## AIRPROX REPORT No 2014166

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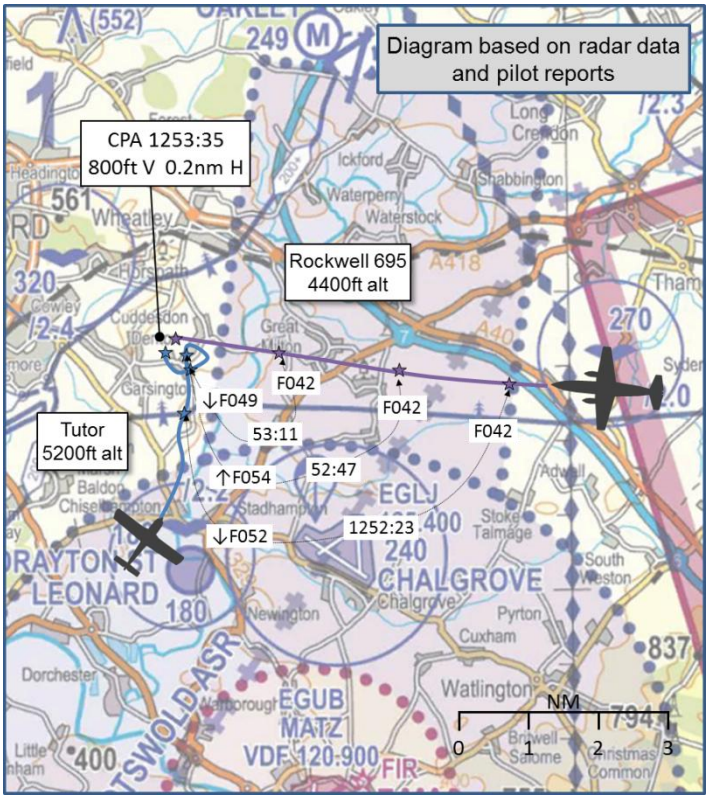
| *Date/Time*: | 29 Aug 2014 1254Z | |
| *Position*: | 5142N 00108W (1nm E Oxford) | |
| *Airspace*: | Oxford AIAA | (*Class*: G) |
| | *Aircraft 1* | *Aircraft 2* |
| *Type*: | Tutor | Rockwell 695 Jet prop 1000 |
| *Operator*: | HQ Air (Trg) | Civ Exec |
| *Alt/FL*: | 4000ft NK | FL45 |
| *Conditions*: | VMC | VMC |
| *Visibility*: | 10km | 10km |
| *Reported Separation*: | 150ft V/100m H | |
| *Recorded Separation*: | 800ft V/0.2nm H | |




## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE TUTOR PILOT** reports flying a white aircraft with all lights illuminated and transponder selected with Modes 3A and C. The aircraft was fitted with TAS. Whilst conducting an Air Experience Flight, the Tutor pilot manoeuvred to approx 1nm from the edge of Oxford. As he turned and descended, the TAS alarm sounded and, at the same moment, a white aircraft was seen to pass below. The conflict had not been identified as approaching on the TAS display. The other aircraft was white with straight wings and, he believed, a propeller on the nose; it flew from east to west at a relatively high airspeed. On first sighting the conflicting aircraft was 150ft below and slightly west; the pilot of the other aircraft did not appear to take avoiding action.

He assessed the risk of collision as 'Medium'.

**THE ROCKWELL 695 PILOT** reports flying a white and black aircraft with strobes and navigation lights illuminated and transponder selected with Modes 3A, C and S. The aircraft was equipped with TCAS 1. He reported that, because he flies this route every week, and a few weeks had passed before he was notified of the Airprox, he couldn't remember all of details about the day; however, he didn't remember anything dangerous or hazardous happening. The route is always flown outside controlled airspace, and Brize and Farnborough (north and west) are always busy but provide lots of traffic information. He recalled that whilst receiving a Traffic Service from Brize Radar (he believed), information was given about traffic to his left. He recalls that he saw the aircraft and initiated a turn to the right for separation, and the aircraft then passed behind him. Once clear he resumed his original heading. The aircraft was visible on TCAS.

He assessed the risk of collision as 'Medium'.

**THE BENSON APPROACH CONTROLLER** reports that, at the time of the Airprox, he had 3 aircraft on frequency (two Tutors general handling and a Chinook on an IFR departure) all under a Traffic Service. Traffic intensity in the local area was high, and multiple contacts had been called to all of the aircraft on frequency. The Supervisor informed him that an aircraft which Zone was working in a similar position to the Airprox Tutor, but indicating 1000ft below on Mode C, was climbing and transiting west. However, at the time he was focused on the Chinook, which had traffic 1nm to the

south at a similar level and, conscious that they were co-altitude, he was trying to ensure the Chinook pilot was visual with it before handing it over to Odiham Director. He subsequently called further traffic information to the Tutor pilot, who informed him of an Airprox with traffic heading towards Oxford. He acknowledged the report and informed the Supervisor.

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

**THE BENSON LARS CONTROLLER** reports that the weather conditions were assessed as BLU and, as a result, the airspace around RAF Benson was congested. At the time of the incident he had 3 aircraft on frequency, 2 under a Traffic Service and one on a Basic Service, with another aircraft calling up for a service and asked to "standby". The Rockwell 695 was being step-climbed north of the MATZ, keeping him underneath controlled airspace. Simultaneously another of his aircraft on a Traffic Service was conflicting with a Chinook climbing out from Benson and his attention was focused on resolving this confliction. Although he knew he had called a number of aircraft to the Rockwell 695 pilot, he could not recall whether he had specifically called the conflicting Tutor. He was in the process of handing the Rockwell 695 over to Brize LARS when he was advised that the Tutor had reported an Airprox.

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

**THE BENSON SUPERVISOR** reports that the unit were operating at a high workload and medium to high complexity just before the incident. The radar training circuit was active, and up to 5 Tutors were on Air Experience Flights receiving a Traffic Service. Additionally, Zone had been working up to 6 aircraft on frequency and so a Zone 2 console had been manned. All 4 radar consoles and PAR were manned. The Tutor flights were concentrated in 3 areas, Oxford, Vale and Lambourne, possibly as a result of recommendations from previous incidents requesting not to use Brize East, which can infringe on Oxford Kidlington inbounds and outbound. At the time of the incident he was monitoring the Director and Approach frequencies, which were the busiest. He monitored the Approach controller controlling the Chinook and was involved in liaising with Zone to ask their aircraft, which conflicted with the Chinook, to change location in order to deconflict the potential hazard. At this time he heard the Zone controller issue a climb to another aircraft: it was not immediately apparent which aircraft he had given the clearance to; however, once the supervisor had assimilated which aircraft it was, he highlighted it to the Approach controller by pointing to the Rockwell 695 on the radar screen and telling him it was climbing. At this time the separation was 1nm and 1000ft (as indicated by Mode C). He recalls that the aircraft had approximately 500ft vertical separation as they passed; shortly afterwards the Tutor pilot reported an Airprox.

## Factual Background

The weather at Benson was reported as:

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METAR EGUB 291250Z 20015KT 9999 FEW030 BKN060 18/11 Q1012 BLU NOSIG
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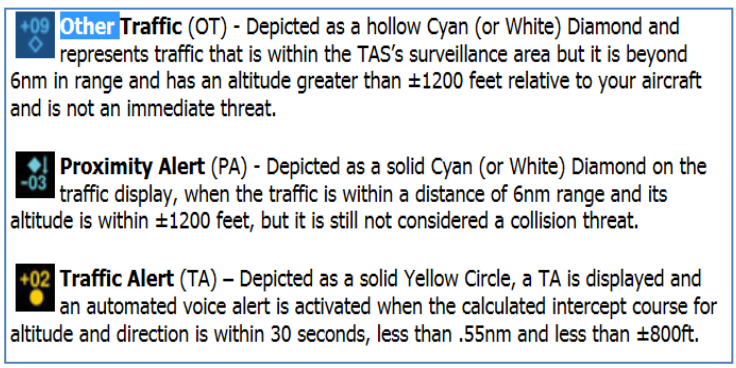
The Grob Tutor is fitted with an Avidyne 600 TAS for which the manufacturer's web-site describes the warning alerts as shown in the figure adjacent. It is probable that the Rockwell 695 was not initially showing on the Tutor's TAS because it wasn't within the surveillance area for the *Other Traffic* alert; the Tutor's own turn and descent then likely put the two aircraft into a position which meant that the TAS jumped straight to an audible *Traffic Alert*.



## Analysis and Investigation

### Military ATM

The Tutor was under a Traffic Service with RAF Benson Approach and the Rockwell 695 was under a Traffic Service with RAF Benson Zone.

All heights/altitudes quoted are based upon SSR Mode C from the radar replay unless otherwise stated, based on 1013hPa.

At 1246:11 the Tutor was informed of two sets of traffic on non-Airprox traffic and approved to manoeuvre in the block between 3000 and 6000ft. At 1249:47 and at 1249:58 (Figure 1), the Tutor was informed of two further tracks, "[Tutor c/s] *traffic north five miles tracking currently west indicating one thousand seven hundred feet below*" and "[Tutor c/s] *further traffic err inbound on radar north east five miles tracking south indicating two thousand seven hundred feet below*." The Rockwell 695 was tracking towards Benson from the east.

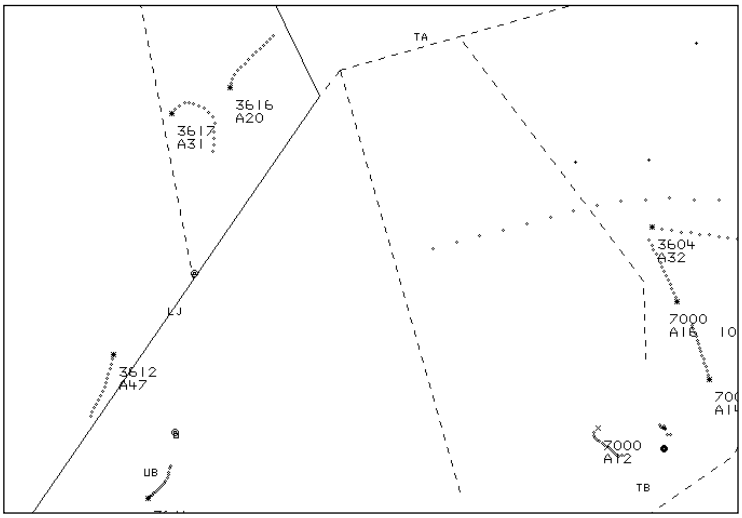



Figure 1: Tutor Traffic Information at 1249:58 (Tutor 3612; Rockwell 695 3604; 3616/3617 Benson non-Airprox traffic).

At 1250:56 (Figure 2), Zone called non-Airprox traffic to the Rockwell 695, "[Rockwell 695 c/s] t*raffic twelve o'clock five miles crossing right left one thousand two hundred feet below inbound on radar at Benson*." The Rockwell 695 confirmed 'traffic in sight'.

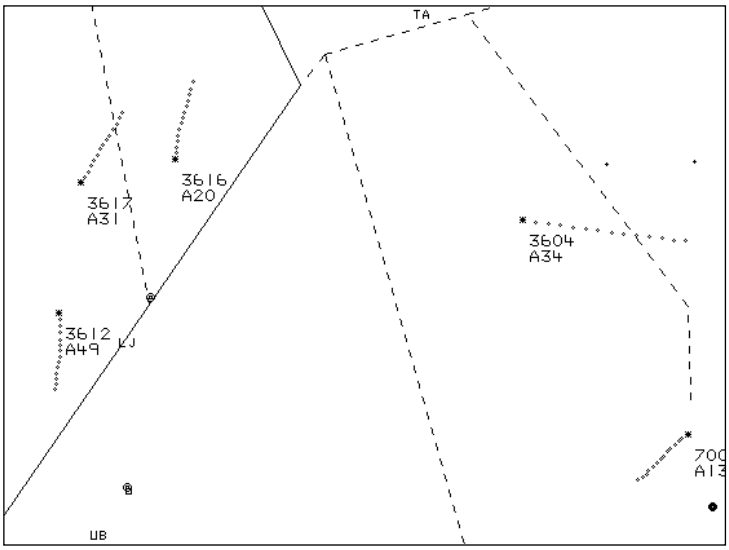



Figure 2: Traffic Information at 1250:56.

The Rockwell 695 confirmed a further climb to FL65 at 1253:01 (Figure 3).

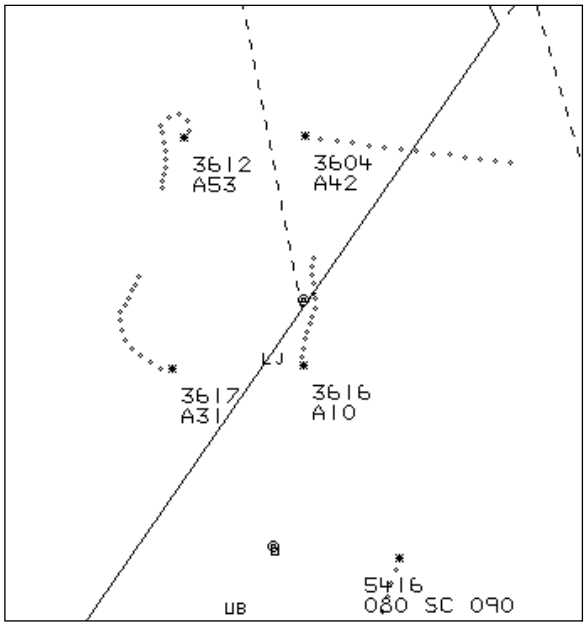



Figure 3: Geometry at 1253:01 as Rockwell 695 informs Zone of climb to FL65.

At 1253:28 (Figure 4), Zone passed information as, "[Rockwell 695 c/s] *traffic south west one mile tracking north east visual with you indicating slightly below*." The Rockwell 695 replied with "*looking"* at 1253:33.

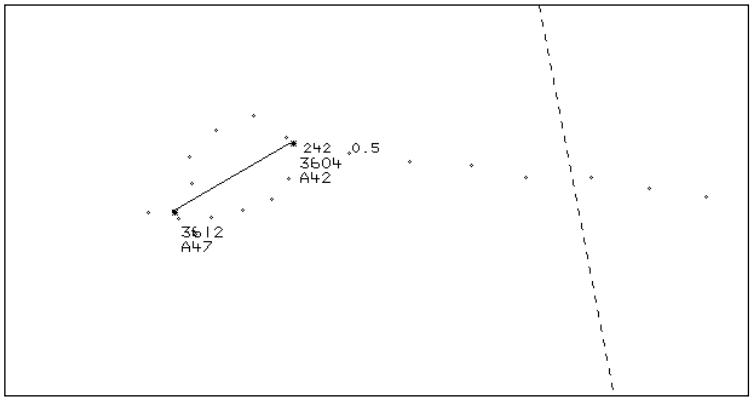



Figure 4: Traffic Information at 1353:28.

The CPA was at 1253:39 (Figure 5) with 800ft vertical separation and 0.2nm horizontal separation.

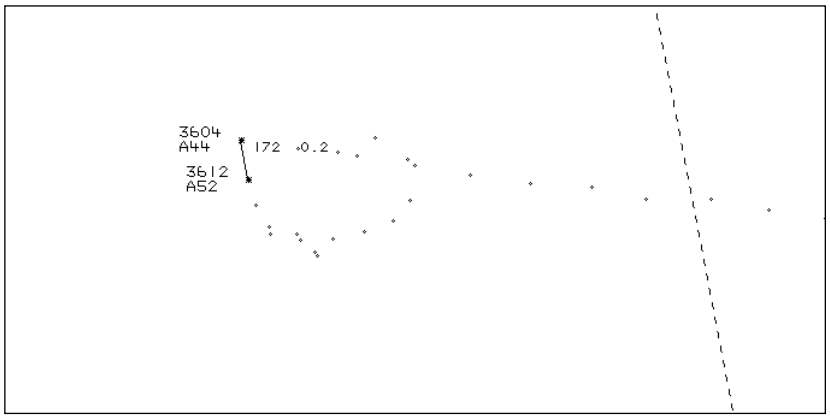



Figure 5: CPA at 1353:39.

Following a prolonged busy spell, the Zone controller was providing a LARS to aircraft crossing the Benson MATZ; the controller had two aircraft under a Traffic Service and was aware of a confliction with a Chinook conducting an IFR climbout from Benson. IFR traffic had been called to the Rockwell 695 at 1250:56. Further Traffic Information was passed to another Zone transit to allow it to get visual with the Chinook. The Rockwell 695 transmission, at 1253:01, informing him of a climb occurred with 1100ft vertical separation and the Tutor tracking south. At 1253:22, a GA transit called Zone for a MATZ penetration and this delayed the Traffic Information subsequently given at 1253:28, which was then delivered at a fast pace. The transmission to the Rockwell 695 stated that the Tutor was visual but this may have been an erroneous call because this information was not passed by the Supervisor/Approach or the Tutor pilot. Also, the information described the Tutor as 'slightly below' but the replay indicates a Tutor 500ft above. Despite the sheer volume of Traffic Information calls after a long and busy session, the Zone controller recalled that the controllers were more comfortable with the vertical separation between the Rockwell 695 and the Tutor, than the Chinook and another Zone transit.

The Approach controller had three aircraft under a Traffic Service, including the Tutor. The Supervisor had called the climbing Rockwell 695 to Approach but the controller gave the Chinook confliction priority because of the proximity; at 1253:08 Approach called traffic to the Chinook. The Chinook reported visual at 1253:15 and Approach instructed a squawk change for a handover to Odiham; a call to Odiham was made for the Chinook handover at the Tutor CPA (1253:39) and the handover was given priority over Traffic Information to the Tutor. Whilst the Approach controller was informed by the Supervisor of the climbing Rockwell 695 in a similar position to the Tutor, with 1000ft separation, the controller had focussed on the Chinook confliction as the aircraft were co-altitude. No information was passed to the Tutor until 1254:35, when the Tutor acknowledged with an Airprox report. CAP774 (Ch 3, 3.5) states, the controller shall pass Traffic Information on relevant traffic,

> *"However, high controller workload and RTF loading may reduce the ability of the controller to pass traffic information, and the timeliness of such information."*

The Rockwell 695 pilot was flying on a steady heading in the moments leading up to the Airprox and although the occurrence report may be subject to memory fade, it is plausible that the TCAS readout would have detected the transponding Tutor and given more situational awareness than was available to the general handling Tutor pilot. The Tutor's TCAS should also have detected the Rockwell 695 but the high energy manoeuvres may have made this less likely until there was a more definite hazard. The Rockwell 695 confirmed in the climb to FL65 at 1253:01 showing Mode C of 042 on the radar replay; by CPA at 1253:39, the Mode C was at 044, which may indicate that TCAS was showing a contact above and the rate of climb may have slowed to accommodate a positive sighting. The Rockwell 695 pilot report recollected a turn to the right and did not perceive the situation to be hazardous; the replay does not show evidence of a Rockwell 695 right turn and the pilot responded to information with 'looking' at 1253:33, several seconds before CPA. It is not known if the Rockwell 695 had been visual or had been comparing Traffic Information with TCAS. The Rockwell 695 appeared suddenly to the Tutor, with no warning, and this will help explain the element of surprise and the report of an Airprox.

The normal barriers to an Airprox of this nature would have been radar-derived Traffic Information, ACAS and the 'see and avoid' principle. Traffic Information was not passed by Approach to the Tutor but was given by Zone to the Rockwell 695 at 1nm range; the passage of information can be seen in the context of the congested airspace, busy workloads and another confliction at the same time that took the attention and priority of the controllers. The pilots had chosen a Traffic Service in Class G airspace and were responsible for their own collision avoidance. TCAS gave a late warning to the Tutor pilot, presumably because of his general handling profile and it is likely that the Rockwell 695 TCAS did provide awareness to the crew. Lookout was hampered for the Tutor pilot, conducting high energy manoeuvres, against an aircraft overtaking from below and behind. The 'see and avoid' principle was subject to lookout constraints with probable obscuration of the Rockwell 695 from within the Tutor cockpit. Visual

acquisition should have been easier for the Rockwell 695 pilot, on a steady heading, climbing towards the Tutor in approximately the 11 o'clock position.

**UKAB Secretariat**

Both pilots shared an equal responsibility for collision avoidance and for not flying into such proximity as to create a danger of collision[1]. If the geometry is considered to be a 'converging' situation then the Tutor pilot was required to give way[2], if it is considered that the Rockwell 695 pilot was overtaking, then he was required to keep out of the way of the Tutor by altering course to the right[3].

## Comments

**HQ Air Command**

This report highlights the importance of lookout irrespective of ATS or the use of TAS/TCAS, especially in a known area of intense activity. It is likely that the traffic information provided to the Rockwell 695 pilot at 1253:28 would have given the false impression that the conflicting Tutor was visual and able to maintain separation regardless of his own ability to obtain visual contact. The description of the Tutor as 'slightly below' may also have focussed lookout away from the actual relative position of the aircraft; the Tutor is indicated as 500ft above from the radar replay. This may have led the Rockwell 695 pilot to maintain his current track and climb in order to remain predictable to the conflicting aircraft. The lack of timely Traffic Information to the Tutor aircraft compromised the pilot's maintenance of situational awareness in this instance; controller workload is a contributory factor, with the majority of the attention being focussed on deconflicting the Chinook IFR departure.

## Summary

An Airprox was reported on 29th August 2014 at 1254z when a Tutor and a Rockwell 695 flew into proximity. The Tutor was receiving a Traffic Service from Benson Approach, but did not receive specific Traffic Information; the Rockwell 695 was receiving a Traffic Service from Benson LARS and was given Traffic Information. Both pilots received Traffic Information from their respective TCAS/TAS.

## 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.

In looking at the actions of the Tutor pilot, the Board agreed that his surprise in suddenly seeing the Rockwell had probably contributed to his assessment of the risk of collision. He had not been given any traffic Information by Benson ATC and, when his TAS suddenly gave him a Traffic Alert as he manoeuvred, it no doubt gave him immediate cause for concern. Nevertheless, in the busy Class G airspace around Benson, the Board opined that ultimately it remained his responsibility to see-and–avoid other traffic, regardless of whether it had been called to him or not.

For his part, the Rockwell pilot said he had the Tutor on TCAS. He did receive Traffic information from Benson LARS, but the information was rushed and inaccurate, and the controller had erroneously told him that the other pilot was visual with him and below him. This undoubtedly altered his perception of risk given that his information was that the Tutor was below him as he climbed and that its pilot had him in sight anyway. The Rockwell pilot recalls making a right turn and gaining

[1] Rules of the Air 2007 (as amended), Rule 8 (Avoiding aerial collisions).
[2] Ibid. Rule 9 (Converging).
[3] Ibid. Rule 11 (Overtaking).

visual contact with the Tutor, but the radar recording shows this turn to be slight, so the Board couldn't be sure whether he was actually visual with the Tutor or not given that his memory was hazy about the incident.

Benson ATC were undoubtedly busy at the time of the incident and, understandably, the attention of the controllers was drawn to another conflict that was also being controlled by the same two controllers and which was perceived to be a greater risk. But the Board agreed that the Approach controller allowed himself to become distracted and should have prioritised the Rockwell aircraft Traffic Information to the Tutor over the handover of the other traffic. For his part, the Board commented that it was regrettable that the LARS controller did not give the Rockwell pilot accurate Traffic Information in telling him the Tutor was indicating slightly below (when in reality it was above), and that the Tutor pilot was visual with him when he was not. The Board felt that this erroneous information may have been a significant factor in influencing the actions of the Rockwell pilot. Some members of the Board wondered whether, having told the Approach controller that the Rockwell was climbing, the Supervisor should have made more efforts to ensure that he called it to his traffic; however, without the full picture of the situation in the ACR at the time it was impossible to tell whether this was feasible or not.

The Board assessed the cause of the Airprox to be a non-sighting by the Tutor pilot and a late sighting by the Rockwell pilot, with a contributory factor of a lack of Traffic Information to the Tutor pilot and inaccurate Traffic Information to the Rockwell pilot. Notwithstanding, the aircraft did achieve 800ft separation at CPA and so the risk was assessed as Category C, effective and timely actions had been taken to prevent the aircraft colliding.

## PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the Tutor pilot and a late sighting by the Rockwell pilot.

Contributory Factor: A lack of Traffic Information to the Tutor pilot and inaccurate Traffic Information to the Rockwell pilot.

Degree of Risk: C.

ERC Score[4]: 4.

[4] 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.