

AIRPROX REPORT No 2012107

Date/Time: 25 Jul 2012 1351Z

Position: 5302N 00029W (O/H
Cranwell - elev 218ft)

Airspace: ATZ (Class: G)

Reporting Ac Reported Ac

Type: BE200(A) BE200(B)

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

Alt/FL: 1000ft
QFE (1010hPa) NR

Weather: VMC HAZE NR

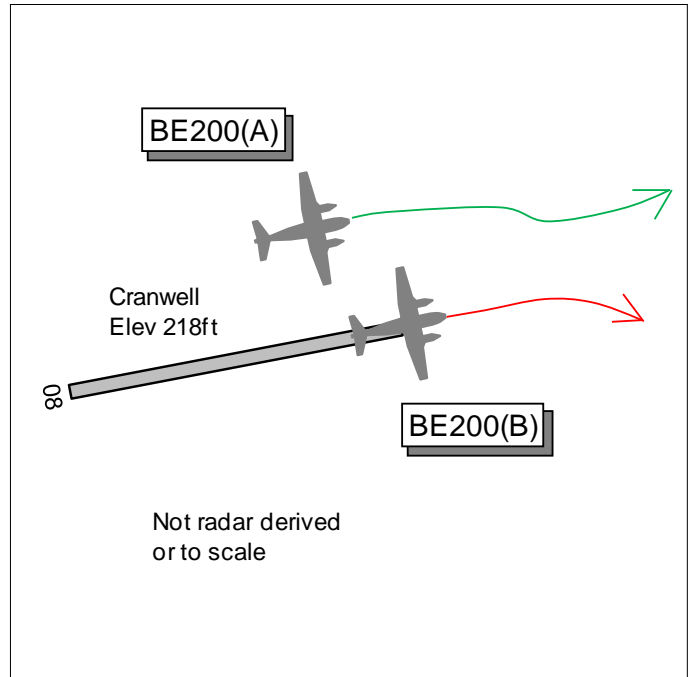
Visibility: 10km NR

Reported Separation:

400ft V/150m H Not seen

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BE200(A) PILOT reports flying a dual student advanced training sortie from Cranwell, VFR and in receipt of a BS from Cranwell Tower on 268.625MHz squawking, he thought, 7010 with Modes S and C. The visibility was 10km in haze, flying 2000ft below cloud in VMC and the ac was coloured white/blue with HISL, nav, taxi, anti-collision and landing lights all switched on. On rejoining the RW08 RH visual cct through 'Initial' [2nm from the threshold, 100m from the C/L on the deadside], the crew was informed that there was 1 Tutor in the cct, 1 Tutor joining O/H, 1 Tutor joining downwind and a King Air on an instrument approach. They were able to identify the Tutor in the cct and the Tutor descending deadside but were unable to locate the Tutor joining downwind. The ac was configured for the cct but they were still unable to identify the ac joining downwind. Having not heard a 'roundabout' call in accordance with local procedures [roundabout 2.5nm ESE Cranwell], he felt safe that the Tutor was still at a safe distance from the cct and, on approaching the upwind RW threshold he made the decision to turn. The crew confirmed that the lookout was clear and the PF rolled into the turn. Shortly after this, while turning through heading 110° level at 1000ft QFE 1010hPa and 140kt, the PNF took control to reverse the turn and commenced a climb, having identified a King Air 150m ahead and to their R, and 400ft below, in a climbing turn from the RW. After confirming that there was no longer a conflict, the PF went around at cct height to reposition. TCAS did not give a TA. He assessed the risk as medium. On reflection the crew was fixated on identifying the white Tutor in the haze and assumed the radar traffic was landing.

THE BE200(B) PILOT reports flying an IRT training flight from Cranwell, IFR and in communication with Cranwell Tower on 268.625MHz, squawking 7010 with Modes S and C. After landing it was established that an Airprox had occurred with another King Air in the visual cct. At no time during the flight was either of the crew aware of the close proximity of the other ac. Although the TCAS system was set to TA only, no TAs were received.

THE CRANWELL TOWER CONTROLLER reports BE200(A) flight reported departing out to initials. Radar traffic was broadcast as a King Air [BE200(C)] at 7nm for touch and go. BE200(A) rejoined through initials and was advised of the position of cct traffic and radar traffic [BE200(C)] at 4nm. A broadcast was then made for BE200(C) at 3nm for touch and go. BE200(A) flight, which was on the deadside, reported extending upwind. At this stage he understood that an Airprox occurred but he did not see it as he was looking in the other direction towards final. Wx conditions were very hazy

and it was difficult to see ac in the cct. Tutor traffic, in particular, was difficult to see and he was spending longer than usual scanning for traffic to confirm their positions.

THE CRANWELL SUPERVISOR reports present in the VCR iaw with Cranwell ATC Order Book as the visual cct was full. The VCR was very busy with Duty Senior Supervisor, Duty Instructor, VCR team and SUP in attendance. The incident occurred when he was requesting a radar clearance for BE200(B) to enter the radar training cct. He remembered distinctly saying “that was close” as BE200(A) broke L to avoid BE200(B). His position at the time allowed him to see the incident but the angle at which he was positioned did not allow him to judge the separation but he thought it was closer than it should be. He also made comment to the DI seated next to him. No mention was made on the RT; however, the BE200 Sqdn UFSO called ATC 1hr later to inform him that an Airprox was being filed.

BM SAFETY MANAGEMENT reports that this Airprox occurred between 2 BE200s within the RW08 RH visual cct at Cranwell. BE200(A) was manned by a student crew conducting a visual cct consolidation sortie; BE200(B) was on an IRT but operating within the visual cct and had just conducted a ‘touch and go’.

All heights/altitudes quoted are based upon SSR Mode C from the radar replay unless otherwise stated.

Although the desk side recording from the Tower Supervisor position captured a comment from the Supervisor about seeing the Airprox occur, thereby giving a time stamp for the occurrence, and despite NATS SSR radar data showing ac at ground level within the Cranwell cct, the Airprox was not recorded on the radar replay. Extensive investigation by the RAC, involving confirmation of the time of the occurrence and the identity of all ac within the Cranwell visual cct, did not shed further light on the event. Analysis of the radar replay has shown an intermittent PSR-only contact in the vicinity of the Cranwell visual cct before, during and after the Airprox. In the absence of contrary evidence, BM SM contends that the PSR-only contact was BE200(A) and, given that other ac squawking SSR 3A data at ground level were displayed, albeit only their SSR return, either the crew of BE200(A) had not selected their transponder to the ‘on’ position, their selection was not effective or the transponder was unserviceable. Moreover, initially, there was some confusion over the identity of BE200(B) as the crew did not realise that they had been involved in an Airprox; this was confirmed following correlation of the available radar data with the transcript and DASOR from BE200(A). Cranwell local orders specify the use of the aerodrome traffic pattern conspicuity squawk within the visual cct. The ADC is not required to validate the SSR 3A of ac within the visual cct.

The ADC described the workload and task complexity as high, a view supported by the Supervisor who added that the unit’s workload was similarly high. The ADC reported that ‘Wx conditions were very hazy and it was very difficult to see ac in the cct. Tutor traffic in particular were [sic] extremely difficult to see and he was spending longer than usual scanning for traffic to confirm their positions’. The crew of BE200(A) assessed that visibility was 10km in haze with FEW at 3400ft; a view confirmed by the PNF who stated in a subsequent conversation that the conditions were hazy and that it was difficult to see the Tutors. The RAF Cranwell Met Office 1350Z Wx report states that Cranwell was BLUE, 20km visibility in nil weather, FEW at 3400, BKN 25000ft.

The incident sequence commenced at 1346:13 as BE200(B) was cleared to join the visual cct from Radar and was passed the airfield details and circuit state. At this point there were 2 other ac in the cct: 1 on short finals to land and BE200(A) downwind. At 1346:26 the crew of BE200(A) reported, “*departing downwind for initial to rejoin.*” The ADC acknowledged this replying, “*roger, report rejoining through initials, one Tutor joining through the overhead*”, which was acknowledged.

At 1347:05, the crew of BE200(B) reported, “*downwind touch and go*” and the ADC replied that there was, “*one King Air (BE200(A)) out to initials*”, which was not acknowledged. At 1347:50, the ADC called APP advising them of BE200(A) routeing toward initials and, at 1348:02, received notification of an unrelated BE200(C) at, “*6 and ¾ miles (BE200(C) c/s) touch and go further.*” The ADC made a

subsequent broadcast to this effect at 1348:08. At 1348:11, the crew of BE200(B) reported, "*finals, gear down*" and was "*cleared touch and go*" by the ADC.

At 1349:07, the crew of BE200(A) reported, "*Initial*" and the ADC advised them, "*1 Tutor joining through Initials, 1 Finals, 1 joining downwind, radar traffic 4 miles, wind 0-3-0, 1-0 kt*" which was acknowledged. Analysis of the transcript demonstrated that this cct state was incorrect in that the, "*Tutor joining through Initials*" was actually descending on the deadside, having conducted an O/H join. However, based upon the report of BE200(A)'s crew, they sighted this Tutor and were not confused by the incorrect cct state; consequently, whilst noteworthy, this incorrect cct state was neither causal nor contributory to the reported Airprox.

At 1349:27, the pilot of the Tutor joining downwind broadcast on the TWR freq that they were "*abeam the roundabout.*" The crew of BE200(A) did report however that they were 'unable to identify the Tutor joining downwind' and felt that they had 'fixated on identifying the white Tutor in the haze' to the detriment of a wider lookout.

At 1349:49, the ADC cleared BE200(C) on PAR to, "*...touch and go, one on touch (BE200 (B)) and go, 3 in*" and, at 1349:58 made the TWR broadcast to this effect. From this point until the approximate time of the CPA, the ADC was involved in a continuous exchange of RT with unrelated ac operating within the visual cct; including BE200(C), there were 6 ac operating within the cct area.

At 1350:39, the pilot of BE200(B) informed the ADC that, "*after this next touch and go, looking to depart into the radar pattern*" which was acknowledged. At 1350:46, the TWR Supervisor's deskside recording captured the Supervisor saying, "*...did you see that?*" which the Supervisor has stated was in response to observing the Airprox. The ADC stated in their DASOR that they did not see the Airprox as they were 'looking towards finals' the requirement for which is borne out by the tape transcript.

The crew of BE200(A) reported that 'having not heard a 'roundabout' call in accordance with local procedures (the call made by the Tutor pilot at 1349:27), the pilot felt safe that the Tutor was a safe distance from the cct and, on approaching the upwind threshold, the pilot made the decision to turn'. The pilot of BE200(A) has reported that they assumed that 'the radar traffic was landing' which suggests that they believed that they had the Airprox with BE200(C).

In their DASOR, the crew of BE200(A) make no mention of a second BE200 operating within the visual cct and the fact that they believed that the Airprox occurred with BE200(C) suggests that they had reduced SA of BE200(B). Based upon their report and subsequent provided information, the PF of BE200(A) believed that the other ac within the visual cct were all Tutors. This view was supported by the PNF who did not recall there being other BE200's in the visual cct. BM SM contends that this assessment may have been based on the cct state passed to the pilot of BE200(A) by the ADC at 1349:07, stating, "*1 Tutor joining through Initials, 1 Finals, 1 joining downwind, radar traffic 4 miles*". This could be interpreted as meaning that all of the ac within the visual cct were Tutors. Given the known difficulties in sighting Tutors and that the crew of BE200(A) were students, the ADC's desire to highlight to the crew of BE200(A) the specific presence of Tutors is understandable; however, the use of additional phraseology to boost situational awareness should be consistent in application, to ensure that ambiguity is not introduced. That said, notwithstanding the previously highlighted issue pertaining to the Tutor descending on deadside, the cct state passed by the ADC was correct in as far as the positions and numbers of ac were concerned and the pilot of BE200(A) was required to be visual with all ac within the cct, prior to entering the cct. Subsequent conversation with the PF revealed that the crew believed that the PNF had declared 'visual' with the ac on finals; however, the PF did not believe that this call confirmed the ac type and he believed that the ac was landing. In subsequent conversation with the PNF, he could not recall having stated that he was visual with the ac on finals. Had he been visual with the ac on finals (BE200(B)), then it is reasonable to argue that he would have been aware that there was another BE200 within the visual cct. However, BE200(B) had joined the visual cct prior to BE200(A) departing the cct and there were multiple exchanges of RT between the ADC and the crew of BE200(B) that the crew of BE200(A) would have heard; the purpose of these exchanges of RT being to boost the SA of all crews operating within the visual cct.

Therefore, the information was available that would have allowed the crew of BE200(A) to have been aware of BE200(B)'s presence within the cct. BM SM contends that cct congestion was a contributory factor in the loss of SA of the crew of BE200(A).

Based upon the report of and subsequent conversation with the PF of BE200(A), whilst they were aware of the presence of an ac on finals (BE200(B)), they believed that the ac was landing and there are clear indications that this may have been HF related. The crew had already reported that they were task-focussed on visually acquiring the unrelated Tutor joining downwind and felt under a high workload. Moreover, given the dynamic cct state described to the crew of BE200(A) at Initial, it may be that they were affected by the 'Serial Position Effect' where the information in the middle of the transmission was not/incorrectly stored/recalled from working memory. Some research has demonstrated that high levels of psychophysiological stress, which can be caused by high workload, have a deleterious effect on working memory.

Whilst the potential ambiguity introduced by the ADC's reference to Tutors in the cct may have contributed to the crew of BE200(A)'s reduced SA, it was not a causal factor in the Airprox. Given the ADC's workload and the timing of events, once BE200(A) had passed inside Initial, there was no further ability for the ADC to affect the outcome of the incident.

In summary, the crew of BE200(A) were unaware of the presence of BE200(B) and, having conducted a lookout and believing there to be no conflict, turned into conflict with BE200(B). Whilst the inclusion of ac type in the ADC's transmission of the cct state to the crew of BE200(A) may have led them to believe that only Tutor type ac were within the visual circuit, BM SM contends that sufficient cues were available to the crew of BE200(A) to highlight the presence of BE200(B); however, the crew of BE200(A) was unable to use these cues to adapt their SA. Critically, the crew was aware of an ac being on finals but do not appear to have visually acquired it as they passed Initials and, although in a position to be aware of its intentions, believed the ac to be landing and therefore no factor.

RECOMMENDATION

Whilst what follows should not detract from what the Cranwell ATC investigation was able to determine, the BM SM investigation of this Airprox has highlighted causal and contributory factors that would have been better captured and investigated by a more formal Station-level investigation. For instance, great benefit would have been obtained from an in-depth HF analysis, both in terms of determining cause and contributory factors, but also in terms of identifying potential mitigations.

AP3207 200.110.5 states that 'A Unit-Level investigation may be ordered by an Operational Duty Holder (ODH), Delivery Duty Holder (DDH) or his delegates to investigate an accident, incident or occurrence which warrants formal investigation but does not justify the convening of a Service Inquiry by the MAA'; however, it does not provide guidance on what types of incident might warrant a unit investigation. BM SM requests that RAF FS consider the development of a mechanism to inform the decision making of the ODH, DDH or their delegates in this regard.

HQ AIR (TRG) comments that the BM SM analysis is entirely plausible. It appears that the crew's coordination broke down in the cockpit, particularly in regard of who could see what. Hopefully this crew learnt a salutary lesson. Their concern over the sighting of the Tutor is understandable, as the combination of Tutors and hazy conditions is always a concern, but the option remained to request a position update or to fly through and rejoin if required. Whilst the crew did not identify BE200(B) during its final approach and roller, the PNF is to be commended for his lookout during the turn into the circuit, and for his prompt and positive action in taking control and resolving the conflict. The lack of IFF return warrants further investigation as it potentially indicates a HF-related error on the part of the crew or a technical issue. On the matter of Airprox investigation processes in AP3207, a draft amendment is awaiting release. The requirement for 'investigation' by units is stated in RA 1410(1) para 50, which has been updated recently, but no guidance is given. Not all events will require an Occurrence Safety Investigation (OSI), which is the only unit-level investigation in current use. However, as Airprox can be manifestations of some of the higher risks owned by Duty Holders at unit

or group level, it behoves Safety Staffs to consider each event seriously as a potential OSI subject. OSIs can also be mandated by group Safety Staffs or by the MAA. As a minimum, 'investigation' should ensure that sufficient and complete data has been gathered and recorded on a D-ASOR for the UKAB to analyse; the AMC to RA 1410(1) implies that completion of a D-ASOR is the minimum requirement for such an investigation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members agreed that the BE200(A) crew did not have SA on the cct traffic when they rejoined the cct through Initial. Although the cct state passed by the ADC was incorrect – the Tutor joining through initials was in fact joining O/H – the BE200(A) crew had seen this traffic but did not assimilate that the '1 [ac on] finals' was BE200(B) whose crew had previously called downwind and then final. The student pilots on BE200(A) had seen something on final but apparently dismissed this as landing traffic when it was actually BE200(B) on a touch and go. BE200(A) crew had also not assimilated the Tutor pilot's call at 'the roundabout' as he positioned to join downwind and were focussed on looking for this Tutor when they turned at the upwind end into conflict with BE200(B) climbing out. One Member commented that owing to the reported difficulty of seeing Tutor ac in the haze perhaps it would have been better to only accept them via O/H joins instead of joining via downwind.

Looking at risk, it was not possible to verify the separation at the CPA in the absence of any SSR returns from the BE200(A). The ADC did not witness the incident as he was looking in the other direction, his attention only being drawn to it by the Supervisor making comment. With the BE200(B) climbing out and turning onto crosswind, positioned ahead of BE200(A,) the crew did not have opportunity to see the converging BE200(A). Members agreed that the BE200(A) PNF did well to recover the situation when, visually acquiring BE200(B) an estimated 150m ahead and 400ft below, he took control, reversed the turn and commenced a climb. These actions were enough to persuade the Board that any risk of collision had been quickly and effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The crew of BE200(A) did not have SA on cct traffic and turned into conflict with BE200(B).

Degree of Risk: C.