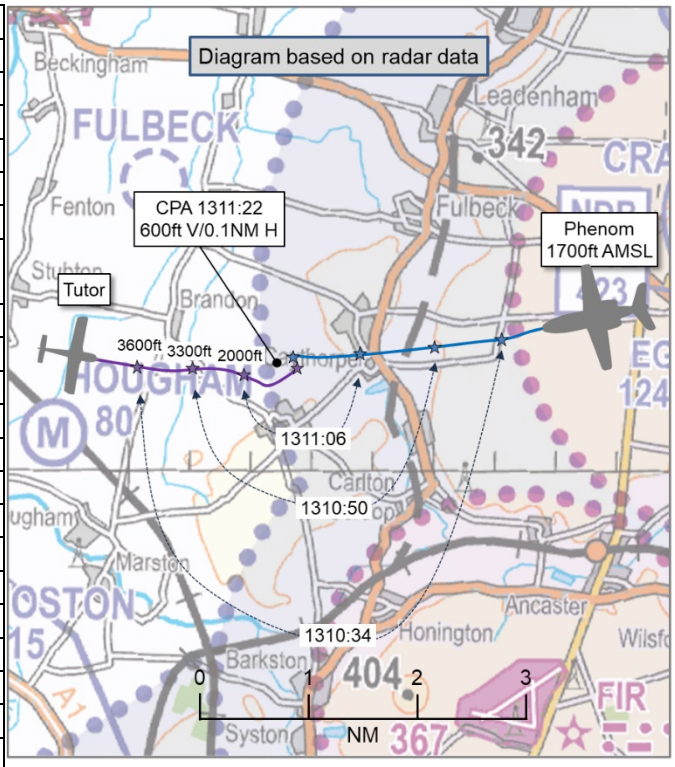
AIRPROX REPORT No 2024047

Date: 04 Apr 2024 Time: 1311Z Position: 5301N 00037W Location: 5NM west of RAF Cranwell

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Phenom	Tutor
Operator	HQ Air (Trg)	HQ Air (Trg)
Airspace	Cranwell MATZ	Cranwell MATZ
Class	G	G
Rules	IFR	VFR
Service	Deconfliction	Traffic
Provider	Cranwell Departures	Cranwell Departures
Altitude/FL	1700ft	1100ft
Transponder	A, C, S+	A, C, S
Reported		
Colours	White and blue	White
Lighting	Strobes, nav	Strobes
Conditions	VMC	VMC
Visibility	NR	>10km
Altitude/FL	1500ft	1500ft
Altimeter	NR	QFE (990hPa)
Heading	262°	110°
Speed	170kt	120kt
ACAS/TAS	TCAS II	TAS
Alert	TA	TA
Separation at CPA		
Reported	0ft V/NK H[1]	<200ft V/0.25NM H
Recorded	600ft V/0.1NM H	



THE PHENOM PILOT reports that they had been the student in the LHS as handling pilot with the QFI in the RHS. Following an asymmetric ILS to low approach and depart, they had been given a climb-out instruction of MID1 with a height restriction of 1500ft. The student pilot briefed to carry out asymmetric flight until 1500ft before resuming symmetric flight. A TCAS contact was identified on the approach lane with vertical separation on the departure lane, considering the climb-out restriction. The QFI switched UHF ATC radio frequencies, listening-in to Cranwell Departures where a transmission had been taking place. On its completion, the Phenom pilot checked in with ATC, requesting a Traffic Service. Cloud was observed ahead but VMC satisfied at that stage. As the aircraft levelled off at 1500ft, the QFI directed the student to resume symmetric flight. The TCAS contact was observed to be at their 12 o'clock position on the MFD, descending at 800ft above. On looking outside, the cloud had been approaching and they were not visual with the TCAS contact. The QFI observed the student as PF resuming symmetric thrust using the correct techniques and a scan of the MFD showed a yellow TCAS traffic indication at 12 o'clock with 400ft above and descending indication. The QFI requested a Deconfliction Service with ATC as the cloud observed ahead and above no longer satisfied VMC. 'Traffic Traffic' aural warning occurred during this very short period of high workload. On scanning the MFD again, a yellow TCAS indication had been about to co-locate with the aircraft indication at 0ft separation. The PF had disengaged the AP whilst the QFI had been clearing the right wing for a right turn. The PF broke right immediately at approximately 50° AOB. As the aircraft established its turn it entered cloud. ATC issued a 'turn right immediately' instruction under the Deconfliction Service whilst the aircraft was [already] establishing the right turn. Shortly after this had been read back, another aircraft transmission was heard stating that it was visual with the Phenom. The Phenom pilot had then been cleared to climb and [they] elected to continue with the sortie.

[1] Derived from TCAS.

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

THE TUTOR PILOT reports that their recovery had been initiated from altitude 7000ft to RW26. They do not recall any mention on ATIS that the visual circuit had been closed; airfield colour state was reported as White. They therefore requested a visual recovery and were informed that the visual circuit was closed so offered to transfer to a radar recovery. The Departures controller was very helpful and stated that Cranwell was content for them to execute a visual recovery for a downwind join. At approximately 3000ft on the descent and on the approximate centreline, they had been informed that a Phenom was departing on a MID1. Cognisant that [their inbound track] had been close to the departure lane [for the Phenom] and had not wanted to be in it, they offered to 'accept radar vectors as required' and correspondingly expedited onto a southeasterly heading in a bid to position south of the centreline ASAP. They had also chosen to expedite their descent to ensure height separation as rapidly as possible as they had not been subject to a height restriction. They had maintained 'clear of cloud and in sight of the ground' throughout but had had to arrest their rate of descent and resume a more easterly heading to maintain VMC at circa 2000ft due to the SCT cloud. Shortly after this, and still in the VMC descent (at circa 1300ft), their TCAS [sic] issued a 'Traffic Alert' and they had seen the Phenom emerge from behind some of the aforementioned SCT cloud; it appeared to be approximately 0.25NM to the north and west [they recall] of their position, 100-200ft above their level and initiating a RH turn. The Tutor pilot informed ATC that they were visual and maintained visual contact thereafter. They switched to Tower and executed the downwind join and circuit without further incident.

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

THE CRANWELL DEPARTURES CONTROLLER reports that they had been the Departures controller with #3, #15 and VHF frequencies selected. The weather had deteriorated much quicker than the cross section had displayed on the morning brief, with Barkston Heath (BKH) having closed due to the bad weather. Cranwell (CWL) therefore had control of the BKH MATZ, and the visual circuit at CWL being closed for most of the day. They had 2 Tutor aircraft on #3 with a Phenom pre-noted that had been currently on PAR and the HELIMED on VHF. The Waddington (WAD) restriction was in place to facilitate their radar pattern, so the Phenom had been restricted to 1500ft on climb-out. Tutor 1 had been operating [between] 0ft and 8000ft 10NM to the north of Coningsby (CON) and Tutor 2 had been to the northwest of CWL by 10NM. The HELIMED had been north of Wittering (WIT) landing at Bourne. CWL APP received a call from CON DEPS asking for Traffic Information on Tutor 1 as they had had multiple northerly departures. The Cranwell Departures controller had been told to ask Tutor 1 pilot if they were continuing to track south. They replied ''affirm'' and asked if this [request] had been from CON. The Cranwell Departures controller replied ''affirm'' and asked if the Tutor 1 pilot could take up a north-westerly track to enable the CON departures. They obliged and provided a cloudbase report. The Cranwell Departures controller then informed the Tutor 1 pilot that D342A had gone HOT. The Tutor 2 pilot had then called asking for a downwind join. The Cranwell Departures controller replied with the short weather and stated the circuit was closed. CWL Radar SUP called CWL TWR SUP to ask if they could approve the downwind join which they did. The Cranwell Departures controller told the Tutor 2 pilot that their downwind join had now been approved. The HELIMED pilot called on VHF to report letting down. Tutor 2 had then been abeam CWL to the west by 7NM. The Cranwell Departures controller gave the Tutor 2 pilot the short weather again and told them there had been a Phenom released from CWL on MID1 departure climbing. The Tutor 2 pilot said that they were happy for instrument recovery, but the Cranwell Departures controller informed them that the downwind join had been approved by Tower, and they stated that they would provide a weather report on the circuit condition. The Cranwell Departures controller asked the Tutor 2 pilot to maintain a southeasterly track and that they were cleared through the BKH MATZ as there had been a Phenom released on MID1, (the Cranwell Departures controller noted that they had been unsure if they had told the Tutor pilot the Phenom had been restricted [to] 1500ft, however [they note that] the tape transcript will confirm). The Tutor 2 pilot stated that they were happy to take vectors. The Phenom pilot then called on climb-out, departing MID1 to 1500ft, Traffic Service. The Cranwell Departures controller had then identified the Phenom, applied a Traffic Service, and asked them to maintain 1500ft as there had been Tutor traffic [in their] 12 o'clock [travelling in the] opposite direction 1200ft feet above, descending. The Phenom pilot replied that they would be going to a Deconfliction Service; a few seconds later they had requested a Deconfliction Service. The Cranwell Departures controller gave them a Deconfliction Service and

avoiding action turn right immediately heading 360° as the previously called Tutor traffic had then been [to their] west, half a mile 200ft above. Tutor 2 appeared to have turned back towards the Phenom from their southeasterly track and had called visual with the Phenom. The Cranwell Departures controller had then to give further avoiding action to the Phenom as they had been heading for the WAD MATZ with D324A HOT and RAFAT on the boundary of D324A to the south. The Tutor pilot had been visual and sent to Tower. The Phenom pilot continued their sortie.

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

THE CRANWELL BANK SUPERVISOR reports that they had been the afternoon Cranwell (CWL) radar Supervisor on duty, with CWL/BKH (Barkston Heath) departures/zone and CWL/BKH approach staffed. The weather conditions had been changeable with cloud layers and showers that had reduced the colour code to GRN at times resulting in the visual circuit being closed.

Whilst monitoring the departures frequency, they had heard a Tutor pilot call for a visual recovery from the northwest. Knowing that the circuit had been closed, but [another] pilot had just done a weather check of the circuit, the Supervisor had called the CWL VCR Supervisor to request a downwind join for the Tutor. This had been approved with the VCR Supervisor stating that there had been a layer of light broken cloud at normal circuit height, but that it should have been ok for the Tutor as the downwind join is flown at 500ft QFE.

The Supervisor had been aware of the Phenom on PAR and its intention to depart on the MID1, but had been unaware of the 1500ft climb-out restriction in place as this had been instigated by the Approach controller. Having told the Departures controller that the downwind join had been approved for the Tutor recovery, which took some time as they had been busy controlling another Tutor to the northeast and in negotiations with Coningsby (CGY) Departures to deconflict their traffic, the Cranwell Supervisor had answered a call from CGY approach. That call had been requesting coordination with the Tutor to the northeast of CWL and a CGY inbound departing airways to the north of Waddington. That call had taken the Supervisor's attention away from the developing situation between the Tutor visual recovery and the departing Phenom. Having agreed coordination with CGY approach and passed the course of action onto the CWL Departures controller, they had turned their attention back to the Tutor downwind join. The Tutor pilot had been helpful and when Traffic Information had been passed to them on the departing Phenom they had stated that they would accept radar vectors to remain clear. The Departures controller did not give vectors but asked the Tutor pilot to remain on a southeasterly heading which would keep it clear of the climb-out lane. The departing Phenom had been in receipt of a Traffic Service whilst in the RTC and was expected to be on a Traffic Service on climb-out so no coordination had been required between them and the Tutor recovering VFR . The Supervisor had then witnessed the scenario stated in the report and had been happy with the Departures controller's actions in the situation that had developed.

As Cranwell Radar is displaced from Cranwell Airfield, CWL Radar has no warning of weather deteriorating or the circuit condition. The CWL Radar Supervisor's workload is already very high, recognised as one of the top hazards sent to Battlespace Management [headquarters] quarterly, but additional phone calls to the Cranwell Tower Supervisor to get accurate information on the weather and circuit condition to try and facilitate aircrew requests can reduce capacity and can become detrimental to the supervision they can provide.

SEQUENCE OF EVENTS

1308:12 Tutor pilot requested a downwind (DW) join.

- CWL visual circuit closed.
- TATCC Sup (whilst Deps was identifying the Tutor) called the CWL VCR Sup to request a D/W join on behalf of both, which was approved.

1308:50 Deps reiterated that the circuit was closed, however the VCR Sup had approved their D/W join.

- Tutor pilot stated that they would be happy with vectors for ease.

1310:19 Deps – Tutor *"[C/S], there has been a Phenom just being released. Climbing on runway track, currently indicting 2000ft below climbing. If you can take a south easterly track".*

- Tutor pilot was told that they had been cleared through the BKH MATZ.
- The southeasterly heading was anticipated to ensure satisfactory lateral separation.
- Position of traffic (Phenom-Tutor): 12 o'clock, ~5NM, indicating 1900ft below (on Mode C) climbing.

1310:36 Phenom pilot called climbing out, level at 1500ft.

1310:42 Deps immediately called the Tutor to the Phenom pilot, "*[C/S], Cranwell Departures, identified, depart MID1, Traffic Service, if you can maintain height 1500ft, there's traffic 12 o'clock, 2 miles, opposite direction, Tutor recovering visually to Cranwell. Indicating 1200ft above, descending."*

- This was the first point at which the Tutor pilot was aware that the Phenom's height had been restricted.
- The Phenom was height restricted initially against an extended radar pattern into Waddington. It was kept on for the Tutor that had been, at that time, manoeuvring 11NM close to the projected climb-out lane.

1311:01 Phenom pilot requested a Deconfliction Service

- Avoiding action immediately provided by Deps and Traffic Information updated. *"[C/S], roger, Deconfliction Service, avoiding action, turn right immediately heading 360°. Previously called traffic was left 11 o'clock, half mile, crossing right to left ahead, Tutor, indicating 200ft below, descending*".
- From the radar replay it appeared that the track the Tutor was on at this time would have kept it on a divergent path from the Phenom.

1311:11 Tutor began to turn back towards the Phenom.

- Separation between tracks ~<0.5NM laterally and 300 ft vertically
- The Tutor pilot was manoeuvring to remain VMC.
- As the Phenom pilot took the avoiding action the vertical separation had increased to 600ft and a gap laterally.
- The Phenom was simulated asymmetric, reducing the rate of turn and increasing the size of the turning circle.

1311:28 The Tutor pilot reported visual with the Phenom, avoiding, visual with the aerodrome and continuing with CWL Tower.

Factual Background

The weather at Cranwell was recorded as follows:

```
METAR EGYD 041250Z 26002KT 9999 FEW011 SCT020 OVC045 10/08 Q1002 NOSIG RMK WHT WHT=
```

Analysis and Investigation

Military ATM

An Airprox occurred on 4th April 24 at approximately 1315, approximately 5NM west of RAF Cranwell. The Phenom pilot had been conducting a routine training sortie departing RAF Cranwell on a MID1 departure profile in receipt of a Traffic Service from the Cranwell Departures controller. The Tutor pilot had been conducting a routine training sortie recovering visually to RAF Cranwell in receipt of a Traffic Service from the Cranwell Departures controller.

Utilising occurrence reports and information from the local investigation, outlined below are the key events that preceded the Airprox. Where available they are supported by screenshots to indicate the positions of the relevant aircraft at each stage. With the exception of the CPA image, the screenshots are taken from Unit Radar recordings and present the radar presentation of the aircraft available to both the controller and Supervisor. Separation data is derived from the NATS radar data.

During the period preceding the Airprox, the Cranwell Departures controller had been providing a Traffic Service to 2 Tutors and a Basic Service to a HeliMed [aircraft]. The Airprox Tutor pilot had been conducting general handling approximately 10NM northwest of RAF Cranwell whilst the additional Tutor had also been general handling but to the north of RAF Coningsby. The Phenom had been prenoted to the Cranwell Departures controller with the intention to depart via a MID1 profile on completion of its instrument approach to RAF Cranwell.

As per the standing agreement to facilitate the extended radar pattern for RAF Waddington, a climb-out restriction of not above 1500ft had been in place. This had been issued to the Phenom pilot as part of their MID1 departure clearance. Whilst the RAF Waddington extended radar pattern had then subsequently completed, the Cranwell Departures controller had elected to not remove the climb-out restriction for the Phenom due to the proximity of the Tutor to the departure lane.

Sequence of Events

At **1308:12**, the Tutor pilot reported complete and requested a downwind join for RAF Cranwell. The Cranwell Departures controller had provided the Tutor with the airfield information stating the closed nature of the visual circuit. Simultaneously, the Cranwell Radar Supervisor had called the Cranwell Aerodrome Supervisor to request permission for the downwind join, conscious of the closed visual circuit status preventing such a recovery. The request had been subsequently approved by the Cranwell Aerodrome Supervisor based on a recent weather report in the visual circuit.

At **1308:44**, the Cranwell Departures controller informed the Tutor pilot that a downwind join had been approved. The Tutor pilot acknowledged the approval but also signified their willingness to convert to a radar recovery if required. The Phenom had by then completed its instrument approach to RAF Cranwell and commenced the MID1 departure.

To facilitate a northerly departure from RAF Coningsby, Coningsby ATC contacted the Cranwell Radar Supervisor to ascertain the intentions of the additional Tutor under the control of the Cranwell Departures controller. This call had resulted in a prolonged exchange involving both the Cranwell Radar Supervisor and Cranwell Departures controller to agree an operating area that would have facilitated the RAF Coningsby departure.

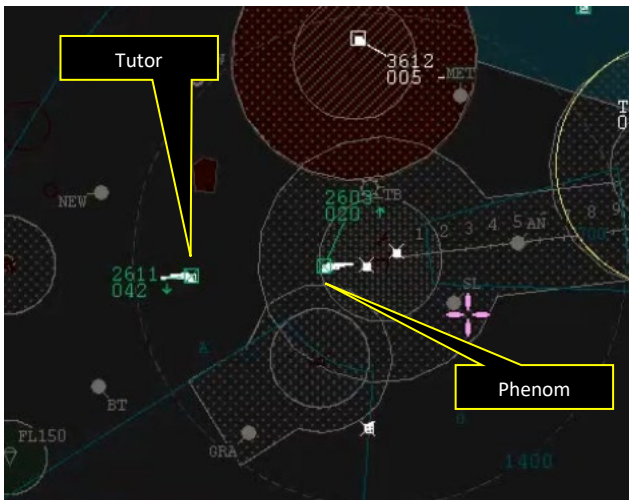


Figure 1 at 1310:19: Tutor pilot had been informed of the Phenom departure.
(Separation: 5.6NM and 2300ft)

At **1310:19**, the Cranwell Departures controller informed the Tutor pilot of the Phenom departing RAF Cranwell "*there has been a Phenom just being released. Climbing on runway track, currently indicating 2000ft below climbing. If you can take up a south easterly track*". The Tutor pilot acknowledged the Traffic Information and again signified their willingness to accept vectors. The Cranwell Departures controller authorised transit of the Barkston Heath ATZ but did not provide vectors based on the assumption that the previously requested southeasterly track would provide adequate lateral separation.

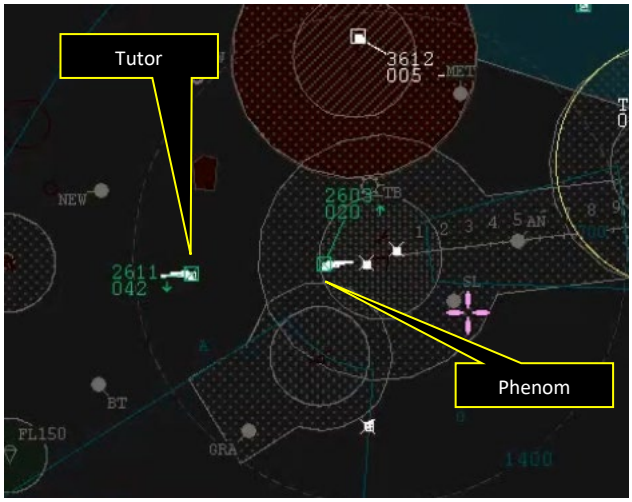


Figure 2 at 1310:36: The Phenom pilot on departure was provided with Traffic Information on the Tutor.
(Separation: 4.2NM and 1900ft)

At **1310:36**, the Phenom pilot had contacted the Cranwell Departures controller on MID1 departure from RAF Cranwell, reporting "*level 1500ft MID1, request Traffic Service*". The Cranwell Departures controller immediately identified the Phenom, applied a Traffic Service, restated the 1500ft Climb-out Restriction and provided Traffic Information on the Tutor "*there's traffic 12 o'clock, 2 miles, opposite direction, Tutor recovering visually to Cranwell. Indicating 1200ft above, descending*". The Phenom pilot had acknowledged the Traffic Information but informed the Cranwell Departures controller that they had been about to require a Deconfliction Service.

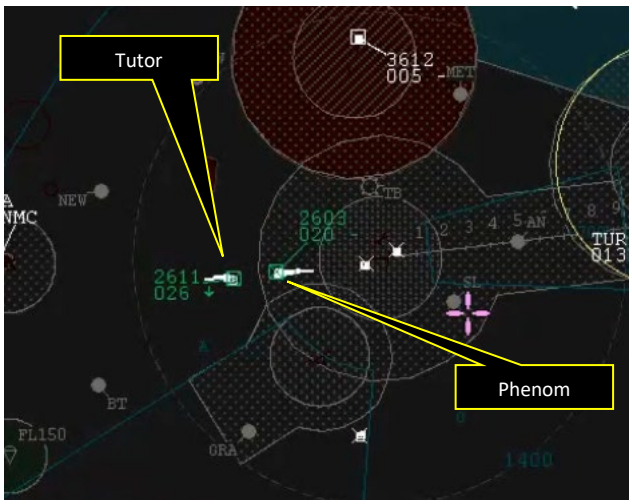


Figure 3 (1311:01): Phenom pilot requested Deconfliction Service.
(Separation: 2.1NM and 1000ft)

At **1311:01**, the Phenom pilot had requested the anticipated Deconfliction Service. The Cranwell Departures controller subsequently applied a Deconfliction Service and provided an avoiding action turn to deconflict from the Tutor - "*Deconfliction Service, avoiding action, turn right immediately heading 360°. Previously called traffic had been left 11 o'clock, half mile, crossing right-to-left ahead, Tutor, indicating 200ft below, descending*". The Phenom pilot acknowledged the avoiding action and initiated a turn to the north. The Tutor pilot reported visual with the Phenom and that they had been avoiding followed by transferring to Cranwell Tower.

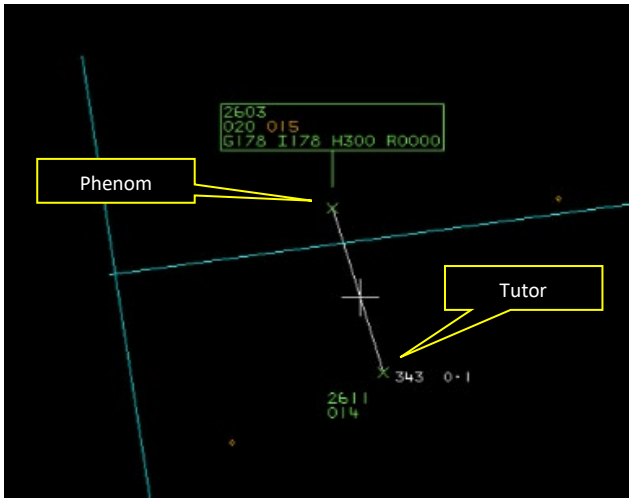


Figure 4: 1311:22 CPA.

CPA occurred at **1311:22** and was recorded as 0.1NM H and 600ft V separation.

Local BM Investigation(s)

The local investigation conducted by RAF Coningsby identified the event outcome as a loss of safe separation between two non-cooperating aircraft. Several Battlespace Management-related causal/aggravating factor were identified, with recommendations identified where suitable:

a. The forward-leaning actions by Cranwell Radar Supervisor to gain approval for the downwind join had altered the plan of the Cranwell Departures controller who had felt compelled to comply. This had been exacerbated as the Cranwell Radar Supervisor had been unaware of the climb-out restriction having still been imposed and therefore not having considered the Tutor pilot's visual recovery profile as a factor. Recommendation: Local review of climb-out restriction use and removal where possible.

b. The Tutor pilot had been unaware that the Phenom had been departing in accordance with a climb-out restriction, which in essence changed the standard pattern of traffic. The recovery profile of the Tutor had been based on achieving a descent below the departing Phenom.

c. The use of the downwind join had been iaw RAF Cranwell local procedures. However, the Tutor pilot had been required to remain VMC to continue the visual join; in doing so this had resulted in the recovery profile of the Tutor interacting with the MID1 departure profile of the Phenom. This interaction had been to a greater degree than the Cranwell Departures controller had been anticipating. Recommendation: Local review of downwind join use.

2 Gp BM Analysis

Conscious of the closed visual circuit preventing a downwind join, the Cranwell Radar Supervisor's actions to facilitate the downwind join through request had inevitably resulted in an amendment to the Cranwell Departures controller's mental model for the Tutor's recovery. Irrespective of the Cranwell Radar Supervisor having been unaware of the climb-out restriction, there had been multiple methods to deconflict the Tutor recovery from the Phenom departure.

Whilst the Cranwell Departures controller's selected model of a VFR Tutor recovery, with supporting information on the Phenom, was a viable option, it had relied upon the Tutor pilot having an accurate awareness of the Phenom's departure profile. Although a southeasterly track had been requested by the Cranwell Departures controller as the means of introducing lateral separation, ultimately the downwind join profile for the Tutor had required a crossing of the extended centreline. With the requirement to remain VMC and without any detailed Traffic Information regarding the Phenom's vertical position, the Tutor pilot's recovery profile had not provided sufficient lateral separation. Ultimately, as there had also been no established vertical separation between the recovery and departure profiles, it had resulted in the Airprox.

When considering the weather conditions and amended nature of both the Phenom departure and Tutor recovery, the Cranwell Departures controller should have given greater consideration to the application of radar vectors for the Tutor's recovery. On two occasions the Tutor pilot had signified their willingness to accept vectors which had potentially indicated their lack of situational awareness and consciousness of their positioning in relation to the departure lane. The provision of radar vectors could have ensured lateral and/or vertical separation had been achieved between the Tutor and Phenom, therefore negating the requirement for avoiding action when the Phenom pilot had upgraded from Traffic Service to Deconfliction Service.

Overall, whilst local procedure had been followed by all parties involved, the combination of events had resulted in a complex scenario that only the Cranwell Radar controller had complete situational awareness of. The application of positive control to achieve procedural separation would have resolved the complexity and most likely prevented the Airprox.

UKAB Secretariat

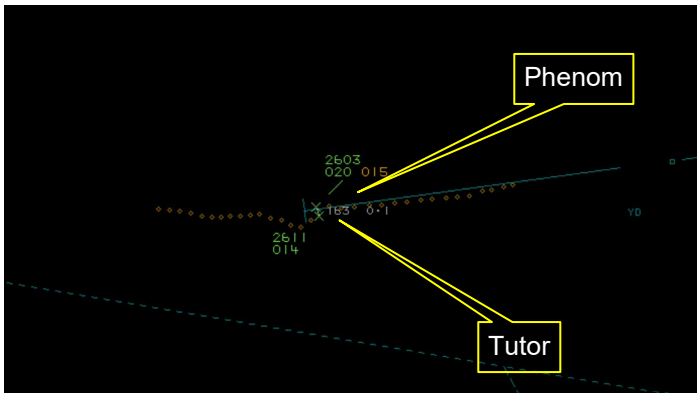


Figure 1: CPA 1311:22 600ft V/0.1NM H

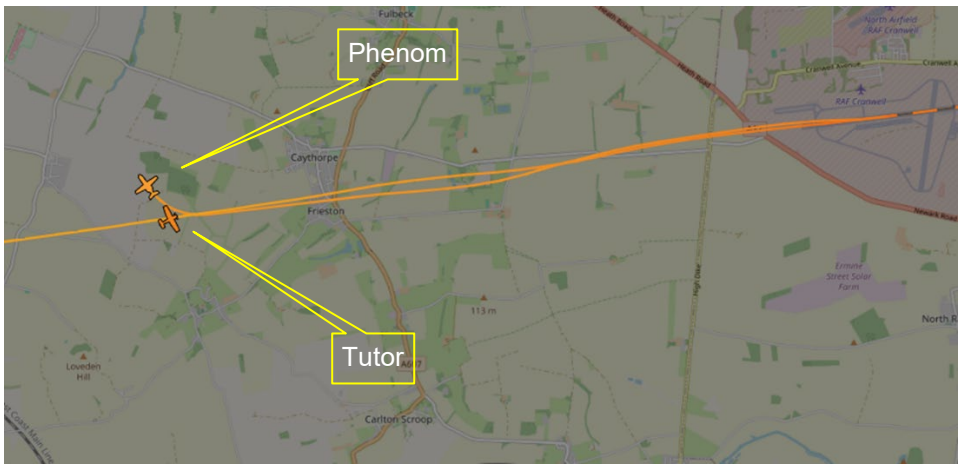


Figure 2: Post CPA - Phenom pilot's avoiding action.

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] An aircraft operated on or in the vicinity of an aerodrome shall conform with or avoid the pattern of traffic formed by other aircraft in operation.[4]

Comments

HQ Air Command

This Airprox was subject to a Local Investigation. The initial trigger for this Airprox had been at the point where the Tutor pilot had been permitted to carry out a visual recovery. Due to cloud, the Tutor pilot had been unable to both maintain VFR and lateral separation from the departure lane in accordance with the routeing stated in the Flying Order Book. The Tutor pilot's air picture had been incorrect as, without knowledge of the climb out restriction, they had expedited their descent expecting this to have built in vertical separation between them and the departing Phenom. Their inclination to take vectors and route around had been the correct one; had this been implemented, this near miss would have been averted. Neither the Phenom nor the Tutor pilots had been visual with each other and it had been only when TCAS prompted action by the Phenom crew that a near-miss had been averted. Since this Airprox, Tutor (and Prefect) aircraft are encouraged to conduct standard joins and departures at Cranwell vice downwind joins.

Summary

An Airprox was reported when a Phenom and a Tutor flew into proximity in the vicinity of Cranwell at 1311Z on Thursday 4th April 2024. Both pilots were operating under VFR in VMC, the Phenom pilot in receipt of a Deconfliction Service and the Tutor pilot in receipt of a Traffic Service, both from Cranwell Departures.

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 firstly discussed the actions of the Phenom pilot, noting that they had been practising asymmetric work with an instructor pilot. Leading up to the reported Airprox incident, they had initiated

[2] MAA RA 2307 paragraphs 1 and 2.
[3] MAA RA 2307 paragraph 13.
[4] MAA RA 2307 paragraph 17.

departure following a low approach, intending to remain asymmetric until reaching their height limited departure of 1500ft before then resuming symmetric flight. On their approach, the crew had identified a TCAS contact (**CF7**) on the departure lane which, with a climb-out restriction in place, had displayed sufficient vertical separation so the crew had continued their flight. On reaching 1500ft, the crew had switched frequency to Departures and had noted that the TCAS indication had now shown other traffic to be in their 12 o'clock with only 400ft vertical separation and descending. The Instructor pilot had requested a change from Traffic to a Deconfliction Service as the weather had reduced to below VMC limits and the other aircraft had been obscured from their view (**CF9**, **CF10**). At this point, the crew had received an aural warning of traffic and the TCAS indication had been close to co-locating with themselves and, being concerned that the opposing traffic had been too close (**CF6**), the Instructor pilot had cleared the right turn as the student pilot had disengaged the autopilot and turned hard right. Members felt that the crew had acted coherently and in a timely manner ensuring separation from the oncoming traffic.

Turning to the actions of the Tutor pilot, members accepted that the recovery path had been driven by a desire to remain clear of opposing traffic. They had noted the latest ATIS broadcast and that the visual circuit appeared to have been open, making their intention to join visually downwind sensible as it would also have put their flightpath to the south of the departure lane. They had selected their rate of descent based on their desire to be below departing traffic before they had reached the vicinity of the departure lane and had been in receipt of a Traffic Service but had not been made aware of the climb-out restriction imposed on the Phenom. The Board agreed, therefore, that their situational awareness of the outbound traffic had consequently been inaccurate (**CF5**). As they had descended, the pilot of the Tutor had alerted the controller to their willingness to accept vectors to remain clear of the Phenom but the controller had not issued any vectors to the Tutor pilot. The pilot had continued to expedite descent, maintaining VMC and had then received a TAS alert (**CF8**), visually acquiring the Phenom above them and to their left and executing a right-hand turn. The Tutor pilot had informed ATC that they were clear and happy to continue visually, switching at that point to the Tower frequency. Members noted that the Tutor pilot had maintained VMC and had on 2 occasions offered to take vectors to remain clear. The Board agreed that they had been aware of the issues associated with recovering against the stream and had done all possible to remain clear. Members felt that there had been no more that they could have done.

In considering the role of ATC in this event, members noted that the Departures controller had been covering 3 separate frequencies, and that the weather had deteriorated faster than forecast. There had been a number of aircraft on frequency, and a climb-out restriction had been in place to enable Waddington operations. On initial contact with the Tutor pilot, the Supervisor had responded to the request for a visual join at Cranwell by telephoning Cranwell Tower for approval, which had then been passed to the Tutor pilot. The Phenom pilot had been cleared for an asymmetric approach and departure under IFR whilst initially under a Traffic Service which had latterly, and at the request of the pilot, been converted to a Deconfliction Service. The Board noted that a number of opportunities to alert the Tutor pilot to the climb-out restriction for the Phenom had been missed (**CF1**), leading to inaccurate situational awareness for the Tutor pilot. As the Phenom and the Tutor had closed, there had been no directive control to resolve the conflict (**CF2**) which the members attributed to the workload and distraction of the Supervisor in their calls to surrounding units to coordinate traffic. This had been compounded by issuing a clearance for the Tutor to switch to a 'visual join left' rather than downwind which had allowed the Tutor to turn back towards the oncoming Phenom (**CF3**). Although this unit is equipped with a Short Term Conflict Alert system, it did not provide an alert to the controller (**CF4**), thus denying a significant barrier to Airprox in this case. The Board felt that the picture within the control room had been unclear, with distractions and inoperative equipment that had contributed to the Airprox.

When determining the risk of the Airprox, the Board considered the reports from both pilots, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate operating authorities; they noted the lack of information sharing regarding climb-out restrictions, and a rapidly changing weather pattern coincidental with a surge in surrounding traffic activity. Fortunately, both the Phenom and the Tutor had been equipped with electronic warning systems that had operated as expected and allowed the pilots to make informed judgement calls on their actions. Ultimately, the Phenom pilot had performed an avoidance manoeuvre that led members

to accept that although safety had been degraded, there had been no risk of collision and members awarded a Risk Category C to this event.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2024047			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Situational Awareness and Action			
1	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
2	Human Factors	• Conflict Resolution-Inadequate	An event involving the inadequate provision of conflict resolution	
3	Human Factors	• Traffic Management Information Provision	An event involving traffic management information provision	The ANS instructions contributed to the Airprox
	• Electronic Warning System Operation and Compliance			
4	Technical	• Conflict Alert System Failure	Conflict Alert System did not function as expected	The Conflict Alert system did not function or was not utilised in this situation
	Flight Elements			
	• Situational Awareness of the Conflicting Aircraft and Action			
5	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late, inaccurate or only generic, Situational Awareness
6	Human Factors	• Unnecessary Action	~~Events involving flight crew performing an action that was not required~~	Pilot was concerned by the proximity of the other aircraft
	• Electronic Warning System Operation and Compliance			
7	Contextual	• ACAS/TCAS TA	An event involving a genuine airborne collision avoidance system/traffic alert and collision avoidance system traffic advisory warning triggered	
8	Contextual	• Other warning system operation	An event involving a genuine warning from an airborne system other than TCAS.	
	• 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
10	Contextual	• Visual Impairment	Events involving impairment due to an inability to see properly	One or both aircraft were obscured from the other

Degree of Risk: C.

Safety Barrier Assessment[5]

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

Ground Elements:

Situational Awareness of the Confliction and Action were assessed as **ineffective** because the Cranwell controller did not pass information to the Tutor pilot that the Phenom had been subject to a climb-out restriction and had not then applied positive control to resolve the conflict.

Electronic Warning System Operation and Compliance were assessed as ineffective because the STCA did not alert to highlight the confliction between the Phenom and the Tutor.

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

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because the Tutor pilot had been unaware that the Phenom had been operating under a climbout restriction and the Phenom pilot had become concerned by the proximity (as displayed on their TCAS) of the Tutor.