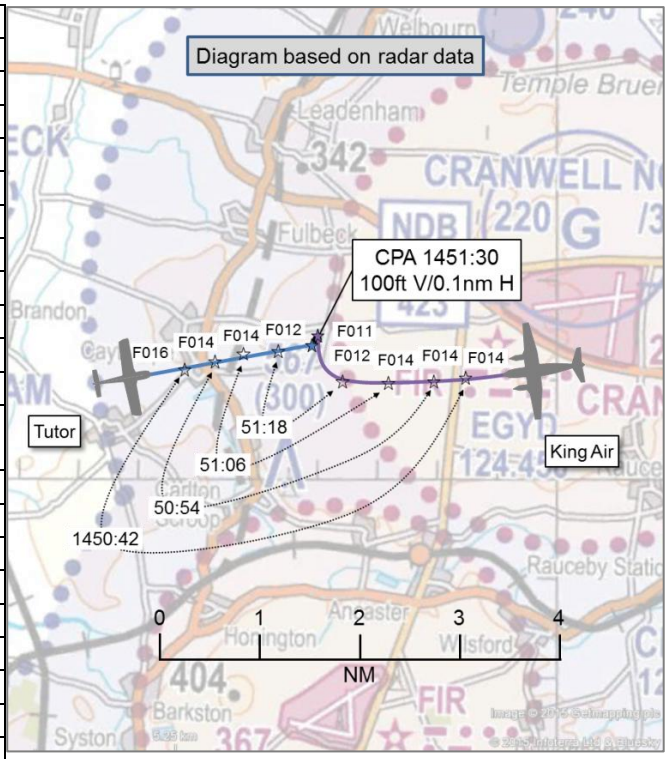
AIRPROX REPORT No 2015003

Date: 20 Jan 2015 Time: 1452Z Position: 5301N 00034W Location: RAF Cranwell

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Tutor	King Air
Operator	HQ Air (Trg)	HQ Air (Trg)
Airspace	MATZ	MATZ
Class	G	G
Rules	VFR	VFR
Service	Traffic	Aerodrome
Provider	Talkdown	Tower
Altitude/FL	FL012	FL011
Transponder	A, C, S	A, C, S
Reported		
Colour	White	White/blue
Lighting	Nav, HISL	Nav, beacon, recognition, HISL
Conditions	VMC	VMC
Visibility	20km	6km, haze
Altitude/FL	800ft	1000ft
Altimeter	QFE (1001hPa)	NK
Speed	100kt	NK
ACAS/TAS	TAS	TCAS II
Alert	Information	TA
Separation		
Reported	0ft V/200m H	Not seen
Recorded	100ft V/0.1nm H	



THE TUTOR PILOT reports that, during the latter stages of a PAR, the non-handling (safety) pilot became visual with a King Air which appeared to be flying downwind in the visual circuit. The King Air was then seen to commence a turn towards the airfield, as if commencing its final turn. The King Air did not descend but continued level in the final turn, which appeared to put the King Air's flight-path into conflict with the Tutor. The safety pilot was about to take control to take avoiding action, but quickly assessed that the King Air would pass ahead, albeit by approximately 200m, and thus allowed the handling pilot to continue the approach. Due to the nature of the conflict, the safety pilot advised the Talkdown controller of his intention to file an Airprox.

He assessed the risk of collision as 'Low'.

THE KING AIR PILOT reports conducting an instructor training sortie which was primarily based in the visual circuit. The crew had just returned to Cranwell; recovery was flown as a radar-to-visual procedure[1] due to the visibility into sun when heading south not being suitable for a visual transit. During the circuit at Cranwell, the pilot commenced a right-hand finals turn and transmitted "Finals, gear down" in accordance with Standard Operating Procedures. The Tower controller asked whether they were visual with the aircraft ahead and, as neither pilot on the aircraft were, the Tower controller instructed them to go around. Following this instruction, the pilot flew the standard asymmetric go-around procedure in a level, right-hand turn and the conflicting traffic (which was on a radar approach) was identified once he was established on the deadside. The pilot noted that visibility on the downwind leg was marginal, and that he was unsure if the radar traffic had been called following his downwind call. He commented that TCAS was set to 'TA only' (in accordance with Standard Operating Procedures), and that he was in a high-workload teaching environment with lots of instruction on the flight deck.

[1] Radar vectors to the Initial Point for the visual circuit.

He assessed the risk of collision as 'Medium'.

THE TALKDOWN CONTROLLER reports that the Tutor pilot had begun the descent. At the '3 mile clearance point' a "call by 2" was issued by the Tower controller and relayed to the Tutor pilot. The pilot acknowledged and, at 2.5 miles, a track appeared in both the azimuth and glidepath screens of the PAR. The track was in the right 2 o'clock of the Tutor at around 1.5 miles, tracking opposite direction. As the Talkdown controller was about to call the traffic, the Tutor pilot called visual with a King Air, on his right-hand side. The King Air then quickly turned towards the Tutor, whose pilot then declared an Airprox.

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

THE TOWER CONTROLLER reports he had broadcast that the Tutor was at 7nm for low approach and a further radar approach. There were 2 King Airs in the circuit at the time, both extending upwind for simulated asymmetric procedures. As the Airprox King Air pilot called rejoining downwind, the Tower controller passed the upwind position of the other King Air but did not recall giving an update on the Tutor radar traffic. The Airprox King Air pilot called downwind and was told 'one ahead'. The Tower controller then gave a clearance for a Tutor to take off and, as the aircraft had not left the runway as the Talkdown controller requested a clearance at 3nm, he gave a delayed clearance to the Talkdown controller and broadcast 'Tutor 3nm continuing' to the aircraft in the circuit. The Airprox King Air pilot called finals and the controller asked if he was visual with the Tutor, to which he replied 'negative'; the controller sent him around.

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

THE CRANWELL SUPERVISOR reports he was alerted to the issue when he noted the Talkdown controller had not gained a clearance for the Tutor by 2nm. He looked at the PAR screen to see two tracks very close together and at a similar height. Simultaneously he heard the Talkdown controller say Airprox and issue standard break off instructions for the Tutor. On checking with the Tower controller it appeared that when he reported downwind the King Air pilot was advised of one aircraft ahead (the Airprox Tutor); he subsequently started to turn final when the Tutor was at about 2¼ miles. The Supervisor arranged for a PAR radar screen shot of the incident to be taken.

Factual Background

The weather at RAF Cranwell was recorded as follows:

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METAR EGYD 201450Z 14007KT 8000 HZ FEW140 SCT250 01/M01 Q1008 BLU BECMG 5000 HZ WHT
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Analysis and Investigation

Military ATM

The King Air pilot was receiving an Aerodrome Control Service with Cranwell Aerodrome Controller and the Tutor pilot was with Cranwell Talkdown. The radar replay was based on the Claxby Radar using the London QNH of 1009hPa.

The transcript for both aircraft, Cranwell Talkdown and Cranwell Tower is reproduced below:

From	To	Speech Transcription	Time
King Air	Tower	Cranwell Tower, [King Air C/S], request join, Q F E one zero zero one	14:45:14
Tower	King Air	[King Air C/S], Cranwell Tower, join, runway zero eight right hand, Q F E read back correct, circuit clear	14:45:17
King Air	Tower	[King Air C/S], Initial	14:47:01

From	To	Speech Transcription	Time
Tower	King Air	[King Air C/S], circuit clear, radar traffic approaching three miles, wind one four zero, five	14:47:02
Talkdown	Tower	Approach, ???, [Tutor C/S], low approach, further	14:47:56
King Air	Tower	And [King Air C/S], extending upwind, simulated asymmetric	14:47:56
Tower	Talkdown	[Tutor C/S], low approach, further, roger, Tower	14:47:58
Tower	All stations	Tutor seven miles, low approach, further	14:48:02
King Air	Tower	[King Air C/S], extending upwind, simulated asymmetric	14:48:19
Tower	King Air	[King Air C/S], roger	14:48:21
King Air	Tower	[King Air C/S], rejoining downwind	14:49:28
Tower	King Air	[King Air C/S], one upwind	14:49:32
King Air	Tower	[King Air C/S], downwind, simulated asymmetric, touch and go	14:50:15
Tower	King Air	[King Air C/S], one ahead	14:50:20
Talkdown	Tower	Three miles, [Tutor C/S] low approach	14:50:52
Tower	Talkdown	[Tutor C/S], call by two	14:50:54
Talkdown	Tower/ Tutor	[Tutor C/S], final clearance delayed, continue approach	14:50:56
King Air	Tower	[King Air C/S], final, gear down	14:51:11
Tower	King Air	[King Air C/S], are you visual with the Tutor?	14:51:13
King Air	Tower	Negative, [King Air C/S]	14:51:17
Tutor	Talkdown	Talkdown, err we've got a King Air right in front of us now, about two hundred yards, same height	14:51:18
Tower	King Air	[King Air C/S], go around	14:51:19
King Air	Tower	Going around, [King Air C/S]	14:51:20
Talkdown	Tutor	[Tutor C/S], err roger	14:51:24
Talkdown	Tutor	You happy to continue?	14:51:27
Tutor	Talkdown	??? unfortunately he's just turned right in front of us, about two hundred err yards ahead of us	14:51:28
Talkdown	Tutor	[Tutor C/S] apologies, stepped on there	14:51:32
Tutor	Talkdown	Yeah we're gonna have to call that an Airprox with the King Air unfortunately	14:51:34
Talkdown	Tutor	[Tutor C/S] err roger, that's copied, err you're on centreline, well above glide path at the moment, err break off the approach	14:51:39
Talkdown	Tower	Breaking off the approach	14:52:01
King Air	Tower	[King Air C/S], deadside	14:52:17
Tower	All stations	Tutor, one mile, breaking off	14:52:19

At 1450:15, the King Air called downwind and was informed 'one ahead' (Figure 1).

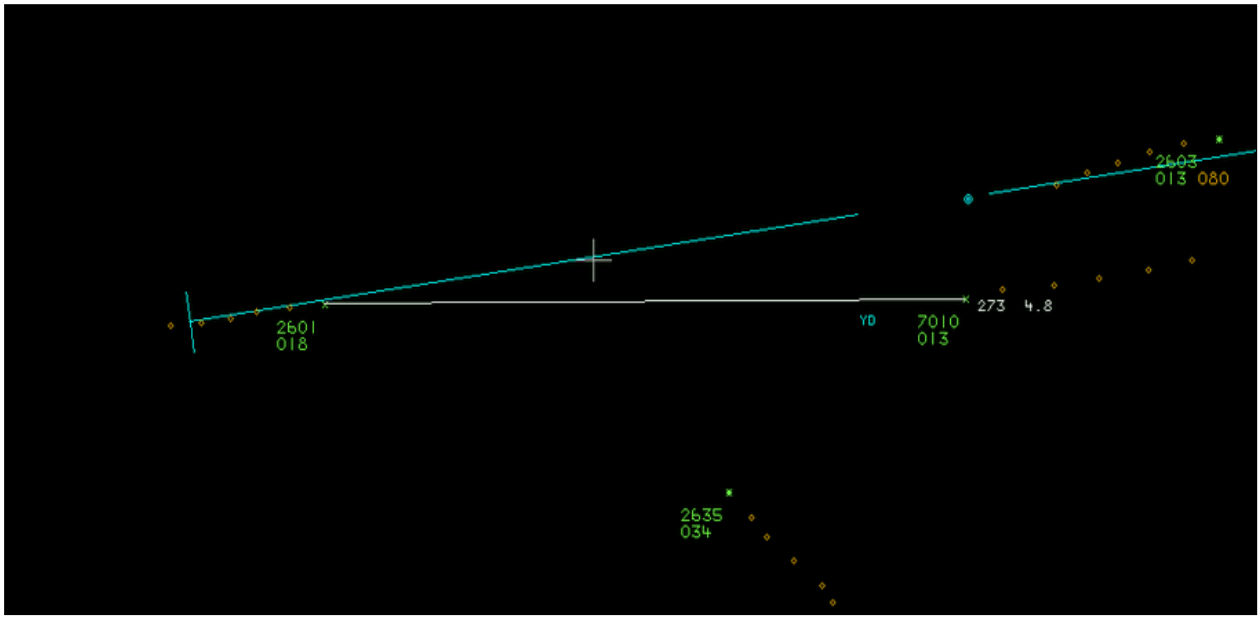

Figure 1: At 1450:20, when King Air informed 'one ahead' (King Air squawk 7010; Tutor 2601)

At 1450:52 (Figure 2), Talkdown requested a clearance for a low approach and the Tower controller confirmed a '*call by two* [nm]' to continue the approach for the Tutor, anticipating a positive clearance prior to 2nm finals.

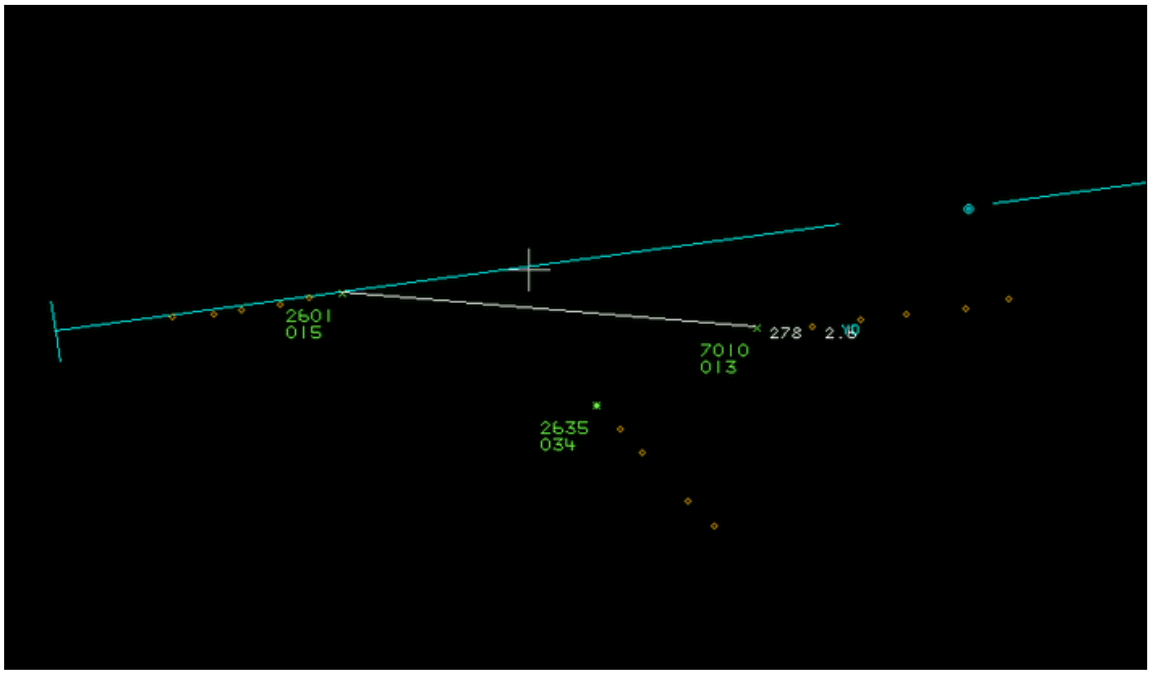

Figure 2: The 3 nm call for the Tutor to low approach at 1450:52

At 1451:11 (Figure 3), the King Air pilot called finals. The Tower Controller requested whether the crew were visual with the Tutor at 1451:13 and the 'negative' reply came at 1451:17.

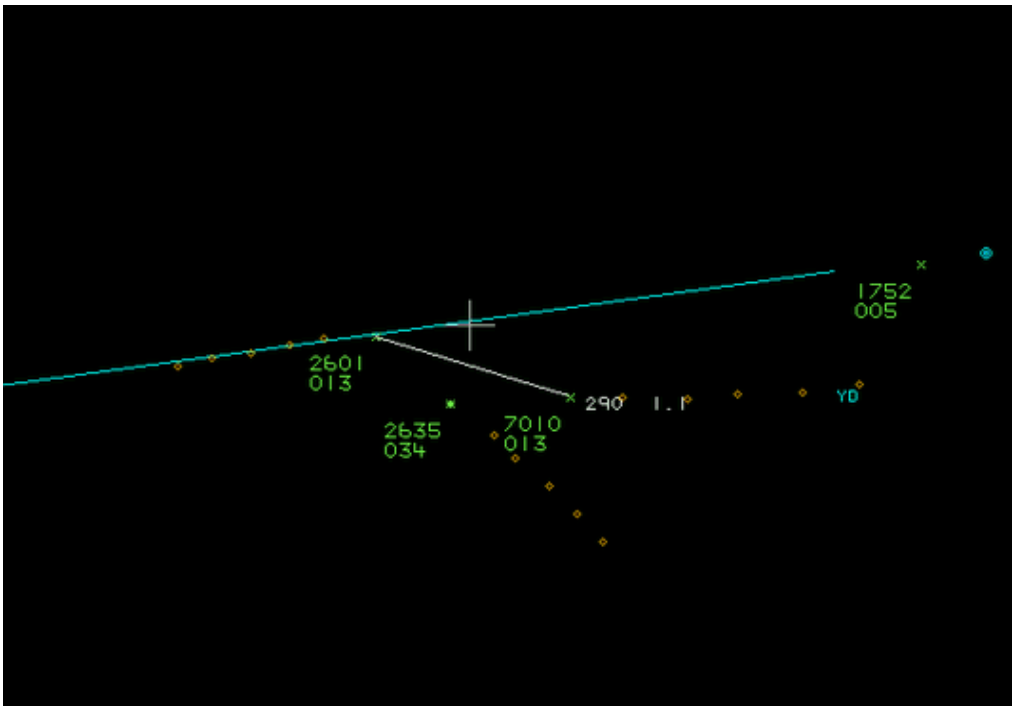

Figure 3: King Air finals call at 1451:11

At 1451:19 (Figure 4), the King Air pilot was instructed to '*go around*'.

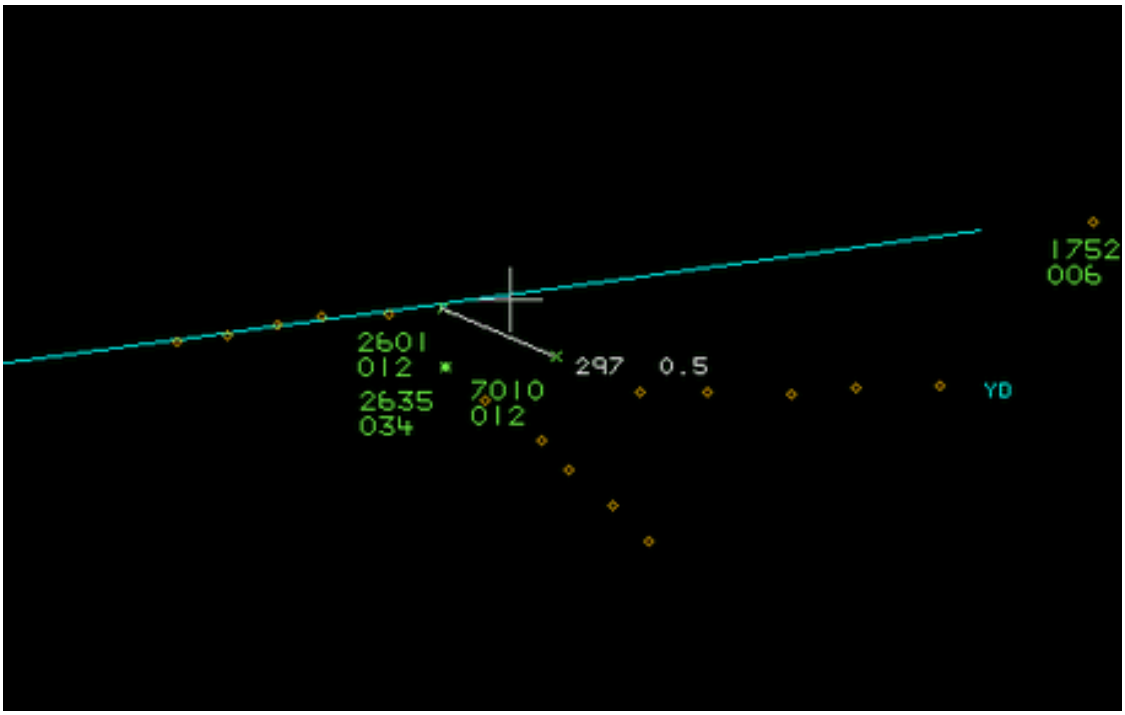

Figure 4: King Air instructed to go-around at 1451:19

The radar replay shows CPA at 1451:27 with 0.1nm horizontal and 100ft vertical separation. A photograph of the PAR screen recording at 1451:26 is shown at Figure 5. On a notional 3° glide path, the Tutor would be at height 600ft at 2nm from touchdown and 750ft at 2.5nm. The elevation display (top) shows the Tutor 90ft above the notional glide path at approximately 2.1nm finals. The descending turn of the King Air is evident at the 2nm point on the range scale.

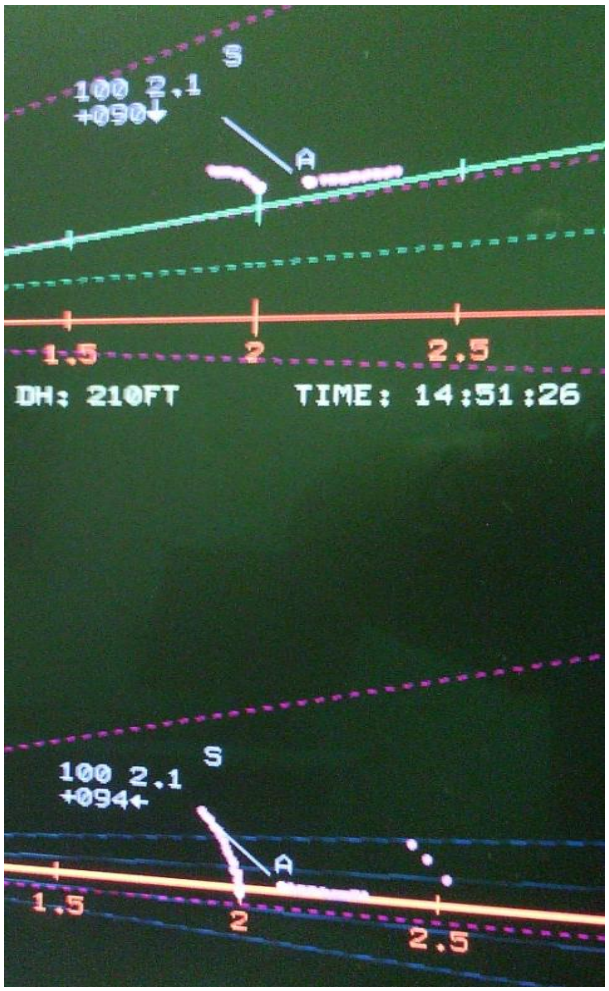

Figure 5: Cranwell PAR recording at 1451:26 showing elevation (top) and azimuth (bottom)

The Tutor pilot had visually acquired the King Air in the visual circuit at 2nm and the VMC conditions allowed the Tutor crew to monitor it. As the King Air turned in front of the Tutor, the crew were in a position to take avoiding action, if necessary. The King Air pilot was not visual with the Tutor and was unaware of its position until on the deadside, after he had gone around. Following the information that there was 'one ahead', the King Air pilot responded with a double-click on the RT rather than a verbal acknowledgement of the traffic. The Talkdown controller had seen the developing confliction on the PAR screen and was about to call traffic when the Tutor declared the Airprox. The Aerodrome Controller had passed the 7nm call but not the 3nm all-stations broadcast of the radar traffic continuing an approach. The call was mandated in the unit Flying Order Book and its omission was considered to be as a result of the controller workload. The King Air pilot was sent around from final when he stated he was not visual with the Tutor.

The barriers to an Airprox of this nature are ACAS, lookout and Traffic Information. The broadcast at 7nm and information that the King Air had 'one ahead' did provide a degree of information but the controller omitted the 3nm call that would have aided the King Air pilot's situational awareness of the Tutor. The Tutor pilot was due general circuit Traffic Information with a positive clearance by 2nm; in this instance the Tutor pilot called visual with the King Air before any Traffic Information was passed by Talkdown. The Tutor crew were assisted in acquiring the King Air by their on-board TAS; the King Air pilot, as per SOPs, had TCAS selected in TA mode (RA disabled) and the crew did recall receiving a 'TCAS warning' on finals. The Tutor crew lookout and situational awareness was the key barrier to avoiding a collision. The King Air crew were not visual with the Tutor and had turned finals into confliction without becoming visual; the crew performed a lookout but did not see the white Tutor. The characteristics and paint scheme of the Tutor presents well-known limitations for visual acquisition. Furthermore, the attitude of the King Air as it turned finals would have meant that the Tutor was obscured from the King Air cockpit.

UKAB Secretariat

The Tutor and King Air 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]. Notwithstanding ATC instruction to the contrary, the pilot of an aircraft in flight, or operating on the ground or water, is required to give way to aircraft landing or in the final stages of an approach to land and when two or more heavier-than-air aircraft are approaching an aerodrome or an operating site for the purpose of landing, aircraft at the higher level shall give way to aircraft at the lower level[3]. Although CPA as measured by area radar was 100ft/0.1nm, the Cranwell PAR screen photograph at Figure 5 of the Military ATM report indicates that the aircraft were at the same altitude at CPA.

Comments

HQ Air Command

Clear communication and maintenance of situational awareness are key to safe deconfliction in the visual and/or radar circuit. In this instance, it seems that the King Air pilot may not have appreciated that he was number 2 to the Tutor; although a 'Tutor 7 miles, low approach, further' call had been made, there was other traffic in the circuit and a '3 mile' broadcast was omitted by the Tower controller. The lack of formal acknowledgement from the King Air pilot with regards to the Traffic Information, may also have led the Tower controller to believe that he was aware of the approaching traffic and therefore an assessment that he would sequence himself appropriately. When told to 'go around', the King Air pilot conducted his manoeuvre across the approach path, without becoming visual with the radar traffic, thereby resulting in the conflict with the Tutor. It is disappointing that this manoeuvre was conducted despite an onboard 'TCAS warning' alerting them of a potential confliction. Thankfully, the Tutor safety pilot was visual with the conflicting King Air and was able to assess that separation would be sufficient without significant manoeuvre or distraction to the handling pilot.

Summary

An Airprox was reported when a Tutor and a King Air flew into proximity at 1452 on Tuesday 20th January 2015. Both pilots were operating under VFR in VMC, the Tutor pilot in receipt of a Traffic Service from Cranwell Talkdown and the King Air pilot in receipt of a military Aerodrome Control Service with Cranwell Tower.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of 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.

The Board first considered the controllers' actions. The Tower controller had informed the King Air pilot that there was 'one ahead' (the Tutor on PAR) and received a 'double-click' in reply. When the King Air pilot called finals, the Tower controller asked whether he was visual with the Tutor and, when he replied that he was not, instructed him to go around. In this regard, effective ATC action was taken to prevent collision. Members noted that the King Air pilot had turned final despite being informed of the Tutor's 7nm range. However, importantly, the King Air pilot was not passed a '3 mile' call to assist him with his situational awareness. Members agreed that, having been informed of 'one ahead', it was for the King Air pilot to clear his flight path, but they also agreed that the lack of a '3 mile' call had been contributory to the Airprox. Military ATC members commented that the PAR controller may have been able to pass earlier Traffic Information or avoiding action to the Tutor pilot; consequently, HQ Air Command had instigated a review of PAR controller training, to include scenarios such as this one, thereby helping PAR controllers to react more promptly to other aircraft returns on the PAR.

[2] SERA.3205 Proximity, as reflected in Military Flying Regulations.
[3] SERA.3210 (4) Landing, as reflected in Military Flying Regulations.

Turning to the pilots' involved, members noted that military pilots flying within a military visual circuit are normally responsible for aircraft sequencing. Military members explained that this was due to the often austere nature of military operations, and that pilots conducting their own sequencing was the most effective training to ensure required levels of safety on operations. Local orders stipulated that arriving traffic on radar approach had priority over traffic in the visual circuit, of which both pilots were no doubt aware. Members felt that the King Air pilot's double-click response to the Tower controller informing him there was one ahead, and the evident lack of situational awareness as to the Tutor's position, were indicative of a high cockpit workload in the training asymmetric configuration. Also, the larger size of the asymmetric circuit placed the King Air further downwind at the start of its final turn and therefore more prone to conflict with radar traffic during a go-around at circuit height. Nevertheless, although the King Air pilot had not been helped by the omission of the '3 mile' call (or the likely poor visibility into sun), members opined that it still remained his responsibility to sequence safely behind the traffic which he had been informed was ahead. If he had insufficient situational awareness of where that traffic ahead was, members noted that this may necessitate an early decision regarding terminating the training task in order to re-acquire situational awareness.

Nevertheless, the Tutor safety pilot had seen the King Air when it was downwind, and had maintained visual contact. He was therefore always in a position to effect deconfliction, and had assessed that no avoiding action was required. In the end, it was agreed that the cause of the Airprox was that the King Air pilot had flown into conflict with the Tutor. Members discussed the risk at length; with some considering that 'effective and timely action' had been taken by the Tutor pilot in assessing that no avoiding action was required, and that the risk category was therefore 'C'. Whilst all agreed that effective and timely action had indeed been taken, it was nevertheless felt by the majority that, in this incident, an aircraft passing only 200m or so in front of one on a radar approach meant that safety margins had been much reduced below normal.

PART C: ASSESSMENT OF CAUSE AND RISK

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

Contributory Factor: The Tower controller did not make a '3 mile' call.

Degree of Risk: B.