

AIRPROX REPORT No 2014121

Date/Time: 21 Jul 2014 1426Z

Position: 5302N 00026W
(RAF Cranwell)

Airspace: Cranwell ATZ (Class: G)

Aircraft 1 Aircraft 2

Type: Tutor King Air

Operator: HQ Air (Trg) HQ Air (Trg)

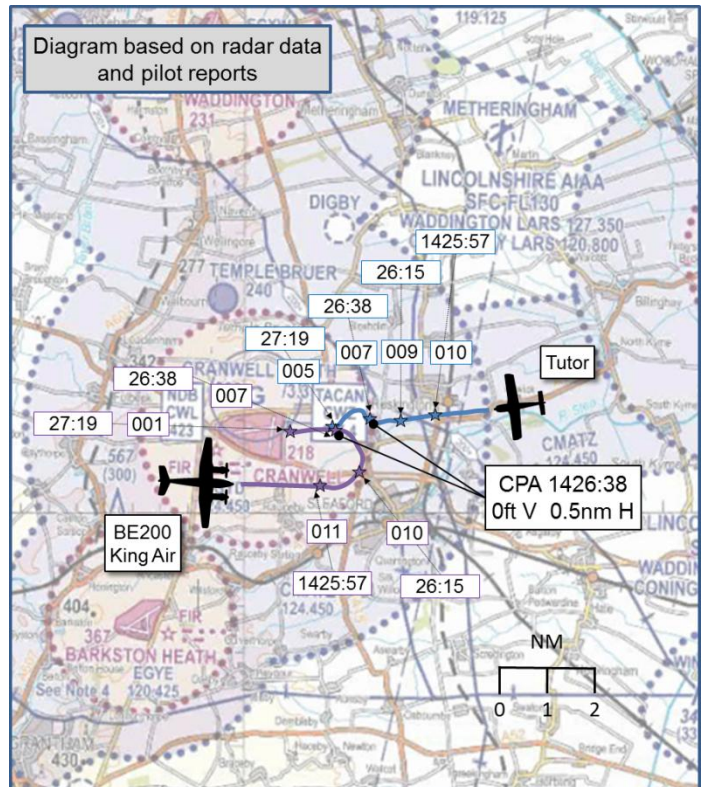
Alt/FL: 500ft 1000ft
NK (NK hPa) NK (NK hPa)

Conditions: VMC VMC

Visibility: >10km 20km

Reported Separation:
0ft V/750m H 200ft V/800m H

Recorded Separation:
0ft V/0.5nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TUTOR PILOT reports on short finals for a PAR¹ approach to RW26 at Cranwell, heading 270° at 120kt. The predominantly white aircraft had HISLs, navigation and landing lights selected on, as was the SSR transponder with Modes A, C and S. The aircraft was fitted with a Traffic Advisory System. The pilot was operating under VFR in VMC, under 'Radar Control' the pilot thought, with Cranwell ATC. The student was flying the PAR 'visually' in response to a request for controller training. Both the student and he were aware of the King Air in the circuit, and were visual with it from its early downwind position. With his positive clearance delayed at 3nm, he received clearance to land at approximately 2nm and was told the King Air pilot was going around at circuit height (1000ft). Having been visual throughout, it was apparent the King Air pilot had continued the downwind leg and started the final turn, turning in towards the Tutor pilot's flight path. This was not consistent with the information given by ATC. As the King Air pilot continued the final turn, with no 'go around' seen, the Tutor pilot took avoiding action (a 360° turn to the right at 500ft, he recalled) that positioned him well behind the King Air, which was now lined up on RW26, on short final to land. The Tutor pilot switched to Tower frequency in the avoiding turn, and requested a straight in approach after breaking off from the PAR; Tower informed him he was number two to the King Air. Shortly after, a red flare was fired from the runway caravan and the King Air pilot went around.

He assessed the risk of collision as 'Medium'.

THE KING AIR PILOT reports joining the Cranwell visual circuit at the end of a student sortie. The white and blue aircraft had navigation, beacon, strobe, landing and taxi lights selected on, as was the SSR transponder with Modes A, C and S. The aircraft was fitted with TCAS II. The pilot was operating under VFR in VMC, in contact with Cranwell Tower but he did not recall being in receipt of an Air Traffic Service. The aircraft was positioned at initials² for RW26 at circuit height (1000ft QFE for the King Air). Whilst on the deadside, the aircraft was configured prior to joining the circuit, during which a radio call was heard declaring that there was Tutor radar traffic inbound to Cranwell. The aircraft was then positioned downwind, where a radio call was made 'stating our downwind position and our intention to land'. The remainder of the downwind leg was flown, and the final turn started in

¹ Precision Approach Radar

² A point displaced 1-2nm short of the runway threshold and normally offset slightly to the deadside.

the normal position. Early in the final turn the student pilot (PF) made a radio call stating his position as finals with gear down. Shortly afterwards a radio call was heard stating that there was instrument traffic at 3nm with an instruction then issued to go around. The crew believed that the instrument traffic had been called to go around as a Tutor callsign was then heard on the Tower frequency. The crew were visual with the Tutor to their right-hand side as they were in the left-hand finals, and continued the approach. They had no permission to land, but believed that they were ahead of the instrument traffic and that it was going around. At approximately 250ft agl a red flare was seen and an overshoot was carried out. They positioned back on the deadside at 1000ft QFE and flew another visual circuit to land.

He assessed the risk of collision as 'Low'.

THE TOWER CONTROLLER reports a fine day with good flying conditions, using RW26. The King Air pilot had flown several circuits and was climbing upwind. Radar Traffic (the Tutor) was warned in, and the controller broadcast 'Tutor, 6.5 miles, land'. The 'caravan' (runway controller) acknowledged the broadcast. The King Air pilot turned crosswind and then established downwind to land when the radar traffic was at 4.5nm. The controller was unable to issue a positive clearance for the Tutor at 3nm, due to the runway being occupied. Clearance was delayed to 2nm. The King Air pilot then turned finals, with the controller's intention being for the King Air pilot to continue behind the radar traffic if visual. The King Air pilot stated 'finals - gear down'. The controller asked the King Air pilot if he was visual with the radar traffic, to which there was no response. After about 4sec, he instructed the King Air pilot to go around at circuit height. He believed this would stop any conflict between the 2 aircraft. At 2¼nm he issued the clearance to the Tutor, '[Tutor C/S], cleared to land, one in going around, circuit height'. The King Air pilot did not acknowledge the instruction to go around and continued to descend and line up with the runway. The Tutor pilot broke himself off to resolve the subsequent conflict and requested a straight in approach, questioning that he thought the circuit traffic was going around circuit height. The controller cleared the Tutor pilot for a straight in approach and informed him that the King Air pilot had been instructed to go around. Despite this conversation on frequency, the King Air continued to descend to decision height and only went around when a red flare was fired from the caravan. The King Air pilot appeared unaware of the hazardous situation that had just occurred.

He perceived the severity of the incident as 'Medium'.

THE CRANWELL SUPERVISOR reports being in the supervisor's position, sat between Director and Approach in the radar room, where the units' workload was relatively low. The supervisor recalls looking at the radar screen to see a potential conflict between the visual circuit traffic in the downwind position, and the radar traffic at approximately 4nm. Upon hearing the PAR controller receive a "call by 2" delayed clearance, the Supervisor re-assessed the situation and saw the visual circuit traffic turning finals, with the Mode C indicating it was in the descent. The PAR controller received a clearance at 2¼nm stating the "one in" was going around; the Supervisor looked across to the PAR console and saw the tutor break off its approach. The Supervisor went upstairs to talk to the Tower Controller, who described the sequence of events as stated in his report.

Factual Background

The Cranwell weather at 1350 was recorded as:

METAR EGYD 211350Z 30010KT 9999 SCT045 25/12 Q1019 BLU NOSIG

Analysis and Investigation

Military ATM

At 1425:09, the King Air pilot called downwind with the Tutor at 4.5nm on final approach, Figure 1.

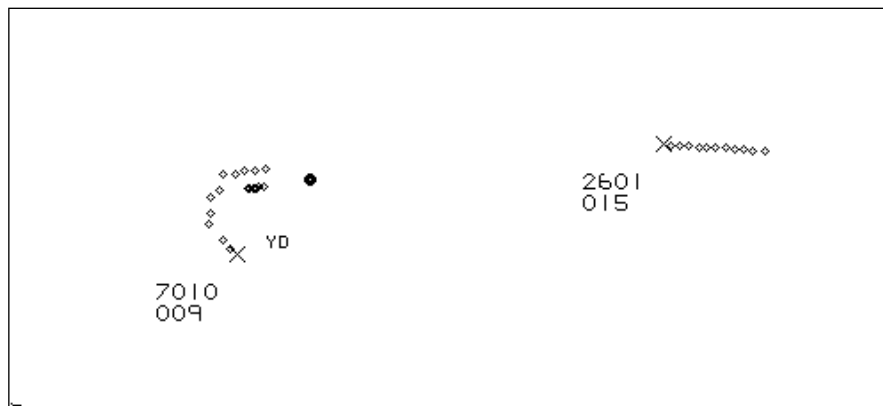


Figure 1: Geometry at 1425:09 King Air downwind call (King Air 7010, Tutor 2601)

At 1426:05, the Tower controller broadcasted that the Tutor was at 3nm and continuing the instrument approach, Figure 2.

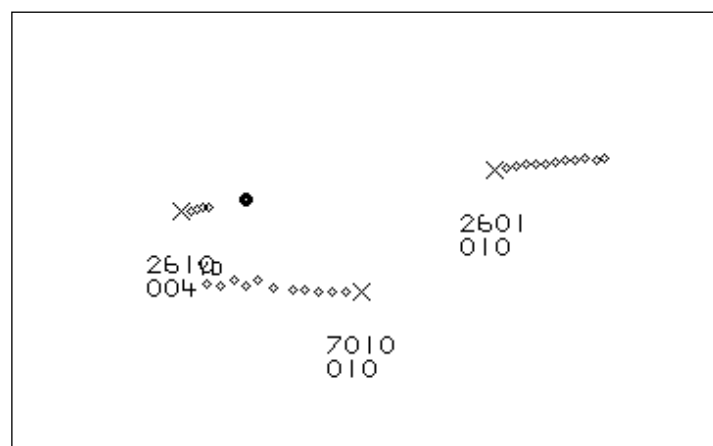


Figure 2: Geometry at 1426:05 with Tutor 3 nm call

The King Air pilot called finals at 1426:12, Figure 3.

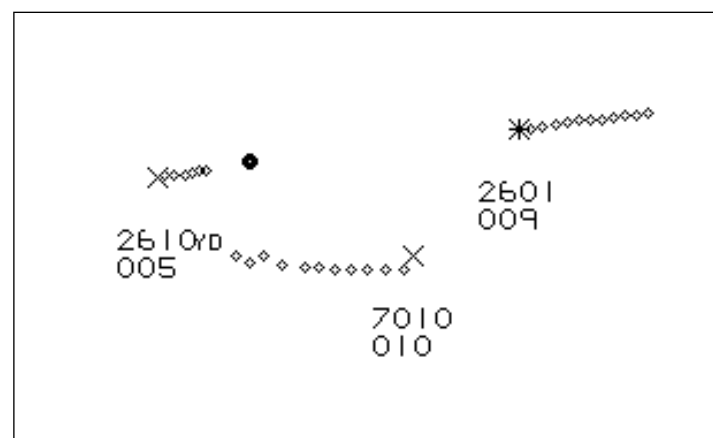


Figure 3: Geometry at 1426:12 as King Air pilot called finals

The King Air pilot was instructed to 'go around circuit height' at 1426:21, Figure 4.

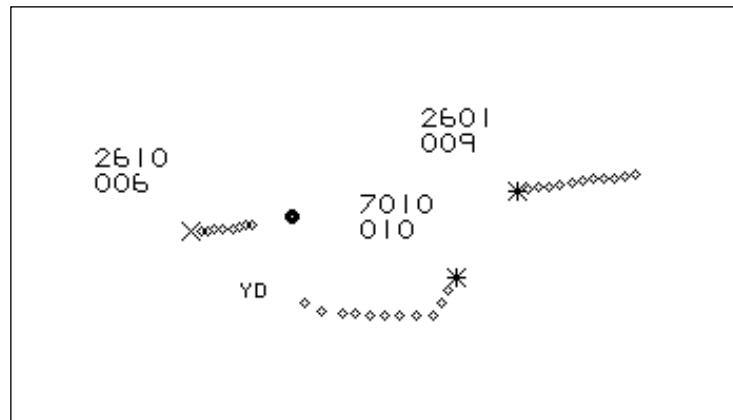


Figure 4: Geometry at 1426:21 as King Air pilot instructed to 'go around circuit height'

At 1426:30, the Tutor pilot broadcast that he was breaking clear of the King Air. The CPA on radar replay was at 1426:38 with 0.5nm lateral separation at the same height, Figure 5.

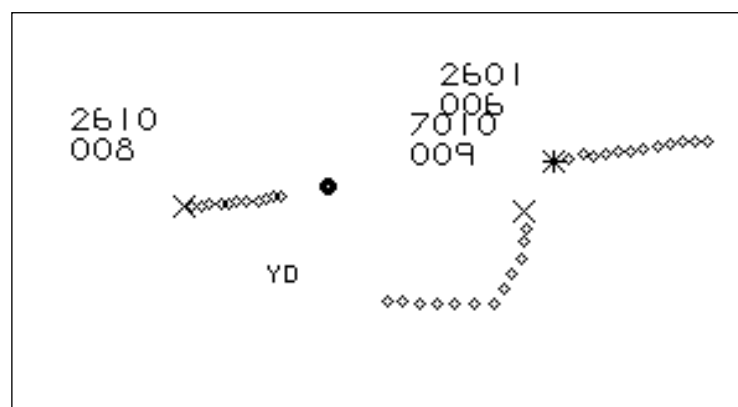


Figure 5: Tutor initiated avoiding action at 1426:30

The RAF Cranwell Defence Aerodrome Manual (Annex Q, Part 2, B208, paragraph 7) lists the priorities for circuits:

'Circuit Priorities. Ac on final approach will have priority over other ac (in this context final approach can be considered to be within 3 nm of an IFR approach or after the entry to the final turn on a visual circuit). In all other circumstances, the following priorities will be applied to air traffic operating to and from Cranwell:

...

f. Approach to land (instrument traffic to have priority over visual traffic).'

At 1425:58, PAR called Tower for clearance as the Tutor was at 3nm on an instrument approach (broadcast on Tower frequency at 1426:05); the King Air pilot called finals at 1426:12.

The King Air pilot was instructing in the visual circuit at the time of the incident. At the downwind call, the Tower controller had not informed him of any aircraft ahead, but there was an all-stations transmission when the Tutor was at 3nm; as per the Defence Aerodrome Manual, this placed priority with the Tutor. The King Air pilot made the finals call, but did not immediately respond when Tower asked if he was visual with the Tutor. Similarly, the King Air pilot did not respond to the 'go around at circuit height' instruction. The King Air pilot then appeared to transmit 'not visual' with the Tutor, although the occurrence report stated that the crew were visual and assumed they were ahead of the Tutor. The King Air pilot reported hearing the 'go around' instruction and presumed it was for the Tutor. It appears that the Tower controller's transmissions were being received by the King Air crew but they were not being fully assimilated. Once the King Air was on short finals, the Tower controller changed the sequence and transmitted a clearance to land; the crew correctly responded to the red flare from the Caravan Controller and went around. The RT had been readable for other parts of the sortie, pre and post Airprox. The King Air crew

did not respond to two radio calls, did not obtain a positive runway clearance on turning finals, and continued in front of the Tutor. To add context, there are various scenarios that could have led a crew on an instructional sortie, at a busy stage of flight, to perceive that the King Air was number one priority for the runway. The King Air crew were ahead of the Tutor, and were under the perception that the Tutor was going around; at no point during the downwind leg, were they informed that the Tutor was ahead. The King Air pilot's occurrence report stated that the finals turn was conducted prior to the 3nm call, which would have reinforced the crew's perception that they had priority. The King Air crew perceived that they were number one priority, and the extra demands of an instructional sortie may have stretched their attentional resources, possibly contributing to a lack of awareness of the RT communications and the deconfliction plan.

The Tutor instructor had been keeping an effective lookout because the instrument approach was flown in VMC, as it was for controller benefit. Situational awareness was maintained by the Tutor instructor and, once the King Air pilot did not initiate a go-around, an avoiding turn was taken, and the approach converted to a visual recovery with adequate spacing behind the King Air.

At the downwind call, the Tower controller did not inform the King Air pilot that the Tutor was ahead; this may have been an omission, or a perception that the King Air would approach first. However, by the time the Tutor was at 3nm, the intention was to continue the King Air downwind behind the Tutor, if it's crew was visual with it. Once the King Air pilot had turned and descended on finals, the option to extend the King Air downwind was lost and within 6sec of asking if the crew was visual, the 'go-around' transmission was issued. The go-around would have put the King Air at 1000ft (circuit height) against the Tutor, which would have been descending from approximately 900ft at the 3 mile point. Tower did not make the broadcast following the Tutor clearance at 2¼nm, which was required by SOPs. Once the King Air was on short finals and the Tutor pilot had manoeuvred behind it, the Tower controller responded to the situation and attempted to give a positive clearance to land but, once again, there was no response on the RT from the King Air crew. At any point, the Tower controller could have re-enforced a clearance or attempted to get a positive acknowledgement from the King Air pilot. The Caravan Controller was aware that a positive clearance to use the runway had not yet been issued when the King Air was on short-final, and as the Tower controller transmitted the late clearance for the King Air, fired a red flare.

The PAR controller conducted the approach, as per SOPs, and gained a positive clearance by 2nm. Shortly after the clearance, the Tutor pilot declared his intention to avoid the King Air; with the narrow beam on the PAR, the King Air would have entered the radar picture only when particularly close to the Tutor. With the aid of the precision radar, the PAR controller estimated the minimum separation as co-height and 0.5nm horizontally.

The normal barriers to an Airprox between integrated visual and instrument patterns are lookout, Traffic Information and correct application of procedures. Information was passed to the Tutor pilot, who maintained visual contact and initiated the separation turn. Information was passed to the King Air pilot on the Tutor and the first sighting, as per the occurrence report, was when two-thirds of the way around the final turn. The procedure for radar integration at Cranwell is tried and tested. However, the integration procedure required a flow of communication and situational awareness that were missing, considerably weakening this barrier. A thorough local investigation was conducted and a number of recommendations were made and acted upon. Crews were re-briefed on the priorities of an instructional sortie (Aviate – Navigate – Communicate – Instruct, in that order) and ATC were reminded that appropriate instructions should be repeated until an acknowledgement is received from the crews.

UKAB Secretariat

The Tutor and King Air pilots shared an equal responsibility for collision avoidance and not to fly into such proximity as to create a danger of collision³. Notwithstanding Military Flying Regulations, Rule 13 (Order of landing) states:

(1) An aircraft landing or on its final approach to land shall have the right-of-way over other aircraft in flight or on the ground or water.

(2) An aircraft shall not overtake or cut in front of another aircraft on its final approach to land.

(3) If an air traffic control unit has communicated to any aircraft an order of priority for landing, the aircraft shall approach to land in that order.

(4) If the commander of an aircraft is aware that another aircraft is making an emergency landing, he shall give way to that aircraft.

...

(6) Subject to paragraphs (2), (3) and (4), if two or more flying machines, gliders or airships are approaching any place for the purpose of landing, the aircraft at the lower altitude shall have the right-of-way.'

Comments

HQ Air Command

Clear communication is key to safe deconfliction in the visual and/or radar circuit. In this instance it seems that the King Air pilot did not appreciate that he was number 2 to the Tutor (possibly because he had not been informed of the 'one ahead' after his 'downwind' call) and thought that the instruction to 'go around' was meant for the Tutor. However, an aircraft on an instrument approach will be instructed to 'break off the approach' (on the PAR frequency) so it should at least have cast doubt as to which aircraft the instruction to 'go around' was for. That said, the Tutor pilot switched to Tower frequency of his own volition and transmitted on that frequency which probably then reinforced the King Air pilot's perception that he had priority. This, coupled with crucial missed radio calls on the part of the King Air pilot, allowed the two aircraft to come into close proximity, ultimately resolved by the Tutor pilot breaking off his approach.

Summary

An Airprox was reported when a Tutor and a King Air flew into proximity in the Cranwell visual circuit. Both pilots were operating under VFR in VMC; the Tutor pilot was carrying out a PAR approach under the control of Cranwell Talkdown, and the King Air pilot was in receipt of an Aerodrome Control Service from Cranwell Tower.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both aircraft, transcripts of the relevant RT frequencies, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

Turning first to the King Air pilot, it was clear to the Board that when he heard the instruction to go-around he believed that it was an instruction for the Tutor pilot. However, members were at a loss to understand why, because the Tutor was on an instrument approach and, according to the Aerodrome Manual, clearly had priority. This being the case, the Board opined that the King Air pilot should have

³ Rules of the Air 2007 (as amended), Rule 8 (Avoiding aerial collisions).

anticipating a go-around from his finals turn as the default requirement, which is normal procedure if the pilot cannot see the instrument traffic.

Turning next to the actions of the Tower controller, the Board felt that he should have exercised more positive aircraft sequencing, and should have communicated his intentions more clearly to the pilots when he realised that the King Air was going to be No.2 to the Tutor. Furthermore, the Board considered that the Tower controller should have been more assiduous in obtaining a read-back of his instructions from the King Air pilot. Notwithstanding, the Board agreed that these factors were only contributory, and that the cause of the Airprox was that the King Air pilot had flown into conflict with the Tutor.

Regarding the degree of risk, members observed that this could have been a very serious occurrence, or even an accident, but for the fact that the Tutor pilot was VMC and flying the PAR visually. Having maintained a good lookout, maintained well-attuned situational awareness, and having taken timely and effective avoiding action, members agreed that, as a result of the Tutor pilot's actions, the Airprox was Category C.

The Board then discussed the type of ATS⁴ that is provided to pilots by military Tower controllers and were informed that pilots in a military circuit are not under any type of ATS at all. That being said, even though military controllers do not 'control' the visual circuit in a similar manner to civilian airfields, ATC instructions are mandatory to military pilots within the MATZ⁵. Nevertheless, although a fine line of distinction, 'control' implies a more pro-active approach to marshalling and sequencing aircraft within the circuit, and Board members recalled that there had been similar occurrences in the visual circuit at other military aerodromes. They observed that the lack of any defined ATS in the visual circuit could have contributed to the confusion in this Airprox, and resolved to recommend that the MAA reviews the provision of Aerodrome Control Service at military airfields.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The King Air pilot flew into conflict with the Tutor.

Contributory Factor(s): 1. Insufficient traffic sequencing from Cranwell Tower.
2. The King Air pilot did not go around when instructed to do so.

Degree of Risk: C.

ERC Score⁶: 4.

Recommendation: The MAA reviews the provision of Aerodrome Control Service at military airfields.

⁴ Air Traffic Service

⁵ Military Air Traffic Zone

⁶ Although the Event Risk Classification (ERC) trial had been formally terminated for future development at the time of the Board, for data continuity and consistency purposes, Director UKAB and the UKAB Secretariat provided a shadow assessment of ERC.