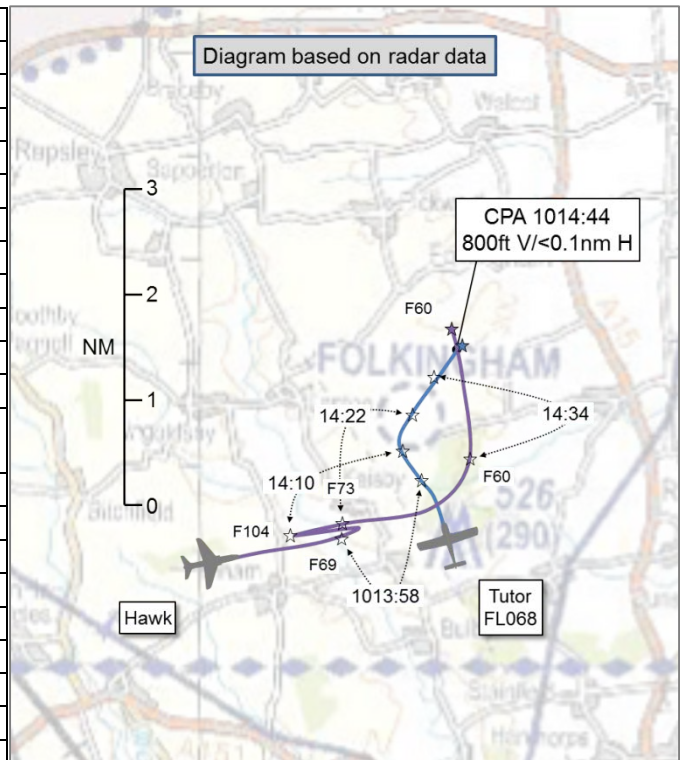


**AIRPROX REPORT No 2016025**

Date: 4 Mar 2016 Time: 1014Z Position: 5252N 00026W Location: 9nm S Cranwell

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

Recorded	Aircraft 1	Aircraft 2
Aircraft	Tutor	Hawk T1
Operator	HQ Air (Trg)	HQ Air (Ops)
Airspace	Lincs AAIA	Lincs AAIA
Class	G	G
Rules	VFR	VFR
Service	Traffic	Traffic
Provider	Cranwell	Waddington
Altitude/FL	FL68	FL60
Transponder	A, C, S	A, C
Reported		
Colours	White	Mil colours
Lighting	White HISL, Nav, LED landing	NK
Conditions	VMC	VMC
Visibility	10km	10km
Altitude/FL	6000ft	NK
Altimeter	RPS (983hPa)	NK
Heading	350°	NK
Speed	100kt	NK
ACAS/TAS	TAS	Not fitted
Alert	TA	N/A
Separation		
Reported	200ft V/0m H	Not seen
Recorded	800ft V/<0.1nm H	



**THE TUTOR PILOT** reports that he was carrying out stalling exercises in receipt of a Traffic Service from Cranwell Departures. The frequency was busy with constant Traffic Information calls to both the Tutor pilot and other aircraft, most of which were being acknowledged, but some required further confirmation and hence caused further RT traffic. Due to the level of calls, sortie progress was being interrupted and he had considered dispensing with the Traffic Service in order to complete the sortie within the syllabus time given that the weather and visibility were good. In the event, he decided to retain the Traffic Service and the sortie was completed successfully but with 15 minutes extra added to the duration. During the latter half of the sortie, several Traffic Advisory System (TAS) contacts were visible on the display as "Other Traffic." (traffic not representing an immediate threat). None were providing a Proximity Advisory (traffic within 5nm and +/- 1200ft). A TAS audio announcement then warned of "Traffic, 11 o'clock, High" with Traffic Advisory (TA) symbology and audio alert. This TA warned of 'traffic within 15-30 secs of closure, or within 0.55nm and +/-800ft.' The exercise was stopped, and the contact identified as a fast-moving jet conducting some high-energy vertical manoeuvring to the north-west. The sortie continued when no immediate threat was apparent. Shortly afterwards, the controller called a contact as "Traffic 6 o'clock 1 mile probably Tutor." At the same time TAS again announced "Traffic, 6 o'clock, same altitude, 1 mile" with TA warning symbology and audio alert. The student (right-hand seat) identified the contact as a Hawk at high speed behind them at "Half 5" and slightly low. The Hawk appeared to him from under the nose heading north about 200-300ft below them. No apparent avoiding action was seen by the Hawk, and there was no avoiding action available to them. He responded to the ATC call by advising them "no it's a [Hawk] directly underneath me." It is not known if the other pilot had seen their aircraft but considering it would have been a tail-on aspect, white, hard to see, light-aircraft above the horizon, it is possible he did not. He commented that all-white Tutor aircraft are very difficult to acquire visually, a known and as yet unresolved risk. He assessed the risk of collision as 'Very High'.

**THE HAWK PILOT** did not complete an Airprox report because the Airprox was initially believed to have occurred with a different Hawk and by the time he had been informed that it was him, he could not recall many details. The Airprox Hawk pilot did not recall seeing a Tutor.

**THE CRANWELL DEPS CONTROLLER** reports that he was controlling 3 or 4 aircraft in 'BLU'<sup>1</sup> conditions. After handing one aircraft over, he called traffic to the Tutor. He stated that the traffic was 'south, 1 mile, similar height, believed to be a Wittering Tutor' because the squawk he could see started with 37. The Tutor pilot responded with, 'it was a ['Hawk'], passed about 300ft below us'. He then saw the Waddington squawk the Hawk was wearing. It appeared to have dropped off or had been overlapped by the Wittering squawk. About 3 minutes later, the Tutor pilot stated that he would be submitting an Airprox report.

**THE CRANWELL SUPERVISOR** reports that he did not witness this event as he was not in the Approach room at the time. The event details were brought to his attention immediately upon his return to the Approach room.

## Factual Background

The weather at Cranwell was recorded as follows:

METAR EGYD 040950Z 25018KT 9999 FEW016 04/MS00 Q987 BLU NOSIG=

## Analysis and Investigation

### Military ATM

An Airprox occurred on 4th March 2016 at 1014, 9nm south-east of RAF Cranwell. The incident took place between Hawk(A), under a Traffic Service with RAF Waddington, and a Tutor, under a Traffic Service with RAF Cranwell.

The occurrence report was initially filed by Hawk(B) but the transcripts showed that the incident happened at around 1014:41, when Hawk(B) was not in the vicinity of the Tutor. Given the Airprox report from the Tutor, it is believed that Hawk(A) was the other aircraft involved.

Portions of the tape transcript between Cranwell Departures, Waddington Approach, Hawk(A) and the Tutor pilots are below: Another Hawk(C) was included in the transmissions initially.

From	To	Speech Transcription	Time
WAD APP	Hawk(A) and (C)	[Hawk(A)/(C) (C/S's] be advised you are manoeuvring in an area of high activity believed to be Tutor aircraft.	1013.00
WAD APP	Hawk(A)	[Hawk(A) C/S] traffic north east one mile manoeuvring three thousand feet below possibly a Tutor.	1014.14
Hawk(A)	WAD APP	Is that for [Hawk(A) C/S]?	1014.23
WAD APP	Hawk(A)	[Hawk(A) C/S] affirm.	1014.23
Hawk(A)	WAD APP	[Hawk(A) C/S].	1014.23
CWL Deps	Tutor	[Tutor C/S] traffic south er half a mile manoeuvring believed to be a Wittering tutor, seven hundred feet below.	1014:35
Tutor	CWL Deps	No it's a [Hawk], just come underneath me by about three hundred feet.	1014:41
WAD APP	Hawk(A)	[Hawk(A) C/S] traffic overhead of you one thousand feet above the previously called Tutor. Further traffic north east three miles tracking west similar altitude also believed to be a Tutor.	1014.46
Hawk(A)	WAD APP	Looking [Hawk(A) C/S] and [Hawk(A) C/S] will be moving further to the north.	1014.57

<sup>1</sup> Lowest Cloud Base of at least 3/8 coverage equal to or more than 2500ft; surface visibility equal to or more than 8km.

At 1013:55 (Figure 1), the respective tracks were in close proximity manoeuvring in the busy Lincolnshire airspace.

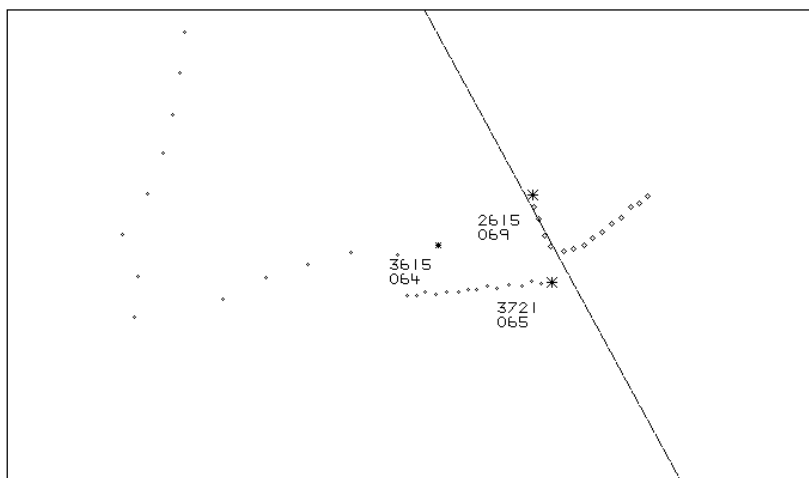


Figure 1: Geometry at 1013:55 (Tutor squawking 2615; Hawk(A) squawking 3615).

Waddington Approach first called Traffic Information to Hawk(A) at 1014:14 (Figure 2) as north-east, 1nm, 3000ft below.

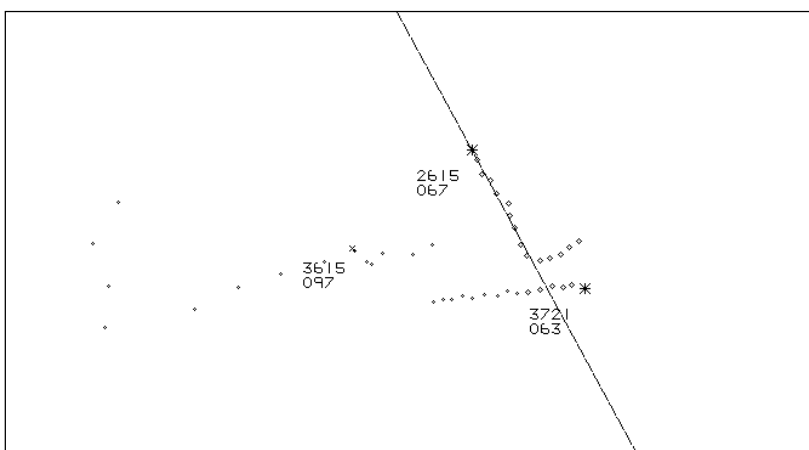


Figure 2: Traffic Information at 1014:14.

The Hawk(A) pilot confirmed that the Traffic Information was for his aircraft at 1014:23 (Figure 3).

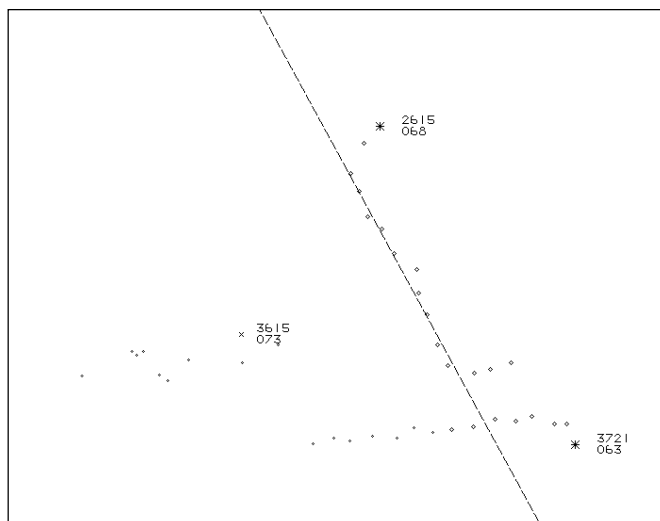


Figure 3: Geometry at 1014:23 as Hawk(A) pilot confirms receipt of Traffic Information.

At 1014:35 (Figure 4), Cranwell Departures provided the first piece of Traffic Information to the Tutor as south, 0.5nm, 700 feet below, believed to be a Wittering Tutor (3721 squawk).

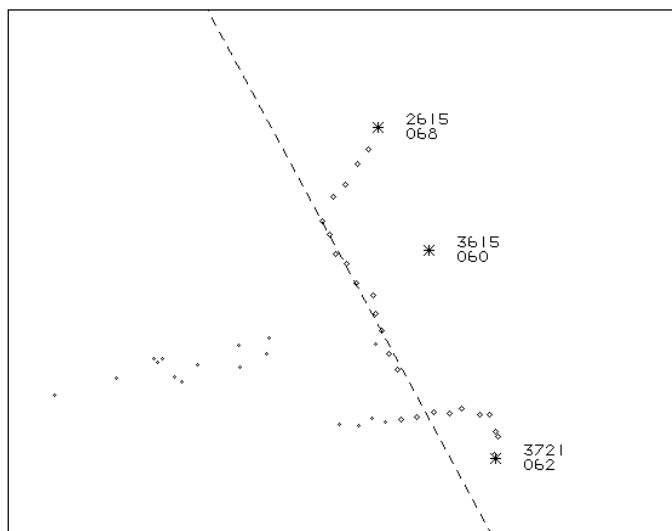


Figure 4: Traffic Information from Cranwell at 1014:35.

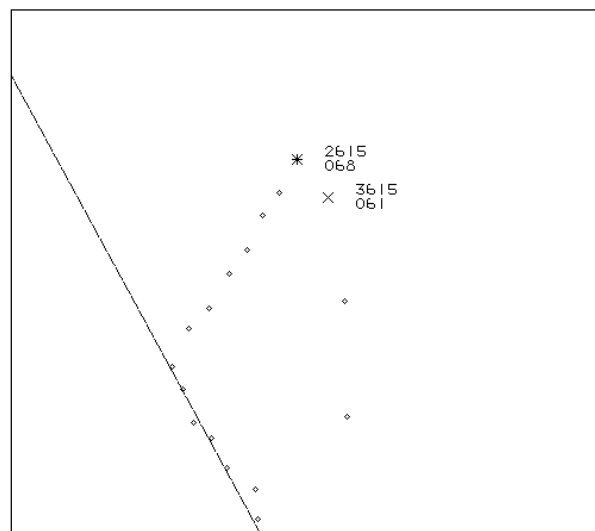


Figure 5: CPA at 1014:43.

The CPA at 1014:43 (Figure 5) with 800ft vertical and 0.1nm horizontal separation, coincided with the Tutor confirming that a Hawk was passing underneath by 300 feet.

At 1014:46 (Figure 6), Waddington called further Traffic Information to the Hawk(A) pilot at 1000 feet above.

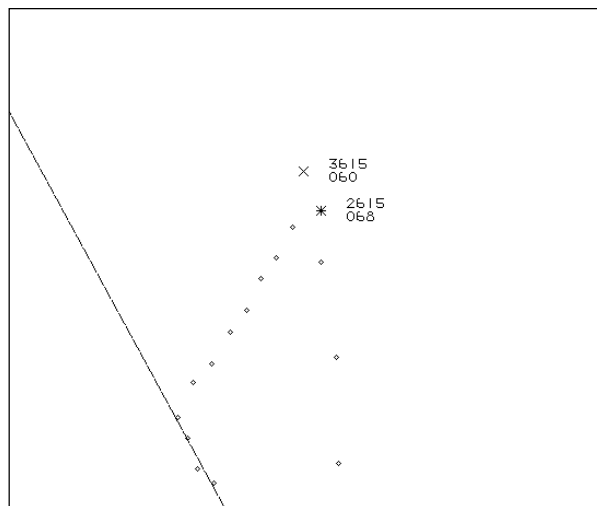


Figure 6: Traffic Information to the Hawk (A) pilot at 1014:46.

The accurate Traffic Information from Cranwell ATC to the Tutor was at 1nm and ideally would have been earlier as the crews had been in close proximity one minute prior to the CPA. However, there seemed to be an intensity of traffic in the area and an overlap of SSR codes. The Cranwell controller had 3 to 4 aircraft on frequency and had initially thought that the conflicting traffic was a Tutor from Wittering. The Hawk(A) squawk had momentarily disappeared from the radar screen as the pilot was conducting high energy manoeuvres. It appears that the Hawk(A) squawk overlapped with the non-Airprox Wittering Tutor squawk, leading the controller to believe that the conflicting track was another Tutor.

Waddington ATC did not provide an occurrence report because the initial investigation centred on a different aircraft believed to be under the control of RAF(U)Swanwick. The Waddington Approach controller had warned the Hawk(A) pilot of high Tutor activity and Traffic Information was passed at 1014:14 (30 seconds prior to CPA) on a possible Tutor, north-east 1nm, 3000ft below. Once again, the information was accurate but an earlier warning of traffic may have assisted the crews in achieving greater separation.

The Tutor pilot had been conducting a stall exercise and had commented upon the high level of Traffic Information that had interrupted the training. The captain had to extend the sortie to complete the training exercise and had received several TAS contacts. TAS had alerted with a Traffic Advisory (TA) and an audio alert; the exercise was ceased and the contact identified as Hawk(A). Shortly after, ATC warned of the traffic at 1nm, describing it as a Tutor; TAS once again provided a TA with an audio alert and Hawk(A) was sighted by the student pilot.

Timelier Traffic Information from both radar units would have helped crews with situational awareness and maintaining separation; however, the airspace was congested, and information is subject to controller workload. Waddington had passed information to the Hawk(A) pilot at 1014:14 to the north-east and 300ft below. It is not known how well the Hawk(A) pilot assimilated the information because the pilot asked for confirmation that the call was meant for him and then took up a north-east track descending through the level of the Tutor.

### **UKAB Secretariat**

The Tutor and Hawk(A) pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard<sup>2</sup>. If the incident geometry is considered as overtaking then the Tutor pilot had right of way and the Hawk(A) pilot was required to keep out of the way of the other aircraft by altering course to the right<sup>3</sup>.

## **Comments**

### **HQ Air Command**

The Hawk unit has been unable to positively identify exactly which of their aircraft was involved in this Airprox; however, all pilot's that were airborne at the time and in the vicinity of the Tutor have been interviewed and none of them reports being visual with the Tutor.

This incident occurred in a known area of high traffic density, and this is borne out by the level of R/T associated with the Traffic Service (TS) that the Tutor pilot was receiving. It was noted that he considered dispensing with the TS (and hence removing a potential barrier to MAC) due to the number of interruptions impinging on his ability to instruct. Ultimately, it was the provision of TI (albeit misidentifying the aircraft type) coincident with the acquisition of the Hawk on the Tutor's TAS that led to the pilot's visual identification of the conflicting Hawk, albeit shortly after CPA.

As far as can be ascertained, the Hawk(s) were in receipt of a TS and were informed of the high density of traffic in their area. The decision to conduct high energy manoeuvres in such busy airspace is questionable, though the factors leading to that choice of area are not readily apparent from the reports (such as suitable weather, other areas of high density, fuel reserves etc).

## **Summary**

An Airprox was reported when a Tutor and a Hawk flew into proximity at 1015 on Friday 4<sup>th</sup> March 2016. Both pilots were operating under VFR in VMC and in receipt of a Traffic Service, the Tutor from Cranwell, the Hawk(A) from Waddington. The minimum separation was recorded as 800ft vertical and 0.1nm horizontal as the Hawk(A) pilot overtook the Tutor.

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<sup>2</sup> SERA.3205 Proximity.

<sup>3</sup> SERA.3210 Right-of-way (c)(3) Overtaking.

## **PART B: SUMMARY OF THE BOARD'S DISCUSSIONS**

Information available included reports from the Tutor pilot and the Cranwell controller, area radar and RTF recordings and reports from the appropriate ATC and operating authorities.

The Board were disappointed that, due to not positively establishing which Hawk had been involved in the Airprox at the time, a fuller report from its pilot or from the Waddington controller had not been available.

The Board first discussed the ATC aspects and noted that, although the 2 aircraft were conducting GH in the same area of the Lincolnshire AIAA, the Tutor had been receiving a Traffic Service from the Cranwell Deps controller whilst the Hawk had been receiving a Traffic Service from the Waddington Approach controller. They returned to this theme later in the discussion, but wondered whether there had been an opportunity for the Cranwell and Waddington controllers to pass any information to each other in order to increase their SA. Turning to the specifics of the actions of the controllers concerned, a Military ATC member commented that the Traffic Information given to the Tutor pilot had been issued when the Hawk had been about 0.5nm behind the Tutor and should, ideally, have been passed earlier. However, it was recognised that the controller had been busy, and that there had been a number of aircraft operating in the area with the radar labels also reported as overlapping. This could explain why the controller had misidentified the conflicting traffic as a Tutor, having believed that he had seen it showing a Wittering squawk; if he had been able to see the squawk clearly, it would have indicated to him that probably it had been a Hawk.

As for the Hawk, it has been established that Waddington had been providing a Traffic Service to its pilot, and the associated R/T recording showed that the pilot had been warned that he was manoeuvring in an area of high activity, believed to be Tutors. Just over one minute later he had been issued with specific Traffic Information, possibly concerning a Tutor, north-east, 1nm, 3000ft below. The Hawk pilot had then queried whether the call had been for him, which had been confirmed. About 20 seconds later CPA had occurred. More timely information would have been ideal, but it was recognised again that the airspace was busy, and that the Hawk was conducting high-energy manoeuvres which would have made the task of giving accurate and timely Traffic Information more problematic.

Turning to the actions of the pilots, the Board noted that the Hawk pilot had been carrying out high-energy manoeuvres in busy airspace close to the Tutor and other aircraft. It appeared from the radar recordings that he had probably been in the process of carrying out a loop at the time, and pilot members with fast-jet experience opined that in pulling out from his loop he would have probably have been in the region of about 300-400kts, which would have left little time to have assimilated the Traffic Information or to have taken any action to avoid the traffic. They thought that this could explain why the Hawk pilot had then inadvertently turned towards the Tutor that he had been specifically warned about, and had descended towards it. Noting that the Tutor pilot had benefitted from TAS indications, the Board then discussed the fact that the Hawk T1 was not fitted with a Collision Warning System (CWS). They were heartened to hear from the HQ Air Command member that there is provision for Hawk T1 aircraft to be fitted with a CWS sometime in the future, although he could not clarify either when this would happen, or which Hawks would have priority. The Board hoped that the provision would occur as soon as possible in order to assist in preventing close encounters where a visual sighting had not been established. On this occasion, it was considered that a CWS would have assisted the Hawk pilot in being aware of the presence of the Tutor in his vicinity before he had carried out high-energy manoeuvres. This would have given him the chance to gauge the feasibility of delaying the action or of moving to another area. Consequently, the Board decided that it was a contributory factor to the Airprox that the Hawk was not fitted with a TAS/TCAS.

Turning to the Tutor pilot, pilot members noted his comments about considering dispensing with his Traffic Service due to the numerous traffic calls which had interrupted his instructional flow. The opinion of the Board was that if ATC were passing numerous reports of Traffic Information, then this was indicative that there was a high number of aircraft in the vicinity; dispensing with the Traffic Service would have removed one of the barriers for the provision of a safe flight, and the Board

commended him for persevering and therefore receiving Traffic Information about the Hawk, albeit later than optimum. Together with his TAS, the Board noted that this had assisted the crew in sighting the Hawk, albeit too late to take any action, and with little else they could have done to improve matters.

The Board then considered the cause and risk of the Airprox. Some members wondered whether the cause had been that the Hawk pilot had turned and descended towards the Tutor after having been issued with Traffic Information about its presence. However, from the previous discussion it was acknowledged that it was possible that the Hawk pilot had not assimilated the information and, therefore, the Board considered that it was unfair to state a cause that implied that he had knowingly turned towards the Tutor. Equally, the Tutor pilot was given little warning of the impending conflict, and had been told by ATC that it was another Tutor (which would have had a slower closure rate) when in fact it was a fast-moving Hawk. Consequently, it was decided that neither pilot had been in a position to have materially influenced the outcome, and that the cause was best described simply as a conflict in Class G airspace. As for the risk, the Board debated at great length whether this had just stopped short of an actual collision (Category A), or whether proximity had been greater than this, albeit with safety margins being much reduced below the norm (Category B). Members noted that the Hawk pilot had not seen the Tutor as he turned and descended towards it, and that the Tutor pilot had only seen the Hawk as it had passed underneath after approaching from behind and initially above. Accepting that it had been highly fortuitous that they had not passed closer to each other, the Board also noted that the minimum vertical separation at the time of the Airprox was 800ft; the majority view was that 800ft separation did not constitute a situation that had just stopped short of an actual collision. It was therefore considered that the risk was Category B; safety margins had been much reduced below the norm.

It became apparent during the Board's discussion that the Airprox had occurred in the very busy and congested airspace of the Lincolnshire AAIA. This was considered to be a contributory factor, and the Board commented that the reduction in RAF airfields had led to airfields in the area becoming increasingly busier. They questioned whether it was practical for at least three units to be operating in that area at the time, especially in view of the different performances of the aircraft involved. On this occasion there had been a number of Tutors and Hawks and Board members recalled that there had been previous occasions when King Airs from Cranwell had also been operating in the vicinity. The Board commented that there had also been three ATC Units providing services to their aircraft; Cranwell and Wittering to their respective Tutors and Waddington to the Hawks. Additionally, Swanwick had provided an ATC service to another Hawk in the vicinity but that had not been in the area at the time of the Airprox. The Board wondered whether there should be a single authority for controlling aircraft in the Lincolnshire AAIA, or at least a level of positive coordination of activities similar to that used in segregated GH areas over Wales. Military Controller members warned that this could lead to controller overload or too high a density of traffic calls if a single frequency was used. Other military members were concerned that segregating areas for individual use might not be practical. Nevertheless, although realising that there was no simple solution, the Board decided to make a recommendation that HQ Air Command review the coordination of military activity in the Lincolnshire AAIA.

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

<u>Cause:</u>	A conflict in Class G.
<u>Contributory Factors:</u>	1. The congested airspace of the Lincolnshire AIAA. 2. The Hawk was not fitted with a TAS/TCAS.
<u>Degree of Risk:</u>	B.
<u>Recommendation:</u>	HQ Air Command review the coordination of military activity in the Lincolnshire AIAA.