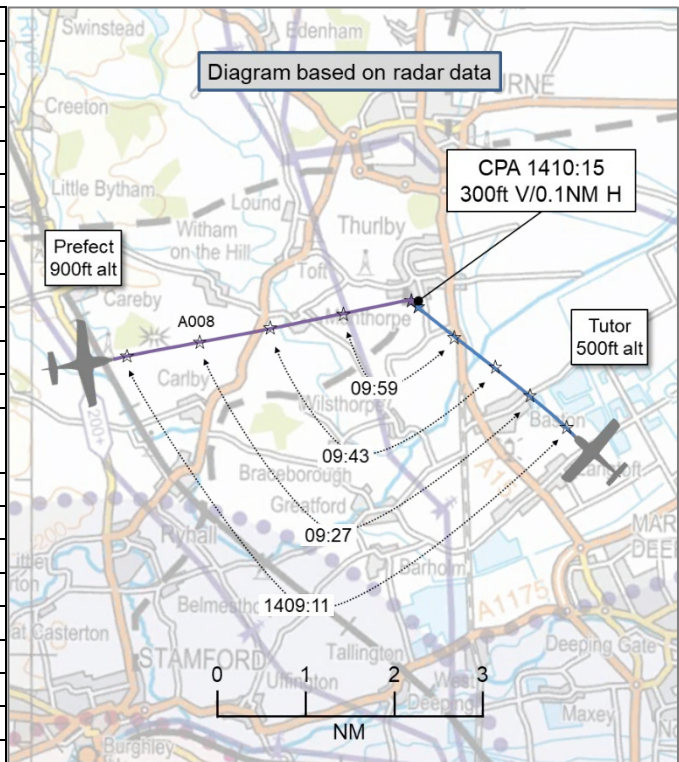


**AIRPROX REPORT No 2021227**

Date: 09 Nov 2021 Time: 1410Z Position: 5344N 00022W Location: 2NM S of Bourne

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

Recorded	Aircraft 1	Aircraft 2
Aircraft	Tutor	Prefect
Operator	HQ Air (Trg)	HQ Air (Trg)
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Traffic	Traffic
Provider	Wittering Zone	Cranwell Deps
Altitude/FL	500ft	800ft
Transponder	A, C, S	A, C, S
Reported		
Colours	White, blue	White, blue
Lighting	Nav, Strobes, Landing	Nav, Strobes, Taxi, Landing
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	500ft	500ft
Altimeter	RPS (1012hPa)	RPS (1012hPa)
Heading	314°	097°
Speed	120kt	180kt
ACAS/TAS	TAS/FLARM	TAS/FLARM
Alert	TA	Information
Separation at CPA		
Reported	100ft V/0.25NM H	100ft V/200m H
Recorded	300ft V/0.1NM H	



**THE TUTOR PILOT** reports that during a low-level navigation exercise from [departure airfield] to [destination airfield], they had an Airprox with a Prefect approximately 1NM to the SW of Bourne. They were tracking NW towards their initial point for their grid run and, although Traffic Information was passed to them by ATC and the aircraft showed on their TAS at 600-700ft above and descending, they were not visual with the aircraft. They continued with the leg whilst looking for the traffic but were still not visual, and the TAS showed the Prefect to still be descending. After receiving a Traffic Advisory on their TAS along with increased volume and flashing lights on [other compatible EC equipment], they spotted the aircraft in their 11 o'clock moving left-to-right and they took avoiding action to move behind the aircraft. They didn't feel it was close enough to declare an Airprox at the time, however on reflection, they realised that if they hadn't spotted it there would have been a risk of collision due to converging headings and decreasing height deconfliction. Their route was submitted on the CADS,<sup>1</sup> flown on an accurate timeline and showed no conflict in that area prior to take-off.

The pilot perceived the severity of the incident as 'Medium'.

**THE PREFECT PILOT** reports that the sortie was a proficiency sortie for a trainee instructor. The sortie profile was introduction to low-level operations. A simple route was planned that included two medium level legs [prior to arrival at the] the low-level entry point. The sortie route was entered into CADS in the usual manner and the conflicts checked, which included two Prefects and one other aircraft, but no Tutors. Prior to walking to the aircraft the CADS entry was checked again and no new conflicts were noted. Having entered low-level at [low-level entry point] on an eastbound heading, and in receipt of a Traffic Service from Cranwell, the [compatible EC equipment] triggered an alert for traffic below them and to the right. The traffic was sighted at around 200-300m and approximately 100ft below, no avoiding

<sup>1</sup> Centralised Aviation Data Service

action was required or taken. They have no recollection of any TAS warnings during the incident. The sortie continued without further incident

The pilot perceived the severity of the incident as 'Medium'.

**THE WITTERING CONTROLLER** reports that they had taken over the control position at 1400Z. [The Tutor pilot] was received on frequency and identified by the outgoing controller, and it was logged that the pilot was reminded of their own terrain clearance given they were operating low level. The intentions of [the Tutor pilot] were ascertained as conducting a low-level navigation exercise in the local area north of the Wittering MATZ before returning to base. SSR was intermittent on the aircraft given its altitude but a solid primary contact was continuously present, and track ident was maintained, thus the service was not downgraded. [The Tutor pilot] looped [sic] anticlockwise through sectors 3 and 4 passing the town of Bourne before calling for recovery. Their recollection of the air picture outside this profile is unclear given the time that has passed since its occurrence. They do believe that there were multiple general handing aircraft within the vicinity of Bourne comprising of both station-based and non-station-based aircraft and they believe that all relevant traffic was called. No Airprox or concerns were raised on frequency.

The controller perceived the severity of the incident as 'Low'.

**THE CRANWELL CONTROLLER** reports that they were the Departures controller working multiple aircraft on frequency. On departure, they planned on transferring control of [the Prefect pilot] to Waddington however this did not happen as they had taken up a southerly track, so they kept control of the [Prefect pilot] for the duration of their sortie. The pilot was on a low-level introductory sortie, thus operated at and near the base of radar cover throughout. On two occasions they reduced the service provided to [the Prefect pilot] from a Traffic Service to a Basic Service due to the return disappearing from radar cover. When the return was intermittent, they kept [the Prefect pilot] on a Basic Service but provided as accurate Traffic Information as possible when it was relevant. They recall seeing a Wittering squawk displaying on secondary radar and manoeuvring, indicating low level and without a primary return. They cannot recall whether at any point they were required to call this specific track to [the Prefect pilot], but it is possible that at some point during their respective sorties that the two aircraft may have been operating in the same vicinity, with one or potentially both aircraft not displaying on radar at the time. Due to not having clarity surrounding the time of the Airprox, they are unable to recall or listen to the correct time on the tapes.

The controller perceived the severity of the incident as 'Low'.

**THE CRANWELL SUPERVISOR** reports that following review of the RT recording, they confirm that the Airprox was not reported on frequency and they don't have a radar replay option so it's not completely clear whether Traffic Information was passed to the Prefect pilot regarding the Tutor by the Cranwell controller. However, there were two Traffic Information calls made to the Prefect pilot at 1413 and 1415 which seem to match up with the Airprox timing. The first of these was called as a "*possible Tutor*", the second was "*no height information*".

## Factual Background

The weather at Wittering was recorded as follows:

```
METAR EGXT 091450Z AUTO 21013KT 9999 OVC020/// 14/10 Q1020  
METAR EGXT 091350Z 20012KT 9999 BKN021 14/10 Q1020 RMK WHT
```

## Analysis and Investigation

Investigations were carried out by both the Tutor and Prefect training organisations, the findings from which are summarised below.

## Tutor training organisation investigation

The crew were planned, briefed and authorised within the powers of the Tutor Captain for a land-away to [destination airfield] in the morning and return Wittering in the afternoon. Both sorties were input to CADS and no conflicts were noted, although there were several other aircraft airborne in the area during the sorties. The afternoon sortie comprised of a low level navigation at 500ft minimum separation distance (MSD) with an en-route practice diversion to Marham before regaining the planned route. Once the crew arrived at [destination airfield], they assessed they would be able to get airborne on their afternoon sortie earlier, so telephoned Tutor Ops and asked for the CADS booking to be changed to reflect the revised take-off time. No conflicts were noted at the re-planned take-off time. The pilot subsequently got airborne a few minutes late but cut short some of the route, they assess they were on their planned (revised) timings at the time of the Airprox.

It is clear that the Tutor pilot's visual detection of the Prefect was quite late, despite the Traffic Information from ATC. Despite the Tutor crew having to take avoiding action, they did not feel at the time that the proximity of the Prefect was close enough to warrant an Airprox report, hence they did not initially submit one or report it to Wittering ATC. Later however, they decided that if they hadn't seen and avoided the Prefect, there would have been a risk of collision so submitted a DASOR.

As part of the investigation the Tutor captain was interviewed and expanded on some detail:

- The Tutor crew's routing, both for the outbound and the return leg had been entered in to CADS that morning prior to departure from Wittering.
- The student updated the departure time on the return leg over the telephone and it was entered in to the system by [Ops login]. The captain didn't hear the conversation but they believe it was run for conflicts and no conflict was apparent. Of note, when they landed they re-ran CADS and both their route and the Prefect route were displayed but showed no conflict due to CADS timing tolerances.
- Following notification from ATC regarding the traffic, the route was continued and not modified. This was due to not knowing which way to go. They stated that they couldn't climb as that would have taken them closer to the conflict and couldn't descend as they were already at 500ft MSD. They didn't know if the Prefect was going to pass down their right or left side and so didn't want to turn prior to becoming visual in case they exacerbated the situation.

Despite late visual sighting of the Prefect, avoiding action taken early enough by Tutor crew to mitigate risk of collision. Guidance exists regarding the use of TAS to aid visual acquisition of alert aircraft. The pilot had few options available to them with regards to avoiding action. A vertical manoeuvre was not possible as they were at 500ft MSD, and a horizontal manoeuvre based purely on TAS is not advisable. Other findings include:

- CADS is a very limited tool for alerting pilots to the likelihood of encountering other aircraft at close proximity. It requires both aircraft to be on time and in their planned position for the information to be meaningful and alert the crew to the potential close proximity of another aircraft. If plans change after CADS input, then the information on CADS becomes out of date unless an update is made. Even then, once airborne, if plans change at all, any confliction warnings may become invalid and an aircraft that was not previously a conflict could now become one as it appears happened in this case. CADS did not alert the Tutor crew to the potential confliction because their timelines did not cause a confliction at that stage. Even with Traffic Information passed by ATC and the Tutor crew aware of the presence of the Prefect due to TAS and [other compatible EC] warnings, the crew did not see the Prefect until quite late, though early enough to take sufficient avoiding action.  
**Recommendation:** As there is no formal compliant training for [Tutor training organisation] personnel who are mandated to use CADS, liaise with [Tutor operating group] to establish a plan for future training. CADS SOPs are also to be reviewed.

- The Prefect crew did not receive a TAS alert on the Tutor below them. The Prefect TAS is known to have poor performance in the ahead sector below the nose. **Action:** This issue is known to [Prefect operating group] and is being addressed through the associated [group] report. The Prefect [operators] are investigating available improvements to the TAS system. **Observation:** It is of concern that the TAS on the Prefect did not detect or display the Tutor, despite the proximity of the 2 aircraft.

There is no mention in the Prefect DASOR whether Cranwell ATC passed any Traffic Information regarding the Tutor which raises the question whether the Tutor was showing on Cranwell radar which, as it was squawking, would have been expected. If both aircraft pilots had been on the same ATC frequency, there could have been an element of coordination to ensure both aircraft were height deconflicted.

The Tutor training organisation DDH/AM commented that:

Loss of safe separation leading to Mid-Air Collision (MAC) is their number 1 Air Safety risk and that this report is an example of where the barriers have worked. ATC and TAS helped the crew to get their eyes out looking in the correct area, and the Prefect was sighted in time to allow the Tutor crew to manoeuvre and safely avoid. TAS, as always, is an aid to visual acquisition and careful consideration should be given to initiating any manoeuvre based purely on TAS. The pilot's actions in this case were appropriate and effective.

There are points they have noted from this investigation; CADS training and the utility of CADS are areas they will have their team focus on to provide additional guidance to crews if required. The performance of the Prefect TAS is concerning, and is an area that they are assured is being investigated by [Prefect operating group]. Had the Prefect crew received an earlier alert on their TAS, this may have prompted them to arrest their descent and provided greater vertical as well as lateral deconfliction. They are reassured, however, by the efficacy of the barriers that are in place, given much of their operations are conducted in Class G airspace. These will be further enhanced by the addition of ADS-B in and out in the upcoming Tutor cockpit refresh.

### **Additional comments, findings and recommendations from the Prefect training organisation investigation**

The Prefect and Tutor pilots were on low level sorties. The Prefect was entering low level and descending to 500ft, the Tutor pilot was already established on their return to base leg following a land-away. Both aircraft pilots were in receipt of an ATC service however, the Prefect was being downgraded [from a Traffic Service] to a Basic Service at times due to radar cover, and the Tutor pilot had only received a Traffic Information call some minutes previous to the event. The Tutor pilot additionally received an alert from their TAS but they were not sure of the best way to avoid, therefore waited to get visual before taking action. In the moments prior to the Airprox, the Prefect pilot received a late alert from their [compatible EC equipment], and the Tutor pilot became visual and passed to the rear of the Prefect.

Findings in addition to those of the investigation carried out by the Tutor operator include:

- The Prefect pilot received a late [compatible EC equipment] alert, and was unable to take any action. The Tutor pilot was aware of an aircraft in the vicinity via ATC and their TAS but waited to get visual before taking the avoiding action of passing behind the aircraft.
- ATC surveillance coverage in this area has limitations. The Tutor was displayed as a primary only contact at the time of the event, although it was possible to provide a service to the aircraft's pilot. The service provided to the Prefect pilot was at times downgraded by Cranwell ATC to a Basic Service and from the RT recording, no Traffic Information was received from ATC of the Tutor's presence which suggests that it was not detected by the Cranwell Watchman. **Observation:** Improvements to the ATC provision in Lincolnshire are planned but it is not possible to say if this will improve service and detection in this area.

When checking the sorties post-flight in CADS, it appears that neither crew accepted the conflicts shown on screen. This does not necessarily mean that they were not aware of those conflicts, indeed the Duty Authoriser supports the crew's recollection that other aircraft were posing a conflict on that sortie. This process/knowledge gap will be addressed in the interim training solution mentioned under the findings and recommendations above. A warning was not triggered by CADS despite overlapping route lozenges. This is now understood to be due to a 2min planned overlap allowance on CADS and crews are being briefed to not rely on the automatic confliction alerts.

Whilst deemed appropriate by [the Tutor training organisation], the return leg route was updated and run for conflictions by another student. This differs from [the Prefect training organisation] SOP which normally requires a call to the Duty Authoriser to re-run the route. Additionally, the Tutor QFI states that to their recollection that there were no conflicts on the return leg, but looking at the historic CADS data, there were 2 conflicts, none of which were acknowledged on CADS. This has been passed to the [Tutor training organisation] for their consideration.

The Prefect training organisation DDH/AM commented that:

Loss of safe separation (LoSS) leading to MAC remains the highest risk in the context of Prefect operations. Unsurprisingly, considerable effort has been applied to assessing and developing a range of barriers to LoSS. There is currently no means of delivering assured deconfliction of air activity either within the MOD or more widely in the context of combined military and civil air activity. However, the CADS tool does exist to support MOD operators. This provides a degree of awareness to crews during their pre-sortie preparation with respect to other military air activity. However, it falls well short of being a panacea for deconfliction. It provides 'conflicts' based on pre-set criteria including track, altitude and timing and presents them as lozenges on individual track lines and in list format on-screen. In this case, planned timings for both the Prefect and Tutor fell outside the pre-set, 2 minute criteria for alerting via the lozenge display. However, noting the significant likelihood of timing deviations in excess of 2 minutes, it remains incumbent on crews to look wider than the pre-set deconfliction criteria; this requirement has been included in current work to develop a formal MFTS training package for use of CADS.

Among the barriers to LoSS, aids to lookout include provision of a Traffic Service, use of TAS and use of [other compatible EC equipment]. In this instance, the Prefect crew was operating at the base of radar cover and at the time of the Airprox, neither aircraft was reliably visible on either Primary or Secondary radar return from the perspective of the Cranwell controller. Meanwhile, the Wittering controller did have better Situational Awareness and was able to provide requisite warning to the Tutor crew. Over the past few years there have been multiple attempts to rationalise the provision of an ATS to crews based on operating area and departure airfield; these have proved unsuccessful for multiple reasons. The transition to a Terminal ATC Centre and Satellite unit may provide the opportunity to improve this allied to improvements in coverage, especially with regard to wide area multilateration for secondary radar coverage. They have tasked their Air Safety team to work with the aerodrome operator to ensure that any such opportunities are both understood, and grasped. Again, the Prefect TAS has proved unreliable in providing crews of warning in a dynamic scenario; efforts continue to improve TAS performance through update to the equipment, including the provision of ADS-B In capability. However, [other compatible EC equipment] has functioned as intended and alerted the crew, albeit late, to the proximity of the Tutor allowing visual acquisition though only after the Tutor had already initiated the necessary avoiding action.

Whilst the Tutor crew did not take earlier avoiding action based on ATC calls and TAS, it must be noted that these remain aids to lookout rather than pure means of collision avoidance. One option may have been for the Tutor crew to have asked for deconfliction advice but in the end they have used the full suite of Traffic Service, TAS and [other compatible EC equipment] to get 'eyes on' and take avoiding action by turning behind the Prefect.

Weaknesses in the use of CADS pre-sortie, known weaknesses in the provision of Traffic Service and known weaknesses in aircraft equipment have resulted in late visual acquisition and avoiding action. Work is in hand to improve the efficacy of CADS usage and TAS and to understand the

opportunities afforded by MARSHALL.<sup>2</sup> That said, the barriers did function sufficiently well to prevent the LoSS deteriorating to MAC.

### Military ATM

The Wittering Radar controller had taken over the control position 10min prior to the Airprox with the Tutor pilot already in receipt of a Traffic Service. The controller ascertained that the Tutor pilots' intentions were to conduct a low-level NAVEX to the north before returning to base. The SSR was intermittent although track ident was maintained throughout as the Tutor had a constant PSR return.

The Cranwell Departures controller was providing a service to a total of four aircraft at the time of the Airprox and although the initial intent was to hand the Prefect over to Waddington this did not occur as the Prefect tracked south and remained with Cranwell. The Prefect was operating low level and at the base of radar coverage which required a downgrade to a Basic Service from a Traffic Service on two separate occasions as the return disappeared from radar. The controller reported providing Traffic Information to the Prefect pilot when relevant however, although they recall seeing a Wittering squawk, they cannot recall whether Traffic Information was passed regarding the Tutor.

Figures 1-2 show the positions of the Tutor and the Prefect at relevant times during the Airprox. The screenshots are taken from a replay using the NATS Radars which are not utilised by either Wittering or Cranwell ATC, therefore, may not be entirely representative of the picture available to either controller.

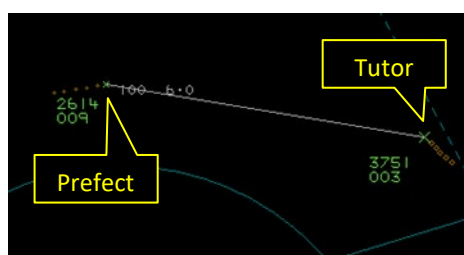


Figure 1 - Traffic Information is passed.

The Tutor pilot was passed Traffic Information “[Tutor c/s], Traffic NW 4 miles tracking East, indicating height 700ft descending” 20sec prior to Figure 1. The Tutor pilot reported that they were looking. No further Traffic Information was provided or requested. No further communication was made to the Tutor pilot until 5min 32sec after CPA.

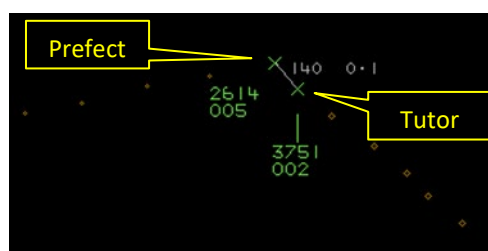


Figure 2 - CPA.

Separation was measured at 300ft vertically and 0.1NM horizontally.

Although the radar replay did not capture the exact time that Traffic Information was passed, assessing by the relative trail and position of the Tutor and the Prefect, Traffic Information was not as accurate as it could have been. Although Traffic Information was passed to the Tutor pilot by the Wittering controller it potentially could have been updated, considering the Tutor pilot did not report

<sup>2</sup> MARSHALL is a program of equipment upgrades and move toward the terminal ATC centre and associated satellite stations

visual considering the relative speed and tracks of both aircraft. After the Traffic Information was passed there was period of over 5min before the Wittering controller transmitted on RT again and it is unknown from the investigation what the controller was doing in this time.

The Tutor pilot could have also requested an update on the Prefect's position especially as they were not visual with the Prefect following the Traffic Information, TAS Traffic Advisory and [other compatible EC equipment] indications.

The tape transcript conducted by Cranwell ATC did not cover the period of the Airprox and, due to the lack recollection from the Cranwell Departures controller, it is unclear whether any Traffic Information was passed. However, the Cranwell Departures controller did note that the Prefect had been dropping in and out of cover. It is possible that the Tutor was not displaying on radar at the time of the Airprox therefore, the controller would have been unable to pass Traffic Information.

Both the Tutor and Prefect were operating towards the base of radar coverage for both controllers, however it is unknown if the Traffic Service had been reduced due to the limits of surveillance coverage which should trigger a need for a greater lookout by the pilots. The initial reported time and subsequent updated time of the Airprox was 20min and 5min different from the actual time of the Airprox which could explain the lack of a sufficient tape transcript from Cranwell ATC. Although an independent DASOR did not get raised by Cranwell ATC until around one month after the Airprox, the initial controller comments were added to the Prefect DASOR six days after the Airprox.

## Comments

### HQ Air Command

A worse incident was ultimately mitigated by See and Avoid; the sighting of the Prefect allowed the Tutor pilot to take avoiding action. Aids to enabling this visual acquisition were TAS and ATC, however, weaknesses in both lead to a late sighting by the Tutor and an effective non-sighting by the Prefect until after avoiding action had been taken by the Tutor. Whilst TAS is a very useful tool in increasing situational awareness with regards to other airspace users, the system may not alert when expected; aerial shielding and geometry of the aircrafts' flight paths in this instance may have hindered this for the Prefect. Efforts continue to improve TAS performance through equipment updates and the provision of ADS-B capability. The Traffic Information called to the Tutor pilot and their TAS alert alerted the Tutor crew to the Prefect's presence, although it was difficult to acquire them visually early. Operating on different frequencies in the same airspace did not assist either pilot; transition to a Lincolnshire TATCC<sup>3</sup> through Program MARSHALL may aid in the future in this relatively busy aviation area. The use of CADS by both crews was looked into by both investigations; whilst a useful awareness tool, users must be mindful of its limitations. It is good to see that a standardised training package and SOPs for CADS use is being looked into.

### UKAB Secretariat

The Tutor and Prefect 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>4</sup> If the incident geometry is considered as converging then the Prefect pilot was required to give way to the Tutor.<sup>5</sup>

## Summary

An Airprox was reported when a Tutor and a Prefect flew into proximity 2NM south of Bourne at 1410Z on Tuesday 9<sup>th</sup> November 2021. Both pilots were operating under VFR in VMC, and the Tutor pilot in receipt of a Traffic Service from Wittering and the Prefect pilot in receipt of a Traffic Service from Cranwell.

<sup>3</sup> Terminal air-traffic control centre.

<sup>4</sup> MAA RA 2307 paragraphs 1 and 2.

<sup>5</sup> MAA RA 2307 paragraph 12.

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

Information available consisted of reports from both pilots, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate operating authorities. Relevant contributory factors mentioned during the Board's discussions are highlighted within the text in bold, with the numbers referring to the Contributory Factors table displayed in Part C.

The Board first considered the actions of the Tutor pilot and were encouraged by the awareness shown regarding the need to keep the timings within CADS as accurate as possible however, members did note the operating organisation's comments regarding training on its use (**CF2**) and agreed that the use of CADS had been sub-optimal (**CF3**). Both of the pieces of EC equipment that had been carried on the Tutor had alerted the pilot to the presence of the Prefect (**CF7**) and members noted that the Tutor pilot had not taken any action as a result (**CF4**) and, although they had been aware of the traffic, they had continued toward it (**CF5**). A GA pilot member commented that it can be advantageous to manoeuvre or weave on receipt of an alert from EC equipment as this enables the pilot to lookout in previously obscured areas, changes the profile of their own aircraft making it more visible to others and may even "break" the constant relative bearing reducing the risk of collision.

Next, the Board considered the actions of the Prefect pilot and noted that although the same EC equipment had been carried as had been on the Tutor, their recollection had been that only one had generated an alert (**CF8**) and that that had been received late and, as such, the Prefect pilot had had only late awareness of the presence of the Tutor (**CF6**). The Board discussed that the Prefect pilot had reported that at the point at which they had become visual with the Tutor they felt that no avoiding action had been required however, members agreed that this had been after the Tutor pilot had taken action to avoid (**CF9**).

The Board then discussed the ATC involvement in this event and the Military ATC member stated that, as this event had happened at low-level, it would have been a difficult situation for both controlling agencies and that had been reflected in the fact that the service provided by the Cranwell controller had been downgraded on two occasions. Members also discussed that Wittering Zone does not provide a LARS service and so it had been reasonable for the Prefect pilot to have remained with Cranwell Departures. Members noted that the Military ATC investigation had stated that the Traffic Information that had been given to the Prefect pilot by Cranwell Departures had not been as accurate as it could have been (**CF1**).

Finally, the Board considered the risk involved in this Airprox. The pilots of both of the aircraft had been in receipt of a Traffic Service and both had had prior awareness of the presence of the other aircraft, albeit late for the Prefect pilot. The Tutor pilot had become visual with the Prefect in time to enable effective avoiding action to have been taken and, as such, members were satisfied that there had been no risk of collision, although safety had been degraded. Consequently, the Board assigned a Risk Category C to this event.

## **PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK**

### Contributory Factors:

2021227				
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
<b>Ground Elements</b>				
<b>• Situational Awareness and Action</b>				
1	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
<b>Flight Elements</b>				
<b>• Regulations, Processes, Procedures and Compliance</b>				
2	Organisational	• Flight Operations Documentation and Publications	Flight Operations Documentation and Publications	Inadequate regulations or procedures
<b>• Tactical Planning and Execution</b>				



3	Organisational	• Flight Planning Information Sources	An event involving incorrect flight planning sources during the preparation for a flight.	
4	Human Factors	• Insufficient Decision/Plan	Events involving flight crew not making a sufficiently detailed decision or plan to meet the needs of the situation	Inadequate plan adaption
• Situational Awareness of the Conflicting Aircraft and Action				
5	Human Factors	• Lack of Action	Events involving flight crew not taking any action at all when they should have done so	Pilot flew close enough to cause concern despite Situational Awareness
6	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late or only generic, Situational Awareness
• Electronic Warning System Operation and Compliance				
7	Contextual	• Other warning system operation	An event involving a genuine warning from an airborne system other than TCAS.	
8	Human Factors	• Response to Warning System	An event involving the incorrect response of flight crew following the operation of an aircraft warning system	CWS misinterpreted, not optimally actioned or CWS alert expected but none reported
• See and Avoid				
9	Human Factors	• Monitoring of Other Aircraft	Events involving flight crew not fully monitoring another aircraft	Non-sighting or effectively a non-sighting by one or both pilots

Degree of Risk: C

### Safety Barrier Assessment<sup>6</sup>

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

#### **Flight Elements:**

**Regulations, Processes, Procedures and Compliance** were assessed as **partially effective** because CADS procedures and training within the Tutor operating group had been found, by their own investigation, to be requiring improvement.

**Tactical Planning and Execution** was assessed as **partially effective** because the Tutor pilot had not manoeuvred when they had first become aware of the Prefect, and because of the sub-optimal use of CADS pre-flight.

**Situational Awareness of the Conflicting Aircraft and Action** were assessed as **partially effective** because the Prefect pilot had only become aware of the presence of the Tutor at a late stage and, although the tutor pilot had been aware of the Prefect early, they had not manoeuvred to avoid it.

<sup>6</sup> The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).