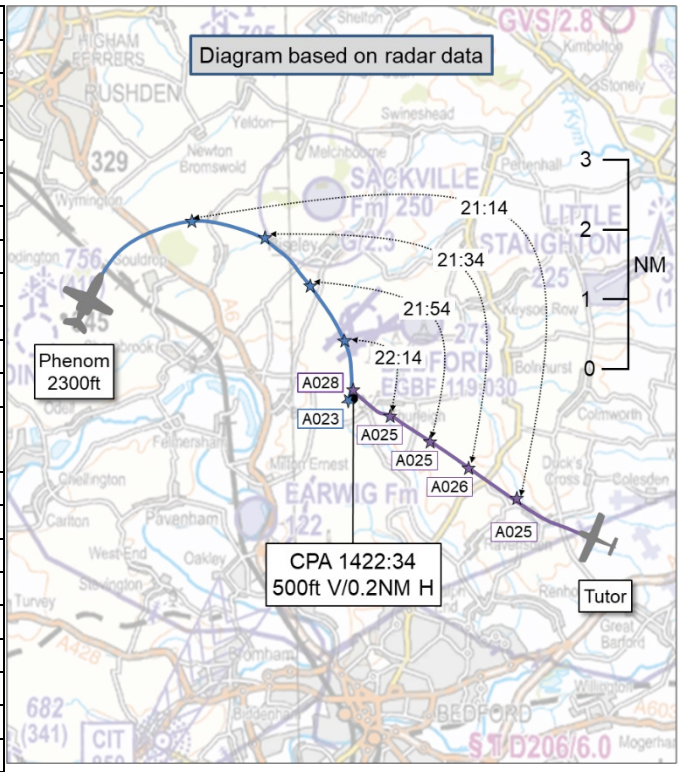
AIRPROX REPORT No 2024166

Date: 18 Jul 2024 Time: 1423Z Position: 5213N 00029W Location: ivo Bedford Airfield

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Phenom	Tutor
Operator	Civ Comm	HQ Air (Trg)
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	VFR
Service	Procedural	Traffic
Provider	Cranfield Tower	Wittering Zone
Altitude/FL	2300ft	2800ft
Transponder	A, C, S	A, C, S
Reported		
Colours	White/Gold	White
Lighting	Beacon, nav, strobe & landing.	Nav, strobes & landing light.
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	2500ft	2500ft
Altimeter	QNH (1019hPa)	RPS
Heading	195°	330°
Speed	170kt	120kt
ACAS/TAS	TCAS II	TAS
Alert	RA	Information
Separation at CPA		
Reported	200ft V/0m H	100ft V/0.5NM H
Recorded	500ft V/0.2NM H	



THE PHENOM 300 PILOT reports that, whilst conducting an instrument approach (RNP RW21 at Cranfield) and just turning inbound at the [intermediate] fix [TC21I], a TCAS contact was seen approaching from the opposite direction. The aircraft was acquired visually and a TCAS TA followed by a TCAS RA and the 'monitor vertical speed' command was actioned. The aircraft passed overhead and slightly above. Cranfield Tower was advised when they were clear of conflict and had tried to contact the other aircraft without success.

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

THE TUTOR PILOT reports that they were an experienced QFI on a medium level navigational exercise with a student pilot. The traffic had been reported to them by Wittering Zone and held on TAS, and they had [acquired the Phenom visually] at approximately 4NM, at a similar altitude. The landing light of the other aircraft showed no relative movement in their 2 o'clock position, signifying converging aircraft. They had waggled their wings to signal that they were visual with the other aircraft, but the other aircraft maintained heading and height and did not acknowledge their signal. Consequently they entered a 30° angle of bank gently climbing turn to the right whilst maintaining visual throughout to avoid the other aircraft, before reversing the turn to fit in behind them and return to their previous track. The closest point was in [the Phenom's] rear left-hand quarter as they turned back behind with no further risk of collision. The other aircraft (civilian Embraer Phenom) [pilot] made no attempt to deviate from their original track.

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

THE CRANFIELD CONTROLLER reports that the [Phenom pilot] reported a TCAS RA on frequency, believed by the [pilot] to be a PA28 crossing the instrument approach track for RW21. The position of

the [Phenom] was roughly 10NM, and the RA was acknowledged. No traffic matched their description on the approach frequency. They made a blind call to any traffic, though they received no response.

THE WITTERING CONTROLLER reports that they were the controller on Wittering Zone and on position between roughly 1400 and 1500. They were working [the Tutor] to the south of Wittering by 20NM under a Traffic Service. At roughly 1421 a conflictor, [the Phenom], was spotted (squawking 7417) indicating 2300ft on Mode C. They called the traffic to [the Tutor pilot] at 5NM indicating 300ft below their current level and at first did not receive a response from the pilot. At roughly 2-3NM they re-called the traffic as indicating a similar altitude, to which the pilot responded with 'visual'. At the point [the Tutor pilot] had reported visual, there was roughly 1.5NM and 300ft separation between the [Tutor and Phenom] observed on their radar screen. They then noticed that [the Tutor] had started to climb. At the point the tracks merged on the radar screen, there was 600-700ft separation indicated on Mode C. They did not recall an Airprox declared on frequency.

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

Factual Background

The weather at Cranfield and Wittering was recorded as follows:

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METAR EGTC 181420Z 18006KT 110V220 9999 FEW049 24/15 Q1019
METAR EGXT 181420Z 20011KT 9999 FEW048 25/14 Q1019 RMK BLU=
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The Cranfield RNP Approach Chart for RW21:

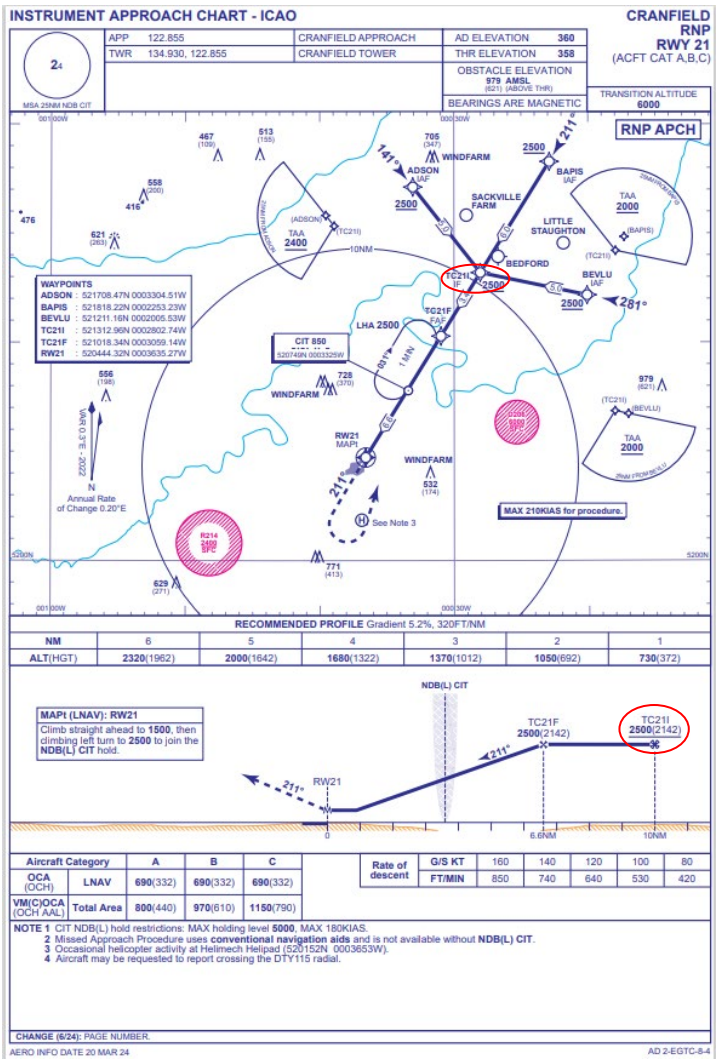


Figure 1 – the Intermediate Fix TC21I is depicted by the red ovals.

Analysis and Investigation

Cranfield Airport

The SATCO consulted R/T recordings, FPS and an ADS-B surveillance system under test in the Tower. The FPS and R/T recordings did not indicate any aircraft on frequency which would have been in conflict with [the Phenom], other than a DA42 in the hold which the flight crew of [the Phenom] were visual with.

The ADS-B replay indicated that the Airprox was likely with the [Tutor callsign]. Cranfield confirmed that the Phenom was in receipt of a Procedural Service with no radar at Cranfield.

Military ATM

No Airprox call was made on frequency at the time of the event and no information was passed after the event when a pilot had reached the point of making an Airprox decision. At the time of the event the RAF Marham ATCO was passing information to help the pilot become visual with a conflictor, which they did, and saw the aircraft move.

The bulk of Wittering ATC physically resides at RAF Marham on a separate desk of consoles in the Marham Tower, and they provide the Approach Radar Services to RAF Wittering aircraft and then the visual aspect of ATC passes back to RAF Wittering for circuits within their ATZ. In this case the Tutor was at distance using RAF Marham as their home Approach ATS.

At the time of the event a late confirmation by the pilot that they were visual only came after an appropriate initial warning at 5NM. The pilot was further informed at 2-3NM at which point they responded and visually sighted the conflictor before adjusting their flight path to increase safe separation. No Airprox was declared by either pilot on frequency and they did not contact Marham later, post sortie, to state that one had been filed. Consequently time passed by over a week before [Marham was able to raise a DASOR].

The investigation concluded that nothing was untoward from the ATC perspective as appropriate ATS was provided. Any delay in response was due to received communications flow between the Tutor [pilot] getting and acting on the information passed at 5NM and again at 2-3NM.

6FTS

An Airprox was filed [referencing] the Tutor but the Tutor crew was unaware that the Airprox had been declared. All aircraft were in class G airspace under ‘see and avoid’ rules. The Tutor [pilot] was aware of the Phenom’s presence via TAS at over 5NM and had visual contact at approximately 4NM and manoeuvred to maintain safe separation. The TAS and ‘see and avoid’ procedures had worked.

It was not known if the Phenom [pilot] saw the Tutor manoeuvring but maintained its course to remain predictable or did not visually acquire the Tutor and filed an Airprox as a result of a TCAS RA, as a result of the Tutor penetrating the TCAS bubble when it reversed its turn to remain visual as it passed behind the Phenom. The Tutor QFI did not believe that this was an Airprox or that safety margins were compromised so did not raise an Airprox report.

Local BM Investigation(s)

A local investigation was conducted by RAF Marham[1] following the event to identify the Air Traffic Service-related causal/aggravating factors. The outcome of the investigation was a Loss of Safe Separation between two non-co-operating aircraft however no Air Traffic Service-related factors were identified. The Wittering Zone controller provided relevant and timely Traffic Information that enabled the Tutor pilot to visually acquire the Phenom at a suitable range to enable adequate

[1] Wittering Radar is provided as part of the Eastern Terminal Air Traffic Control Centre located at RAF Marham.

confliction resolution. This Traffic Information was then subsequently updated as the aircraft profiles continued to present a conflict.

2 Gp BM Analysis

The actions of the Wittering Zone controller ensured that timely and relevant Traffic Information was provided to the Tutor pilot regarding the Phenom's position and profile. Given the nature of both the Tutor and Phenom's changing profiles in respect to heading, the controller identified the potential confliction at the earliest point available.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and both the Phenom and Tutor were identified using Mode S data. The Phenom was seen taking a procedural right turn towards the Cranfield Intermediate Fix TC21I for RW21 while maintaining a steady altitude of 2300ft. The Tutor was heading approximately northwest at about 2500ft and was seen to make a slight right turn with a 300ft height gain to 2800ft, taking them behind the Phenom. CPA was at 1422:34 with a separation of 0.2NM horizontally and 500ft vertically (Figure 2).

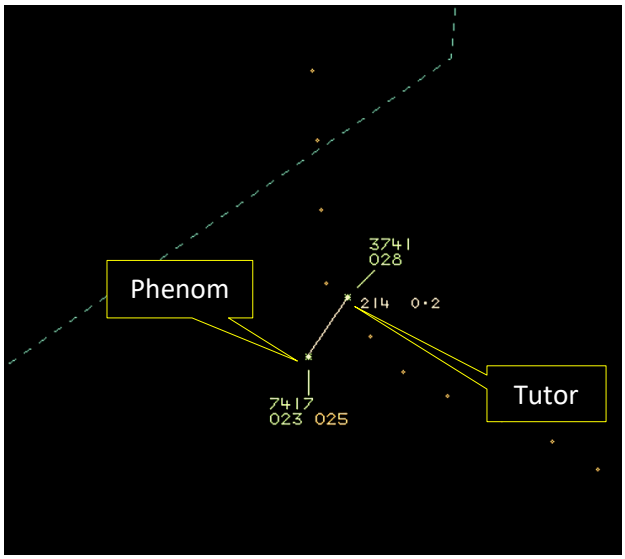


Figure 2 - CPA at 1422:34 Separation 0.2NM and 500ft

The Phenom and Tutor pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[2] If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right.[3] If the incident geometry is considered as converging then the Tutor pilot was required to give way to the Phenom.[4]

Comments

HQ Air Command

The Tutor was conducting a navigation exercise and was in receipt of an Air Traffic Service from Wittering. Notification of the traffic from Wittering, in conjunction with a TAS warning and visual lookout, provided sufficient barriers for the Tutor pilot to detect the Phenom and avoid it.

[2] (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.
[3] (UK) SERA.3210 Right-of-way (c)(1) Approaching head-on. MAA RA 2307 paragraph 13.
[4] (UK) SERA.3210 Right-of-way (c)(2) Converging. MAA RA 2307 paragraph 12.

AOPA

This Airprox again highlights the issues of RNP fixes being outside the warning areas of instrument approaches in Class G airspace and not being highlighted on VFR charts.

It is also worthy of note how effective appropriate electronic conspicuity is in alerting flight crew of possible conflicts giving them the time to take appropriate avoidance action.

Summary

An Airprox was reported when a Phenom and a Tutor flew into proximity in the vicinity of Bedford Airfield at 1423Z on Thursday 18th July 2024. The Phenom pilot was operating under IFR in VMC and in receipt a Procedural Service from Cranfield Tower and the Tutor pilot was operating under VFR in VMC in receipt of a Traffic Service from Wittering Zone.

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 looked at the actions of the Phenom pilot who had become concerned about the proximity of an aircraft that had been the subject of a TCAS RA. The Board agreed that although the pilot had not received any Traffic Information from ATC on the Tutor, they had received information and a TA from their onboard TCAS, and had correctly followed the RA to 'monitor vertical speed'.

In consideration of how the Phenom pilot might have been better served, the Board wondered if there was anything that the controllers could have improved upon and members agreed that the Cranfield controller had not been able to provide information on traffic both unseen and unknown to them. The Board further agreed that the controller, who had previously had no situational awareness of the Tutor traffic, had made efforts to contact them.

Turning their attentions to the actions of the Tutor pilot, the Board noted that although the pilot had seemingly missed the first ATC call alerting them to the conflicting Phenom traffic at 5NM, they had responded to a subsequent call and had been monitoring the traffic on their onboard TAS. The Board agreed that the Tutor pilot had formed a good mental picture and, on sighting the Phenom, had been fully alert to adequately manoeuvre above and behind the Phenom's track. Some members, in their discussions regarding the Tutor pilot's planning, wondered if the Tutor pilot might have considered avoiding an area known to have an approach profile into Cranfield or to call Cranfield. However, it was agreed that the Tutor pilot had been better served by utilising a full Traffic Service from a radar-equipped controller.

Finally, turning their attention to Wittering Zone ATC, the Board acknowledged that they had fulfilled their obligations and passed Traffic Information to the Tutor pilot as soon as they had been alerted by their STCA equipment.

In conclusion, the Board agreed that due to the actions of both the Phenom pilot, who had followed their RA, and the Tutor pilot, who had assessed the proximity of known traffic in order to 'fit in behind them', normal safety standards and margins had pertained. Members were satisfied that there had been no risk of collision and assigned a Risk Category E to this event.

CF1. The Wittering Zone controller had received an STCA warning between the Tutor aircraft and the Phenom, and alerted the Tutor pilot.

CF2. The Phenom pilot had received a TCAS TA on the Tutor, followed by an RA.

CF3. The Tutor pilot's TAS had indicated the presence of the Phenom.

CF4. The Phenom pilot had been concerned about the proximity of the Tutor.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

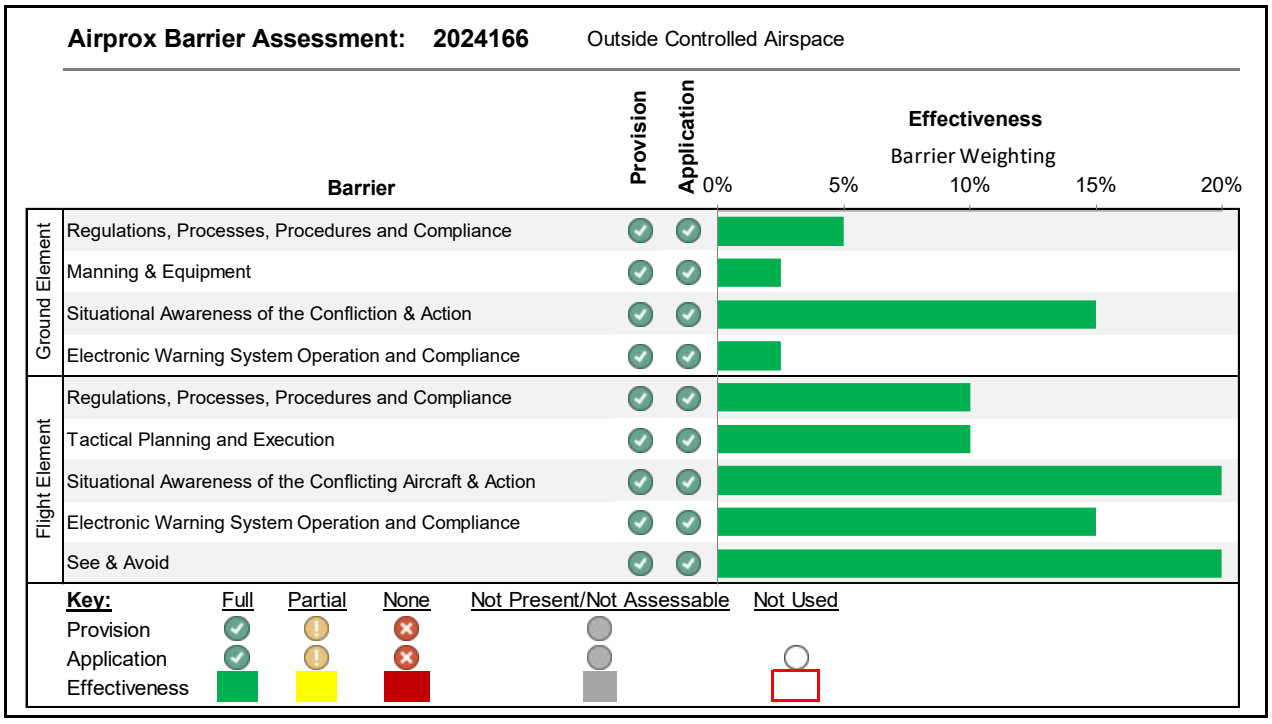
Contributory Factors:

	2024166			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Electronic Warning System Operation and Compliance			
1	Technical	• STCA Warning	An event involving the triggering of a Short Term Conflict Alert (STCA) Warning	
	Flight Elements			
	• Electronic Warning System Operation and Compliance			
2	Contextual	• ACAS/TCAS RA	An event involving a genuine airborne collision avoidance system/traffic alert and collision avoidance system resolution advisory warning triggered	
3	Contextual	• Other warning system operation	An event involving a genuine warning from an airborne system other than TCAS.	
	• See and Avoid			
4	Human Factors	• Perception of Visual Information	Events involving flight crew incorrectly perceiving a situation visually and then taking the wrong course of action or path of movement	Pilot was concerned by the proximity of the other aircraft

Degree of Risk: E.

Safety Barrier Assessment[5]

In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that all ground and flight elements' barriers had been effective.



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