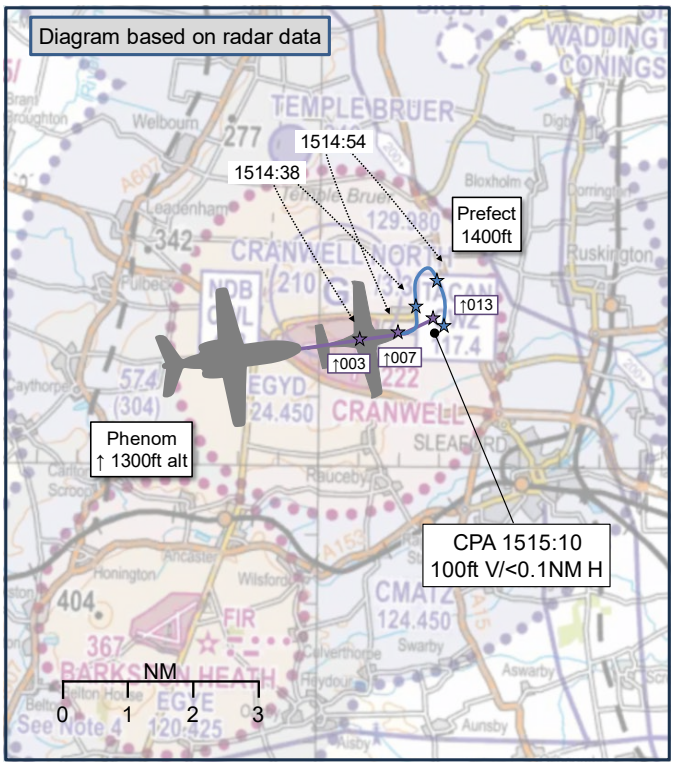
# AIRPROX REPORT No 2023182

Date: 16 Aug 2023 Time: 1515Z Position: 5302N 00026W Location: Cranwell

## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

| Recorded | Aircraft 1 | Aircraft 2 |
|---|---|---|
| Aircraft | Prefect | Phenom |
| Operator | HQ Air (Trg) | HQ Air (Trg) |
| Airspace | Cranwell ATZ | Cranwell ATZ |
| Class | G | G |
| Rules | VFR | VFR |
| Service | ACS | ACS |
| Provider | Cranwell Tower | Cranwell Tower |
| Altitude/FL | FL014 | FL010 |
| Transponder | A, C, S | A, C, S |
| **Reported** | | |
| Colours | White, Blue | Blue, White |
| Lighting | Strobes, Nav, Landing | HISLs |
| Conditions | VMC | VMC |
| Visibility | >10km | >10km |
| Altitude/FL | 1400ft | 1100ft |
| Altimeter | QFE | QFE (1013hPa) |
| Heading | 140° | 082° |
| Speed | 140kt | 170kt |
| ACAS/TAS | TAS | TCAS II |
| Alert | None[1] | RA |
| **Separation at CPA** | | |
| Reported | NK | 100ft V/100m H |
| Recorded | 100ft V/<0.1NM H | |




**THE PREFECT PILOT** reports that, following completion of the circuits, the aircraft had been cleared to depart on a non-standard, left-hand turn, squawk 2610 and contact departures on Stud 3. During the process of flying this clearance, when established in the left-hand turn, they were instructed to climb "Not above height 1400" due to traffic in the Coningsby instrument pattern. This was acknowledged and as the aircraft levelled at 1400ft whilst approaching a heading of approximately 360°, the departure clearance was changed to an 'End of Downwind Leg' departure due to the same traffic. The turn was then reversed to the right, maintaining 1400ft, turning cross-wind to position downwind as directed. During this turn ATC asked if they were visual with the Phenom traffic, to which they responded "negative" but at this point a Phenom shadow was seen tracking under the aircraft. As the wings were rolled level "Airprox" was heard on the radio followed by "TCAS RA" from the same callsign and the Phenom was spotted to the left of the aircraft approximately 200-300ft below, departing on the extended runway centreline. The position of the identified aircraft was not deemed to be a conflict at that time and the sortie was continued as planned.

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

**THE PHENOM PILOT** reports that during a PAR to RW08, at approximately 3NM, they were directed by Cranwell Talkdown to contact Cranwell Tower and continue visually due to 3 aircraft in the visual circuit. On frequency change, they were informed of a Prefect going around at circuit height, which they acquired visually. A "continue" instruction was issued on check-in due to another Prefect ahead on the runway to touch-and-go. They directed the trainee to continue on instruments for the test whilst they maintained visual contact with the traffic. None of the aircraft were perceived to be a threat and they were visual throughout the approach. At approximately 400ft they were cleared to touch-and-go. Their extant departure clearance, provided by the radar controller, was to depart MID 2 not above 1400ft,

[1] Reported by the pilot as none, but subsequent investigation found that the TAS had alerted but had not been heard.

owing to the active RAF Coningsby radar pattern. A normal visual touch-and-go took place, the Instructor, as the IRE, was in the right-hand pilot seat. The circuit deadside was to the left, and the previously reported Prefect was due to depart to the north. Again, it did not appear to be a threat. On the runway they lost sight of the Prefect due to the limit of the windscreen but the departure lane was clear. On climb-out whilst still with Cranwell Tower, retracting aircraft services and accelerating to 180kts, at a height of approximately 1100ft they heard ATC call "Prefect [C/S] are you visual with the departing Phenom?". At the same time they saw a Prefect appear from the left-hand windscreen arch, converging left-to-right across the nose at a range of approximately 100m ahead in the 10 o'clock position, and 100ft above. The Instructor immediately took control and initiated a descent, simultaneously they transmitted "Cranwell [C/S] Airprox". At the same time they heard a TCAS RA "Descend, Descend" on the intercom which they also relayed to ATC . The TCAS RA was short-lived and post their initial reaction. Their visual acquisition and reaction overtook events. The Prefect crossed their path above. They believed that they bottomed out from the descent at approximately 900ft. They elected to depart the ATZ at 1000ft to anchor east abeam Sleaford whilst they reviewed the incident and decided on a course of action, they informed ATC of their intention to remain clear until ready to recover to the airfield and curtail the sortie. They were not in the correct frame of mind to continue the test profile. With ATC confirmation that there was then only one aircraft in the visual circuit, and for RAF Barkston Heath avoidance, they requested a downwind join to land back at RAF Cranwell. The circuit and subsequent landing were uneventful.

On landing they spoke to ATC to confirm callsign details and inform them that they would raise an Airprox report. Both crews have since debriefed the incident with each other. As a result they were informed that the Prefect pilot was directed to/elected to change intentions and depart via the end of downwind leg, hence the crossed path. Fortuitous to the incident was that they had been transferred to Cranwell Tower and did not remain on Talkdown for the touch-and-go, as this had provided the mental trigger for the ATC query to the conflicting Prefect traffic.

The pilot assessed the risk of collision as ‘High’.

**THE CRANWELL TOWER CONTROLLER** reports that they had two Prefects in the visual circuit, one looking for a VFR departure to the west, and the other conducting some visual circuits at the end of its sortie before landing. There was also one Phenom inbound making an instrument approach to the airfield, with the intention of conducting further instrument approaches. Cranwell had recently switched from RW26 to RW08RH; RAF Coningsby had various instrument approaches inbound to their airfield, resulting in a 1400ft QFE climb-out restriction for departures from Cranwell. In addition, a "call for release" was active, requiring approval from the Cranwell Approach controller before aircraft could be cleared to depart the visual circuit; the only remaining departure of the day was one of the two Prefects already airborne in the visual circuit.

The departing Prefect (Prefect A) called downwind on their final circuit before departure, prompting the Tower controller to request release from the Approach controller. Departing to the west was unusual on RW08RH as it was the reciprocal direction; aircraft seeking a departure to the west would usually depart at the end of the downwind leg (EDWL), or with a Non-Standard Left Turn, as a left turn is outside the standard VFR departure arcs for RW08RH. This conversation was had between the Tower and the Approach controller, who requested the Prefect make an EDWL departure, which would also keep the Prefect away from the Coningsby radar pattern, which was still active.

Prefect A [pilot] was cleared to touch-and-go. During the time this clearance was given and the aircraft was making use of the runway, the Talkdown controller requested the Phenom's clearance via the Radar Clearance Line. Given their relative speeds, there wasn't going to be time for the Phenom's clearance to be obtained so [the Tower controller] elected to instruct the Phenom to continue visually. The Phenom pilot switched to the Tower frequency, announced they were continuing with their gear down and, shortly after, when the runway was clear, was given the clearance to touch-and-go. Prefect A [pilot], now upwind, announced they were switching to the Cranwell Departures frequency. At this point the controller instructed the Prefect pilot to depart not above 1400ft QFE, which was acknowledged. Then on the radar display they saw that Prefect A was turning left, and requested they make an EDWL departure to deconflict with Coningsby - this was also acknowledged. Seeing that

Prefect A's turn was potentially going to conflict with the Phenom's flightpath, they asked Prefect A [pilot] if they were visual with the Phenom departing upwind. After a brief delay, Prefect A pilot acknowledged the radio call with their callsign, this was immediately followed by the Phenom [pilot] declaring an Airprox on frequency. Their next broadcasts clipped one another but it was heard that the Phenom pilot stated 'TCAS RA'.

The Phenom pilot appeared to comply with TCAS instructions and deconflicted with Prefect A by positioning beneath it. Prefect A continued turning crosswind and departed EDWL. The Phenom then repositioned ivo Sleaford and elected to RTB Cranwell visually and land.

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

**THE CRANWELL SUPERVISOR** reports that they were monitoring circuit traffic on stud 2 from the ACR at the time of the incident. They heard the Phenom pilot call 'Airprox' and immediately proceeded to the VCR to investigate. After discussion with the ADC and the Duty Pilot, they arranged for a relief for the ADC. They then listened to the radio recordings and discussed the incident with TATCC. The preferred direction to depart VFR to the west on RW08RH was with a left turn; ATC and flying sqns have been pro-active in encouraging aircrew to depart with a left turn where it does not conflict with sortie requirements. This prevents unnecessary crossing of the RW08 approach lane from an EDWL departure.

For Prefects and Tutors, a left turn remains clear of Coningsby Sterile area A; a climb-out restriction of 1400ft CWL QFE imposed on any departures negates any potential loss of separation against any Coningsby inbound radar traffic. Through their discussion with the Duty Pilot, it seemed that the Prefect had drifted slightly to the deadside and its turn to depart EDWL put it crosswind in front of the departing Phenom, resulting in the Airprox call. On this occasion a Non-Standard (but approved) Left Turn to the west would have prevented the Prefect cutting across the Phenom. Any potential confliction with Coningsby radar would have been mitigated by the imposition of a 1400ft climb-out restriction.

## Factual Background

The weather at Cranwell was recorded as follows:

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METAR EGDY 161450Z AUTO 03007KT 9999 FEW046/// SCT078/// 23/13 Q1020=
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## Analysis and Investigation

### Military ATM

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 both the Prefect and Phenom available to the Cranwell Tower controller.

In the hours preceding the Airprox, the duty runway at RAF Cranwell had been RW26. However, in the period between the Prefect crew warning-out and then requesting taxy, the duty runway had changed to RW08RH. The Prefect's warn-out details, based upon RW26 as the active runway, were to conduct visual circuits before departing VFR northwest. With the change to RW08RH a VFR northwest departure was no longer a recognised departure profile and required amending by ATC.

As a result of the proximity between RAF Cranwell and RAF Coningsby, local procedures are established to manage interactions between RAF Cranwell RW08RH departures and RAF Coningsby RW07RH recoveries. On this occasion, Coningsby Sterile Area A, depicted in Figure 1,

had been activated; imposing both a 'Call for Release' and Climb Out Restriction of 1400ft QFE on all RAF Cranwell RW08RH departures.[2]

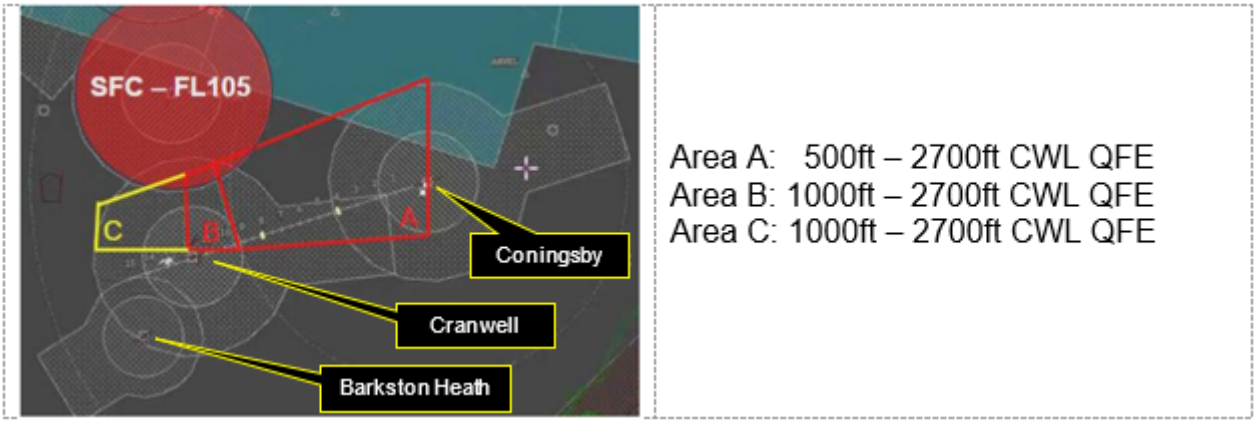



Figure 1. Coningsby Sterile Areas.

The Cranwell Tower controller was operating the Tower and Ground positions band-boxed, as was routine when circuit activity was 3 aircraft or less. The circuit complexity was assessed as low with a single aircraft conducting visual circuits on recovery prior to landing. The Cranwell Supervisor was also situated within the Visual Control Room supporting the Cranwell Tower controller with the runway change.

Sequence of Events

At 1426:27, the Prefect pilot requested taxy. In support of the Cranwell Tower controller, who was preparing to initiate the runway change, the Cranwell Supervisor fulfilled the role of Cranwell Ground temporarily and instructed the Prefect pilot to taxy for RW08.

At 1431:20, the Prefect pilot requested departure instructions. The Cranwell Supervisor was still fulfilling the role of Cranwell Ground, due to the visual circuit being active with 2 aircraft and a further 3 ground taxying. The Cranwell Supervisor called Cranwell Departures at 1432:13 informing them of the Prefect pilot's intention to conduct visual circuits prior to departure. Cranwell Departures approved the Prefect's departure as "*depart VFR west, non-standard left turn approved*". The Cranwell Supervisor informed the Cranwell Tower controller of the departure clearance but did not update the plaque from "VFR to the west" to "VFR Non-Standard Left Turn".

At 1435:44, with the Cranwell Supervisor no longer within the Visual Control Room, the Cranwell Tower controller passed the departure details to the Prefect pilot, "*following your circuits depart VFR west with a left turn*". The Prefect pilot read back the departure clearance correctly.

At 1501:05, a handover of the Cranwell Tower position commenced. The handover was conducted over a 4-minute period with multiple aircraft active within the visual circuit. Whilst the status of the Coningsby Sterile Area and associated Call for Release and Climb Out Restriction were included within the handover, there was no specific mention of the Prefect's departure profile. On completion of the handover, the off-going Cranwell Tower controller left the Visual Control Room and the oncoming Cranwell Tower controller continued to operate with Tower and Ground positions band-boxed and the Cranwell Supervisor engaged elsewhere.

At 1510:40, the Prefect pilot informed the Cranwell Tower controller "*downwind, touch and go, for the last one before departing*". The Cranwell Tower controller acknowledged the call and was immediately informed by the Cranwell Talkdown controller of the Phenom's position at 7 miles on an instrument approach with intentions to touch-and-go for a further instrument approach.

[2] RAF Cranwell FOB.

At 1510:55, the Cranwell Tower controller requested release for the Prefect's departure from Cranwell Departures. During this phone call the Cranwell Tower controller observed the incorrect VFR west details still on the plaque. To resolve the incorrect departure profile, and conscious of the Coningsby Sterile Area activation, the Cranwell Tower controller requested an end of downwind leg departure. Cranwell Departures initially questioned the request, but as it is a recognised departure profile for RW08RH they approved the end of downwind leg departure.

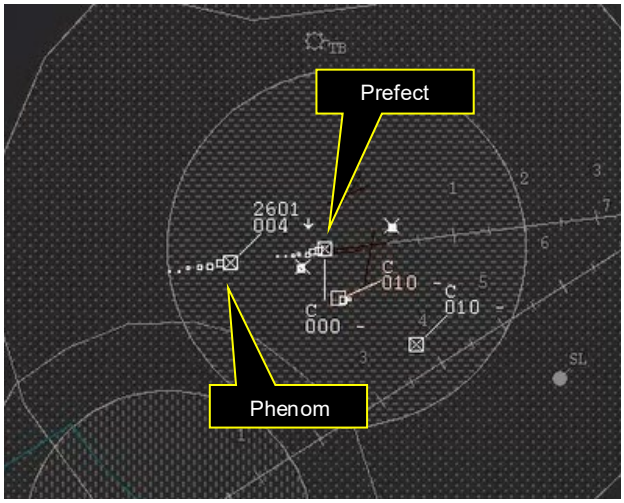



Figure 2 (1513:33) - Phenom cleared with Prefect climbing upwind.

The Cranwell Tower controller sequenced the Prefect and Phenom by clearing the Prefect to touch-and-go at 1512:00, then visually continuing the Phenom past 3 miles at 1512:42, before issuing a clearance to touch-and-go to the Phenom at 1513:33, once the Prefect was airborne.

At 1514:17, whilst climbing upwind, the Prefect pilot reported changing to Cranwell Departures. The Cranwell Tower controller issued the Climb-Out Restriction of not above 1400ft, which was acknowledged by the Prefect pilot. At 1514:27, the Cranwell Tower controller observed the Prefect commencing the previously issued VFR Non-Standard Left Turn and instructed the Prefect to depart End of Downwind Leg. This resulted in the Prefect pilot reversing the turn and crossing back through the extended centreline.

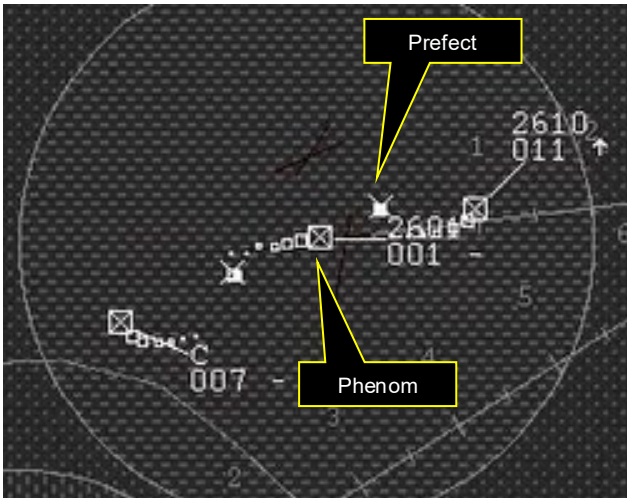



Figure 3 (1514:27) - Prefect pilot instructed to depart end of downwind leg.
(Separation: 1.4NM)

At 1514:36, the Phenom was climbing out from the touch-and-go and a further Prefect reported final, to which the Cranwell Tower controller issued a clearance.

Observing the proximity of the Phenom and Prefect, at 1514:53 the Cranwell Tower controller requested whether the Prefect pilot was visual with the Phenom. This was immediately followed at

1515:03 by the Phenom [pilot] declaring an Airprox and the Prefect pilot reporting visual with the Phenom.

CPA occurred at 1515:11 and recorded as 0.1NM and 100ft separation.

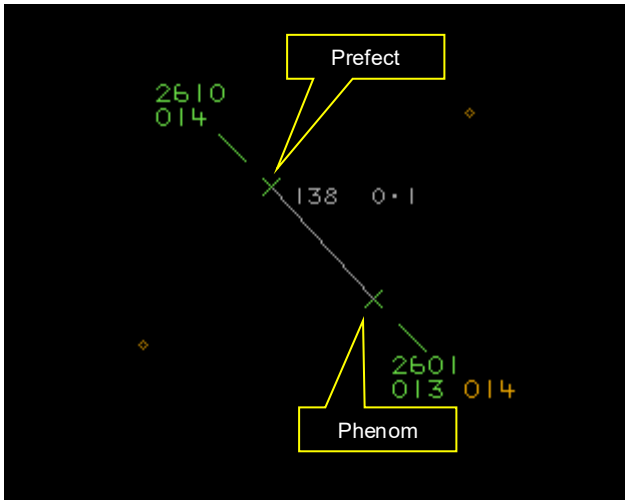



Figure 5 (1515:11) - CPA.

Local BM Investigation

An Occurrence Safety Investigation was conducted by RAF Cranwell following the event with independent involvement from the RAF Air Safety Investigation Team. The investigation identified the cause of the Airprox as a loss of safe separation between non-co-operating aircraft due to a loss of situational awareness by both aircraft captains. Several BM-related causal/aggravating factors were identified, with recommendations identified where suitable:

a. The Prefect pilot was instructed to turn back across the extended centreline by the Cranwell Tower controller due to confusion regarding the Prefect's departure clearance.

i. Recommendation: Departure clearances to be issued to aircraft whilst airborne when a significant delay occurs between taxy and visual circuit departure.

b. The amended departure clearance was not passed to the Prefect pilot early enough to prevent a re-cross of the extended centreline.

i. Recommendation: ATC to conduct a review of departure procedures guidance contained within local orders.

c. The change in departure clearance was not updated on the plaque despite being verbally passed from the Cranwell Supervisor to the Cranwell Tower controller and then to the Prefect [pilot].

d. The Cranwell Tower position handover did not contain specific information regarding aircraft departure profiles.

i. Recommendation: ATC to establish standardised position handover formats.

e. The Cranwell Tower and Ground positions were band-boxed throughout with the workload requiring support from the Cranwell Supervisor. This increased workload introduced distraction and increased the potential for mistakes such as the plaque not being updated.

i. Recommendation: ATC to review procedures for establishment of the Cranwell Ground position.

2 Gp BM Analysis

The Occurrence Safety Investigation conducted by RAF Cranwell has provided an in-depth and accurate investigation outlining several failings within the Cranwell ATC operating model. The Cranwell Supervisor correctly identified that the initial Cranwell Tower controller required support due to the workload and intervened. However, their action of conducting the Cranwell Ground role as opposed to instructing all aircraft requesting taxy to hold whilst the Cranwell Ground position was established, resulted in procedures not being followed. Had the Cranwell Ground position been established, and the controller been then solely focused on that task, it is justifiable to expect the departure plaque for the Prefect to have been updated. The initial Cranwell Tower controller did not ensure the plaque was updated iaw the departure instructions passed to the Prefect pilot, and did not provide the oncoming Tower controller with a full traffic picture. The oncoming Cranwell Tower controller acted correctly based on the information available to resolve the departure profile issue, however, [did not] pass the departure clearance to the Prefect pilot in a timely manner. Overall, the Airprox highlights how the lack of adherence to procedure, either through an imbalance in task load, distraction, or poor handover, has significant potential for an Airprox.

### UKAB Secretariat

The Perfect and Phenom pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[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

Ultimately, errors and mistakes in ATC caused the Prefect pilot to rejoin the circuit without situational awareness, which led to this Airprox with a Phenom. Recommendations made by the investigators focussed on the mistakes and errors made in ATC and all have been implemented: departure clearance is now only given within 4 circuits; a trial to understand the potential impact of band-boxing on safe operations at Cranwell has reduced instances of band-boxing, and procedural tightening by ATC means that workloads are managed better when band-boxing is in force. Implementation of a formal handover procedure and plaque updates have also improved information flow and situational awareness in the Tower.

## Summary

An Airprox was reported when a Prefect and a Phenom flew into proximity in the Cranwell visual circuit at 1515Z on Wednesday 16th August 2023. Both pilots were operating under VFR in VMC, both were in receipt of an ACS from Cranwell Tower.

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

Information available consisted of reports from both pilots, radar photographs, 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 thought that the events within ATC were the main driver behind this Airprox and so discussed those actions at length. They heard that although a runway change was a routine event, it could increase workload and therefore thought that the Supervisor had been correct to go to the VCR to assist the Tower controller. However, controlling members thought that for the Supervisor to have taken the Ground position had been a mistake; it meant the Supervisor had then become embroiled in the minutia of the taxying aircraft and getting clearances and therefore no longer supervising. Members opined that, if splitting the two controlling positions had been necessary, the Supervisor could have just held all the

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

taxying aircraft until another controller could have been brought in (**CF3**, **CF4**). Furthermore, had they used the controller that had been scheduled to relieve the Tower controller minutes later, that controller would have already have had the opportunity to gain the air-picture prior to the handover. As it happened, the Supervisor had begun controlling and, realising that the Prefect pilot's request to depart VFR NW would be difficult on RW08, they had requested a non-standard departure clearance from the radar controller. Controlling members with Cranwell experience told the Board that this request for a left-hand turn-out had been perfectly acceptable, but that not writing the clearance on the plaque had been a departure from normal procedure and had set the conditions for the oncoming controller to have had no knowledge of the approved non-standard departure clearance (**CF2**).

The next breakdown in ATC communication had come when the Tower controller had handed over the position to an oncoming controller, again a routine occurrence for controllers. However, without a checklist (**CF1**), the standard handover procedure had not been followed, and the oncoming controller had not been passed details of the Prefect pilot's planned departure (**CF2**). This in turn meant that when the Prefect pilot had informed the controller that they had been on their last circuit before departure, the controller had only seen the initial clearance request, not the updated one requested by the Supervisor when acting as the Ground controller. Seeing that this was a request for VFR NW – not a standard departure for RW08 – the Tower controller therefore correctly, given their knowledge of the situation, had requested a new clearance from the radar controller. However, they had assumed that the pilot would depart from the end of the downwind leg and had not been aware that a different clearance had already been issued to the pilot. Unfortunately, the timing had been such that as the Tower controller had requested the departure clearance, the Talkdown controller had called with notice that the Phenom had been at 7NM. This had required the controller to answer and re-broadcast which meant that they had not immediately passed the updated departure clearance to the Prefect pilot. Members were told that the Tower controller then had not wanted to pass the departure details to the Prefect pilot on finals and so the climb-out restriction had been passed once the Prefect had completed the touch-and-go. Meanwhile, the controller had not been able to issue a clearance to the Phenom pilot at 3NM and had instructed the pilot to call on the Tower frequency which, once the Prefect had lifted from the runway, had enabled the controller to clear the Phenom pilot to use the runway, all of which had probably drawn the controller's attention away from the Prefect. When the controller had realised that the Prefect pilot had turned left (as previously cleared, but unbeknownst to the controller), they had been concerned about the Coningsby sterile area and so had instructed the pilot to depart from the end of the downwind leg instead, without considering how that might have affected the circuit traffic. This instruction had caused the Prefect pilot to reverse the turn, back across the path of the Phenom (**CF6**) and, although the controller had then passed Traffic Information, this had been too late to avoid the Airprox (**CF5**). Some members wondered whether the new configuration of having all of the radar controllers based at Coningsby would have had a bearing on the controller's actions; perhaps a controller may have been more likely to have used the radar clearance line to ask for a non-standard departure on seeing the pilot turn left, if they had thought they were contacting a colleague within their own tower, but a more formal landline approach would have been required for contacting a controller on a different unit and the controller would have been concerned about the Coningsby sterile area and had probably assessed that they had not had the time for such a call. Others countered that the new TATCC at Coningsby had no bearing on this Airprox and that the controller had had other options open to them such as requesting that the pilot conduct one more visual circuit whilst they sorted out the departure clearance in a timely manner. The Board was heartened to hear that a thorough investigation by Cranwell had resulted in recommendations for changes in ATC procedures.

Turning to the Prefect pilot's actions, some members questioned why the departure clearance had been requested so early, when the intention had been to conduct 40min of visual circuits. They were told that this had been standard practice at Cranwell because it allowed the trainee pilots to get the departure details sorted out whilst still on the ground, allowing the instructor to talk through them if necessary, however, this process was now under review. Once they had been passed their departure clearance, the pilot would have had no reason to believe it might have changed and so had been surprised when the controller had changed the clearance after they had begun their left turn. Although the pilot would have had generic situational awareness that the Phenom had been in the circuit from hearing the RT calls (**CF7**), the Prefect pilot had not assimilated that a turn back across the climb-out lane would put them into conflict with the Phenom (**CF8**). Whilst members thought that the controller's updated

instructions to depart downwind had prompted the pilot into making the turn immediately, especially because instructions within the MATZ are mandatory for military pilots, still some members thought the pilot could have questioned the instruction. The Board agreed that the Prefect pilot had not seen the Phenom until it had crossed beneath them, making it effectively a non-sighting (**CF11**).

For their part, the Phenom pilot had been cleared to touch-and-go and, although they would have known about the Prefect ahead of them, the pilot reported losing sight of it once on the runway and they had not been expecting that it would turn back through the climb-out lane (**CF7**). The Traffic Information call from the controller to the Prefect pilot had prompted the Phenom pilot to look for the other aircraft and, although late, once visual they had descended to increase the separation (**CF10**), all of which had happened at around the same time as a TCAS RA had alerted (**CF9**).

When determining the risk the Board considered the reports from both pilots and those of the controllers, together with the radar screenshots and investigation reports. They noted that the Phenom pilot had taken action, but they assessed that the late sighting by the Phenom pilot together with the effective non-sighting by the Prefect pilot indicated that safety had been much reduced; Risk Category B.

## PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

| | **2023182** | | | |
|---|---|---|---|---|
| CF | **Factor** | **Description** | **ECCAIRS Amplification** | **UKAB Amplification** |
| | **Ground Elements** | | | |
| | **• Regulations, Processes, Procedures and Compliance** | | | |
| 1 | Organisational | • Aeronautical Information Services | An event involving the provision of Aeronautical Information | The Ground entity's regulations or procedures were inadequate |
| 2 | Human Factors | • ATM Regulatory Deviation | An event involving a deviation from an Air Traffic Management Regulation. | Regulations and/or procedures not fully complied with |
| | **• Manning and Equipment** | | | |
| 3 | Human Factors | • ATM Leadership and Supervision | An event related to the leadership and supervision of ATM activities. | |
| 4 | Organisational | • ATM Staffing and Scheduling | An event related to the planning and scheduling of ATM personnel | |
| | **• Situational Awareness and Action** | | | |
| 5 | Human Factors | • Conflict Detection - Detected Late | An event involving the late detection of a conflict between aircraft | |
| 6 | Human Factors | • Traffic Management Information Provision | An event involving traffic management information provision | The ANS instructions contributed to the Airprox |
| | **Flight Elements** | | | |
| | **• Situational Awareness of the Conflicting Aircraft and Action** | | | |
| 7 | 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 |
| 8 | Human Factors | • Understanding/ Comprehension | Events involving flight crew that did not understand or comprehend a situation or instruction | Pilot did not assimilate conflict information |
| | **• Electronic Warning System Operation and Compliance** | | | |
| 9 | Contextual | • ACAS/TCAS RA | An event involving a genuine airborne collision avoidance system/traffic alert and collision avoidance system resolution advisory warning triggered | |
| | **• See and Avoid** | | | |
| 10 | Human Factors | • Identification/ Recognition | Events involving flight crew not fully identifying or recognising the reality of a situation | Late sighting by one or both pilots |
| 11 | 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 |
| | **• Outcome Events** | | | |

| | | | | |
|---|---|---|---|---|
| 12 | Contextual | • Near Airborne Collision with Aircraft | An event involving a near collision by an aircraft with an aircraft, balloon, dirigible or other piloted air vehicles | |

Degree of Risk: B.

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:**

**Regulations, Processes, Procedures and Compliance** were assessed as **partially effective** because Cranwell did not have adequate procedures for controller handovers, which led to an ineffective handover. Additionally, the aircraft plaque was not kept up to date and the new departure clearance was not passed to the Prefect pilot.

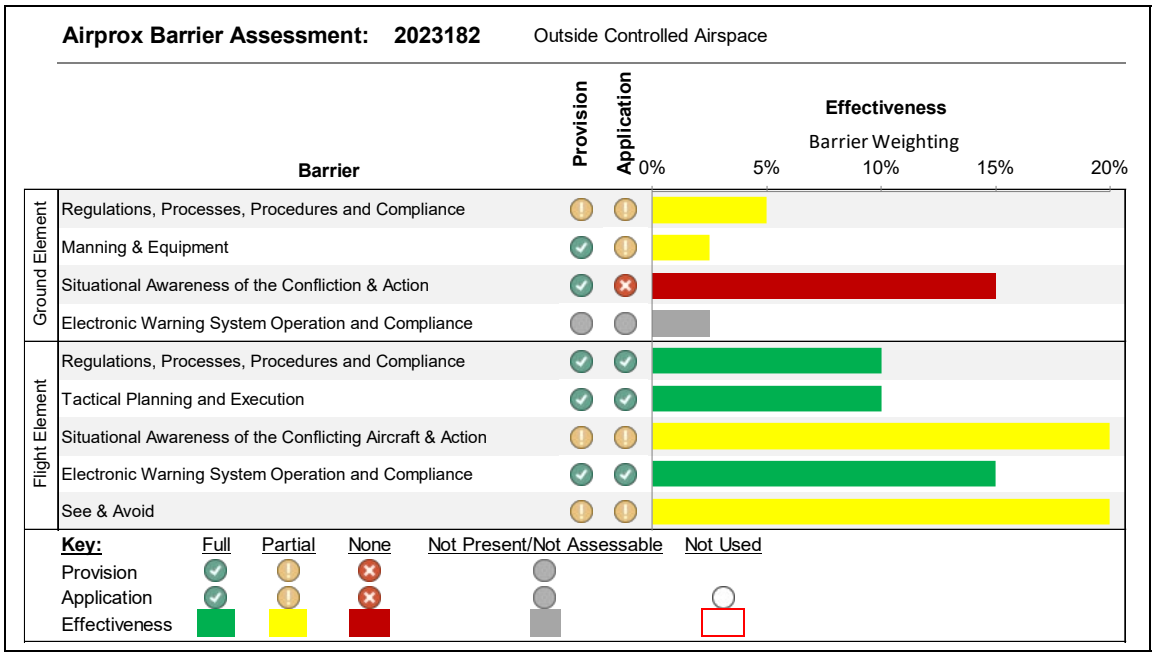
**Manning and Equipment** were assessed as **partially effective** because the Supervisor took over the ground position rather than getting another controller in to spilt the task.

**Situational Awareness of the Confliction and Action** were assessed as **ineffective** because the change in departure clearance to a downwind departure was passed to the Prefect pilot late, which meant that the pilot then turned back across the climb-out lane.

**Flight Elements:**

**Situational Awareness of the Conflicting Aircraft and Action** were assessed as **partially effective** because both pilots had generic situational awareness on the position of the other, but the Prefect pilot had not assimilated that the turn across the climb-out lane would conflict with the Phenom.

**See and Avoid** were assessed as **partially effective** because the Phenom pilot saw the Prefect late, but was able to take avoiding action.




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