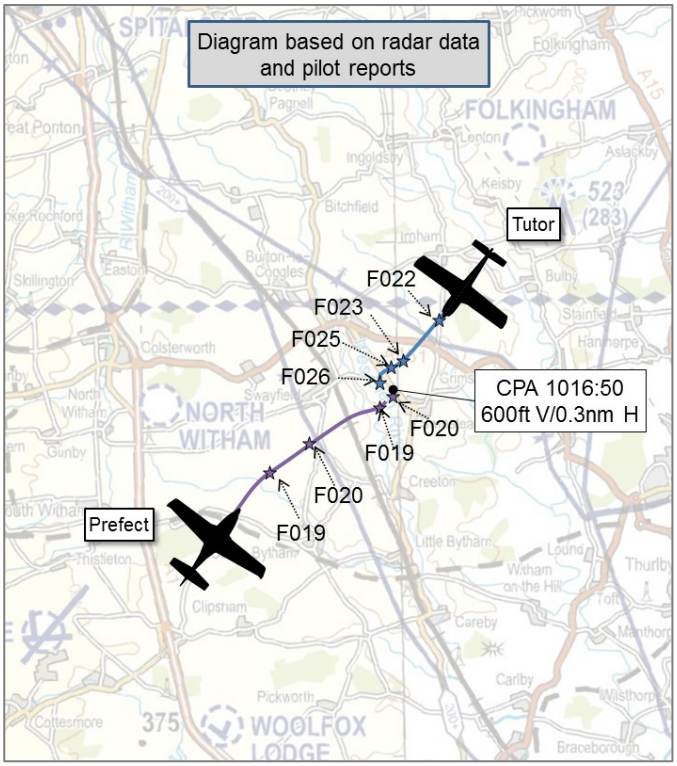
AIRPROX REPORT No 2019150

Date: 20 Jun 2019 Time: 1016Z Position: 5247N 00030W Location: 6nm NE of Cottesmore

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	Cranwell
Altitude/FL	F026	F020
Transponder	A, C, S	A, C, S
Reported		
Colours	White	Not reported
Lighting	Strobe, Nav	Not reported
Conditions	VMC	VMC
Visibility	>10km	Not reported
Altitude/FL	2000ft	1600ft
Altimeter	QNH (1005hPa)	Not reported
Heading	300°	Not reported
Speed	100kt	140kt
ACAS/TAS	TAS	TAS
Alert	TA	TA
Separation		
Reported	200ft V/0.25nm H	300ft V/0.25-0.5nm H
Recorded	600ft V/0.3nm H	



THE TUTOR PILOT reports that whilst he was conducting a test, ATC notified them of a Prefect in the vicinity climbing towards them. Prior to this they were aware of and had been in sight of at least one Prefect also conducting general handling. An ATC call notified them of an aircraft converging, presumed to be a Prefect and initially the straight-and-level track was maintained. After further ATC calls, the lesson was stopped with the converging aircraft indicating on TAS, but it couldn't be visually identified. A further ATC call stating that the aircraft was on the nose less than 200ft below coincided with a TAS alert indicating an aircraft at the same level; this also was the point at which the QFI student spotted the Prefect. The Tutor pilot applied full power and took avoiding action to the left, but the QFI student had eyes on and called for him to reverse the turn and not to descend. He then saw the aircraft pass close down the left-hand side at the same altitude. The Prefect was not seen to alter its track. An Airprox was declared on the frequency and further details given to the controller. The sortie was then continued without further incident.

The pilot assessed the risk of collision as 'High'.

THE PREFECT PILOT reports that he had just completed a PFL to Cottesmore disused airfield and was climbing away to the east with a low rate-of-climb because of traffic that he had been warned of by ATC and was visible on his TAS. ATC advised of a contact ahead and slightly above, and he stopped the climb. He then received a TA on TAS and manoeuvred the aircraft to clear the blind spots and improve conspicuity. At this point he saw a Tutor about ¼ to ½ a mile away and about 300ft above in his 10 o'clock. He did not need to take further avoidance.

The pilot assessed the risk of collision as 'Medium'.

THE WITTERING CONTROLLER reports that he was controlling during a period of high traffic density in the Lincolnshire AIAA in sectors 3 and 4. His workload at the time was high and he had been in

position for 15 mins. All of the tracks he was working were in receipt of a TS and were all conducting GH in the local area blocking various levels. The Tutor was conducting his sortie in sector 3 and operating to the North East of Kendrew Barracks (Cottesmore disused) by about 4nm and between 2000-7000ft AMSL. A Cranwell aircraft squawking 2615 had transited South-West-bound from Cranwell towards Melton Mast about 10mins before the Airprox was called and TI had been passed to all aircraft that it had conflicted with. A short period before the Airprox took place he had noticed what he believed to have been the same aircraft returning to Cranwell from Melton and climbing from low-level. Its track was putting it in confliction with the Tutor who was at about 2000ft AMSL, so he passed TI, initially using cardinals, and stating that it was a possible Prefect based on the squawk and speed of the track. The Tutor pilot reported that he wasn't visual. When the 2615 squawk was still climbing and getting closer, he called the traffic and again the pilot was still not visual. At this point he believed that the two aircraft had the potential to converge so, based on the Tutor's track, he reverted to clock code to call the traffic again. At this point he believes that the 2615 squawk had levelled 300ft below the Tutor and he passed TI to that effect. A few seconds later he saw the mode C of the 2615 squawk indicating that it was still climbing. He called the traffic again, inflecting that there was a high chance of collision/convergence of tracks. He believes that he indicated that the 2615 squawk was now 200ft below converging. At this point he remembers seeing the Tutor climb slightly. The climb allowed the Tutor pilot to gain visual with the 2615 squawk with a readout of 200ft separation on Mode C and less than a 1/4nm lateral separation. On receipt of the Airprox call from the Tutor, he asked the pilot to confirm the details when ready. He confirmed that it was a Prefect and that he was 2nm NE of Cottesmore. He then liaised directly with Cranwell Approach to inform them of the Airprox and received the information that the 2615 squawk was a Prefect.

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

THE CRANWELL CONTROLLER reports she was working 2 aircraft on one frequency. Both of these were operating south of Cranwell; her workload was low. The Prefect pilot was conducting a PFL into the old Cottesmore disused runway and, as the Prefect pilot was climbing away to the NE, she passed TI to him. The first call was '[Prefect C/S] Traffic north-east 4 miles tracking south-west indicating 700 feet above, possible Tutor'; she added the possible Tutor to the TI because it was squawking the published Wittering Tutor Ops squawk and, because they are very difficult to see, she deemed it appropriate to assist the pilot to help him gain visual contact with it. As the Prefect continued towards the traffic, she felt it constituted a definite hazard, she passed TI again stating '[Prefect C/S] previously called traffic now 12 o'clock 2 miles, opposite direction indicating 200 feet above, possible Tutor'. As the respective tracks did not change, she believed there to be a risk of collision between the two aircraft and again updated the TI '[Prefect C/S], traffic now 12 o'clock 1 mile, opposite direction, slightly above.' This was when the Prefect pilot reported visual and appeared to turn away to the right. She was informed by the Supervisor a short time later that the Tutor pilot had declared an Airprox with the Prefect on Wittering's frequency.

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

Factual Background

The weather at Wittering was recorded as follows:

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METAR EGXT 200950Z 25013KT 9999 FEW028 BKN060 17/11 Q1010 RMK BLU
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Analysis and Investigation

Military ATM

The Tutor was conducting a straight-and-level instructional sortie as part of the QFI course and was receiving a Traffic Service from Wittering Zone. The Wittering Controller reported their workload as high with five speaking units on frequency. The Prefect was conducting a solo general handing sortie and reported climbing away from a PFL at Kendrew Barracks in receipt of a Traffic Service

from Cranwell Zone. The Cranwell Controller reported their workload as low with two speaking units on frequency.

Figures 1-5 show the positions of Tutor (Squawk 3737) and Prefect (Squawk 2615) at relevant times in the lead up to and during the Airprox. The screen shots are taken from a replay using the Debden Radar, which is not utilised by either unit and therefore is not representative of the picture available to the controllers.

Following the Prefect conducting a PFL it began a slow climb heading North East. The Cranwell Zone Controller passed Traffic Information on the Tutor at 1015:36 (Figure 1). Separation at this point was 4.9nm and 700ft.

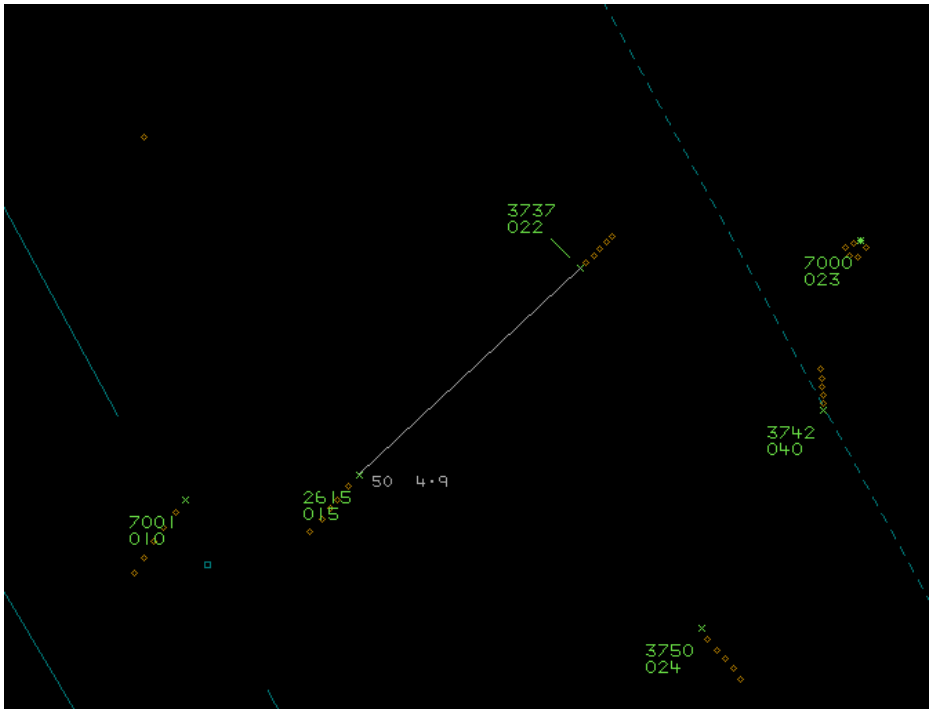


Figure 1

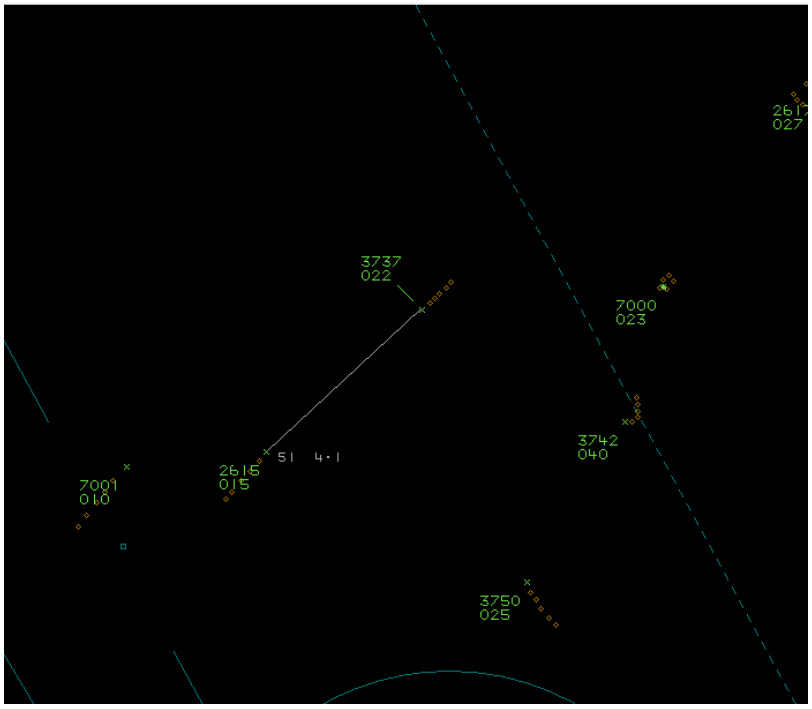


Figure 2

At 1015:48 (Figure 2), the Wittering Zone Controller passed Traffic Information to the Tutor about the Prefect, to which the Tutor reported not being visual with the conflicting traffic. The R/T up to this point had been reasonably congested with transmissions every 15 secs for the previous five minutes. Separation at this point was measured at 4.1nm and 700ft.

The Wittering Zone Controller updated Traffic Information to the Tutor at 1016:06 (Figure 3), and the Tutor again reported not being visual with the Prefect. The Cranwell Zone Controller updated the Traffic Information to the Prefect six seconds later and the Prefect reported not being visual with the conflicting traffic. Separation at this point had decreased to 2.4nm and 300ft.

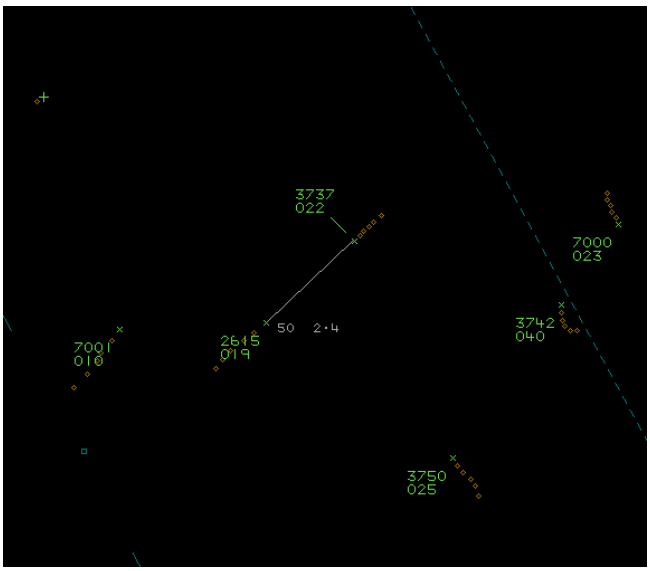


Figure 3

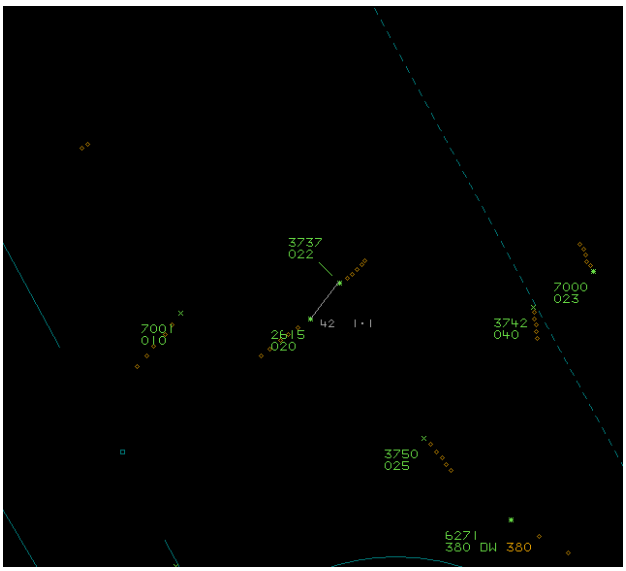


Figure 4

The Wittering Zone Controller passed further Traffic Information to the Tutor at 1016:21 and then for a fourth and final time at 1016:32 and this was concurrent with the Cranwell Zone Controller passing Traffic Information to the Prefect for a third time. The Prefect reported visual with the Tutor and noted in their report that they sighted the Tutor at a range of ¼-½nm, 300ft above and no avoiding action was necessary. The Tutor reported visual with the Prefect after this final piece of Traffic Information and immediately reported the Airprox. At the time of this Traffic Information, separation was 1.1nm and 200ft (Figure 4).

CPA occurred at 1016:50 and was measured at 0.3nm and 600ft.

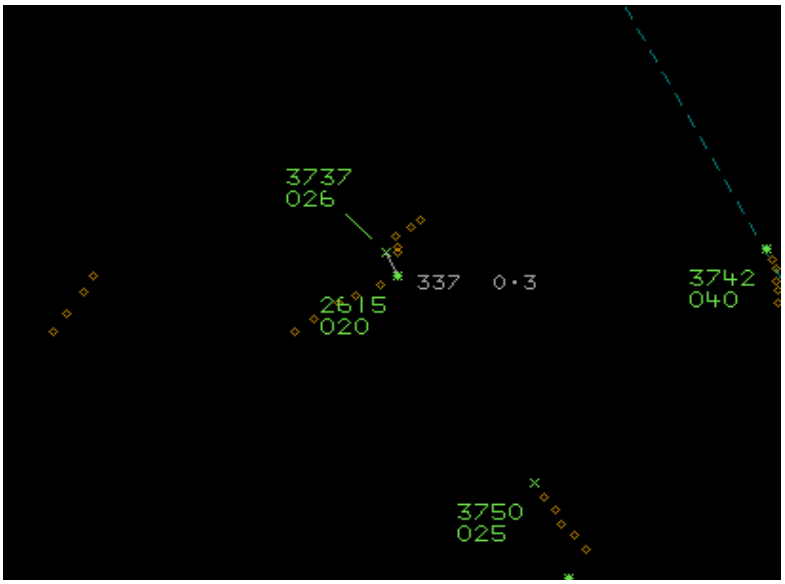


Figure 5 - CPA

The Wittering Zone Controller was working hard with multiple R/T calls in the minutes leading up to this incident. Notwithstanding this workload, Traffic Information was passed to the Tutor on 4 separate occasions. The Cranwell Zone Controller was not working hard and passed Traffic Information to the Prefect on three occasions. Given this evidence, both controllers discharged their duties appropriately.

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[1]. If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right[2].

Comments

HQ Air Command

A Flightlog Awareness Tool exists for shared SA between Wittering, Cranwell and Barkston Heath. This system informs aircrew of the numbers of RAF training aircraft planning to use a certain area and seeks to ensure that the airspace doesn't get too congested. It does not, however, provide information on the exact location that other aircraft may be encountered. CADS is rarely employed for sorties such as those undertaken in this Airprox due to their unpredictable nature. Both aircraft were in receipt of a Traffic Service, albeit from different agencies, and received numerous Traffic Information calls on each other. Each aircraft indicated on the other's TAS and each pilot was subsequently alerted as being in close proximity to the other.

The Prefect pilot opted to cease their climb in light of the information received and therefore separate vertically from the Tutor. Due to the TI/TAS information they received, the Tutor pilot initially perceived the Prefect to be "in my 1 to 2 o'clock" and "not converging" but the Prefect's fast rate of climb caused it to close far quicker than they expected, and they took avoiding action once the Prefect was sighted, shortly after their TAS alert. Clearly, had each aircraft manoeuvred sooner based on the information provided, then this Airprox would have been far less likely to have occurred, if at all. This Airprox highlights the requirement to use all the barriers to MAC to full effect.

Since this Airprox, liaison between RAF Cranwell and Wittering has increased – specifically in relation to the area in which the Airprox occurred. Each unit has re-examined practices and confirmed that the way ATC services are currently being provided remains appropriate – citing that it would not be practicable for all aircraft operating in the same sector to be on the same frequency due to controller loading. As part of their investigation findings into this Airprox, the unit in question has stated that "Crews have been re-educated that persisting with a planned track into confliction should only be undertaken in extremis". Additional R/T calls are being considered in order to increase the SA of airspace users in this area. Prefect will soon be fitted with FLARM to further increase the likelihood of early warning of conflicting aircraft, including Tutor, which is already FLARM equipped.

Summary

An Airprox was reported when a Tutor and a Prefect flew into proximity 6nm NE of Cottesmore at 1016hrs on Thursday the 20th of June 2019. Both pilots were operating under VFR in VMC, the Tutor pilot in receipt of a Traffic Service from Wittering and the Prefect pilot in receipt of a Traffic Service from Cranwell.

[1] MAA RA 2307 paragraphs 1 and 2.
[2] MAA RA 2307 paragraph 13.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings and reports from the air traffic controller involved. 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 began by looking at the actions of the Air Traffic Controllers involved. Both controllers had passed good Traffic Information (TI) to the aircraft under their control and the members particularly commended the Wittering controller who continued to pass TI even though he had a high R/T workload. Given that both aircraft had been largely straight-and-level for some time, one member wondered why in some instances the TI had been passed as cardinals rather than clock-code. However, the aircraft receiving the TI had previously been manoeuvring and was likely to do so again and so it was accepted that the use of cardinals for TI was understandable in the circumstances.

Turning to the actions of the Prefect pilot, members noted that he had stopped his climb and manoeuvred to increase his lookout when he became aware of the conflicting aircraft through his TAS and the TI provided by the controller. However, some members felt that he could have done more to break the conflict geometry in the initial stages other than just continue on his course whilst endeavouring to gain visual contact with the other aircraft **(CF1, 3 & 4)**. When he did see the Tutor, it was climbing away and he perceived that the separation was such that he did not need to take any avoiding action **(CF1)**.

The Board noted that the Tutor pilot had initially believed that the confliction was not head-on and so he had continued his course **(CF3 & 4).** Similar to the Prefect pilot, members also felt that he had had enough information from his TAS and the TI to have done more to break the conflict at an earlier stage, although they acknowledged that his mental model may have been influenced by his TAS azimuth indications that appeared to show the Prefect to his right. The Tutor pilot also had a mental model of the conflicting aircraft being another Tutor, and it was this that had resulted in him being surprised by the rate of climb (ROC) of the other aircraft; a Prefect has a faster ROC than a Tutor. Ultimately, the Board felt that the Tutor pilot had reacted to the available situational awareness later than desirable, and had then unfortunately initiated his turn towards the Prefect before he had sighted it. Fortunately, the PNF had seen the Prefect just before and was able to instruct the pilot to reverse his turn as he carried out the emergency avoiding action **(CF2 & 5)**.

The Board agreed that both pilots had received suitable situational awareness from both internal and external sources, but had then both continued on track to try to gain visual contact with the conflicting aircraft, when they became visual the Tutor pilot felt they had to take avoiding action, although the Prefect pilot did not **CF3 & 4)**. The military Board member said that there has been a re-education drive to ensure pilots correctly use the information they receive from TAS and act on it, rather than using it to aid lookout and waiting for a visual identification of any conflicting aircraft. They have also reviewed the method of liaison between Wittering and Cranwell to try to prevent a recurrence and pass pertinent information quickly between the units.

Turning to the risk, members agreed that the level of SA both pilots received was greater than they required to carry out a suitable course of action to increase separation. However, the Tutor pilot increased the vertical by climbing and the aircraft were 600ft apart at CPA; whilst this was not normal operations and safety had been degraded there was no risk of collision, Risk Category C.

PART C: ASSESSMENT OF CONTRIBUTORY FACTOR(S) AND RISK

Contributory Factor(s):

	2019150		
CF	**Factor**	**Description**	**Amplification**
	Flight Elements		
	• Situational Awareness of the Conflicting Aircraft and Action		
1	Human Factors	• Lack of Action	Pilot flew close enough to cause concern despite Situational Awareness
2	Human Factors	• Interpretation of Automation or Flight Deck Information	Pilot was concerned by the proximity of the other aircraft
	• Electronic Warning System Operation and Compliance		
3	Contextual	• ACAS/TCAS TA	TCAS TA / CWS indication
4	Human Factors	• Interpretation of Automation or Flight Deck Information	CWS misinterpreted or not optimally actioned
	• See and Avoid		
5	Human Factors	• Monitoring of Other Aircraft	Late-sighting by one or both pilots

Degree of Risk: C.

Safety Barrier Assessment[3]

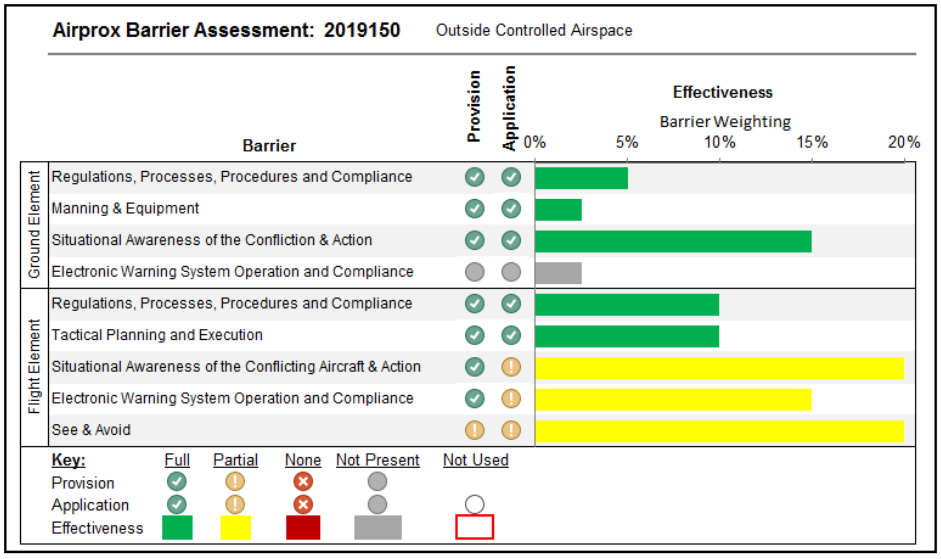
In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that the key factors had been that:

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because both pilots had sufficient SA but could have acted sooner.

Electronic Warning System Operation and Compliance were assessed as **partially effective** because both pilots had TA indications from their TAS but didn't act soon enough on the information.

See and Avoid were assessed as **partially effective** because the Tutor pilots only saw the Prefect late as they carried out emergency avoiding action. The Prefect pilot only saw the Tutor after it had climbed to avoid the Prefect.



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