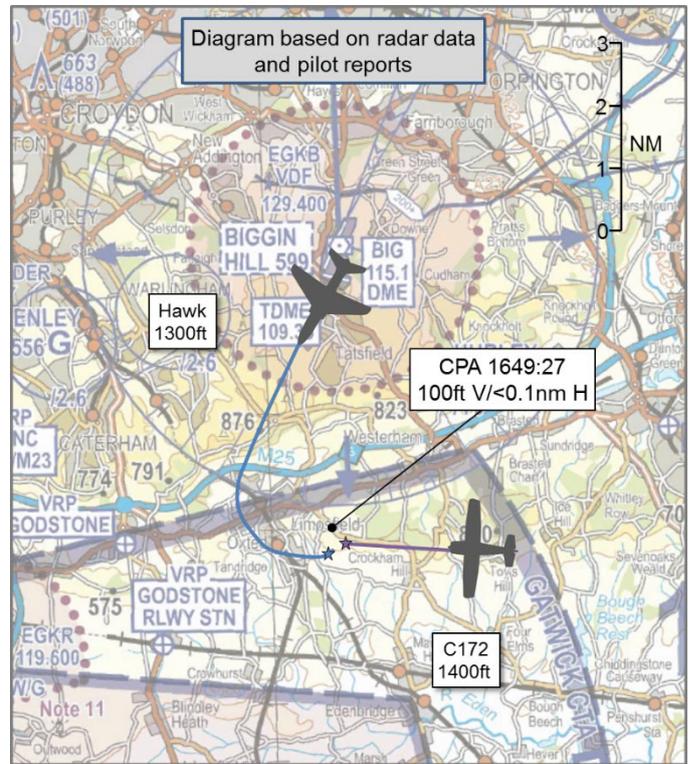


AIRPROX REPORT No 2017238

Date: 20 Aug 2017 Time: 1649Z Position: 5115N 00001E Location: 4nm SE Biggin Hill

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Hawk	C172
Operator	HQ Air (Ops)	Civ Pte
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Unknown ¹	Basic
Provider	Biggin Hill	Farnborough
Altitude/FL	1300ft	1400ft
Transponder	A, C	A, C, S
Reported		
Colours	Red	White, Blue
Lighting	Strobes	Strobes, Nav, Landing, Beacon, Flashing Wing.
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	1400ft	1400ft
Altimeter	QNH (1023hPa)	QNH
Heading	040°	270°
Speed	NK	110kt
ACAS/TAS	Not fitted	Not fitted
Separation		
Reported	200-400ft V	300ft V/1-2nm H
Recorded	100ft V/<0.1nm H	



THE HAWK PILOT reports that he was leading a stream take-off for 10 aircraft from Biggin Hill, with a 10sec interval between each aircraft. Once airborne, a left-hand turnout was made in accordance with the briefed departure profile. During the left-hand turn, when level at 1400ft, a prop aircraft was seen below and slightly left of the nose. He called the position of the aircraft to the rest of the formation and turned on his smoke to assist their acquisition of his position. The formation had not yet left the Biggin Hill Approach frequency, but, even if they had switched to Thames Radar by then, he did not believe there was time for a Traffic Service to be established in order to receive the required situational awareness on the prop aircraft. Biggin Approach had not notified the formation of any conflicting traffic on the planned departure route. As formation leader, he elected not to call an Airprox on the frequency at that moment because some members of the formation had aborted take-off due to a minor technical issue so he prioritised the safe join of the of the remaining 8 aircraft, and established a Traffic Service as soon as reasonably practicable with Thames Radar.

He assessed the risk of collision as 'Medium'.

THE C172 PILOT reports that he was aware that the Hawks were operating in the area all day and had called Biggin before departing. He was assured that if there was no display he could transit through the NOTAM area. He also asked Farnborough whether he could transit, and thought that they had contacted Biggin. He was told that the Hawks were taxiing so he couldn't now transit the [NOTAM] area so his only option was to transit below 1500ft below the Gatwick CTA. He briefed his passengers that the Hawks would be around and to look out for them. He presumed the Hawks would stay within the NOTAM'd area. He first saw one cross from right to left, initially 1-2nm away, it then

¹ The Hawk pilot reported that he was receiving a Procedural Service, but was VFR so it was likely he was under an Aerodrome or Basic Service.

flew 300ft above him with its smoke on, he wasn't expecting them to be there so told the Farnborough controller, who advised him there were a number of Hawks in his position. However, he judged they were not on a collision course (they were moving on the windscreen) and didn't feel an Airprox report was necessary. He couldn't remember whether he was receiving a Traffic Service or a Basic Service from Farnborough, but the weather was good, so he thought it likely to be a Basic Service.

He assessed the risk of collision as 'None'.

Factual Background

The weather at Biggin Hill was recorded as follows:

EGKB 201620Z 22009KT 9999 SCT035 18/12 Q1023=

The following NOTAM was issued for the transit of the Red Arrows:

H4929/17 NOTAMN

Q) EGTT/QWVLW/IV/M /W /000/030/5217N00008W065

A) EGTT B) 1708201640 C) 1708201740

E) FORMATION TRANSIT BY RED ARROWS ACFT ROUTING:

BIGGIN HILL 511951N 0000157E 1655

SEVENOAKS 511628N 0001132E 1657

E OF SEVENOAKS 511552N 0001557E 1657

FLYPAST INGATESTONE 514012N 0002303E 1701

S OF BURY ST EDMUNDS 521045N 0004645E 1707

REDGRAVE 522139N 0005950E 1709

BURNHAM HARBOUR 525857N 0004519E 1716

OVERSEAS 530833N 0002204E 1718

SCAMPTON 531828N 0003303W 1724

FORMATION PLANS TO TRANSIT AT 250-2000FT AGL. TIMINGS, HGT AND ROUTE ARE APRX AND MAY CHANGE DUE TO WX OR OTHER REQUIREMENTS.

17-08-0423-AS2

F) SFC G) 3000FT AMSL

Analysis and Investigation

CAA ATSI

An Airprox was filed by the pilot of a Hawk as a result of coming into proximity with a C172. However, due to incorrect initial reporting, the pilot reports were not received until 45 days and 60 days after the event. As a result, there are no R/T recordings or controller reports for the event. The area radar was reviewed for the period of the incident.

The Hawk pilot reports that they were departing Biggin Hill as part of a formation take off, were in the climb out, VFR, and were in receipt of a Procedural Service from Biggin Hill Approach at the time of the Airprox. The C172 pilot reported routing VFR and receiving a service from Farnborough LARS East but could not remember if this was a Basic Service or a Traffic Service.

The radar replay displayed CPA as occurring at 1649:27 with the aircraft separated laterally by 0.1nm and vertically by 100ft (Figure 1).

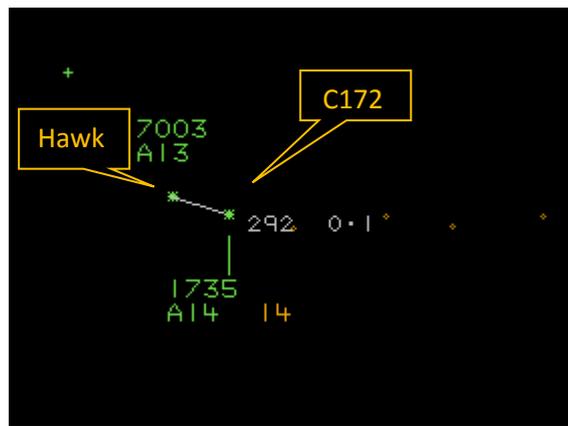


Figure 1- 1649:27

As a result of the R/T recording being unavailable for the period of the incident, it was not possible to determine whether there were any causal or contributory factors that could be attributed to the controllers. However, at the time of the Airprox the aircraft were operating in Class G Airspace where pilots are responsible for their own collision avoidance regardless of the type of service being provided by the controller.

UKAB Secretariat

The Hawk and C172 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard².

Comments

HQ Air Command

The Hawk pilot reported this incident within 3hrs of it occurring; however, due to an administrative oversight, the report was not correctly distributed and thus was received by the UKAB after the 30 day retention period for ATC voice recordings. When the decision to file an Airprox is made after the flight, or there is little or no opportunity to report the Airprox on frequency, then pilots should endeavour to contact the ATSU involved by telephone such that they can take the necessary action to preserve evidence with the minimum of delay.

This incident occurred in a busy area of Class G airspace during a particularly high workload portion of the mission – departure and rejoin of multiple Hawks for onward transit. Without an on-board CWS, or a surveillance-based Air Traffic Service, the Hawk pilot was relying on his own lookout to avoid other aircraft. The Hawk pilot notes in his report that it would have been unlikely that a Traffic Service could have been agreed with Thames Radar in time for sufficient warning to have been given. Thus, lookout was the primary barrier in this encounter and therefore detection ranges are likely to be inferior to those expected from other barriers. It seems that both pilots saw each other's aircraft at approximately the same time, and that neither deemed that further avoiding action was necessary – the Hawk pilot already being in a left hand turn and the Cessna pilot judging that adequate separation already existed.

It should be noted that the NOTAM for 'Red Arrows in Transit' is a warning NOTAM and thus does not require other aircraft to avoid the route, though this is highly advisable. Furthermore, the Hawk pilots are not obliged to remain within the dimensions of the NOTAM and may need to deviate from the published routing for a number of reasons – it should never be assumed that the Hawks will remain within a NOTAM area or on the NOTAM route, or that a warning NOTAM affords any protection.

² SERA.3205 Proximity.

Summary

An Airprox was reported when a Hawk and a C172 flew into proximity near Biggin Hill at 1649hrs on Sunday 20th August 2017. Both pilots were operating under VFR in VMC, the Hawk pilot in receipt of a Procedural Service from Biggin Hill and the C172 pilot in receipt of either a Traffic or Basic Service from Farnborough.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both aircraft, radar photographs/video recordings, and reports from the appropriate ATC and operating authorities.

The Board first looked at the actions of the Hawk pilot. Members with fast-jet experience commented that he would have had a high cockpit workload having just got airborne, was joining up a large formation of aircraft (of which two had aborted on the runway causing even more complexity for the formation leader), and had an imminent frequency change to Thames Radar. With regard to the choice of join procedure, some members noted that the formation had chosen to route and join underneath the Gatwick CTA (base 1500ft), which then constrained them and other pilots in altitude and airspace; they wondered whether the Hawk leader would have been better placed following the standard Biggin Hill departure by turning inside the M25 and joining up slightly later whilst avoiding the busy airspace beneath the Gatwick CTA. Military members pointed out that the easiest and quickest way for the formation to join was for the lead to conduct a wide 'lazy turn' on departure so that the following pilots could cut the corner in order to join him expeditiously; they commented that the quicker the formation joined and became one speaking unit, the better it was for ATC. This view was backed up by ATC members who controlled in that airspace, who confirmed that Thames Radar would have wanted the Hawks joined up as soon as possible; the alternative of a tight turn after take-off within the M25, followed by a joining-up turn later, was far from ideal they opined. Furthermore, other members stated that the whole of the airspace around Biggin Hill was very busy, with many pilots choosing to go through the gap between Biggin Hill and Gatwick, so there was no guarantee this incident wouldn't have happened even if the Hawks had turned earlier. With that latter comment in mind, and recognising that the requirements of display operations sometimes required compromises to be made, some members wondered whether Biggin Hill was the best place to operate from at all given the busy and constrained airspace surrounding the airfield; there were other, perhaps more suitable airfields in the area.

Some members wondered whether the NOTAM about the Hawks' profile could have been more descriptive of what was actually going to happen. They thought that the routing and timings were fairly loose in that 'Biggin Hill to Sevenoaks' did not describe how the Hawks would route to Sevenoaks, gave no indication of a lateral boundary to the route, and did not give any suggestion that the Hawks might in fact be up to 5nm south of the nominal track as was the case for this incident. However, it was quickly agreed that the NOTAM was intended only as a warning that the Hawks would be in the area, not an avoid, and that if the route was more prescriptive and the Hawks deviated from it to meet the circumstances of the day, it may have caused as much confusion. As it was, the C172 pilot had read the NOTAM and was suitably forewarned such that he had questioned Farnborough, and many members thought that the NOTAM had therefore fulfilled its purpose. Notwithstanding, and noting that the C172 had expected the Hawks to remain within the 'NOTAM'd area', the Board thought it pertinent to remind pilots that, as only a warning, there was no requirement for the Hawks to remain within the NOTAM, or for GA to remain outside, albeit both courses of action would be preferable.

Noting that the airspace was tight for the Hawks to join up, that there was no surveillance-based ATC at Biggin Hill or controlled airspace to protect them, and that they were not equipped with a CWS, the Board wondered whether more efforts could have been made to seek Traffic Information just prior to the formation rolling at Biggin Hill. If Biggin Hill ATC had been able to contact Farnborough as the formation lined up for departure then the formation could have been given generic Traffic Information on aircraft to the south of the field which would have at least pre-warned the formation leader of any potential conflicts, such as the C172. In respect of availability of situational awareness and warnings,

the Board were heartened to hear from the HQ Air Command military member that the fitment of a CWS to the Hawks was being considered at some point in the future, although there was disappointment that there was no fixed timeframe for this as yet

Turning to the C172 pilot, the Board commended him for his pre-flight planning and consideration of the NOTAM and potential hazards. It appeared to have been him who had prompted Farnborough ATC into finding out the exact location of the Hawks, although without the ATC transcript it was difficult to know for sure. Members noted that he had seen the lead Hawk crossing ahead of his track, 1-2nm away, and was probably surprised to see it turn towards him. Members also noted that he and the Hawk pilot had reported that the Hawk had flown above the C172, but the radar replay showed the opposite until just before CPA. Either the Hawk had rapidly climbed, or there was some disparity in the transponder height readouts of one or both of the aircraft. The former seemed unlikely given that the C172 pilot had not felt the need to take emergency avoiding action and reported the risk of collision as 'none'. Finally, given that they were at 1400ft to remain beneath Gatwick Airspace, the Board noted that Farnborough would not have been able to provide the C172 pilot or the Hawks with a Traffic Service because they were both beneath their 1500ft minimum for such an ATS.

The Board then turned to the ATC aspects of the incident and were disappointed that reporting shortfalls had meant that the RT recordings for Biggin Hill and Farnborough had not been available. Without them there was no way of knowing what information was passed between the two units, and this served as a reminder to pilots that reporting Airprox on frequency alerts ATC and other pilots of the need to preserve materials such as maps, notes, radar and RT data. Accepting that the Hawk pilot was busy at that moment and could not report on frequency, the Board agreed with HQ Air Command's comments about the desirability of contacting ATC after he had landed to ensure that they were aware of the Airprox. Military members pointed out that he had filed the Airprox report as soon as possible, it had been an administrative issue that had prevented the correct people from being notified. Given that the C172 pilot reported that Farnborough had told him that the Hawks were taxiing, it was likely that the Farnborough controller had spoken to Biggin Hill; however, it was not known whether they had informed Biggin Hill about the C172. Some members wondered whether the ATM in Biggin tower was able to see the C172, but were cautioned that controllers could not use the ATM like a radar, and it was not known whether it was available on that day anyway.

In determining the cause of the Airprox, the Board quickly agreed that it had effectively been a non-sighting by the Hawk pilot in that he had only seen the C172 as he passed over it, and then too late to take avoiding action. However, the Board spent some time assessing the risk. The radar replay indicated that the two aircraft were in very close proximity, but both pilots estimated the separation to be more than the 100ft shown. Given that the C172 pilot had reported that he was at 1400ft (as confirmed on the radar recording), it seemed unlikely that the Hawk was 2-400ft above (as both pilots reported) because that would have placed the Hawk in the CTA. Some members thought that this indicated that the two aircraft were closer than the pilots perceived and that safety had been much reduced below the norm (risk Category B). Others noted that the C172 pilot had reported that the two aircraft were not on a collision course, and that there was no need for an Airprox to be reported at all; they argued that the risk should therefore be Category C. After considerable debate, the Chair called for a vote by the members with the latter view prevailing; accordingly, the risk was assessed as Category C, safety had been degraded but there had been no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively a non-sighting by the Hawk pilot.

Degree of Risk: C.

Safety Barrier Assessment³

In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that the key factors had been that:

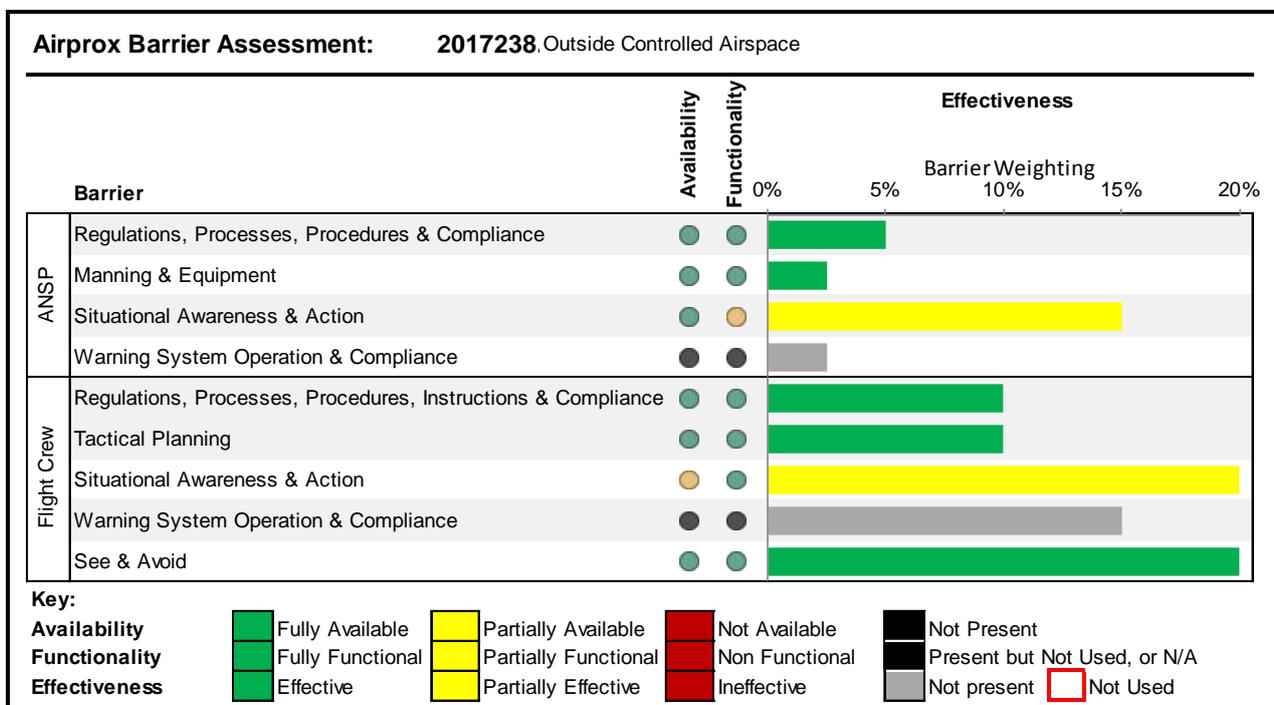
ANSP:

Situational Awareness and Action were assessed as **partially effective** because although Biggin Hill ATC were not aware of the C172, Farnborough ATC had provided generic TI about the Hawks taxiing (and therefore implicitly imminently departing) to the C172 pilot.

Flight Crew:

Situational Awareness and Action were assessed as **partially effective** because the Hawk pilots were not aware of the C172 (either from ATC or from electronic conspicuity) but the C172 pilot was generically aware that the Hawks would be in the area.

Warning System Operation and Compliance were not present in either aircraft.



³ The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](http://www.ukab.co.uk).