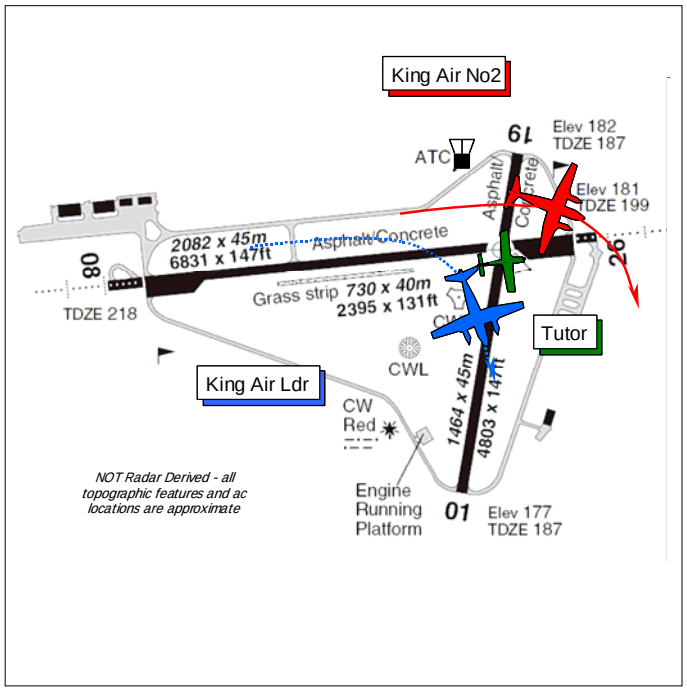
AIRPROX REPORT No 2010015

Date/Time:	8 Mar 2010 1258Z	
Position:	5301N 00029W (Cranwell - elev 218ft)	
Airspace:	Cranwell MATZ/ATZ (*Class:* G)	
	Reporting Ac	*Reported Ac*
Type:	Grob Tutor T Mk1	BE200 King Air
Operator:	HQ Air (Trg)	HQ Air (Trg)
Alt/FL:	400ft QFE (1024mb)	600ft QFE (1024mb)
Weather:	VMC CLNC	VMC CLNC
Visibility:	10km+	10km+
Reported Separation:		
	Nil V/300m(No1) 100m(No2)	NR
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GROB 115E TUTOR T Mk 1 PILOT, a QFI, reports he was conducting a VFR instructor-training sortie in the cct at Cranwell whilst in communication with TOWER on 125·05MHz. They were flying in the RH cct (RHC) and using the RW08 grass strip. As P-I-C he was seated in the R seat with his student instructor in the L seat. His ac has a white colour-scheme and the HISLs and landing lamp were both on. Mode S is fitted, but SSR was selected to 'standby' in accordance with unit cct procedures.

Climbing out in the cct upwind heading 085° at 80kt, after completing a touch & go, both he and his student were aware of a King Air formation joining for the main RW08 RHC. Climbing through 400-500ft QFE (1024mb), abeam the RW intersection, he saw a King Air in their 5 o'clock at the same height breaking into the cct about 300m behind and at the same height as his aeroplane. A second King Air then appeared in their 10 o'clock, 100m away at the same height in a right-hand break across the nose of his Grob from L - R. No avoiding action was taken but he assessed the Risk as 'high'.

TOWER asked the King Air formation if they had seen the Tutor upwind, whilst also stating that the grass runway was active. The response from the leader of the King Air formation was unclear but he thought it was 'negative'. An Airprox was reported to TOWER on the RT at the time of the occurrence.

UKAB Note (1): The UK Mil AIP at AD2 – EGYD-1-13 specifies that the main [conventional] cct height is 1000ft QFE with the light ac (LA) cct at 800ft QFE. The RW08 grass strip is situated 150ft S of the edge of RW08.

THE BE200 KING AIR PILOT reports he was flying as No2 of a formation of two ac inbound to Cranwell under VFR and in communication with TOWER on 125·05MHz. His ac has a white and blue colour-scheme and the HISLs were on; Mode S is fitted but SSR was selected to 'standby'.

Flying a visual recovery to Cranwell for a visual 'run-in and break', he was flying in echelon to port of the lead ac. Following the lead pilot's call at Initials, TOWER reported 2 ac in the cct and during the run-in at 200kt to RW08 RHC, both of these ac were seen visually by the formation. The lead King Air pilot broke slightly further upwind than normal and, having seen the Grob Tutor climbing away

from the grass runway, he delayed his own break to avoid over flying it. He was visual with the Grob Tutor throughout the level break at 600ft QFE (1024mb). No avoiding action was necessary and he assessed the Risk as 'none'.

UKAB Note (2): Although the No2 King Air pilot did not quantify the minimum separation, his diagram shows the Grob Tutor passing obliquely to starboard, some 450m abeam, about 150ft below his ac.

THE CRANWELL AERODROME CONTROLLER (ADC) reports that his workload was medium/high. Two Grob Tutor ac were operating in the visual cct to RW08 RHC, when the King Air formation called to join through Initials, which was approved. When the King Air formation leader called at Initials he was told, 'one upwind main, one upwind grass remaining' and given the surface wind. After calling 'on the break' the lead King Air broke and turned downwind; however, the No 2 continued on the deadside for a couple of hundred feet and then broke at 600-800ft QFE (1024mb). The level turn crosswind took the No2 towards the Grob Tutor that was climbing-out upwind of the grass strip at about 500-600ft QFE, so he asked the pilot whether he was visual with the Tutor 'upwind grass'. No response was received, he thought, so again he asked 'are you visual with the Tutor departing upwind grass?' The next call received was the Grob Tutor reporting the Airprox in the visual cct. He was not aware of any confirmation by the No2 King Air pilot that he was visual with the Tutor at the time of the Airprox. He estimated the minimum separation to be 50-80ft horizontally, 50ft vertically.

HQ AIR ATM SAFETY MANAGEMENT reports that the ADC was operating under a medium workload with 2 ac in the visual cct prior to the arrival of the King Air formation and had been in position for 58min; the weather conditions were reported as good – Aerodrome Weather State Colour Code (CC): Blue – min 8km; lowest cloud SCT 2500ft agl.

At 1256:01, the leader of the King Air formation called on the Cranwell TOWER frequency 125.05MHz for a clearance to join the cct. The ADC gave the standard response, "[C/S] *Cranwell TOWER join runway 0-8 right hand Q-F-E 1-0-2-4 2 in grass active".* The King Air formation leader acknowledged TOWER's call at 1256:07 "*08 right hand 1-0-2-4* [C/S]*".* The 2 ac reported to be in the cct on the joining call were two Grob Tutor ac – including the ac flown by the reporting pilot - both operating to the grass RW08.

The subject Grob Tutor crew called finals for the grass runway, to which the ADC responded at 1256:15, "[C/S] *clear touch and go grass".* At 1256:39, the second Grob crew called a 'fan stop', which was acknowledged by the ADC. After the second Grob crew called, *"..climbing away",* the King Air leader reported, "[C/S] *initial for the low break"* at 1257:04. This was immediately acknowledged by the ADC who advised "*..1 short final for the grass* [the subject Grob Tutor] *1 cross wind* [the second Grob] *surface wind 3-6-0 10 knots".* This cct information was acknowledged by the King Air leader using the formation C/S. Two sec after the lead King air pilot reported at 1257:45 "[C/S] *on the break low land"* and having heard the message passed by the ADC to the lead King Air pilot, the second Grob crew then reported in a clipped transmission that they were sequencing to let the King Air formation execute their approach, *"..at the beginning of the downwind leg to let the pair in"*; this was acknowledged by the lead King Air pilot at 1257:51. The ADC reports seeing the lead King Air break and turn downwind but the No2 King Air extended further into the deadside before breaking. This caused the ADC some concern so he passed further TI about the subject Grob Tutor at 1258:01, "[King Air No2 C/S] *Tutor up wind grass..departing",* and then again 8 sec later, "[King Air No2 C/S] *are you visual with the Tutor upwind grass?".* The RT transcript reveals at 1258:10, that the No2 King Air pilot acknowledged this call using just his call sign, although the controller reported that the next call received was from the Grob Tutor QFI reporting the Airprox, which actually occurred some 5sec later at 1258:15. After breaking into the cct the lead King Air departed for a further radar approach whilst the No2 landed.

This AIRPROX is not shown on the Claxby Radar recording.

Military controllers are encouraged not to 'over control' military ac. However, the passing of cct information is fundamental to enable aircrew to sequence correctly in the cct. In this case the ADC, who was working within his abilities in a busy aerodrome visual cct, provided timely and accurate

information to the crews involved. Initial joining calls were standard and should have enabled all crews in the visual cct to gain adequate SA. The ADC correctly identified a concern that might arise over the positioning of the No2 King Air in relation to the Grob Tutor and so called the Grob Tutor to the King Air pilot twice; this TI was subsequently acknowledged on frequency. By extending the break upwind further into deadside the No2 effectively cut across the climb-out to the grass strip, which brought him into confliction with the Grob Tutor.

Air Cmd ATM Safety Management does not believe ATC contributed to this Airprox. Since this incident Cranwell ATC has carried out a safety survey into visual cct procedures, which has included amendments to the use of the grass strip running parallel to the paved runway surface. In a recent standards bulletin SATCO has reinforced the importance of controllers keeping a good lookout in the visual circuit and reacting in a timely manner. The Station Flight Safety Officer has also reminded ac operators of their responsibilities whilst flying in the visual cct. These measures are reasonable given the importance military crews attach to maintaining their autonomy in the visual cct.

Air Cmd ATM Safety Management Support recommended a review of the Run-in and Break procedure at Cranwell, in particular the interaction between the break point within the cct and the grass runway.

UKAB Note (3): The UK MIL AIP at AD2-EGYD-1-10, Local Traffic Regulations notes a Warning at para 4c that: '…a grass strip South and parallel to Rwy 26/08 may be in use with circuits flown inside the main visual circuit. Both circuits are flown independent of and co-incident to the main circuit.'

UKAB Note (4): The RAF Cranwell Flying Order Book (FOB) specifies at D-12-2, para 8a Circuit Joins via the Initial Point (IP).

> 'The IP for each RW is 2nm from the threshold, displaced 100m from the centre line, on the deadside. The standard join is to be flown through the IP at circuit height. Any subsequent descent, for a low-level circuit or low break, is to be made after leaving the IP. Aircraft are not to over fly Cranwell village below 1000ft QFE (800ft QFE for light ac). The minimum height for a visual run-in and break (VRIAB) is 300ft QFE. Ac leaving the circuit...'

UKAB Note (5): A Safety Management Survey was conducted by the Unit, which considered the conditions required to support Grass RW operations, and a final report was issued on 28 Aug 2009. It was noted that:

> 'The positioning of the Grass RWs relative to the main instrument runway are in contravention of [JSP 554 Sect 200, 201.100.5 – that gives the criteria and specific dimensions allowable when designing new RWs to operate parallel strips] which require a minimum centreline separation distance of 210m for VFR operations and 1035m for IFR operations. The current distance between centrelines of the northern and southern Grass RWs and the main RW are 87.3m and 124.85m respectively. Due to the cost implications and impracticality in meeting these requirements, permission has previously been granted to retain the existing aerodrome features without complying with current regulation.'

Many facets of the operation of the Grass RWs were considered in this detailed Survey, which was too extensive to précis here. It was concluded that:

> 'Grass RW operations have proven to be effective under the current SOPs. The hazards identified have been mitigated by the implementation of procedures or by the addition of restrictions.

HQ AIR (TRG) comments that this Airprox raises several questions however, the fundamental issue was how the King Air formation integrated into the visual circuit at Cranwell that at the time had Tutors operating from the parallel grass strip. The King Air formation joining the Cranwell circuit from a 600ft break through the Tutor circuit of 800ft was not a good plan. Had the Tutor been operating from the main RW08 this Airprox could have still occurred.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts of the relevant RT frequency, a report from the air traffic controller involved and reports from the appropriate ATC and operating authorities.

Members recognised that it was the responsibility of pilots joining the cct to integrate safely with traffic already established in the pattern. The reporting Tutor pilot had little impact on the outcome of this Airprox other than being one of the ac involved; although aware of the formation joining from the RT, he was unable to sight the formation any earlier as they approached from astern and it was the King Air pilots that chose the final separation. The Tutor QFI reports the Airprox occurred as he passed abeam the RW intersection when he became aware of the two King Airs breaking either side. It seemed to the Board that his best course of action in these circumstances was to stay predictable by maintaining his course, speed and RoC allowing the King Airs to fly around him. The Tutor QFI was uncertain whether the pilot of the No2 had seen him and so was the ADC. Having passed TI on the Tutor to the No 2, the ADC then asked if he was "..*visual with the Tutor upwind grass"; the* No2 King Air pilot acknowledged the call using his callsign but did not confirm that he was visual. However, the No2 pilot's written account reinforces that both of the circuiting Tutors were seen by the formation; additionally he reports seeing the Grob Tutor climbing away from the grass runway, but it is not entirely clear when the subject Tutor was first seen.

Before this Airprox occurred the main RW and the grass were controlled independently by TOWER; the grass strip is now treated as an extension of the RW surface. It was the Board's view, however, that the functional use of the grass strip by the Tutor was not intrinsic to the Cause here. The catalyst to this Airprox was the execution of the low break into the cct by the King Air formation. This had been requested in good time by the formation leader and approved by the ADC. The cct state passed by TOWER was correct and should have facilitated visual acquisition of the two Tutors already established in the cct to the grass strip for RW08. The Board discussed the wisdom of permitting the King Air formation to execute a low break with the LA cct active; some airfields prohibit low breaks by medium and high performance aircraft in these circumstances. However, at aerodromes with intense elementary flying training being conducted there will be few occasions when the LA cct is not active, and the Board was briefed that it was SOP at Cranwell to permit low breaks with the LA cct active. Given this requirement to integrate different aircraft types as a matter of routine, the Command has recommended a review of the 'run-in and break' procedures at Cranwell and specifically the location of the 'break' position. The Board agreed that this aspect needed to be reviewed but noted that aircraft joining should always be prepared to adjust their break position if necessary to fit in with aircraft already established in the cct. This was the nub of the issue.

Clearly the No2 King Air PF, whose attention would have been concentrated on the lead ac to starboard, would have been entirely reliant on his leader to position the formation where it could break clear of other circuiting ac. Formation leaders must assume that their wingmen, even in multi-crew ac, are not visual with other ac in the cct. Pilot Members were strongly of the view that in this case the formation leader had left the break too late – a point mentioned in the No2 King Air pilot's report where he states that the lead King Air pilot broke slightly further upwind than normal. Thus when the leader broke to starboard and the No2 became a separate element, he was too close to the upwind end and confronted with the Tutor climbing out at close quarters, which he had to promptly manoeuvre around. Thus the Tutor was bracketed by the two King Air ac as they broke around him. In the Board's view, the lead King Air pilot had not allowed sufficient room for his No2 to manoeuvre at the break, which was executed too late. The Board agreed, therefore, that the Cause of this Airprox was that the King Air formation leader did not integrate his formation into the circuit safely.

When considering the inherent Risk, pilot Members recognised that, since the No2 was visual with the Tutor, he would have been able to delay his break and increase the separation distance if necessary. However, the Board considered that it was fortunate that the No2 had seen the Tutor before executing his break. Although the actual separation could not be ascertained independently,

with the Tutor crew constrained in their ability to manoeuvre as the two King Airs passed either side L and R at far from ideal distances, the Board concluded that the safety of the ac involved had not been assured.

It was clear to the Board that, notwithstanding the poor execution of this run-in and break, the extant cct procedures had been complied with. Rather than make a formal Safety Recommendation, the Board noted and endorsed the Command's recommendation for a review of the visual cct procedures at RAF Cranwell.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The King Air formation leader did not integrate his formation into the circuit safely.

Degree of Risk: B.