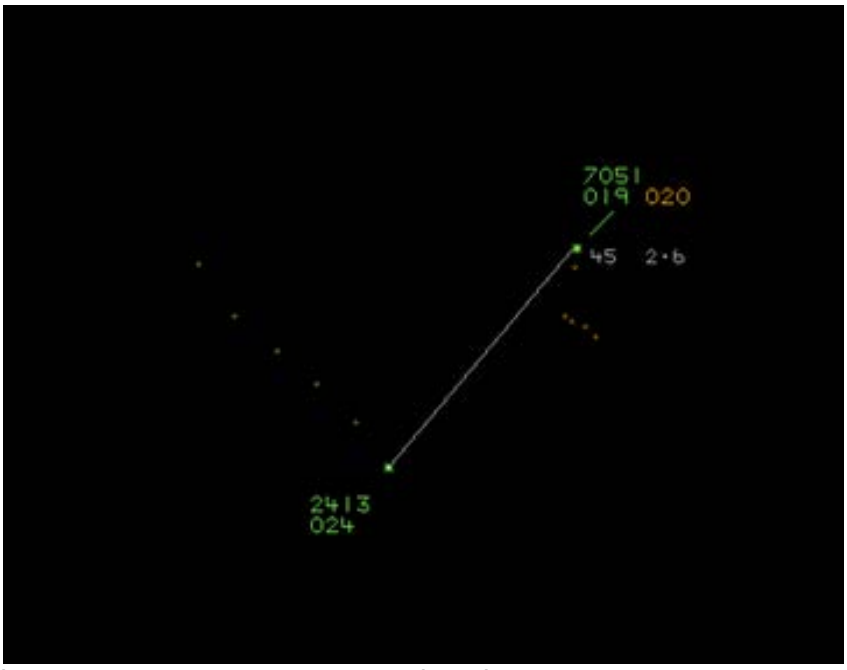


Figure 13: Geometry at 17:47:42 (Hawk SSR 2413; S92 SSR 7051)

The Hawk was participating in an exercise in the D613 complex, with a designated base height of 250ft. He was tasked to descend to low-level in order to 'hit' one of 3 specified targets. On reaching low-level, the pilot immediately became visual with the S92 in his 12 o'clock at a range of approx 10nm, with avoiding action to the South required. The pilot believed that there had been liaison between Blackdog, the exercise organiser and Aberdeen during planning in order to ensure deconfliction of exercise traffic from civil traffic.

The Aberdeen controller was aware that a large number of military aircraft were operating in the D613 complex but were operating down to 250ft and unable to coordinate. He had observed the Hawk at FL120 but noticed the mode C corrupt as it manoeuvred towards the S92; he called Blackdog to attempt coordination, but failed to get through to the correct controller in time.

The Blackdog controller was under training (UT) and was providing the Hawk with Traffic Service (TS) above A5000ft and Basic Service (BS) below due to a combination of radar and communications coverage and controller workload. The controller's attention was on the aircraft involved in the 'fight' while the Supervising personnel were focusing on multiple aircraft in transit to and from the exercise area. CAP 774 states that pilots should not expect any form of traffic information from a controller when operating under BS; however it also states that, if a controller considers that a definite risk of collision exists, a warning shall be issued to the pilot. In this case, the Hawk and S92 became co-altitude with separation of only 8nm, therefore the controller, who was prioritising his TS traffic, had very little time to notice the impending conflict and intervene.

At the time of this report, an Occurrence Safety Investigation (OSI) convened at RAF Leeming is still ongoing; however, early indications were that there may be some errors in exercise planning and briefing. More information will be available in due course.

UKAB Secretariat

The Hawk and S92 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard[1]. If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right[2].

[1] SERA.3205 Proximity.
[2] SERA.3210 Right-of-way (c)(1) Approaching head-on.

Comments

HQ Air Command

This incident was the subject of a detailed investigation which has yet to be finalised; however, sight of the initial findings and proposed recommendations has been provided to HQ Air Command by the investigating unit.

A number of barriers to MAC were either breached or weakened, which led to the separation between the 2 aircraft being reduced. The exercise Airspace Coordination Notice (ACN) was developed by the lead squadron and specifically stated that there was to be no low-level flight north of the ADN 119 radial unless in contact with ADN. This was missed during the planning phase when the Hawk was tasked to conduct a low-level target prosecution north of that radial; unfortunately, this was not questioned by the Hawk crew. It was also specifically stated that crews operating at low-level in the Aberdeen Offshore Safety Area (AOSA) were to be in receipt of a radar service from either Aberdeen or ASACS. It is possible that the Hawk pilot assumed that he had complied with this requirement as he was in receipt of a Basic Service (BS) from ASACS; no coordination activity had taken place between ASACS and Aberdeen due to the nature of the exercise. As the Hawk pilot was under a BS there was no obligation for the controller to pass Traffic Information on the approaching helicopter. However, it would appear from the transcript that the workload was not exceptional and there may have been an opportunity for the controller to pass Traffic Information on the helicopter to the Hawk pilot.

The Aberdeen controller reacted well to the 'threat' presented to his aircraft and offered a turn to the helicopter pilot (under a Deconfliction Service) to ensure separation. The helicopter pilot delayed executing the turn, allowing separation to reduce further, stating that he thought he was visual with the aircraft. Subsequently the controller re-issued the instruction to turn north, which the helicopter pilot complied with. Coincident to this, the Hawk pilot became visual with the helicopter and turned south to break the conflicting flight paths. It is notable that the TCAS fitted to the helicopter issued a 'TA' after the aircraft had commenced their respective avoidance manoeuvres.

This incident stems from poor adherence to and/or briefing of published procedures – the ACN quite clearly stipulates the requirement to remain at or above 5000ft AMSL until south of the ADN 119 radial – by both the operating crews and the controllers; recommendations are likely to be forthcoming to address this. Furthermore, it also highlights discrepancies between the UK AIP and the UK Military Low Flying Handbook regarding guidance to crews wishing to operate within the AOSA – this is worthy of further investigation to establish exactly what the procedures should be that best suit both Aberdeen and ASACS requirements. Finally, the more 'active' barriers of a radar service, TCAS and see-and-avoid all functioned to some extent to prevent the situation becoming worse.

Summary

An Airprox was reported when an S92 and a Hawk flew into proximity at 1747 on Monday 14th November 2016. The S92 pilot was operating under IFR in VMC, and in receipt of a Deconfliction Service from Aberdeen. The Hawk pilot was operating under VFR in VMC and in receipt of a Basic Service from ASACs (Blackdog).

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of 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 S92 pilot, he was transiting along a recognised helicopter route at 2000ft, at night, and receiving an Off-shore Deconfliction Service from Aberdeen. Members

commented that, not unreasonably, given that he was on a standard route in the AOSA, the S92 pilot was probably not expecting to encounter a military fast-jet at his level at that time. Some members opined that had he taken the first turn that the Aberdeen controller offered, the subsequent separation might have been greater. However, helicopter members of the Board noted that he may well have been concerned that if he turned off his helicopter route he might then conflict with other helicopter traffic routing along adjacent helicopter routes, which were even more likely to be at his level. They opined that this might explain why he attempted to become visual with the fast-jet traffic first before turning. Notwithstanding, on receipt of the updated Traffic Information call he did take the controller's turn which, in conjunction with the Hawk pilot's turn, meant that 2.3nm separation was achieved.

Turning to the Hawk pilot's action, the Board discussed at great length the planning of an exercise such as the one he was participating in. They were told that all participants of such exercises were given the ACN and SPINs[3] beforehand, and were expected to understand and comply with the details within. Noting that the ACN specified that exercise traffic was not to operate north of the ADN 119 radial below 5000ft without speaking to Aberdeen first, the Board wondered why the Hawk pilot was therefore operating autonomously where he was. Military members informed the Board that he had been given airborne tasking by the exercise planners, which meant he needed to plot his targets whilst flying. They commented that the Hawk, a single-seat aircraft, had very little in the way of navigational aids, making workload high; some members wondered whether the pilot had been lulled into believing that whatever targets he was given would be in the main exercise area, and duly coordinated, thereby meaning that he did not need to check any airspace restrictions. Other members with single-seat military fast-jet experience retorted that, even if he was planning to receive airborne tasking, the pilot would still be expected to carry and check a map annotated with any pertinent airspace or exercise restrictions (such as the ADN 119 radial), in order to ensure he complied with their requirements. That being said, members thought that had the Blackdog controller been paying closer attention to the Hawk, they could have issued a reminder to him to call Aberdeen in the knowledge that he was planning to descend to low-level in the area within which the Hawk pilot was required to establish communications with Aberdeen Radar. It was reiterated that, under Class G requirements, the Hawk pilot was entitled to operate where he was, it was just that, in order to comply with the ACN specific to that exercise, he needed to be speaking to Aberdeen ATC when north of the ADN 119 radial below 5000ft. Finally, members noted that the Hawk pilot was receiving a Basic Service from Blackdog, and the Board was told that this was standard practice. However, members noted from his report and comments on the RT that it appeared that the Hawk pilot had expected to be given Traffic Information on the helicopter; this was contrary to Blackdog's expectation as his controlling agency, and it appeared to the Board that the Hawk pilot may have had a flawed perception of the level of service he was receiving. However, ultimately, the Hawk pilot maintained a robust look-out throughout, and managed to see the S92 in plenty of time to take avoiding action.

The Board then went on to discuss Blackdog's involvement in the Airprox. The same as for the Hawk pilot, the Blackdog controllers were expected to be fully familiar with the exercise documentation and be especially aware of any airspace limitations and requirements. The Board were told that until recently, controllers signed as having received any exercise briefing literature, but not necessarily as having read and understood it; this anomaly had been addressed for future exercises and the Board were glad to hear it. The ASACs advisor explained that, during the main exercise, controller work-load was high, and it was standard practice for controllers to concentrate only on one element of the exercise traffic; the other elements were usually just given a Basic Service. The advisor went on to explain that on this occasion there was a Supervisor in place, but he was helping the Fighter Marshall at the time.[4] Noting that the Supervisor was focused on one aspect of the exercise, some members with military experience recalled that for exercises of this nature it used to be standard practice to have an overall exercise safety officer (called 'Eagle Safety') who's role was not to get involved with exercise play but to maintain overall safety oversight of the whole exercise; the Board were informed that this role had fallen out of use. Members opined that had there been someone who was not directly involved in the controlling aspects of the exercise then they might have spotted the position of the Hawk relative to the S92 and would probably have been able to alert him to the impending

[3] SPINS - **Sp**ecial **Ins**tructions – detailing specific coordination and exercise procedures.
[4] The Fighter Marshal is the controller who deals with exercise traffic as it flies in and out of the exercise areas.

conflict. In this respect, and noting also the Supervisor's comments in his report, ATC members were disappointed by an overall impression that the controllers as a whole felt they had discharged their duty, and that the Hawk's descent to low-level was the Hawk pilot's and Aberdeen's problem, not theirs. Members felt that a seeming lack of overall knowledge by the controllers of the exact exercise procedures had meant that the Hawk pilot was not reminded that he needed to call Aberdeen as he descended, nor was he given any Traffic Information on the helicopter, even though CAP774 states that when providing a Basic Service controllers should provide Traffic Information if they are aware that a definite risk of collision exists. All of which led the Board to wonder how much attention was being paid to the Hawk. Although the exercise documentation stated that co-ordination would not be available, the Board thought that tactical co-ordination for safety reasons (such as the position of the Hawk and the S92) should have been given more consideration and not dismissed out of hand. In general, the Board thought that Blackdog's overall focus had been on the tasking of the exercise and not on the safety of the aircraft.

The Board then discussed the Aberdeen controller's actions. He was providing an Off-shore Deconfliction Service and the Board was told that although this meant that separation between participating helicopters could be reduced, all other aspects remained the same as for a standard Deconfliction Service. The Board thought that the controller gave good initial Traffic Information, with an appropriate option for a turn if the traffic was not sighted. ATC members commented that they fully understood why he attempted to contact Blackdog for co-ordination (even though the ACN had stated that co-ordination would not be available), because the traffic was within the area that he could have expected to receive a call from the Hawk pilot. The Board were informed that his associated call to Blackdog was initially picked up by the Fighter Marshall and then transferred to the Weapons Controller's Assistant; unfortunately, due to the Blackdog controller's workload, he did not come on the line until after the event and, as a result, co-ordination was not achieved. During that time, the Aberdeen controller updated the Traffic Information to the S92 pilot and gave him an avoiding action turn (albeit without using the correct phraseology), which the S92 pilot took. The Board commended the Aberdeen controller for his prompt action in helping to resolve the conflict.

Finally, the Board discussed the overall planning and supervision of the exercise. They were told by military members that although the ACN covered the need to call Aberdeen if operating north of the ADN 119 radial below 5000ft, it was uncertain whether this had been specifically highlighted in relevant briefings. As a result, there may have been a lack of awareness of this requirement for both the Hawk pilot and the Blackdog controllers. The Board were told by the military members that an Occurrence Safety Investigation (OSI) had been convened at RAF Leeming to review this incident and had made recommendations to ensure that such omissions were not repeated.

The Board then looked at the safety barriers that were relevant to this Airprox and decided that the following were the key factors:

- **Airspace Design and Procedures** was considered to have been only **partially effective** because the overall design, planning and coordination of the exercise and its tasking had not been robust enough.

- **ATC Strategic Planning and Management** was assessed as having been only **partially effective** because the Blackdog Supervisor was involved in tactical exercise aspects and there was therefore nobody overseeing the whole exercise from a safety perspective.

- **Flight Crew pre-flight planning** was **ineffective** because the Hawk pilot was seemingly not aware that he needed to call Aberdeen if he was operating north of the ADN 119 radial below 5000ft.

- **Flight crew compliance with ATC instructions** was only **partially effective** because the S92 pilot did not take the initial avoiding turn issued by the Aberdeen controller.

- **See and Avoid** was **fully effective** because the Hawk pilot saw the S92 in time to take avoiding action.

Finally the Board discussed the cause of the Airprox. The main cause was agreed to be that the Hawk pilot had been tasked into the Aberdeen OSA and had flown into conflict with the S92. However, they thought that there were a number of contributory factors as follows: a lack of overall exercise safety supervision; a lack of rigour in exercise planning and coordination; the Hawk pilot had not been sufficiently aware of the rules relating to operating north of the ADN 119 radial; and the Blackdog controller had been unable to receive Aberdeen's telephone communication in a timely manner. Notwithstanding, when it came to assessing the risk, the Board quickly agreed that there was no risk of collision because both pilots had taken avoiding action and were visual with each other well before CPA; the risk was accordingly agreed as Category C.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Hawk pilot was tasked into the Aberdeen OSA and flew into conflict with the S92.

Contributory Factors:

1. There was a lack of overall exercise safety supervision.

2. There was a lack of rigour in exercise planning and coordination.

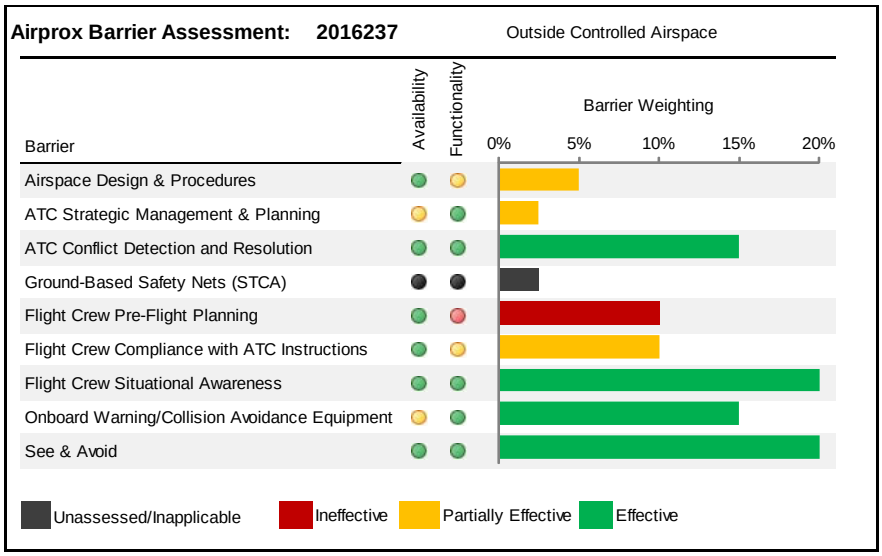
3. The Hawk pilot was not sufficiently aware of the rules relating to operating north of the 119 radial.

4. The Blackdog controller was unable to receive Aberdeen's telephone communication in a timely manner.

Degree of Risk: C.

Barrier Assessment[5]:

Modern safety management processes employ the concept of safety barriers that prevent contributory factors or human errors from developing into accidents. Based on work by EASA, CAA, MAA and UKAB, the following table depicts the barriers associated with preventing mid-air-collisions. The length of each bar represents the barrier's weighting or importance (out of a total of 100%) for the type of airspace in which the Airprox occurred (i.e. Controlled Airspace or Uncontrolled Airspace).[6] The colour of each bar represents the Board's assessment of the effectiveness of the associated barrier in this incident (either Fully Effective, Partially Effective, Ineffective, or Unassessable/Absent). The chart thus illustrates which barriers were effective and how important they were in contributing to collision avoidance in this incident.



[5] The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the UKAB Website

[6] Barrier weighting is subjective and is based on the judgement of a subject matter expert panel of aviators and air traffic controllers who conducted a workshop for the UKAB and CAA on barrier weighting in each designation of airspace.