

ASSESSMENT SUMMARY SHEET FOR UKAB MEETING ON 13 APR 2011**Total: 15 Risk A: 2 Risk B: 1 Risk C: 11 Risk D: 1**

No	Reporting	Reported	Airspace	Cause	Risk
2010113	Tucano (MIL)	GA-8 (CIV)	ATZ (G)	The GA-8 pilot landed on the out of use runway, without clearance, into conflict with the Tucano pair taking off on the duty runway.	C
2010124	Tristar (MIL)	TB20 (CIV)	G	The Tristar was vectored into conflict with the TB20.	C
2010133	Sentry (MIL)	Grob Tutor T Mk 1 (MIL)	G	Sighting Report.	C
2010136	DHC-8 (CAT)	PA28R (CIV)	G	A conflict in Class G airspace resolved by the DHC-8 crew using TCAS.	C
2010139	BE76 Duchess (CIV)	DA42 Twin Star (CIV)	D	1. Lack of positive control by ATC. 2. Having taken avoiding action against joining traffic (PA28(B)), the Twin Star pilot did not position No2 on final to the BE76 as instructed by the ADC.	A
2010140	DR400 (CIV)	BE200 (MIL)	G	Late sightings by the pilots of both ac.	B
2010143	Dominie T Mk 1 (MIL)	DR400 (CIV)	G	The Dominie was vectored into conflict with the DR400.	C
2010152	Tutor (MIL)	BE200 (MIL)	G	The BE200 crew elected to turn downwind early and flew into conflict with Tutor(A), of which they had lost sight.	C

2010153	Tucano (MIL)	Hawk x 2 (MIL)	G	The Hawk pilots flew into conflict with the Tucano, which they did not see. Recommendation: That RAF Linton on Ouse reviews the SOP requiring visiting ac to squawk standby when transferring to TWR.	A
2010158	Grob Tutor (A) T Mk1 (MIL)	Grob Tutor (B) T Mk 1 (MIL)	G	Effectively a non-sighting by the pilots of Tutor (A) and a late sighting by the pilots of Tutor (B).	C
2010164	B737-500 (CAT)	EV97 Eurostar (CIV)	D/G	Perceived loss of separation.	C
2010166	Saab SF34 (CAT)	Tornado GR4 (MIL)	G	The GR4 crew flew close enough to the SF34 to cause its crew concern.	C
2010168	R44 (CIV)	DA42 (CIV)	G	A controller perceived conflict.	C
2010173	DH3 UAV (MIL)	Tornado GR4 (MIL)	G	The GR4 flew close enough to the DH3 UAV to cause its operators concern.	D
2010176	Tornado GR4 (MIL)	C120 (CIV)	G	The C120 pilot entered a notified and active danger area.	C

AIRPROX REPORT No 2010113

Date/Time: 17 Aug 2010 1225Z

Position: 5403N 00115W
(Linton-on-Ouse – elev
53ft)

Airspace: Linton ATZ (Class: G)

Reporting Ac Reported Ac

Type: Tucano GA-8

Operator: HQ AIR (Trg) Civ Club

Alt/FL: 0ft 0ft

Weather: VMC VMC

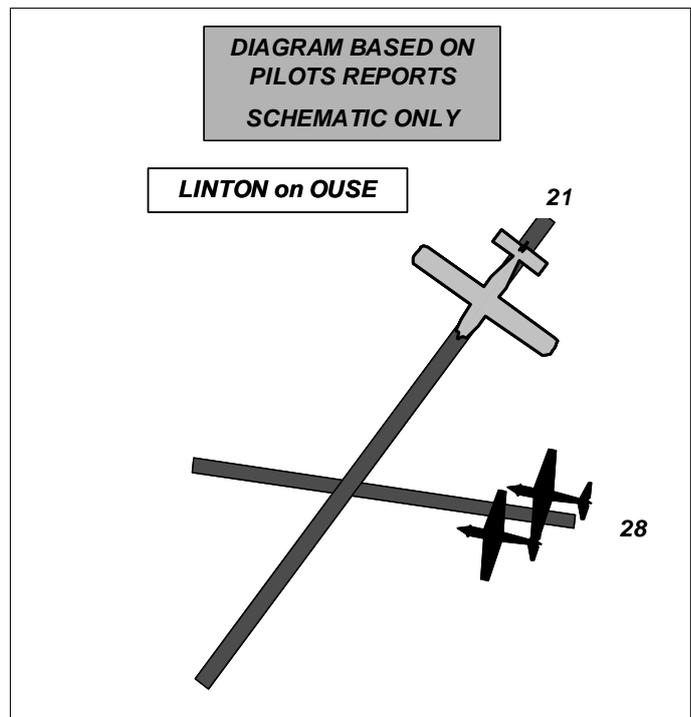
Visibility: NK 15km

Reported Separation:

NR 50ft V/100m H

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TUCANO PILOT reports that he was leading a pair of Tucanos on [a pairs] take-off from RW28 at Linton on Ouse, in receipt of an aerodrome control service from them. During the take off roll at about 20kt, a civilian registered GA-8 ac landed on RW21, the intersecting RW. He assessed the risk as being low. The incident was subject to a Unit Inquiry (UI) and a video from a hand-held camera was provided.

THE GA-8 PILOT reports that several weeks before the incident a military Parachute Display Team, with whom they had worked previously, contacted his operator to determine the availability of an ac for a show at Whitby. The Team requested a pick-up at RAF Linton-on-Ouse and sent full details of the task.

On the morning of the flight the pilot called Linton Ops to confirm his details, determine the airfield details and RW in use and was given a PPR number.

He departed Peterlee airfield at 1200 and flew a direct track towards Linton during which he was cleared through the Teesside CTR, they handed him to RAF Leeming Radar who directed him through the Topcliffe overhead and en-route he passed them his Linton PPR number. At a range of about 5nm he could see ac manoeuvring close to Linton-on-Ouse and, as he had not yet been handed over to Linton APP, he prompted Leeming Radar for a handover. At the time his alt was 2500ft on the Barnsley RPS and he was becoming concerned about his proximity to the airfield, which he knew to be busy. Following a change of squawk and on handover to Linton APP he requested an immediate descent as he had about 4nm to run to the airfield.

He was instructed to call TWR on 129.350; he called 2 or 3 times but got no response so he returned to Linton APP, informed them he could not contact TWR and asked APP to confirm the frequency. They confirmed that he was using the correct frequency and was told to try again, which he did, again with no response. By that time he was at cct alt and again he switched back to APP, stating that he could not raise TWR and asking if they wanted him to stay on their frequency, but they replied 'Wait'. At that time he was on very short finals to a clear runway, which he believed to be the duty RW, (but with hindsight knows to be RW21) and made a safe landing.

Although he was aware that there was a problem, there had been no communication whatsoever from TWR and, in addition, Linton APP did not provide any information other than an instruction to wait.

As he was braking through 20kt to taxi speed, he saw 2 Tucano ac passing from left to right at about 50ft after take off so he stopped his ac immediately about 100m short of the RW intersection. From that position he called TWR and requested taxi instructions but their response was, '*You have landed on the wrong runway*', which he considered to be stating the obvious and not at all helpful. He then asked for taxi and parking details twice but again received no answer so he checked the RW to his left and right proceeded to taxi towards a marshaller in the dispersal.

The pilot secured the ac and went to Operations and was taken to SATCO's office and interviewed with another officer present. He was asked why he landed on the wrong RW; he responded by saying that he landed on a safe RW and asked why TWR did not respond to any of his calls, but he did not receive a suitable reply. He also stated that in his opinion, the chain of events had been as a result of a late handover from Leeming.

Prior to departing Linton airfield the pilot asked Operations to confirm if he needed to call TWR for start-up but he was told to call on GND and was given 129.350 as the frequency. He was aware that this is the TWR frequency and observed that if it is also used as a GND frequency he would expect that there should be 2 different controllers listening out but again he had to request start-up 3 times from getting a response from GND. In his opinion the VHF frequencies were not being monitored adequately.

On landing back at base he checked his radios and found them fully serviceable and also that he had called on the published frequency.

With hindsight, he thought that the VHF frequency at Linton TWR is not routinely monitored as they work primarily on UHF; he considered this inappropriate particularly since he gave over two weeks notice of the exact time of his arrival. Furthermore, Leeming had apparently not alerted Linton that he was inbound. Again with hindsight, he considers that the action he took, although non standard, was the safest course given the circumstances at the time, most of which were totally outside of his control. It was not possible to talk to Linton TWR or other ac and consequently he had no SA and thought that, had he attempted to join the circuit for RW28 without communication with TWR, this would have exacerbated the situation. He was under a high workload at the time and considered it important to get the ac on the ground quickly and clear of other traffic that was probably unaware of his presence. He was fully aware that he must stop before the RW intersection but could not understand why ATC cleared a pair of ac to depart knowing he was landing on another RW.

Finally he wished to inform the Airprox Board that this is the first time he has been involved in such a situation and hopes it will be his last, as it was, and continues to be, a very stressful experience. He has been involved in parachuting for over 30 years in the military, including the last 10 as a pilot and has always been fully committed to Flight Safety; he was recently commended for his actions during a RW incursion [by another ac] at Durham Tees Valley.

HQ AIR BM SM reports that the pilot of the GA-8 received the airfield details from Linton Ops during his planning procedure. The Linton Sup logbook recorded the RW in use at the start of the day as being RW21RH and it changed to RW28RH at 1200Z. The RW change was recorded in the Stn Ops logbook at 1207Z and in the ATC Switchboard logbook at 1158Z. It appears therefore, that although the RW change took place after the GA-8 was airborne, he was aware of it since while speaking to Linton App he gave a correct readback of RW28RH a number of times.

As the GA-8 required a MATZ crossing of RAF Topcliffe, the handover from RAF Leeming Zone was initiated when it was clear of the RAF Topcliffe visual cct, as is standard practice. [The radar recording shows the GA-8 was transiting at 2500ft]. The handover between RAF Leeming Zone and

Linton APP was standard but the pilot, being perhaps unfamiliar with local airspace, had expected an earlier handover.

The Linton APP call to Linton GND did not include a range or ETA for the GA-8. It is not standard practice to pass a range on visual recoveries but in this particular case the lack of information regarding the range or ETA hindered the ADC's planning. Further Linton APP did not communicate that the ac was switching to TWR imminently.

The Linton ADC acknowledged the pre-note of the GA-8 passed by GND but the ac was closer to Linton than he anticipated. This delayed the ADC's decision to select VHF 129.350. Pre-note details are passed face to face between GND and the ADC as they are seated next to one another. The [new] Linton Tower has no 'Live-mike' facility in the VCR, therefore the conversation regarding the pre-note between GND and the ADC was not recorded.

When the GA-8 pilot called on VHF, his transmission was heard by GND who assumed that the ADC, having acknowledged the pre-note, had selected VHF 129.350 and was listening in. After the first few sec of the GA-8's transmission GND deselected the VHF 129.350 and continued talking to other traffic on UHF. As a result he was not listening out for a response from the ADC to the GA-8's call. Further there was no positive handover of VHF 129.350 between Linton GND and ADC.

After the GA-8 pilot had tried to establish 2-way comms with TWR three times on VHF 129.350, he reverted back to APP on 123.3 informing them that there was no reply. Linton APP instructed the pilot to '*Standby*' and via landline asked GND to confirm that the Linton ADC was listening in; GND replied '*To what*' and APP replied '*C/S*'. Linton GND then informed APP the ADC had spoken to the GA-8 when in fact he had not.

Overhearing Linton APP's conversation, the Sup instructed APP to try frequency VHF 122.1, as he assumed that there had been a technical fault with VHF 129.350. However the ATC Engineering watch-log, recorded that there were no frequency unserviceabilities outstanding or reported.

The process of switching frequency from VHF 129.350 to VHF 122.1 meant manually dialling a new frequency into the standby box located in the VCR. This process added further delay in establishing 2-way comms between the GA-8 and the ADC. It also meant both controllers in the VCR were temporarily heads down focused on adjusting the standby radios and this could have affected the lookout for both controllers.

The ac details were not on the Linton Flt Log but had been annotated on the ATC Electronic Tote. The lack of an airborne time and ETA at Linton could have hindered planning processes for the Controlling staff.

The Linton Runway Controller does not routinely use the Station Visitors Programme as a guide to daily movements. Additionally, and though technically able to, the Runway Controller does not select a VHF frequency at any time, listening only to the Linton Tower UHF frequency.

The UI was not able to determine if the GA-8 had been visible on Hi-Brite radar during the final stage of its approach. Linton APP could have identified it to the ADC on the Hi-Brite as the GA-8 had been given a Linton squawk and this would have helped the ADC pinpoint the ac's position visually.

The Inquiry also noted that when RW28RH is in use the threshold of RW21 is behind and to the right to where the Linton ADC is seated and is therefore out of his peripheral vision. Further to that there is a stanchion obstructing a portion of the Linton ADCs view of the approach lane to RW21.

HQ AIR (Trg) comments that the GA-8 pilot appears to have allowed himself to proceed with a pre-planned course of action without altering his plan in light of external situational indicators, leading to a dangerous outcome. It is not clear exactly what contributed to the 'high workload' that the pilot describes, on what appears to be a straightforward transit flight. This incident would have been

identical had the lack of comms with the Linton ADC been the result of a RT failure, which the Supervisor suspected had happened at the time. The UI acknowledges issues with the operation of the VHF frequencies at Linton and appropriate changes will be mandated once the UI is released. However, while the outcome *may* have been different had the GA-8 pilot received an immediate reply to his first radio call to Linton ADC, his actions suggest that this is by no means certain. Furthermore, it is not reasonable for Linton ATC to have predicted the outcome of the failure to establish 2-way comms in this instance, as all the indicators were that the GA-8 pilot understood the RW in use and could therefore have been expected to integrate safely with the extant traffic pattern. It is also unreasonable to expect them to have held the formation taking off, as they would have expected an ac that could not talk to tower would join the visual circuit, or the overhead at the very least, and not proceed to land, deliberately as he implied, on the non-duty RW.

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 photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

The GA Member reminded pilots of 'Safety Sense Leaflet 26 - Visiting Military Aerodromes', which provides a useful guide to procedures used at military airfields for pilots not familiar with them.

Although accepting that this was clearly a very serious incident, many Members, both Controllers and pilots considered that the incident did not meet the normal criteria for an Airprox since the GA-8 was stationary (or almost stationary) on the ground, about 100m short of the intersection, when the Tucanos crossed ahead at about 50ft agl.

It was also pointed out by a Military Controller Member that the Tucanos would have been given take-off clearance before the GA-8 landed and the ADC was not aware of the presence of the GA-8, so he would not have been in a position to cancel that clearance.

Members discussed whether the GA-8 had entered the Linton ATZ without permission but agreed that, although no specific approval was given by Linton APP, the pilot had been in communication with them when he entered the ATZ and, in Members' view, that had constituted tacit approval.

Although there were significant mitigating factors for the GA-8 pilot and shortcomings by Linton ATC, Members agreed unanimously that he should not have landed without permission from ATC; they found it difficult, however, to agree a suitable course of action that the GA-8 pilot should have followed when faced with a total lack of communications with TWR. Returning to the previous and workable frequency and perhaps requesting that TWR come up on that frequency was considered to be a sensible first step, but when also faced with a lack of any assistance from APP, Members agreed that the GA-8 should have climbed immediately to above cct height and departed the ATZ/MATZ, while continuing to attempt to establish communication and position his ac at a safe distance (and/or height) from the airfield/cct. Should that also fail (as it might have done in this case since the ADC was not listening on VHF) he should have returned to his base or, if he had insufficient fuel, initiated a diversion. Members agreed, however, that although the pilot had been placed in an unenviable situation by ATC, he should not have landed at a busy airfield without permission. When considering why the GA-8 pilot had landed on RW21 rather than RW28, one Member suggested that, despite reading back (on more than one occasion) that RW28 was the RW in use, the GA-8 pilot might not have registered the change from RW21 to RW28 that was made after he planned the flight, had formed a mental picture of the profile and also after he had taken off. On being transferred from Leeming to Linton (in his opinion) late and being very rushed and confused when he did not get the expected responses to his transmissions, he had become anxious and his normal routine and checks had been disrupted.

Since the GA-8 was aware of the Tucanos crossing ahead and stopped his ac before the RW intersection, Members agreed that there had been no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The GA-8 pilot landed on the out of use RW, without clearance, into conflict with the Tucano pair taking off on the duty RW.

Degree of Risk: C.

AIRPROX REPORT No 2010124

Date/Time: 3 Sep 2010 1228Z

Position: 5300N 00034W (10nm SbyW of Waddington elev: 231ft)

Airspace: Lincolnshire AIAA (Class: G)

Reporting Ac Reported Ac

Type: Tristar TB20

Operator: HQ Air (Ops) Civ Pte

Alt/FL: FL66↓ FL61↓

Weather: VMC In rain VMC CLAC

Visibility: 5km >10km

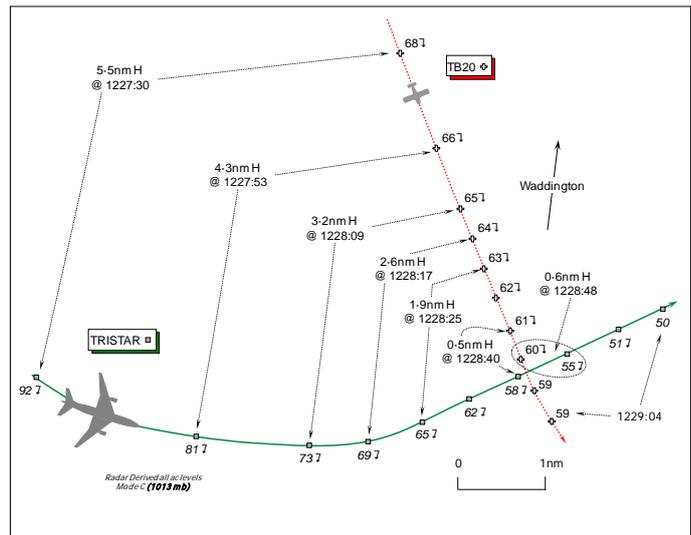
Reported Separation:

200ft V 300ft V

Recorded Separation:

Nil V @ 1.2nm H

0.5nm Min H @ 300ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TRISTAR PILOT, a QFI, reports he was instructing an IFR training flight inbound to Waddington, descending to FL50 under a TS, as 'cleared' by LATCC (Mil) following a handover to Waddington APPROACH (APP) on VHF 123.3MHz. A squawk of A3612 was selected; Mode S and TCAS are fitted.

Approaching FL70 some 10nm SSW of Waddington and turning L onto 090° at 250kt, they received a broken transmission from APP and heard FL75 mentioned. Clarifying the call whilst descending at 2500ft/min passing FL67, APP instructed them to level at FL70 and a level off was immediately initiated. At the same time TCAS annunciated an RA demanding a descent that was complied with. Initially they could not make visual contact with the conflicting ac, then TCAS demanded an increased RoD that was followed accordingly. They subsequently made visual contact with, he thought, a Tutor in their 10 o'clock ¼nm away about 200ft above their ac and also descending.

He is in little doubt that the TCAS RA prevented a collision between the two ac. TCAS declared Clear of Conflict passing about FL54 and they levelled off at FL50; ATC was informed of the TCAS event. He assessed the Risk as 'very high'.

The ac has a grey colour-scheme; the HISLs and nav lights were on. No RT report was made at the time of the Airprox, which was subsequently reported to their Station Flight Safety Officer.

THE TB20 PILOT provided a brief account stating that he was in transit from Inverness to Peterborough (Conington) under VFR, whilst in receipt of a TS from Waddington on 127.37MHz. A squawk of A3602 was selected; Mode S and TCAS I is fitted.

Heading 160° descending through FL61 in VMC at 155kt, he saw a Tristar below him at FL58. Minimum vertical separation was about 300ft but no avoiding action was needed. He assessed the Risk as 'low'.

His ac is coloured white and blue, with red and grey stripes; lighting in use was not stated.

THE WADDINGTON APPROACH CONTROLLER (APP) reports that the Supervisor accepted a handover from London (Mil) on the Tristar descending to FL50 heading S under a TS. She was working two frequencies when the Tristar crew eventually called; by this time the ac was heading E overhead Cranwell so she turned the ac onto N and then noticed there was conflicting traffic - the TB20 - in a steady descent through FL65 working Waddington ZONE. She called the TB20 traffic and instructed the Tristar crew to stop descent at FL75, but the crew advised they had just passed FL75 so she then instructed them to stop descent at FL70, which the pilot acknowledged. She then told ZONE the Tristar was stopping descent, whereupon the Tristar pilot advised that he was following a TCAS RA and descended through the level of the TB20 to FL50. The Tristar passed through the TB20's level in its 12 o'clock at 2nm, she thought.

She added that during this period an E3D was being vectored on another frequency around the radar pattern through an area of high traffic density.

THE WADDINGTON SUPERVISOR reports that the APP controller was busy so he took the handover from London (Mil) on the Tristar, which was heading S descending to FL50. He identified the ac and called conflicting traffic to London (Mil) who transmitted this to the crew and instructed them to contact Waddington APP on 250.85MHz. London (Mil) called back moments later to request a VHF frequency, which was not stated in either the prenote or handover. The controller then had to dial a NATO common frequency into the standby VHF set in order to take control of the ac. The Tristar crew then called on VHF 123.3MHz heading E. APP was now controlling on multiple frequencies and was transmitting on two, which he perceived lead to some confusion with the Tristar pilot. APP then turned the Tristar to position it for the radar pattern. As APP widened her scan she saw conflicting traffic, which ZONE was now pointing out and giving traffic information about. APP quickly instructed the Tristar crew to stop descent at which point the pilot advised he had already passed FL75 and was at FL70, which she then requested him to level at and which he read back. However seconds later the Tristar pilot reported a TCAS descent.

The controller did what she believed was the best avoiding action to stop the ac from colliding with the TB10 by stopping its descent.

HQ 1GP BM SM reports that Waddington ATC was unable to provide a report from the ZONE controller or ZONE RT tape transcript, consequently, this analysis has been completed without it. Furthermore, comparison of the radar replay and APP RT tape transcript timings highlighted a significant discrepancy of approximately 21secs that was confirmed by engineers at the unit. Consequently, the RT transcript timings in this report have been amended to align with the radar recording time base.

It should also be noted that, given the differing data update rates between the Waddington ASR and the LATCC (Mil) radar recording used for this investigation, the indicated SSR Mode C levels may differ from that displayed to APP at the time of the occurrence.

Waddington was operating to RW02, the radar training circuit (RTC) overlaps the Cranwell radar pattern and climbout lane. The unit reports that this Airprox occurred during a lunch period where a DIRECTOR is not normally rostered unless multiple ac are expected to be operating within the RTC.

At 1225:51, LJAO NE commenced the handover on the Tristar, which was completed at 1227:14. Meanwhile, it is apparent that the Tristar commenced a L turn at 1227:01, introducing the risk of conflict with the TB20. The unit investigation states that this turn was issued by LJAO, although there is no evidence to substantiate this. The turn occurs whilst the Supervisor is conversing with LJAO about the provision of a VHF for the Tristar; consequently, the Tristar is still on LJAO's frequency. The turn was not notified to Waddington ATC by LJAO. At this point, the Tristar is approximately 12nm SW of Waddington descending through FL96 Mode C and 3nm NW of the extended CL.

APP's workload was high, providing a TS to the RAFAT operating within EGR313 on a dedicated VHF frequency, plus a TS to an E3D completing multiple circuits within the RTC on UHF and the

Tristar on a third VHF frequency. The Tristar crew established first contact with APP at 1227:33; however, APP was receiving and then responding to a transmission from the E3D. The Tristar crew re-transmitted their initial call on VHF 'stepping on' the UHF transmission from the E3D. APP provided a vector to the E3D but the Tristar crew mistakenly believed that the transmission was for them asking, "*confirm that was for [Tristar C/S] to head 1-1-0°?*" APP replied at 1227:56, "[Tristar C/S] *negative, working 3 frequencies at once now identified descending Flight Level 5-0 traffic service.*" The ATS was not 'Reduced'. At this point, the Tristar is 4.3nm SW of the TB20, descending through FL81 Mode C, with the TB20 itself descending through FL66.

With the Tristar descending through FL73, APP turned it L onto N at 1228:08, when it was 3.2nm SW of the TB20. CAP 774 states that:

"when providing headings/levels for the purpose of positioning and/or sequencing or as navigational assistance, the controller should take into account traffic in the immediate vicinity, so that a risk of collision is not knowingly introduced by the instructions passed."

The Supervisor reports that at some point between the time that the instructions to turn onto N and to stop descent at FL75 were issued, ZONE pointed out the TB20 to APP. At 1228:15, APP instructed the Tristar crew to, "*..stop descent flight level 7-5, traffic north east 4 miles, tracking south, at flight level 6-5.*" The TB20 is 2.6nm NE of the Tristar, the latter indicating FL69. The Tristar crew replied that they were, "*just passing 7-0 this time*" and APP instructed them to, "*stop descent 7-0*" at 1228:25. At this point the Tristar is shown descending through FL65, 1.9nm SSW of the TB20; the Tristar crew read back this instruction also advising that they were, "*rolling out [on heading] 0-7-0.*" At 1228:37, the Tristar pilot reported a TCAS RA, [which APP acknowledged] and just after this the point of minimum horizontal separation is shown at 1228:40 as 0.5nm, the Tristar passing FL58 having descended 300ft below the TB20 indicating FL61 Mode C. [The Tristar pilot reported "*..clear of conflict*" at 1229:03.]

APP would have been aware of the regulation regarding taking into account traffic in the immediate vicinity prior to issuing a vector to ac under their control. The ATSU has stated that the taskload on APP should not have been a problem for the controller, considering her ability and experience. However, it is clear that the taskload and complexity were significant factors in this occurrence. Specifically that APP was operating in the band-boxed APP-DIR position. The taskload and complexity faced by APP caused attentional tunnelling, which in turn meant that APP was unable to perceive the presence of the TB20, hence the Tristar was unknowingly turned into conflict with the TB20.

Operation of the band-boxed APP-DIR position and the associated increase in taskload that this generated was a causal factor in this Airprox.

SATCO Waddington has reviewed lunchtime manning arrangements to ensure that staff are available for DIR when appropriate.

HQ AIR (OPS) concurs with HQ 1 Gp BM SM, timely compliance with the TCAS RA ensured separation was sufficient.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board expressed concern at the lack of a report from the Waddington ZONE controller and the absence of an RT transcript for the ZONE frequency over the period that the Airprox occurred. It is fundamental to the investigation that, where appropriate, the controller's account is provided and the RT recording preserved so that all of the facts can be established. As ZONE was providing an ATS

to the reported ac a report should have been provided. The absence of these details hindered the Board's determination of Cause and Risk.

The LATCC (Mil) Member provided some added insight into the earlier stages of this occurrence when the Tristar crew was under the control of LJAO. Following a late hand-over from ScATCC (Mil), he confirmed the crew had been in receipt of a TS with LJAO NE and the ATS initially requested by them. It was also confirmed that the crew had contacted Waddington themselves and confirmed the availability of the PD at an earlier stage. Controller Members were somewhat surprised, therefore, that the Tristar had been accepted for the PD at Waddington when no controller was rostered for the DIR position; alternatively, having accepted the PD booking, that no controller was made available for the DIR position. Members noted that there was a missed opportunity at that stage for the SUP to cancel the PD if he believed that the unit was going to exceed its capacity to handle the Tristar without a rostered DIR. It was confirmed by the LATCC (Mil) Member that LJAO NE Tactical had turned the Tristar eastbound, as the controller perceived that the ac was progressing too far to the S away from Waddington during the extended handover whilst a VHF channel was obtained. This was not picked-up by the LJAO NE Planner controller during the hand-over to the SUP as the Planner was obtaining the VHF channel requested by the crew, which also delayed the transfer of control to APP. By turning the Tristar easterly, the LJAO NE Tactical controller perceived he was assisting APP, but the turn was not noticed nor notified by his colleague to the SUP in retrospect, who accepted the hand-over on APP's behalf. This requirement for VHF communication with the aerodrome it seemed might not have been specified at the outset, which concerned the Board. This clearly placed an unexpected and additional load on the SUP and APP at a busy moment, but a military Member advised that not all of the Tristar fleet are fitted with UHF radios and ATSUs should be prepared for such requests. Conversely, military crews should be aware that the availability of dedicated VHF frequencies at UK military ATSUs is limited and many will only have recourse to NATO 'common' frequencies on 'standby' sets, as here. This could potentially result in poorer transmission/reception quality compared to a dedicated UHF as NATO 'common' frequencies are inherently more susceptible to interference from other ATSUs using them in the vicinity, especially in locations such as the Lincolnshire AIAA with many military aerodromes in close proximity.

Some Members viewed the turn onto E as intrinsic to the Cause because it placed the Tristar and TB20 on conflicting flight paths. However, the TB20's squawk would have indicated to LJAO NE that it was also under the control of Waddington ZONE. LJAO NE might, therefore, have perceived quite reasonably that APP would co-ordinate with ZONE as necessary. As it was, the Tristar was descending steadily to FL50 and outpacing the TB20, which the radar recording revealed was also in a descent. There did not, however, seem to have been any co-ordination between APP and ZONE, either formally or 'off-mic', but in the absence of an input from the ZONE controller this was not clear. However, APP should have been scanning for conflicting traffic and should have detected the TB20 earlier. The HQ 1Gp BM SM report confirmed that in between the instruction to turn onto N at 1228:08 and the stop descent instruction at FL75 given by APP at 1228:15, ZONE had pointed out the TB20 to APP and controller Members concluded that this was the point that APP first realised the Tristar was in conflict with the TB20. APP immediately issued an instruction to the Tristar crew to stop their descent at FL75 in addition to TI, but by that stage it was too late. The Tristar had already descended through that level and, despite issuing an instruction to level at FL70, APP was unable to influence the outcome any further. Whilst some might argue that APP was exceeding her remit under the TS, but having turned the descending Tristar across the path of the descending TB20, in the Board's view, APP wisely endeavoured to resolve the situation in the vertical plane as best she could, but late appreciation of the true situation meant APP was continually behind the 'drag curve' and unable to catch up.

The Board accepted that APP was busy and faced a complex situation that was complicated by working multiple frequencies. Members also noted that the Unit perceived this should not have been a problem for an experienced controller albeit that the Command considered that the taskload and complexity were significant. Whilst accepting that APP did not *knowingly* turn the Tristar into conflict, controller Members contended that between them, the SUP, APP and ZONE controllers should have been alert to a conflict between the Tristar and the TB20 and taken action earlier to

forestall this close quarters situation; that they did not do so was indicative of a lack of teamwork within ATC. Whilst setting up the standby VHF box would undoubtedly have been a distraction, after accepting the hand-over the SUP should have recognised that the Tristar was turning L, that there was potential for a conflict and ensured that APP and ZONE did something about it.

On a wider point, a CAT pilot Member considered that a TS was inappropriate for such a large ac, and the Tristar crew would have been wiser to have asked for a DS. Controller Members contended that achieving stipulated deconfliction minima in the Lincolnshire AIAA would often preclude an expeditious recovery but there was no reason to suppose that separation could not have been engineered between these two ac by ATC that could have forestalled this Airprox. Generally, if an ATSU was not able to provide a DS then they will provide the best level of ATS that they can, other higher priority tasks permitting, within the limitations of available manpower and equipment. The Air Command Member suggested that if the Tristar crew considered that they were able to fulfil their responsibilities to 'see and avoid' other ac under the prevailing weather conditions and were satisfied that they only needed traffic pointed out to them, then a TS was acceptable while being vectored around the pattern. It was up to the PIC to decide what level of radar service was available and appropriate given the circumstances.

The absence of an RT transcript from ZONE prevented the Board from determining if TI had been passed to the TB20 pilot about the Tristar. The short account from the TB20 pilot did not provide any clarification of this point, neither did he mention if his TCAS I had warned him of the Tristar's presence, but it seemed that he had not seen the Tristar until it was below his aeroplane at FL58 he reports. Therefore, if he had not known about the other ac until that point, he would have been unable to fulfil his responsibilities under the Rules of the Air to 'give way' to the Tristar on his starboard side. A CAT pilot postulated that the TB20 pilot might have perceived that as he was in receipt of a TS from ATC he need not be concerned about 'right-of-way' and that ATC would issue appropriate advice to ensure separation. Any pilot that might perceive that a TS from an ATSU absolves them from their responsibility to 'see and avoid' other traffic was under a dangerous misconception. The Rules-of-the-Air still hold sway and here in Class G airspace separation is ultimately the pilot's responsibility under a TS.

In concluding their determination of the Cause, some Members suggested that supervisory aspects had played a significant part here coupled with an apparent lack of timely co-ordination between APP and ZONE. Other Members considered that whilst these all had some impact and there were lessons to be learned from this Airprox for the benefit of all concerned, fundamentally, the Tristar crew were following the vectors issued and complying with ATC instructions. Whilst acknowledging the view of HQ 1Gp BM SM and weighing all these factors for relevance, the Board concluded that the Cause of this Airprox was that the Tristar was vectored into conflict with the TB20.

Turning to the inherent Risk, it was clear that once APP had appreciated the conflict the controller had tried to stop-off the Tristar above the TB20, whilst also passing TI. At close quarters TI is essential and the Tristar pilot reports that he did see the TB20 in their 10 o'clock, he thought about ¼nm away but actually ½nm at the closest point, some 200ft above their ac and realised it was also descending. However, this was after TCAS had demanded a descent, and then further descent at an increased rate, which the Tristar crew had complied with. Such crossing descent scenarios are not always straightforward, but it was plain that the Tristar crew was able to descend clear below the level of the descending TB20, such that 300ft of vertical separation was evident from the recorded radar data before the tracks crossed. By that point the TB20 pilot was also visual with the Tristar, but decided that no avoiding action was needed as vertical separation continued to increase, with 500ft evident on the next sweep. The Members agreed unanimously that all these factors combined had effectively removed the Risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Tristar was vectored into conflict with the TB20.

Degree of Risk: C.

AIRPROX REPORT No 2010133

Date/Time: 14 Sep 2010 1545Z

Position: 5309N 00043W (6½nm
S by W of Waddington
A/D - elev 231ft)

Airspace: Lincolnshire AIAA (Class: G)

Reporting Ac Reported Ac

Type: Sentry Tutor

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

Alt/FL: FL85 8000ft
RPS

Weather: VMC CLOC VMC CLAC

Visibility: 30km 30km

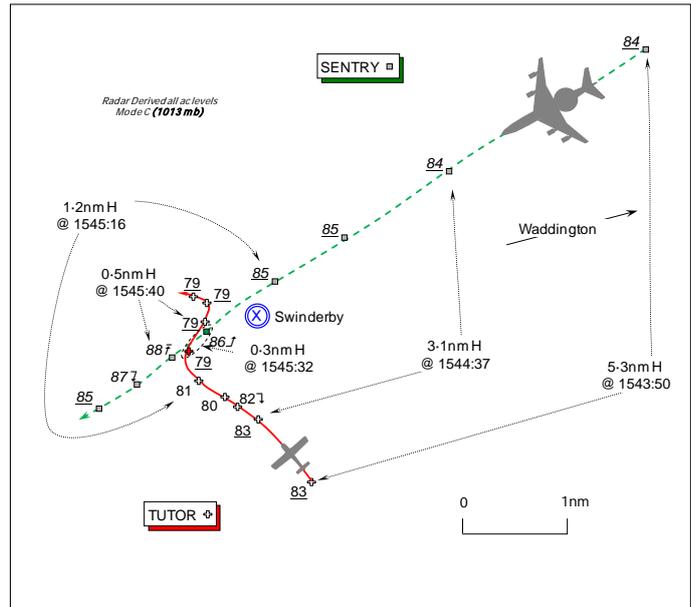
Reported Separation:

200ft V 500ft V/nil H

Recorded Separation:

100ft Min V @ 3.1nm H

0.3nm Min H @ 700ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BOEING SENTRY PILOT reports he was on an IFR recovery to base at Waddington and in receipt of a TS from Waddington APPROACH (APP) whilst holding in the Waddington COLBY hold - approximately 210° WAD 7nm - heading 245° at 220kt. A squawk of A3612 was selected; Mode S and TCAS are fitted. The ac has a grey colour-scheme; the HISLS were on.

The Tutor ac was initially pointed out by APP and observed on TCAS 6nm away before being acquired visually, being on a constant sightline but slightly low. A decision to turn off the hold and potentially lose visual contact with the Tutor by going 'belly up' was delayed as the Tutor appeared to be manoeuvring and unaware of their presence. The contact displayed on TCAS became proximate traffic then quickly changed to an RA, whereupon the crew initiated a climb in response. The Tutor passed about 200ft directly below his ac with a 'medium' Risk of collision.

He stated that the cockpit workload was 'low' and added that they were operating in good VMC with a TS and functioning TCAS, therefore they maintained good SA on all local traffic. An Airprox was reported to APP on RT.

THE TUTOR T Mk1 PILOT, a QFI, reports he was teaching Effects of Controls (1) during an early instructional sortie in the SW Sector of the Lincolnshire Agreed Airspace and manoeuvring at 8000ft Barnsley RPS (1002mb). He was operating in compliance with the agreed procedures, not in receipt of an ATS, but squawking A2637 with Mode C and S on and operating on a discrete frequency, VFR in good VMC, some 2000ft above and 5nm clear of cloud with an in-flight visibility of 30km. TCAS is not fitted.

Due to particularly strong winds he was progressing slowly to the W (at a GS of about 40kt) and due to a poor horizon, had climbed to 8000ft. During the ascent he saw the Sentry as it passed from R – L in front of his aeroplane; he then saw it turn L and fly towards Waddington. As they continued W he saw it turn L and fly towards them again. Heading 300° at 75kt, at the point when it appeared to have zero angular velocity, he turned R and flew towards it to remain visual. The Sentry was higher than his aeroplane and he then decided not to continue but to reverse his turn so that he could stay

visual with it. He flew directly underneath the Sentry at what he judged visually was about 500ft vertical separation with a 'low' Risk of collision. He added that his cockpit workload was 'low'.

His Tutor has a white colour scheme; the HISLs and landing light were on.

THE WADDINGTON APPROACH CONTROLLER (APP) reports that the Sentry was established in the COLBY TACAN hold at FL85 under a TS. As the Sentry set course westerly from Waddington, an update on the Tutor, which had been called previously, was passed as the Tutor was indicating FL83, some 200ft below the Sentry.

The Tutor was then seen to descend, so an update was passed at 3nm as FL81 descending, which the pilot of the Sentry confirmed on TCAS. Shortly afterwards, the Sentry pilot followed a TCAS RA and climbed. The callsign of the Tutor aeroplane was confirmed by Cranwell.

THE WADDINGTON ATC SUPERVISOR (SUP) reports that the Tutor appeared to be conducting general handling in Class G airspace around the vicinity of the COLBY hold. The Tutor was called to the Sentry crew and shortly after TI was updated they received a TCAS RA and climbed to avoid the Tutor.

HQ 1GP BM SM reports that the Tutor pilot was operating VFR in the Lincolnshire AIAA and the Sentry in the Waddington COLBY hold, in receipt of a TS from APP whose workload was reported to be medium to low.

Based upon APP's choice of phraseology at 1543:50, it is clear that TI about the Tutor had previously been passed by the controller to the Sentry crew before the RT transcript commences. However, at 1543:50 this TI was updated describing the Tutor as, "*Tutor now south west, 5 miles, manoeuvring 2 hundred feet below.*" APP was able to positively identify the Tutor type due to the SSR code in use, which is recognised throughout the Lincolnshire AIAA. At this point the Tutor, indicating FL83, was 5-3nm SW of the Sentry at FL84 Mode C.

Based upon the Tutor pilot's report and the radar replay, the Tutor first became visual with the Sentry in an earlier phase of its exercise at approximately 1541:26. Both the Sentry and the Tutor pilots report being visual with each other's ac. However, the Sentry pilot reports that they became visual after correlating TI from APP with their own TCAS information. This might suggest that first sighting occurred when APP provided a further update to the TI at 1544:33, describing the Tutor as, "*left 11 o'clock, now 2 miles (the radar replay shows 3-1nm separation at 1544:37) manoeuvring 3 hundred feet below appears to be descending.*" The Sentry responds, "*yeah on TCAS that confirms it thank you.*" It is equally possible to interpret the crew's response as having already correlated a visual target with the TCAS prior to the updated TI and then simply acknowledging the TI. At the point when the Sentry crew acknowledges this updated TI, both ac are closing on a constant relative bearing with the Tutor's Mode C indicating a slow descent.

The Sentry pilot reports that in order to ensure that they remained visual with the Tutor, he elected to remain within the COLBY hold, rather than to manoeuvre to avoid it. At 1545:15, the Sentry pilot reports manoeuvring in accordance with a TCAS RA against the Tutor, with the Tutor 1-2nm SW of the Sentry indicating FL81 Mode C. It is between 1545:32 and 1545:40 that the Tutor begins its reported turn towards the Sentry once the angular velocity between the 2 ac had reduced to zero. It is between these times that the CPA occurs, with the TCAS RA Climb shown on the radar recording at 1545:32, the Sentry indicating FL86 and the Tutor indicating FL79.

From an ATM perspective, APP provided a good level of service to the Sentry crew, with timely updates of TI that would have enabled them to correlate the TI with their TCAS display and visual picture; furthermore, the reporting pilot stated that they had '*good SA on all local traffic.*'

Notwithstanding that CAP 774 states that 'pilots are ultimately responsible for collision avoidance', JSP 552 201.200.3 states that:

‘when 2 aircraft are converging in the air at approximately the same altitude, the aircraft that has the other on its right shall give way.’

UKAB Note (1): The LATCC (Mil) radar recording shows that the Tutor directly underflew the Sentry in between radar sweeps and Mode C indicates vertical separation of 700ft existed at the point of minimum recorded horizontal separation of 0.3nm just before the tracks crossed. The Sentry ascends to a maximum of FL88 above the Tutor that maintains FL79.

HQ AIR (OPS) comments that timely TI was passed to the Sentry which correlated with its TCAS, the crew then became visual and continued to the point of receiving a TCAS RA. Notwithstanding the Rules of the Air this incident could have been avoided by the higher performance ac with the greater situational awareness taking early avoiding action.

HQ AIR (TRG) comments that the Tutor avoided the E3-D in accordance with the Rules of the Air. Both crews were visual with each other in good time and the Tutor pilot did what he could considering his speed disadvantage, for which the Rules of the Air do not cater. A small turn by the E3-D, once visual with the Tutor, might have avoided the eventual TCAS RA, without impacting its ability to remain visual. Whilst this is against the instruction for the aircraft with the right of way to maintain its course, the Rules of the Air also require all crews ‘...to take all possible measures to ensure that his aircraft does not collide with another aircraft...’ and not to fly ‘...in such proximity to other aircraft as to create a danger of collision.’

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Each pilot had a legitimate right to operate here in Class G airspace but the Sentry pilot was concerned that the Grob Tutor pilot might have been unsighted on his ac. From the Tutor pilot's report it was clear that he had seen the distinctive ac at an early stage and had kept it in sight as it flew towards him. Whilst some Members saw potential for criticism of the Grob pilot for operating in the vicinity of the COLBY hold, the Board recognised how busy the Lincolnshire AIAA is with both basic and instrument training flights units vying for airspace amongst a profusion of other flying activities. The Grob pilot might not have known this was the location of an IFR hold and the difficulties of finding clear airspace within which to conduct basic training were well known. Considerable numbers of training ac operate in this vicinity every day so pilots operating under IFR in VMC should expect to see them. Conversely, when the weather was not so good, teaching early instructional sorties in IMC was impractical. Controller Members opined that to a certain extent, it was a self-regulating situation: on good VMC days traffic will be encountered throughout the AIAA; however, when flight under IFR is predicated by poor weather much of the training fleet is unlikely to be airborne.

Members agreed that APP had provided a good TS to the Sentry crew and was not required to effect separation between these ac. The Tutor had been observed by APP converging with the Sentry and TI had been passed by the controller in good time on at least three occasions overall. Furthermore, the Tutor was continuously displayed to the Sentry pilots on their TCAS throughout the encounter, which contributed to their SA until they saw the small white Tutor visually themselves.

The Rules of the Air required the Grob Tutor pilot to ‘give way’ in this situation as the Sentry turned and flew towards him. Whereas some Members thought it unwise for the Grob QFI to fly toward the Sentry, the Tutor pilot had kept it in sight throughout and elected to descend beneath it to remain clear. Pilot Members questioned the wisdom of descending directly below this large multi-engine jet ac in a small aeroplane as there was potential for wake vortex to affect the lighter more vulnerable Tutor. Furthermore, ‘the Rules’ discouraged pilots required to give-way from passing directly

beneath another ac. The Tutor pilot had limited ability to put distance between himself and the faster ac but a hard turn to the right while it was at range would have allowed him to break the collision course and regain visual contact almost immediately. A turn combined with a descent would have maximised the separation and avoided generating a TCAS RA. That said, the Tutor pilot had ensured that over 500ft of vertical separation existed before he flew underneath and all this before the Sentry pilot reacted to his TCAS CLIMB RA and increased the separation even more to 700ft just before the tracks crossed. The Board noted the comments from the Command and perhaps the Sentry pilot, operating IFR in VMC, had more options open to him, but both crews still had a responsibility to 'see and avoid' in Class G airspace. The Board agreed that the Tutor pilot had fulfilled his responsibilities and avoided the larger ac by a suitable margin; it was just unfortunate that it was not quite enough to prevent a TCAS RA. The Board concluded, therefore, that this Airprox was the result of a sighting by the Sentry crew of traffic operating in the AIAA and that no Risk of a collision had existed in the circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting Report.

Degree of Risk: C.

AIRPROX REPORT No 2010136

Date/Time: 19 Sep 2010 1111Z (Sunday)

Position: 5028N 00354W (8.5nm ENE Plymouth)

Airspace: LFIR (Class: G)

Reporting Ac Reported Ac

Type: DHC-8 PA28R

Operator: CAT Civ Pte

Alt/FL: FL45↑ FL50

Weather: IMC NR VMC CLAC

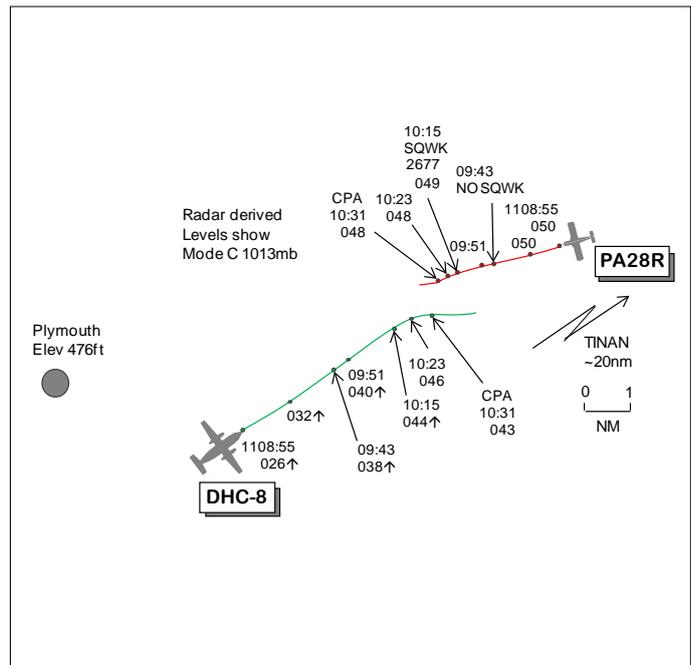
Visibility: NR 10km

Reported Separation:

200ft V/NR H Not seen

Recorded Separation:

500ft V/0.8nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DHC-8 PILOT reports departing Plymouth under IFR and in receipt of a PS from Plymouth Approach on 133.55MHz, squawking 1407 with Modes S and C. The Wx was layered cloud, SCT to BKN but improving towards the S Coast. Both RWs were in use and they elected to use RW13 for departure. On taxiing out they received the initial clearance to make a R turn out (through 300°), rather than a L turn that was expected before setting track to TINAN, owing to traffic passing through the climb out from W to E. However, the taxi phase took longer than expected resulting in the transit ac having passed well to the E, thus the R turn out was cancelled. They took off from RW13 and made a L turn towards TINAN onto heading 065° at 150kt. Approach asked for them to call passing 3000ft but as they did the frequency was busy with another flight transmitting. Passing FL45 heading 065° and 150kt an open cyan diamond (not depicted as proximate traffic) suddenly appeared on the TCAS screen in their 12 o'clock range 2.25nm and 1100ft above. It appeared so suddenly it was as if the ac's transponder had just been switched on. This coincided with another flight checking in on the frequency for the first time and being assigned a squawk of 2677. He pointed this out to the FO, PF, and within seconds it had changed to a 'descend' RA with a green arc demanding a ROD of 1000-1500fpm. The RA was followed with a R turn being initiated as it seemed as though the traffic was opposite direction. The other ac passed 200ft above and clear to their L. Normal flight was resumed following satisfactory resolution. He assessed the risk as high. He commented that the TCAS display went from clear of ac to 'other traffic' to full blown RA with exceptional speed, certainly not appearing to represent a closing speed of circa 300kt. After speaking to the ATCO, it appears that London Military saw the potential conflict either by PSR or SSR and had luckily taken the initiative to contact Plymouth Approach, asking if they were aware of the traffic. Plymouth ATC was not aware of this traffic and about this time the flight made its initial call. Plymouth immediately asked the flight to squawk conspicuity before informing the crew of the traffic to the E. It appeared to him that the ac's transponder was selected on at this stage but this was only his perception of events, and it was at this stage the RA occurred.

THE PA28R PILOT reports en-route to Newquay via St Austell VFR and had just established contact with Plymouth Approach on 133.55MHz and been issued a 2677 squawk; immediately prior to this he had been receiving a service from Exeter on an assigned squawk. The visibility was 10km flying 100ft above cloud in VMC and the ac was coloured blue/white with strobe lights and beacon switched on. The incident occurred about 8nm ENE of Plymouth when he was heading 255° at 120kt and

FL50. He did not see the other traffic but was later told that it had been climbing through cloud from below on a reciprocal heading.

THE PLYMOUTH APPROACH/AERODROME CONTROLLER reports the DHC-8 had initially been issued with a CAS joining clearance from Swanwick Sector 6/9 and was also pre-noted to London Military who had agreed to provide a radar service outside CAS. The London Mil controller had been passed the airways joining clearance and had issued a radar clearance for the flight to route direct to TINAN climbing to FL120 together with a London Mil squawk. He had originally instructed the flight to make a R turn out after departure to ensure separation from a VFR SR22 joining LH downwind from the Ivybridge VRP, approximately 7nm SE of Plymouth. He also told London Mil of this but owing to minor delays caused by other traffic, the SR22 had actually joined the visual cct before the DHC-8 was ready for departure and therefore the crew was offered a more expeditious L turn after departure, which was accepted. London Mil was updated with this information. Once the DHC-8 was airborne, he instructed the flight to report on track TINAN and passing altitude 3000ft in the climb to ensure that the ac would be above MSA on transfer to London Mil. He then dealt with some other traffic and this may have prevented the DHC-8 crew from reporting passing 3000ft. At about this time London Mil telephoned, being under the impression that the DHC-8 was still on the ground, to ask if he was working any traffic to the E of Plymouth with Mode A 7000 indicating FL50. He told London Mil that he was not controlling any traffic in the area and, as London Mil did not appear concerned and did not amend the radar clearance, he felt that London Mil would be best placed to separate the ac on radar. He informed London Mil that the DHC-8 was airborne and would be contacting them shortly. Almost simultaneously he received an initial call from the PA28R pilot giving his details and requesting a BS. He noticed from its DF QDM that the ac appeared to be close to the planned track of the DHC-8 so he instructed the flight to squawk 2677 (Plymouth Conspicuity Code) to ensure that the ac would appear on the DHC-8's TCAS and would also be seen by London Mil. He also passed TI on the DHC-8 to the PA28R pilot. He then requested the passing level of the DHC-8, which was FL40, and passed TI on the PA28R which the crew acknowledged. About 30sec later the DHC-8 crew reported that he had received a TCAS TA and would be filing an Airprox. He acknowledged the call and having ascertained that the 2 ac had passed each other, he transferred the DHC-8 flight to London Mil. He then informed London Mil and the PA28R pilot that an Airprox would be filed. Subsequent discussions with the DHC-8 Capt revealed that the PA28R did not appear on the TCAS display until he had instructed the PA28R flight to squawk 2677, which then generated an RA, not a TA as previously notified. In addition London Mil believed that there was a primary only contact to the E of Plymouth, not the Mode A 7000 Code that was previously mentioned. He had no way to establish the exact identity of the ac concerned but this would be consistent with the lack of ac return on the DHC-8 TCAS display.

ATSI reports that the Airprox occurred at 1110:31, 8.5nm to the ENE of Plymouth Airport, in Class G airspace, between a DHC-8 and a PA28R.

The DHC-8 was an IFR flight from Plymouth to Newcastle, routing to join CAS on track TINAN, situated 29nm to the NE of Plymouth Airport. Prior to the DHC-8 departure, an airways clearance was obtained from London Swanwick Sector 6/9 and the departure was pre-noted to London (Swanwick) Military Radar (London Mil).

The PA28R was a VFR flight from Headcorn to Newquay routing via St Austell. The PA28R was transferred to Plymouth Approach from Exeter Radar and was in receipt of a BS. The Exeter Manual of Air Traffic Services (MATS) Part 2, Page 109, states: '...when Plymouth Military Radar is not available, IFR aircraftto overfly Plymouth, are to be co-ordinated with Plymouth.' There is no requirement for Exeter to coordinate VFR traffic.

Plymouth were providing a combined Aerodrome and Approach Control Service without the aid of surveillance equipment. A Plymouth conspicuity SSR code A2677 is allocated to Plymouth traffic operating under both a BS and PS.

During weekday periods Monday to Friday, a LARS service is provided by Plymouth Military Radar. However, the Airprox occurred on a Sunday and London Mil had agreed to provide a radar service to

the DHC-8, when above FL40. The standard practice requires that Plymouth Approach transfer such traffic to London Mil after passing an altitude of 3000ft.

METAR EGHD 191050Z 21009KT 9999 BKN011 15/13 Q1017=

Prior to the departure of the DHC-8, a clearance was requested from London Swanwick Sector 6/9. London Control cleared the DHC-8 to join CAS on track TINAN in the climb FL120, to be FL80 or above prior to entering CAS, squawk 1407 and frequency 126.075MHz.

London Mil agreed to provide a radar service prior to the DHC-8 joining CAS. The airways joining clearance was pre-noted to the London Mil controller and the climb to FL120 was approved, with a squawk 3353 and frequency 135.150MHz.

At 1102:27 the Plymouth controller passed the DHC-8 an airways joining clearance and the local departure clearance from London Mil. These clearances were correctly read back and the DHC-8 departed at 1107.

At 1107:34 the DHC-8 was instructed, *“(DHC-8)c/s report on track TINAN passing three thousand feet in the climb.”* The controller's written report indicated that at the same time, the London Mil controller, under the impression that the DHC-8 was not yet airborne, asked Plymouth if they were working traffic to the E indicating FL50. In response the Plymouth controller replied that they were not working the unknown traffic and confirmed that the DHC-8 was now airborne. At this point the DHC-8 was not displayed on the London Mil radar display and there was no discussion regarding any potential conflict.

At 1107:59 the radar recording showed the PA28R, at a position 13.8nm to the ENE of Plymouth Airport, displaying a squawk of 7000 and indicating FL049.

Just under 1min later at 1108:55, the radar recording showed the DHC-8 first appearing on radar 4.3nm E of Plymouth Airport, displaying the London Mil squawk 3353 and indicating FL026 whilst the PA28R was shown 8nm NE of the DHC-8 and indicating FL050.

At 1109:00, the PA28R flight called Plymouth Approach, followed at 1109:10 with the flight details, *“Good afternoon (PA28R)c/s P A twenty eight R routeing from Headcorn to Newquay er currently ten miles to the eastnortheast of your airfield and we'd like to route through your overhead currently flight level five zero er request a Basic Service PA28R c/s.”* Approach replied, *“(PA28R)c/s roger Basic Service squawk two six seven seven.”* As soon as the pilot gave a correct readback Approach passed TI, *“(PA28R)c/s report approaching the overhead traffic for you is a Dash eight just departed Runway one three with a left turn out towards the airway climbing Flight level one two zero.”* The readback from the pilot was distorted due to a crossed transmission.

At 1109:55, in response to a request from Approach, the DHC-8 pilot reported, *“er passing level four zero now (DHC-8)c/s”* and Approach responded with, *“(DHC-8)c/s there's traffic just called me is a P A twentyeight ten miles to the northeast of the airfield flight level five zero just come on my squawk now.”* This is acknowledged by the DHC-8 pilot.

[UKAB Note (1): Meanwhile the radar sweep at 1109:43 shows the PA28R as a primary only return, the transponder having faded from the radar probably as the pilot was changing to the Plymouth conspicuity code. The 2 ac are on reciprocal tracks with separation of 4.3nm, the DHC-8 was indicating FL038.]

The PA28R pilot's written report indicated that the PA28R was VFR and 100ft above cloud. The DHC-8 was climbing IMC. At 1110:15, radar recording showed the SSR code of the PA28R had reappeared, displaying a squawk 2677, indicating FL049 and the DHC-8 was indicating FL044; both ac were on reciprocal tracks and the distance between the ac was 1.9nm.

At 1110:25 the DHC-8 pilot advised, “*Er (DHC-8)c/s we had erm a TA there*”. Radar recording shows the distance between the ac as 1.3nm, the DHC-8 indicating FL046 and the PA28R indicating FL048.

[UKAB Note (2): The CPA occurs at 1110:31, the radar recording shows both ac 8.5nm ENE of Plymouth Airport with the DHC-8 now having descended indicating FL043 and in a R turn passing 0.8nm S of, and 500ft below, the PA28R indicating FL048.]

When questioned, the Plymouth controller considered that in hindsight, with the limited knowledge and information provided by London Mil, a warning about the unknown traffic, passed earlier to the crew of the DHC-8, would have aided their SA.

The ATSU has indicated that the unit have been proactive in trying to improve the flight safety for commercial operations. Prior to this incident a feasibility study was undertaken to consider four options for the provisions of radar environment for Plymouth airport. This is well advanced and a report is likely to make recommendations in the near future.

The DHC-8 was in receipt of a Procedural Service and the Plymouth controller passed traffic information regarding the PA28R that was VFR and in receipt of a Basic Service. The MATS Part1, Section 1, Chapter 11, Page 10, paragraph 6, states:

‘A Procedural Service is an ATS where, in addition to the provisions of a Basic Service the controller provides restrictions, instructions and approach clearances, which if complied with, shall achieve deconfliction minima against other aircraft participating in the Procedural Service. Neither traffic information nor deconfliction advice can be passed with respect to unknown traffic.’

Paragraph 6.5, states:

‘The controller shall provide traffic information, if it is considered that a confliction may exist, on aircraft being provided with a Basic Service and those where traffic information has been passed by another ATS unit; however, there is no requirement for deconfliction advice to be passed, and the pilot is wholly responsible for collision avoidance. The controller may, subject to workload, also provide traffic information on other aircraft participating in the Procedural Service, in order to improve the pilot’s situational awareness.’

The PA28R in receipt of a BS was passed a warning regarding the DHC-8 departure from Plymouth and in the climb to FL120. The MATS Part 1, Section 1, Chapter 11, Page 4, Paragraph 3.1.1, states:

‘A Basic Service is an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. This may include weather information, changes of serviceability of facilities, conditions at aerodromes, general airspace activity information, and any other information likely to affect safety. The avoidance of other traffic is solely the pilot’s responsibility.’

CAA ATSI considered that two factors contributed to the late warning of a potential conflict for the DHC-8 pilot:

London Military gave an indication to the Plymouth controller, albeit limited, about unknown traffic at FL050 to the E of Plymouth. The controller considered after the event, that this might have allowed an earlier warning to be passed to the DHC-8 crew to provide greater situational awareness. After the PA28R flight called Plymouth, the controller passed TI on known traffic to the DHC-8. This was 2min after the initial call from London Mil.

The squawk change of the PA28R occurred at a point when the 2 ac were coming into conflict (4.3nm) and this probably contributed to a delay in a TCAS alert to the crew of the DHC-8.

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 authorities.

Pilot Members agreed that this was not an unusual occurrence for a CAT flight from an airport outside CAS where the ATSU is not radar equipped. Being Class G airspace there could also have been other traffic flying in the area not talking to any ATSU, possibly non-squawking, maintaining their own separation from other traffic through 'see and avoid'. The PA28R pilot had called Plymouth for a service, thereby making his presence known to the controller and this transmission was also noted by the DHC-8 crew. From the radar recording it was apparent that the PA28R was squawking almost continuously prior to the Airprox, having changed from an Exeter squawk to 7000, except for a period of about 30sec whilst the pilot was switching to the Plymouth code. This unfortunately appeared to have been responsible for its 'pop-up' on the DHC-8's TCAS, although the ac should have been visible earlier as 'other traffic' prior to its SSR outage. Members wondered whether the crew had selected a short display range on their equipment or had adjusted the 'look-up, look down' parameters, which might have exacerbated the situation. It was noted that the PA28R pilot had elected to fly under VFR when flying 100ft above cloud. The UK AIP (ENR 1-2-1) and the RoAR (Rule 28) promulgates that VFR flights shall be conducted in Class G below FL100 so that the ac is flown in VMC, which in this case would require the ac to be 1000ft vertically and 1500m laterally clear of cloud with in-flight visibility of 5000m. Flying just above a cloud layer gives a pilot little chance of discharging his responsibilities for 'see and avoid' against IFR traffic climbing through the cloud layer. Had the PA28R pilot been flying 1000ft above the cloud, it would have given him more time and a better chance to see traffic climbing from below. Also if he had been able to fly under IFR and/or requested a PS, the controller would have applied 1000ft vertical separation between the ac, which would have averted this Airprox.

The London Mil controller had done well by alerting the Plymouth controller to the approaching PA28R and, although this information was not passed on to the DHC-8 crew immediately, the Plymouth controller had discharged his responsibilities by issuing TI to both flights after the PA28R's details became known to him from its pilot's RT call. The DHC-8 crew was aware of the PA28R from TCAS and had correctly followed the RA guidance. It was noted, however that the crew manoeuvred their ac laterally as well, which is not recommended owing to the equipment's known inaccuracies in azimuth. Also, for whatever reason, the crew only reported a TCAS TA alert on the RT whereas the 'RA' and 'clear of conflict' should have been broadcast. Owing to the layer of cloud, neither crew was able to visually acquire the other ac, which led Members to classify this as a conflict in Class G airspace. However, the Board agreed unanimously that the actions taken by the DHC-8 crew and ATC were enough to remove any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class G airspace resolved by the DHC-8 crew using TCAS.

Degree of Risk: C.

AIRPROX REPORT No 2010139

Date/Time: 7 Sep 2010 1301Z

Position: 5047N 00148W (1.5nm FIN APP
RW26 Bournemouth - elev 38ft)

Airspace: ATZ (Class: D)

Reporting Ac Reported Ac

Type: BE76 Duchess DA42 Twin Star

Operator: Civ Trg Civ Trg

Alt/FL: 450ft↓ NR↓
(aal) (QNH)

Weather: VMC CLBC VMC GOOD

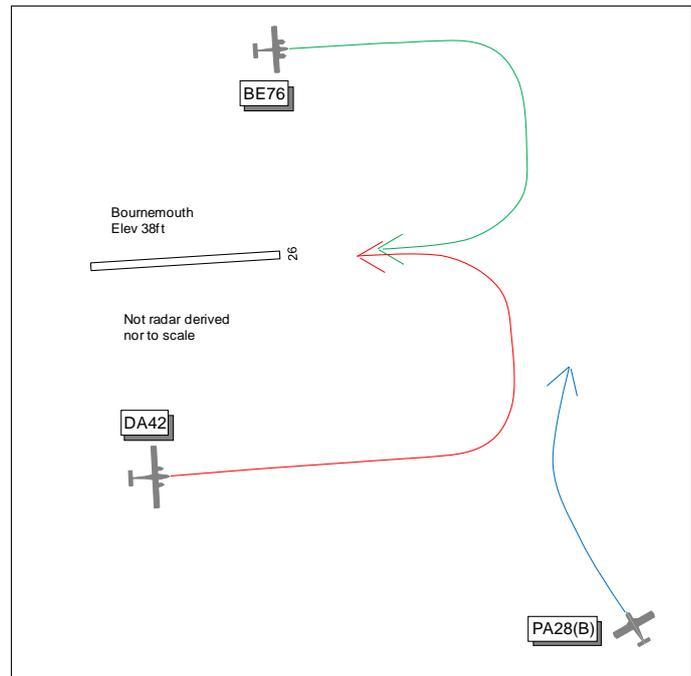
Visibility: >10km Good

Reported Separation:

20-50ft V Not seen

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BE76 PILOT reports returning from a dual training sortie to the NW of Bournemouth and positioning RH downwind for RW26 at 1200ft as requested. He reported downwind and was told he was No2 to a PA28. Towards the end of the downwind leg both he and the student saw the PA28 on final and turned onto base leg. The student called R base for RW26 and recalls being told that he was No1. Both he and the student heard a RT exchange between ATC and a DA42 flight in which its pilot was told that he was No2 to their BE76 on R base. The student called R base for RW26 and was told to continue approach. They commenced their final turn at about 600ft after the instructor had looked up the final approach path and at L base and believed them to be clear of other ac. The ac's Rate 1 turn meant that the L wing obscured the view to the S (L base) for about 30sec. They rolled wings level at about 500ft aal where the student believes he called final, although the instructor cannot recall this for sure. At about 450ft aal and 90kts in a normal descent profile both he and the student became aware of a DA42 overtaking them from below, directly below, at a very close vertical distance. The student estimated 20ft and he thought it possibly that close but certainly no more than 50ft; both of them were totally unaware of where the DA42 had come from. He initiated a 'go-around' and informed ATC and then the DA42 flight called 'final' and was subsequently cleared to land. They repositioned into the cct to land behind another ac.

THE DA42 TWIN STAR PILOT reports flying a dual training sortie from Bournemouth and in communication with Bournemouth Tower on 125.6MHz, squawking with Modes S and C. Whilst demonstrating a cct and flying downwind ATC informed him of an ac joining on L base which he looked for but could not see. ATC then told him he was No2 to another ac on final. After a few seconds he saw it [the BE76] and then looked the other way and saw the joining ac which was high and close. He took avoiding action, an immediate L descending turn which placed his ac on final heading 260° at 90kt. ATC cleared him to land and then held him on the RW to allow the ac on final [the BE76] to go-around. He did not see that ac from initial contact until it went around.

THE BOURNEMOUTH ADC reports the BE76 was inbound from the NW on a standard rejoin clearance. The flight reported downwind and was told it was No2 in traffic, No1 being a PA28 on 0.25nm final. The PA28 landed and vacated the RW making the BE76 No1 for the approach. The DA42 was downwind LH in the visual cct at 1200ft and was passed TI on the position of the BE76, which was now turning R base, and was told it was No2 to the BE76. The DA42 pilot acknowledged

the TI and reported he had the BE76 in sight. Immediately after this transmission Radar pre-noted a VFR inbound, a PA28 from the SE which had been issued a standard joining clearance to join L base. TI was passed to the DA42 pilot on the inbound PA28, informing him of its approximate position and the position this ac would be expected to join (L base). The DA42 pilot did not acknowledge his 1st transmission so he repeated the TI including a revised position of the PA28. The DA42 pilot acknowledged this call on the second attempt. Shortly afterwards the PA28 pilot called joining L base and the DA42 then appeared to make a tight L turn from L base and positioned onto 1nm final ahead and below of the BE76, which by this time had also positioned onto 1.5nm final. The BE76 pilot reported that he had contact with the DA42 ahead and below on final and that he was initiating a go-around. He told the BE76 flight to make a RH cct and instructed the DA42 to land and hold on the RW while the BE76 went around above. Once the BE76 had turned crosswind he cleared the DA42 for take-off back into the cct, the BE76 landed safely on its second approach.

ATSI reports that the Airprox occurred at 1301:20 UTC, on short final for RW26 at Bournemouth Airport between a BE76, returning to Bournemouth Airport after a local VFR flight to the NW, and a DA42 operating VFR in the LH visual circuit for RW26.

Other traffic included a Piper Cherokee PA28(A), completing a final circuit to land; a second Cherokee PA28(B), inbound from the S to join L base for RW26 and a helicopter departing VFR to the S. The Tower was operating split positions with Air and Ground Movement Control. The RW in use was notified as RW26.

METAR EGGH 071250Z 20009KT 9999 SCT023 18/13 Q1000 RERA=

CAA ATSI had access to NATS Swanwick radar recordings, RT transcription and written reports. The NATS radar recording did not show ac operating in the vicinity of Bournemouth but ATSI were able to view the ATSU radar replay on site.

At 1256:54, the BE76 flight, inbound VFR from the NW reported, "*BE76 c/s at about three miles from the airport.*" Tower responded, "*BE76 c/s Bournemouth Tower report downwind righthand Runway two six the circuit is active.*" This was acknowledged correctly by the BE76 pilot.

At 1258:03 the Tower advised the BE76 flight, "*BE76 c/s you're number two in traffic number one is a Cherokee turning left base*" (this was PA28(A)). This was acknowledged correctly by the BE76 pilot. At this point the DA42 was just airborne for a LH cct.

At 1258:11, PA28(B) flight inbound from the S with Radar, reported field in sight. The unit radar replay showed PA28(B) crossing the coast 5nm SE of the airfield. Radar instructed the PA28(B) pilot to join L base for RW26 and advised that the cct was active.

Radar notified the Tower about the inbound PA28(B) and the Tower controller acknowledged, advising Radar about the helicopter departing SE.

At 1258:50 Radar advised the PA28(B) flight about the opposite direction helicopter and then transferred PA28(B) to the Tower on frequency 125.6MHz. PA28(B) pilot did not immediately respond and Radar called PA28(B) a second time to repeat the message, which was correctly acknowledged at 1259:00. The unit radar replay showed PA28(B) positioned 4nm SE of the airfield, with the DA42 turning downwind.

At 1259:03 Tower advised the outbound helicopter about PA28(B), "*...opposite direction Cherokee just coasting in over Hengistbury Head and further traffic's a Diamond Twin downwind lefthand in the circuit.*" This was acknowledged correctly by the helicopter pilot.

At 1259:12, the Tower controller passed the DA42 TI regarding PA28(B), "*DA42 c/s traffic is a Cherokee inbound from Hengistbury Head about a mile north of Hengistbury Head this time joining left base.*" The unit radar replay showed the distance between the 2 ac as 3nm with the DA42 indicating an altitude of 1000ft and PA28(B) indicating an altitude of 900ft. There was no response

from the pilot of the DA42 and the Tower called again to establish communication with the DA42. At 1259:30 the Tower repeated the message, *“Traffic is a Cherokee about a mile and a half north of Hengistbury Head joining left base shortly on your right hand side keep a good lookout.”* The DA42 pilot replied, *“er looking and er left downwind Touch and Go.”* The Tower advised the DA42 *“Roger – DA42 c/s you’re number two number one is a Beech Duchess on a one mile right base.”* The DA42 pilot acknowledged, *“Number one A B-er number two and visual with number one DA42 c/s.”*

At 1259:46, the Tower controller called the PA28(B), *“... c/s Bournemouth Tower on frequency.”* The PA28(B) pilot replied, *“...go ahead.”* The Tower controller responded, *“PA28(B) c/s Bournemouth Tower you’re number three in traffic number two is a Diamond Twin in your looks to be about ten o’clock.”* The unit radar replay showed the 2 ac converging at a range of 1.5nm and both indicating altitude 1100ft.

At 1259:58 the PA28(B) pilot replied, *“er number three in traffic ????looking for the Diamond er PA28(B) c/s.”* The Tower added, *“Roger that traffic’s er in the circuit at circuit height one thousand two hundred feet shortly in your twelve o’clock.”* The PA28(B) pilot reported, *“er contact PA28(B)c/s we ????around.”* The Tower controller responded, *“Roger PA28(B) c/s follow that traffic.”*

At 1300:27, the BE76 pilot reported R base and Tower instructed the flight to continue approach. At this point the unit radar recording showed the DA42 late downwind, with PA28(B) approaching L base 0.3nm SE of the DA42. The PA28(B) is observed commencing a R turn and the DA42 commencing a L turn, with both ac indicating an altitude of 1100ft.

The unit radar replay showed that as the DA42 turned onto L base the ac SSR label fades, leaving only an intermittent primary return. PA28(B) continues towards L base 1nm E of the DA42. The track of the DA42 on base leg, brings the DA42 into close proximity with the BE76 as both ac turn onto final approach.

At 1301:08 the DA42 pilot called, *“...final two six touch and go.”* Tower responded *“continue approach”* and the shortly afterwards at 1301:20 the BE76 advised, *“er BE76 c/s we’re going around because er the Twinstar’s gone under us.”* The Tower controller acknowledged *“DA42 c/s roger see that thanks.”* The DA42 flight was cleared to land and the BE76 flight was cleared to make an early R turn to reposition onto final approach behind PA28(B).

The Manual of Air Traffic Services (MATS) Part1, Section 2, Chapter 1, Page 1, Paragraph 2.1, states:

‘Aerodrome Control is responsible for issuing information and instructions to aircraft under its control to achieve a safe, orderly and expeditious flow of air traffic and to assist pilots in preventing collisions between:

- a) aircraft flying in, and in the vicinity of, the ATZ;
- b) aircraft taking-off and landing.’

Page 12, Paragraph 15, states:

‘Clearance to enter a traffic circuit is issued when an aircraft is still some distance from the aerodrome to enable the pilot to conform with the traffic circuit, pending clearance to land. Information concerning landing direction or runway in use and any other necessary instructions are given at the same time so that the pilot may intelligently position himself in the traffic pattern.’

The DA42 pilot had previously reported visual with the BE76 and was instructed to report final number 2. The DA42 pilot turned onto final approach bringing his ac into close proximity with the BE76.

TI on the DA42 was passed to PA28(B) when the ac were 1.5nm apart (10 o’clock) and then updated by the Tower controller when the distance became 1nm (shortly 12 o’clock). At this point the PA28(B) pilot reported the DA42 in sight. The unit radar replay showed both ac indicating an altitude of 1100ft.

ATSI considers that the delayed passing of TI to PA28(B) was a contributory factor. This delay resulted because the Radar controller needed to call the PA28(B) pilot twice before transfer to the Tower frequency. At the same time Tower needed to call the DA42 pilot twice in order to pass TI concerning PA28(B). At this point, when PA28(B) was changing to the Tower frequency, the resulting RT loading made it probable that PA28(B) was unable to transmit immediately.

ATSI consider it probable that the DA42 and PA28(B) pilots sighted each other late. This may have prompted the DA42 pilot to commence an early L turn onto base leg. It was not clear why the DA42 flight did not adjust the heading to position onto final behind the BE76 or, having made an early L turn, did not make any further report to ATC until turning onto final approximately 45sec later.

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 authorities.

With the BE76 and DA42 already established in the cct, Members agreed that PA28(B), as joining traffic, was required to integrate into the pattern already formed by the other ac. It was clear that PA28(B) was instructed by Radar to join on L base and, after coordination with ADC, the flight was transferred to Tower. ADC passed the DA42 pilot TI on PA28(B) and also told him to position No2 to the BE76 on R base, with which he reported being visual. However, when PA28(B) flight called on the Tower frequency, it appeared that its pilot was surprised to be told he was No3 to the DA42 which he had not sighted. Members believed that with both ac approaching each other towards the L base position at similar levels, ATC should have exercised more positive control to ensure adequate separation in the event that the pilots did not see each other as intended. The ADC could have asked the PA28(B) pilot on first contact if he had the DA42 in sight and/or issued the flight with instructions i.e. an orbit to ensure the DA42 and PA28(B) were not in conflict in close proximity with both pilots unsighted. Because of PA28(B)'s proximity, the DA42 pilot was effectively forced to turn in towards final early to avoid it, which led Members to agree that lack of positive control by ATC had been a part cause of the Airprox. That said, after taking avoiding action on PA28(B) by turning and descending towards final approach, the Twin Star pilot did not position No2 to the BE76, as instructed by ADC, which was the other part cause. Whether the pilot was distracted by the PA28(B), had forgotten about the BE76 or believed it was well ahead on final was not clear. The BE76 pilot had not yet reported final and the Twin Star pilot did not make any report - losing sight of the BE76 or having to take avoiding action - prior to calling on final, by which time the ac were in conflict. Members believed that if the Twin Star pilot had concern about the BE76's position, he should have asked for a position update on frequency.

After the DA42 pilot reported final and was told to continue approach, the BE76 pilot reported 'going around' owing to the DA42 having passed just beneath. The ac passed each other unsighted to both crews whilst descending on final approach. That the ac missed each other was purely fortuitous and, with neither crew nor ATC having taken any action to resolve the conflict, the Board were in no doubt that a definite risk of collision existed during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause:

1. Lack of positive control by ATC.
2. Having taken avoiding action against joining traffic (PA28(B)), the Twin Star pilot did not position No2 on final to the BE76 as instructed by the ADC.

Degree of Risk: A.

AIRPROX REPORT No 2010140

Date/Time: 21 Sep 2010 0848Z

Position: 5317N 00002E (14nm NE Coningsby)

Airspace: LFIR (Class: G)

Reporting Ac Reporting Ac

Type: DR400 BE200

Operator: Civ Pte HQ AIR (TRG)

Alt/FL: FL75 FL85↓

Weather: VMC CLOC VMC CLOC

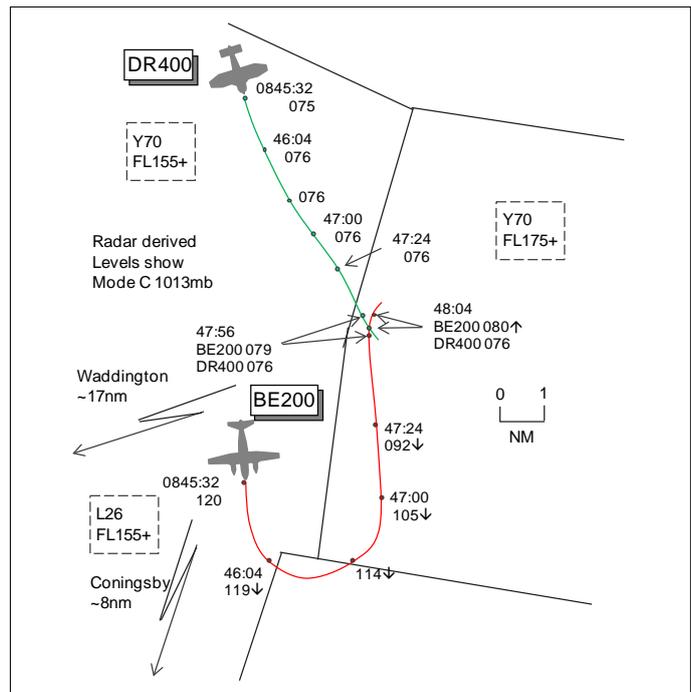
Visibility: >10km 15km

Reported Separation:

400ft V/50m H NR V/2-300m H

Recorded Separation:

300ft V/0.1nm H



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DR400 PILOT reports en-route from a private site in N Yorkshire to Beccles, VFR and in receipt of a TS from Coningsby Zone squawking an assigned code with Modes S and C. The visibility was >10km in VMC and the ac was coloured white/red with strobe lights switched on. Over the Wash after passing OTBED heading 134° at 130kt and FL75 the controller advised, "Contact 12 o'clock heading N 2000ft above"; he replied, "Looking DR400 c/s." Seconds later the profile of a medium-size twin-engine propeller-driven ac appeared descending and heading directly towards him. In the same instance the twin swerved to its starboard and reduced its ROD, passing 50m clear and 400ft above. He took no avoiding action as it all happened very quickly and it was apparent the other ac's avoiding action would be successful. Just after the twin passed the controller said in an anxious voice, "Contact now passing 400ft O/H". He assessed the risk as high.

THE BE200 PILOT reports flying a GH mutual solo sortie to the N/NE of Coningsby and in receipt of a BS from Coningsby Approach on frequency 282.725MHz, squawking 2641 with Modes S and C. The visibility was 15km in VMC and the ac was coloured white/blue with nav, beacon, strobe and recognition lights all switched on. Heading 005° at 200kt and descending through FL85 for a visual recovery, TCAS annunciated "traffic", which they identified as being behind and below. He then looked up to see a twin-engine ac, he thought, in his 12 o'clock 500-600m away on a converging heading and closing rapidly. He took evasive action, selecting full power and turning up and to the R, the other ac passing 200-300m clear to his L. As full power was being selected TCAS generated a "climb, climb" RA and indicated a 2000fpm ROC on the VSI. They were soon clear of conflict and levelled-off. Approach called, "Traffic similar level 12 o'clock" which they took to be a delayed call for the previous conflict. After a moment to gather their thoughts and confirm that the area was clear they continued their recovery to Coningsby. He assessed the risk as high.

HQ 1GP BM SM reports that this Airprox occurred between a BE200 King Air, flown by a solo student crew, in receipt of a BS from Coningsby (CGY) Approach (APP) and a DR400 under the control of CGY Zone (ZON), in receipt of a TS. Unfortunately, the Airprox was not reported until sometime after the event; consequently, the controllers had no recollection of the event and their narrative reports have suffered accordingly.

Although the BE200 pilot reported that the conflicting ac was twin-engined, investigation has proved that it was a Robin DR400. Furthermore, whilst the crew reported that the TCAS display presented the DR400 as approaching from behind and below, the DR400 was in front and below. No engineering investigation seems to have been undertaken to confirm the serviceability state of the TCAS equipment.

The DR400 flight free-called ZON at 0843:36, level at FL75 en-route to Beccles and was identified and placed under a TS at 0844:23. The BE200 flight free-called APP at 0844:38, seeking a visual recovery and was identified at 0845:34. Although a type of service was not agreed between the BE200 and APP, the BE200 stated that they required a BS. At this point, the BE200 is at FL120 tracking approximately 170° with the DR400 approximately 9nm N, tracking approximately 165°.

At 0846:05 the BE200 flight commenced a L turn with APP instructing them to descend to 2000ft QFE at 0846:07. At 0847:01 ZON passed TI to the DR400 on the BE200, *“DR400 c/s traffic twelve o’clock five miles tracking North indicating two thousand five hundred feet above”*; the DR400 pilot replied, *“Looking DR400 c/s”*. At 0847:07 the BE200 is indicating FL097 in a descent (SSR Mode C) and appears to roll out of the turn onto a conflicting track (approximately 355°) with the DR400. Simultaneously, APP passed the BE200 accurate TI on the DR400, *“BE200 c/s roger own navigation traffic North five miles tracking South East at Flight Level seven five”*. The BE200 pilot replied *“Looking BE200 c/s”*.

[UKAB Note (1): Immediately after this transmission APP pre-noted the BE200 with CGY Tower and then informed Waddington of the BE200’s intentions, as the flight was previously booked on a PD for ccts but Waddington were unable to accept the ac. The last telephone call terminated just after 0847:50.]

At 0847:52, APP updated the TI to the BE200 on the DR400, *“BE200 c/s previously reported traffic twelve o’clock one mile opposite direction at FL75.”* The BE200 pilot replied, *“Er BE200 c/s is visual and er manoeuvring away”*. At 0847:56, ZON updated the TI to the DR400 on the BE200, *“DR400 c/s previously called traffic now twelve o’clock one mile opposite direction, indicating four hundred feet above.”* At this point on the radar replay 0.5nm separation existed, the DR400 at FL076 and the BE200 at FL079. The DR400 pilot replied, *“Visual DR400 c/s that was close”*.

[UKAB Note (2): The CPA occurs between radar sweeps for the next sweep at 0848:04 shows the ac having passed, the BE200 now in the DR400’s 7 o’clock range 0.3nm, the DR400 still indicating FL076 whilst the BE200 is seen in a R turn and climbing through FL080, confirming the pilot’s reported avoiding action. It is estimated the ac passed within 0.1nm of each other.]

CAP 774 states that:

- a. Under a TS, ‘the controller shall pass traffic information on relevant traffic, and shall update the traffic information if it continues to constitute a definite hazard.’
- b. Under a BS, ‘if a controller considers that a definite risk of collision exists, a warning may be issued to the pilot.’
- c. For both a TS and a DS, ‘whether traffic information has been passed or not, a pilot is expected to discharge his collision avoidance responsibility without assistance from the controller.’

JSP 552 245.105.2 states that a TCAS TA will be generated between 20-45sec from CPA, with the time varying due to the host ac’s altitude.

The crews of both ac were initially provided with accurate and timely TI on each other iaw CAP774. Typically, the BE200 will descend with a 10° nose down attitude which will have increased the visibility of the white upper body of the ac to the DR400 pilot. Furthermore, the paint scheme of the DR400 viewed from above appears predominantly white, albeit with a band of red on the leading

edge. This, combined with the constant relative bearing between the ac and the possible presence of haze, will have made both of the ac difficult to spot. Moreover, whilst it is impossible to create a timeline of events within the BE200 cockpit, it is likely that the TCAS TA event will have interrupted the crew's workflow and, as the pilot's report states, directed their attention inside the cockpit. It is reasonable to argue that this will have affected the crew's visual scan and delayed their visual acquisition of the DR400, especially given the subsequent requirement to refocus outside the cockpit after viewing the TCAS display.

From an ATM perspective, given the closure speeds of the ac, the updates of TI provided by APP and ZON, whilst given, were too late to have enabled the pilots to take action to prevent the occurrence. APP's workload is unrecorded, but appears low based on the content of the transcript; however, APP was involved in a series of other tasks throughout the time that the BE200 was on frequency, which may have distracted them from passing an earlier update. That notwithstanding, the BE200 was in receipt of a BS and had been provided with TI on the DR400. ZON's workload is unknown, but in the period between ZON passing TI to the DR400 at 0847:01 and the update at 0847:56, they were involved in a series of transmissions with 2 other ac operating around 15nm S of the CPA. Not only will the geographical split between these ac have served to divide ZON's attention, but the RT during that period is constant with no gaps until the TI is updated.

HQ AIR (TRG) comments that the ac were both provided with accurate and timely TI but elected not to act upon it or did not sufficiently register the detail they were passed. The reasons for this are not clear but both had the opportunity to manoeuvre to avoid the impending conflict and the BE200 did so only on receiving a TCAS RA. It is also not clear why the reported TCAS TA was apparently very late and in error. However, with the available TI, the TCAS TA was actually superfluous. It is also noted that the equipment was not snagged and that there is no trend of similar occurrences to indicate a problem with the TCAS. The BE200 formal pre-sortie brief stresses the limitations of the TCAS in respect of it only detecting transponding ac and hence the continuing need for a robust lookout scan. It is disappointing that this incident was permitted to proceed to a point where a well flown TCAS RA response was required.

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.

Notwithstanding that both ac were receiving a service from Coningsby, as the Airprox occurred in Class G airspace, both crews were responsible for maintaining their own separation from other traffic through see and avoid. The BE200 flight had called APP and, having requested a BS for a visual recovery, the crew received TI, more than is required under a BS, on the DR400 at FL75 when at 5nm range. APP then coordinated with Tower and Waddington on the telephone before passing updated TI as the ac approached the CPA. The DR400 flight working Zone had also received TI at range 5nm but this was incomplete as there was no mention that the BE200 was descending, which would have improved the DR400 pilot's SA. This TI was updated as the BE200 still constituted a hazard, however this only occurred as the ac were about to cross owing to Zone being busy with other traffic in the intervening period. Members could not resolve the apparent TCAS discrepancy where the TA was late and indicating an erroneous relative bearing. However, the accurate TI passed by ATC was either not assimilated by the BE200 crew or they elected not to act upon it. Also the TI given to the DR400 may have misled the pilot into believing that the BE200 would be passing 2500ft above. In the end, both crews saw each other late and Members agreed that this had caused the Airprox.

By the time the DR400 pilot saw the BE200 it was too late for him to take avoiding action, but he saw the BE200 manoeuvre away to his L and stop its descent 400ft above. Fortunately the BE200 crew had seen the DR400 slightly earlier, in enough time to take prompt and robust avoiding action as

TCAS generated a mutual RA 'climb'. These actions were judged by the Board to have removed the actual risk of collision; however, safety had not been assured during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by the pilots of both ac.

Degree of Risk: B.

whilst flying a reciprocal route inbound to Brighton, he received an ATS from Coningsby, but when released he was advised to call Humberside and not Waddington as he had requested.) Contact was not made with Coningsby until approx 10-12nm from their overhead as they were very busy with other traffic on UHF. During the interval between Humberside terminating their ATS and calling Coningsby, both crew members observed a dark coloured Dominie ac on a N'y heading about 1km away [0.54nm]. He turned R to avoid the Dominie, whose pilot also turned to the R in avoidance; the Dominie passed down their port side at an estimated range of 200m, about 200ft below his aeroplane with a 'low' Risk of collision.

The flight was continued southbound and contact established with Coningsby ATC, subsequently passing 2nm E abeam their overhead, as requested by the controller.

His DR400 has a white and blue colour-scheme; no external lighting was switched on.

UKAB Note (1): Wickenby Aerodrome is situated about 11nm NNE of Waddington and the UK AIP at AD 2-EGNW-1-3, promulgates the Wickenby ATZ as a circle radius 2nm centred on RW03/21, from the surface to 2000ft above the aerodrome elevation of 84ft. The ATZ intersects the Waddington MATZ stub, consequently at 2.22 it is noted that: flight within the ATZ above 1500ft aal is also subject to clearance from Waddington ATC.

WADDINGTON DIRECTOR (DIR) reports that he was instructing a trainee controller with up to 3 ac in the Radar Training Circuit (RTC). The Dominie was being vectored for an instrument approach to RW20 but, because of a large number of ac in transit and conducting general handling (GH), including aerobatics taking place at Wickenby up to 4000ft, the Dominie crew had been given a wide pattern out to the E. Whilst attempting to keep clear of Wickenby and other traffic in that area, TI was passed on a south-bound contact that was 2nm N of the Dominie and believed to be at a similar level. The Dominie pilot was not visual and the traffic was called again at a range of about 1nm; the pilot called visual and was instructed to turn L onto 280°, whereupon the Dominie pilot reported that he was taking avoiding action to the R and declaring an Airprox.

WADDINGTON SUPERVISOR (SUP) reports that the DIR trainee was working hard and had 2-3 ac on frequency. He passed TI on the conflicting traffic – the DR400 - and also updated it. The Dominie pilot called visual and was given a turn with that ac in sight. He then turned right to avoid the DR400 and declared the Airprox.

HQ 1GP BM SM reports that comparison of the radar replay and DIR RT tape transcript timings highlighted a significant discrepancy of about 21sec that was confirmed by engineers at the unit. Consequently, the RT transcript timings in this report have been amended to align with UTC and the radar recording time base.

DIR was manned by a mentor and trainee controller, albeit an experienced multi-tourist, whose workload was assessed as medium to high with 3 ac on frequency. Background traffic density was high and available airspace volume was reduced due to the activation of restricted airspace to the N of the aerodrome, of radius 5nm up to 9500ft agl [Scampton].

The Dominie was being vectored at 2500ft QFE (1004mb) on a wider radar pattern by DIR to avoid aerobatic ac operating from Wickenby, a local aerodrome to the NNE. At 1359:34 DIR instructed the Dominie crew to turn L onto 350° to, "*try and turn inside...traffic now manoeuvring easterly bound*" [which was not the DR400]. At this point, the DR400 was 7.6nm NNW of the Dominie indicating 3000ft Mode C (1013mb); the Dominie was indicating 2700ft Mode C (1013mb). The turn onto 350° brought the Dominie into conflict with the DR400.

CAP 774 states that:

“when providing headings/levels for the purpose of positioning and/or sequencing or as navigational assistance, the controller should take into account traffic in the immediate vicinity, so that a risk of collision is not knowingly introduced by the instructions passed.”

At 1400:13, DIR passed the Dominie crew accurate TI on the DR400 stating, “[Dominie C/S] further traffic north 4 miles south bound indicating 3 hundred feet above.” At 1400:25, an E3-D crew called DIR on climb-out from Waddington for a further RTC. At 1400:36 the Dominie crew requested an update of the TI, which was passed at 1400:41, DIR stating, “[Dominie C/S] Roger, north, 2 miles, 2 hundred feet above”. The PA responded, “visual” at 1400:45, with the PIC estimating the acquisition range as 1nm. At 1400:46, DIR replied, “roger, with that traffic in sight, turn left heading 2-7-0°.” At this point, the DR400 is in the Dominie crew’s 12 o’clock at 1.1nm indicating 200ft above it. At 1400:51 the Dominie pilot advised that they were “coming hard right” with the turn evident on radar and the DR400 0.4nm NNW of the Dominie. Although the DR400 pilot reports that they acquired the Dominie visually at a range of about 1km and turned right to avoid it, this turn is not apparent on radar.

JSP 552 201.200.3 states that:

“the Rules of the Air require that notwithstanding a flight is being made with ATC clearance, it remains the duty of the captain of an aircraft to take all possible measures to ensure that his aircraft does not collide with other aircraft...When 2 aircraft are approaching head-on or approximately so and there is a danger of collision, each shall alter its course to the right.”

CAP 774 states that:

“Whether traffic information has been passed or not, a pilot is expected to discharge his collision avoidance responsibility without assistance from the controller. If after receiving traffic information, a pilot requires deconfliction advice, an upgrade to Deconfliction Service shall be requested.”

There are a number of potential explanations for DIR’s instruction to the Dominie crew to turn onto a heading of 350°. Arguably, as a result of both the mentor’s and trainee’s level of psycho physiological arousal caused by their workload and the more imminent threat posed by the aerobatic ac, attentional tunnelling may have reduced DIR’s field of view such that they were unable to see the DR400. Alternatively, DIR may have incorrectly assessed that the turn onto 350° would not have brought the ac into conflict; however, this hypothesis is unlikely given the experience of the trainee. The more likely hypothesis is that DIR’s plan was to turn L back towards Waddington earlier than they did and before the point of conflict with the DR400.

The CPA occurred about 15½nm downwind - NNE of Waddington aerodrome; local ATC procedures state that when flown by the PA for a PAR, Dominies should be positioned for a 12nm base-leg. The time when the Dominie reached the approximate point for a 12nm base-leg, accords approximately with the transmission made by the E3-D on climb-out, followed by the Dominie crew’s request for updated TI. DIR might have planned to turn the Dominie onto a base-leg earlier, but this turn instruction was delayed by having to respond to the E3-D crew and the Dominie crew’s request for updated TI. In a subsequent conversation with the controller, DIR stated that they were conscious of how far N the Dominie had transited, which lends support to this hypothesis. On this basis, DIR did not knowingly turn the ac into conflict.

Notwithstanding the turn onto 350°, DIR provided accurate and timely TI enabling the Dominie crew to visually acquire the DR400 at a range of about 1nm. However, this might have been hampered by the reduced visibility in haze and the reportedly poor visibility from the Dominie cockpit exacerbated by the colour scheme and attitude of the DR400, presenting the all white underside of the ac and a relatively small frontal aspect.

Whilst the turn onto 350° issued by DIR to the Dominie took the ac towards the DR400, DIR did not knowingly introduce a conflict as, on the basis of the foregoing hypothesis, their plan was to turn the Dominie onto base-leg before the point of conflict.

HQ AIR (TRG) comments that the Dominie crew ultimately complied with their responsibilities to avoid a collision. It is agreed that DIR did not *knowingly* turn the Dominie into conflict with the DR400. However, the Dominie would have rolled out of the turn onto 350° and 8 seconds later received the TI at 4nm range (the turn was completed at about 1400:05, and the 4nm TI was called at 1400:13). It is not clear why a further turn was not given immediately the 'conflict' became apparent to DIR, perhaps during the turn, unless DIR did not yet consider this to be a conflict, thus bringing into question the controller's SA on the DR400. It is also disputed that the plan was to turn the Dominie earlier; even an immediate turn onto a closing heading to 12nm final would only have produced a CPA of between 2-4nm. In addition, opportunities existed to turn the Dominie earlier despite the call by the E3-D; the turn could have been called as part of the 4nm TI or the 2nm update, so it appears that there was an intent to transit the Dominie further N, even in light of the now apparent conflict. Turning the Dominie further W in the pattern would not have contravened any of the instructions to controllers vectoring traffic in a RTC under a TS. However, it is conceivable that these instructions may have influenced DIR's decision not to issue a turn instruction once the conflict became apparent.

Equally, the Dominie crew could have chosen to take their own avoiding action earlier, but might have expected DIR to provide this avoiding action turn instead. Potential for indecision exists when crews have to constantly switch between being directed to turn to follow the pattern (and avoid traffic in the case of the turn onto 350°) and having to initiate their own traffic avoidance turns. Opting for a Deconfliction Service in this situation might have provided clearer direction from DIR resulting in greater separation, but would still not have absolved the crew from their collision avoidance responsibilities. Crews need to be prepared to take their own positive avoiding action earlier in such situations. Furthermore, more specific emphasis that traffic has been assessed as a direct conflict by the controller might alert crews earlier to the fact that a conflict exists, rather than them having to process the TI and come to that conclusion themselves.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Whilst the DR400 pilot was in receipt of a BS there was no requirement for Humberside ATC to track it on radar or proffer TI. It was also evident from the DR400 pilot's report that he might well have called Waddington ZONE on this return flight and it was unfortunate that he had not managed to do so, which might have prompted ZONE to point out the ac to the DIR. However, at the time the Airprox occurred the DR400 pilot had not established an ATS with Coningsby and was operating VFR without the benefit of either a radar service or BS after Humberside terminated their BS. Without any prompt from radar derived TI, both the DR400 pilot and his colleague spotted the Dominie just over ½nm away and turned R to avoid it in compliance with the Rules of the Air. The Board did not consider that this was a late sighting given the head-on geometry - the DR400 pilot assessing the Risk as 'low' with separation on the Dominie reported to be 200m horizontally and about 200ft below his aeroplane. So for his part the DR400 pilot had complied with his responsibilities to 'see and avoid' other ac in Class G airspace.

At the core of this Airprox was the issue of vectoring ac under a TS within the RTC, where Members recognised that the controller was also under remit when issuing vectoring instructions to take into account traffic in the immediate vicinity so that '...a risk of collision is not knowingly introduced'. Here the mentor and trainee manning DIR had elected to turn the Dominie onto 350° to keep clear of the ac conducting aerobatics. HQ 1Gp BM SM suggested that the controllers had not spotted the conflict with the DR400 before the turn instruction to 350° was issued because, with a high level of

background traffic, they were operating under a medium to high workload and concentrating on the more imminent threat posed by the aerobatic ac at the time. Alternatively, it was contended that DIR had been aware of the DR400 and had planned to turn the Dominie on to a base leg before the ac closed, but this plan was thwarted by the E3-D calling on climb-out. Controller Members sagely argued that it was rarely wise to point one ac directly at another, and this Airprox illustrated just that. Although the recorded radar data did not replicate exactly the radar picture in use by DIR at the time, there was no reason to suppose that the DR400 was not displayed to DIR, which suggested to some Members that this was a late sighting by the controllers. After much discussion, the Board agreed that the Cause of the Airprox was that DIR had vectored the Dominie into conflict with the DR400; the Board accepted HQ 1Gp's view that in this complex scenario DIR had not been aware of the DR400 and therefore had not turned the Dominie into confliction 'knowingly'.

The Board was divided over their assessment of the Risk. Controller Members observed that DIR had passed accurate TI at 1400:13; this was a crucial transmission that had provided the first warning to the Dominie crew about the reported ac. At that stage the ac were 4nm apart and closing head on at a combined speed of 290kt. Twenty three seconds later, as soon as the interchange with the E3-D crew had finished, the Dominie crew asked for an update on the DR400. Passing TI about another ac head-on at a very similar level was potentially more urgent and Members appreciated that the updated TI crucially facilitated the Dominie crew's subsequent sighting of the DR400 at a range of just over 1nm. Some might argue that DIR had fulfilled their responsibilities with that one transmission of TI, but the Command had suggested that here was an opportunity for the controllers to be proactive and turn the Dominie L in the pattern away from the other ac rather than provide the traffic update. However, this would have placed the Dominie 'belly-up' to the 'threat' and make the DR400 more difficult to see at close quarters. Therefore, it was understandable that the Dominie crew rejected DIR's vectoring instruction to turn L onto W after they reported visual. By that stage, it was evident from the radar recording, the DR400 was just 0.4nm away and the Dominie pilot elected to take control of the ac from his assistant and robust avoiding action in the opposite direction. The Board discussed the obligations of pilots being vectored in the RTC while receiving a TS. The Air Ops fast-jet Member was clear that, notwithstanding any navigational assistance around the RTC or TI provided by ATC, pilots receiving a TS have a responsibility to see and avoid other ac.

The CPA occurred in between radar sweeps, hence the horizontal separation could not be corroborated independently. Whilst the Dominie pilot had fulfilled his responsibilities to 'see and avoid' the other ac, he estimated the separation to have been about 150m horizontally and 50-100ft vertically with a 'high' Risk of collision. This suggested to some Members that the safety of the ac had been compromised despite his avoiding action. Whilst this separation was less than that estimated by the DR400 pilot, it was of the same order of magnitude and the latter pilot's vertical estimate was spot-on from the ac's Mode C indications. The DR400 pilot reports he spotted the Dominie at a range of 1km – just 0.54nm; this was closer than the Dominie crew, who called visual at just over 1nm before they executed their R turn. Thus each pilot had seen the other ac in time to assess the situation and avoid each other's ac in-line with the Rules-of-the-Air, which convinced other Members that the pilots' combined avoiding action had effectively removed any Risk of a collision. Given the broadly equal division of the Members, the Board concluded by a majority vote that there was no Risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Dominie was vectored into conflict with the DR400.

Degree of Risk: C.

AIRPROX REPORT No 2010152

Date/Time: 6 Oct 2010 1129Z

Position: 5302N 00029W (O/H RW26
Cranwell - elev 218ft)

Airspace: ATZ (Class: G)

Reporting Ac Reported Ac

Type: Tutor BE200

Operator: HQ AIR (TRG) HQ AIR (TRG)

Alt/FL: 300ft↑ 500ft
(QFE 996mb) (QFE)

Weather: VMC CLNC VMC NR

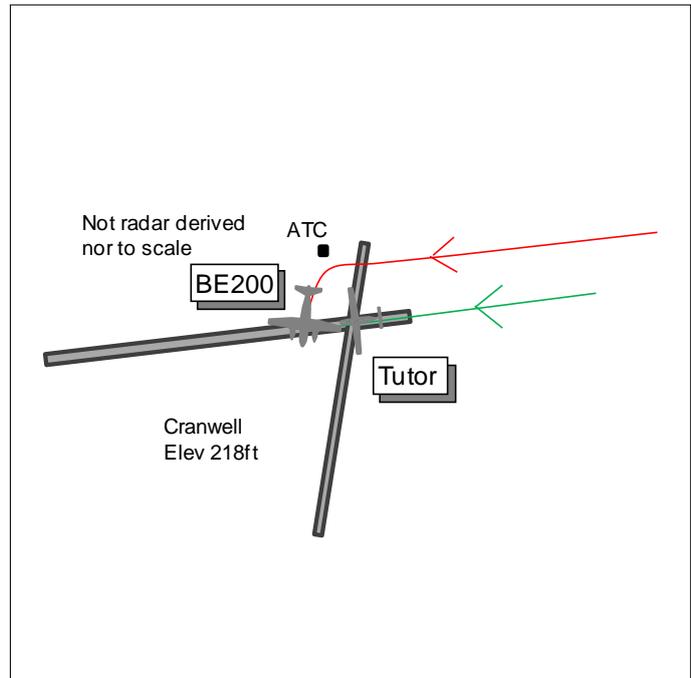
Visibility: 20km

Reported Separation:

200ft V/100ft H Not seen

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TUTOR PILOT reports flying a local dual training sortie from Cranwell, VFR and in communication with Cranwell Tower on 125.05MHz; the transponder was switched off. Heading 264° at 80kt during the climbout from a touch and go, a BE200 King Air was noticed on the deadside of RW26 approximately 200ft above and 500m behind them. Once it was passing abeam, the King Air turned L but before it crossed in front of him the Tutor pilot levelled-off at 300ft QFE 996mb, which led to the King Air passing 100ft in front and 200ft above. He assessed the risk as medium.

THE BE200 PILOT reports conducting a dual advanced training sortie from Cranwell VFR and in communication with Cranwell Tower on 125.05MHz, squawking 2636 with Modes S and C. After joining the visual cct from a straight-in approach they were cleared for a low-level cct. They extended slightly upwind to position behind a Tutor downwind but as they turned downwind the Tutor pilot called for a flapless cct. They now realised that they might not have sufficient spacing behind the Tutor as it would be extending downwind. They continued to just over halfway around finals and, with the Tutor still approaching the threshold, elected to go-around at 500ft for another low-level cct. At this point another Tutor flight called joining downwind so he asked ATC to confirm the position of the joining Tutor and was told it was abeam Carlton Scroop mast, about 3-4nm W of Cranwell. To deconflict with the joining Tutor and the other Tutor last seen rolling about 1nm ahead, they elected to turn early downwind level at 500ft to complete the student's low-level cct before landing. Heading 265° at 140kt the turn was cleared visually to the L and commenced about 1000ft beyond the RW26 threshold; however, halfway around the turn they heard an Airprox called and they rolled out to check for traffic in case it was the joining Tutor in conflict with them. With nothing seen to conflict, the cct was continued to land. After landing and speaking to ATC he was told that it was the Tutor ahead of them on finals that had filed the Airprox and he later spoke to the Tutor pilot to discuss the incident.

THE CRANWELL TOWER CONTROLLER reports the visual cct was full (4 in) and the ATC Supervisor was present in the VCR. The Tutor was on the RW having been given "clear touch and go" and the BE200 was deadside low-level having just 'gone around'. Another Tutor was joining downwind having just called at 'the mast'. The BE200 broke early downwind and at this point the subject Tutor pilot called Airprox which he acknowledged. As he was concentrating on other aspects of the busy visual cct he was not aware of any incident until the Airprox call was made.

THE CRANWELL SUPERVISOR reports he was in the VCR owing to the cct being full. The BE200 had 'gone around' being unable to continue his approach and the Tutor had commenced a 'touch and go'. As the Tutor climbed away the BE200 was deadside O/H the VCR and its pilot called "breaking early low-level" as the BE200 crossed RW26 above the Tutor. He saw the Tutor initiate an immediate descent and once the BE200 had passed the Tutor recommenced a climb and its pilot called Airprox.

HQ 1GP BM SM reports that this Airprox occurred in the visual cct, with the unit operating on RW26, between BE200(A), operated by a QFI and student pilot, going-around from a low-level cct re-positioning from deadside to liveside and Tutor(A), operated by a QFI and student pilot, climbing from a "touch and go."

The ADC's workload was reported as high to medium, with the visual cct full, with dissimilar types (BE200 and Tutor) operating. At 1126:43, BE200(A) pilot reported downwind in the low-level cct (500ft QFE) for a touch and go. TWR responded that 2 ac were ahead, Tutor(A) and BE200(B), such that the order of recovery was BE200(B), Tutor(A) and BE200(A). Tutor(A) was flying a flapless circuit to touch and go, which meant that they would extend downwind, thereby reducing the distance on finals between Tutor(A) and BE200(A).

At 1127:30, Tutor(B) pilot called to join downwind and then at 1127:44 a third BE200 flight, BE200(C), called to join via initials. Due to the reduced spacing on finals between Tutor(A) and BE200(A) as a result of the flapless cct flown by the former, BE200(A) elected to go-around at 500ft at 1127:59. At 1128:10, Tutor(A) flight was cleared to touch and go.

At 1128:41, BE200(A) pilot asked TWR whether they "*...have the position of the Tutor [Tutor(B)] joining downwind.*" There then followed an exchange between BE200(A) and Tutor(B) pilots about the latter's position. At 1128:56, in order to run-ahead of Tutor(B) and "*complete the student's low level circuit before landing*" BE200(A) crew announced their intention to "*turn early downwind.*" The pilot of BE200(A) reports that that they had last seen Tutor(A) when it was "*rolling around 1nm ahead*" of them and cleared the L turn visually, before commencing this turn "*about 1000ft beyond the 26 threshold.*" The ATC Supervisor reports that as "*[Tutor(A)] climbed from the touch and go, [BE200(A)] was deadside overhead the tower and called 'breaking early low level.'*" As "*[BE200(A)] crossed RW26 above [Tutor(A)] I saw [Tutor(A)] initiate an immediate descent.*" The early turn downwind by BE200(A) is evident on the radar replay at 1129:18, although Tutor(A) is not visible on radar. At 1129:20, Tutor(A) pilot declared an Airprox.

JSP 552 310.110.2 states that Aerodrome control is established to deal with VFR traffic flying in the circuit and all movements on the manoeuvring area. Information and instructions will be given to pilots by the aerodrome controller to achieve a safe, orderly and expeditious flow of traffic and to assist pilots in preventing collision between...aircraft flying within the circuit area.

Given BE200(A)'s position in the circuit, it is reasonable to argue that the ADC could have expected BE200(A) to have been visual with Tutor(A) throughout the incident sequence. Consequently, the ADC could not have been expected to have given a warning to BE200(A) about Tutor(A) before the former turned downwind. Furthermore, whilst the Supervisor saw the occurrence, given the potentially short timescales involved, it would be unreasonable to expect him to have been able to pass the information onto the ADC, to provide a warning to BE200(A).

HQ AIR (TRG) comments that the BE200 pilot's statement that he had last seen the Tutor 'rolling 1nm ahead' indicates that he had lost sight of him at the time. The attempt to clear the turn visually was ineffective in that it did not pick up the Tutor. Knowing that the Tutor was in the vicinity, not seeing it should have led to a further question as to where it actually was. It is therefore possible that the crew had been distracted by the joining Tutor, Tutor(B), leading to them flying into conflict with Tutor(A). The pilot of Tutor(A) is to be commended for his awareness and prompt action in resolving the conflict.

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 photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

Members wondered why the BE200 crew appeared to have disregarded Tutor(A) as a factor when, having last seen it rolling on the RW ahead, they then positioned deadside at 500ft before turning crosswind early into the cct. The crew's SA had clearly broken down or they would have ensured they were visual and had adequate separation from the Tutor before turning L. The BE200 crew's attention appeared to have been focussed on completing the low-level cct and trying to establish the position and visually acquiring Tutor(B) joining the cct downwind. Tutor(A) was there to be seen, as it climbed away from its touch and go, and should have been detected and taken into account when the BE200 crew was clearing the flightpath into which they were intending to turn. This manoeuvre caused the Airprox. The ADC could not have known that the BE200 pilot had lost sight of Tutor(A) as the BE200 passed above the VCR on the deadside immediately prior to the CPA. Fortunately Tutor(A) pilot had seen the BE200 approaching from behind and above and took prompt action by levelling-off as it turned to pass just in front and 200ft above. Although Tutor(A) passed unsighted to the BE200 crew, the prompt action taken by Tutor(A) pilot was 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 BE200 crew elected to turn downwind early and flew into conflict with Tutor(A), of which they had lost sight.

Degree of Risk: C.

AIRPROX REPORT No 2010153

Date/Time: 7 Oct 2010 1545Z

Position: 5407N 00109W
(4nm NE Linton-On-Ouse
- elev 53ft)

Airspace: Linton MATZ (Class: G)

Reporting Ac Reported Ac

Type: Tucano Hawk x 2

Operator: HQ AIR (Trg) HQ Navy Cmd

Alt/FL: 2000ft 1500ft
(QFE 1016mb) (QFE 1016mb)

Weather: VMC CLBC VMC CLBC

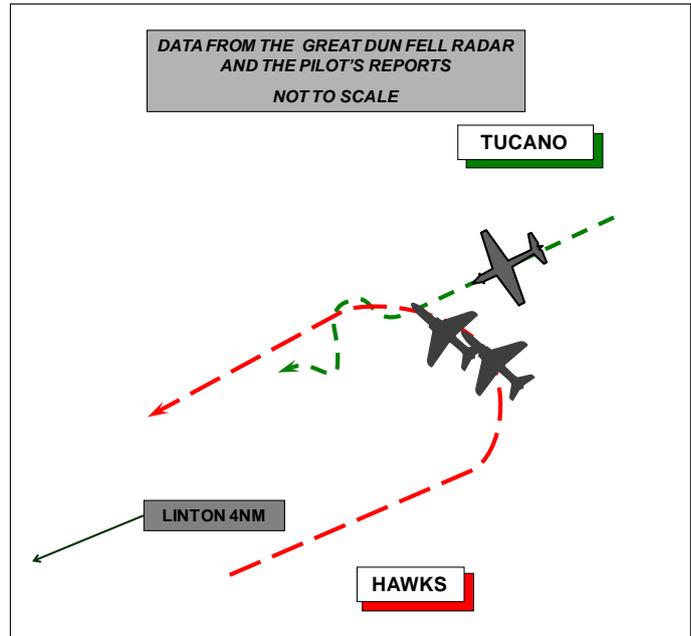
Visibility: 7km 45km

Reported Separation:

0 V/70m H Not Seen

Recorded Separation:

NR (See UKAB Note: (5))



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TUCANO STUDENT PILOT reports he was solo and flying a visual recovery to RAF Linton-on-Ouse, squawking 7001 with Mode C, having just exited from low level and he was in receipt of a BS from Linton APP [See UKAB Note: (1)]. He was heading 230° at 160kt and 2000ft QFE, in poor visibility, and he had transmitted his recovery call to APP at about 9nm from the airfield but the reply was interrupted by a 'Practice PAN' call by another Tucano. He then became visual with the airfield and switched from APP to TWR. He later learned that 2 Hawks were also recovering [to RW 21] on a radar-to-visual recovery from the W but they were not displayed on his TCAS [1]. He was also informed later by ATC that APP had become aware of the possible confliction but was unable to warn them due to the 'Practice PAN' call in progress. The Airprox occurred as the 'Practice Pan' call was being completed and the pair of Hawks in echelon left, passed about 70m away in his 10 o'clock at the same height, in a 60° bank left turn, belly up to him. He did not take any avoiding action as he first saw the other ac at the CPA and he assessed the risk as being high. The visibility into sun (the direction of the Hawk's approach) was poor.

UKAB Note (1): Due to the RT congestion the type of service was not proffered by Linton APP or agreed by the pilot.

THE HAWK PILOT reports that he was leading a pair of black Hawk ac, on recovery to Linton on Ouse having been handed over to Linton DIR on leaving CAS over Leeds Bradford. They were squawking as directed and had all lights switched on and on initial contact with DIR he requested a 'radar to initials' recovery. Although they were visual with the airfield from about 20nm they remained in contact with DIR so that they could receive TI. When they were descending through about 5000ft QFE about 5nm S of the airfield he asked if there was any other joining traffic to affect their approach and, since none was reported, he stated his intent to contact TWR. On contacting TWR he requested a visual join which was approved as they were approaching initials in a left-hand banked turn in a slow descent. He called "Initials" as they turned onto a heading of 210° at 300kt and TI was passed regarding a Grob ac in the circuit; he could not see the Grob so he requested further information to aid his visual acquisition. He then saw the Grob ac which was crossing the upwind end of the RW and climbing through 800ft. Once clear of all known traffic, they carried out a break to

land. Neither he nor his No2 crew saw the Tucano at any time so they were unable to take any avoiding action but he assessed the risk as being Medium.

The APP CONTROLLER reports that during the period the frequency was busy but the scenario was uncomplicated. He had a number of Tucanos and a Church Fenton based Tutor at the time with several Practice PANs and the reporting pilot calling for a visual recovery while he was dealing with the initial call from an ac requiring an instrument approach.

Although initially he did not put the reporting Tucano on a 'standby', he finished identifying the other Tucano and then checked if the Tutor was visual with the aerodrome (not identified but believed to be on the extended C/L at 4 nm), the Tutor pilot reported that he was and then continued with TWR. He then asked the reporting Tucano to continue his message but it was then interrupted by a further Tucano calling a Practice PAN. He was aware of a primary only contact coming in from the SW, which at first he did not believe would affect the traffic joining visually. He asked the reporting Tucano to pass his message but while this Practice PAN message was being transmitted he realised that the primary only contact had extended further [upwind] than he had expected. By the time the Practice PAN message had been completed he called the traffic with reference to the contact he believed to be the reporting Tucano (it had not been identified) but he mistakenly called that traffic as being a '*similar type*'. While he was transmitting this TI he saw the ac that he believed to be the reporting Tucano making a left hand orbit. Then another Tucano acknowledged the TI meant for the reporting ac (although he believes that the Airprox had already taken place while the Practice PAN call was being transmitted). The reporting Tucano then called that he had an Airprox with 2 Hawk ac in the Easingwold area with no more than 50m separation which he acknowledged and rather than question the pilot on frequency allowed him to continue.

Following discussion with the pilot he assessed the risk as being high.

THE SUPERVISOR concurred the APP's report and added that he immediately proceeded to the VCR when it became apparent that the ADC was becoming very busy and was present when the ac joined the cct. The Tutor was asked to cancel its Practice PAN and leave the cct due to the ac joining and the two other Tucanos already in the cct.

He saw the pair of Hawks joining dead-side in formation and he thought pass down the right hand side of the Tucano which took evasive action in the form of a left hand break and orbit. He could not estimate the lateral separation between the ac but believed that they were both at about 1000ft QFE and was not aware whether the Hawks had been visual with the Tucano.

HQ 1 GP BM SM reports that the Tucano was in receipt of a BS from Linton APP [see UKAB Note (1) above], approaching the airfield from the NE and Hawk Lead was initially in receipt of a TS from Linton DIR but at the CPA they had transferred to Linton TWR as they approached the airfield from the S.

Examination of the timeline in the Supervisor's (SUP) report did not appear to accord with the actual timeline of the event and included elements that could only have been ascertained after the event, however it was confirmed that:

- a. The SUP left the ACR, en-route to the VCR, at about 1544:46 (following the transmission of a Practice PAN on the APP freq) as a result of the increasing workload in TWR caused by the Hawks joining the already busy circuit.
- b. Given the size of the ATC building it takes about 45sec to reach the VCR, from the ACR.

The Hawk formation had been originally pre-noted as requiring a radar to visual approach which would have required them to be 'worked' by DIR to facilitate their integration with ac in the Radar Training Circuit; however, at 1543:23 the Hawks converted to a visual approach.

[UKAB Note (2): The Visual recovery was requested by Hawk leader at 1543:23 and the request was approved at 1544:15, DIR starting:

“C/S roger no radar traffic to affect continue with Linton Tower freq 240.82”

At 1544:08, Hawk leader stated that he had the airfield in sight and asked whether there was any traffic to affect; DIR replied that there was *“no radar traffic to affect”* the formation, was transferred to TWR and instructed to squawk standby. At this point the Hawks were 2.5nm S of the airfield, descending through FL060, with the reporting Tucano 10nm NE of the airfield indicating FL029 but not yet in contact with APP. Although it is not recorded in the transcript, the unit investigation showed that GND had pre-noted TWR about the Hawks' intentions, saying, *“[Hawk callsign], visual recovery”*. No information was given to TWR or GND however, regarding the direction of the Hawks approach or their SSR code; moreover, although locally based ac leave their SSR selected to 'on' in the visual circuit, visiting ac are instructed to 'squawk standby'.

At the point at which the Hawks were transferred from DIR to TWR [1544:15] there was no traffic known to DIR traffic [radar traffic] to affect their routeing and the absence of SSR and the routeing intentions of the Hawks will have hampered TWR's efforts to associate the fast moving, primary only contact with the Hawk formation.

At 1544:27 the Hawks squawked standby, as instructed by DIR and 13sec later Lead called TWR requesting that they join the visual circuit and were informed, *“two in, one joining through the overhead”*; at that time they were 2.3nm SE of the airfield heading ENE, with the subject Tucano 9nm NNE of them, tracking SW and indicating 2700ft. The other circuit traffic was a Tutor joining from a PFL and 2 Tucanos.

Just before this (at 1544:21) when the ac was about 9nm NE of the airfield inbound, the Tucano pilot [still squawking 7001 – military low level] re-called APP requesting recovery, having made his first call 30sec earlier and getting no response. Although the [second] call for recovery was interrupted by another Tucano declaring a Practice PAN, APP elected to answer the reporting Tucano first but passed only the airfield details and then instructed the Practice PAN ac to standby. Following an internal handover lasting 15sec APP returned to the Practice PAN at 1545:01 with the sequence continuing until 1545:19. At 1545:32, [after the ac had passed] APP passed TI to the reporting Tucano stating, *“Tucano callsign traffic believed to be you has traffic west, one mile, similar type, similar heading, no height”*. He stated in his report, that he was *“aware of the primary only contact coming in from the south-west [the Hawks], which at first I didn't believe would affect the visual joining traffic (reporting Tucano). I asked [the Practice PAN] Tucano to pass his message, it was while this...message was being transmitted that I realised the [Hawks] had extended further than I had expected. By the time that the Practice PAN message had been completed, I called the traffic to who I believed was [the reporting Tucano]”*.

The CPA was at about 1545:23, during the Practice PAN transmission to APP, when the Hawks crossed the Tucano's nose from left to right, belly-up. The Tucano pilot reported the Airprox to APP 20sec later.

At about 1544:46 the SUP left the ACR en-route to the VCR due to the increasing congestion in the circuit.

[UKAB Note (3): Although not mentioned in his report the radar recording shows that the Tucano makes a hard 'S' turn after the CPA presumably to increase the separation on the Hawks.

At 1545:05 when the Hawks began turning towards the IP, placing them into conflict with the Tucano, TWR's focus of attention would have been the provision of information to the ac in the visual (and PFL) cct (1544:55 to 1545:26) and then on the Tucano turning finals to land (1545:28 to 1545:36). This means that TWR would not have been able to detect the conflict developing as their priorities were rightly with the already established visual cct traffic.

At 1545:01 APP commenced their transmission to the Tucano declaring the Practice PAN. Notwithstanding the verbal response required by APP, they would also have been selecting and completing a new flight strip for this Tucano and viewing the DRDF display to obtain a steer (passed at 1545:10). It is reasonable that these tasks would have also precluded APP from being able to detect immediately the developing conflict. Once APP had acknowledged the Practice PAN at 1545:10 and given the time taken for the Tucano to respond, it was not feasible for them to have provided TI to the reporting Tucano any earlier than 1545:39 [the frequency being continuously busy until then].

Understandably given the developing situation, the SUP elected to leave the ACR to go to the VCR. However, this meant that he arrived in the VCR at about the same time as the CPA occurred; consequently he was unable to advise the ADC of the situation in time for him to pass a warning.

While the Hawk pilot stated that DIR did not make them aware of any joining traffic, at the point when they were transferred to TWR, there was none known. However, this raises an interesting point in terms of nuance of language, considering that the response from DIR was about no '*radar traffic*', whereas the Hawk pilot's request was regarding any *traffic affecting their flight*.

Finally, the procedure whereby visiting ac squawk standby on joining the visual circuit removed the last operative barrier to the occurrence, TCAS.

From an ATM perspective, there appears to have been nothing that the ATC personnel involved could have done to prevent the occurrence. Under the terms of CAP774 (see Note), the pilots of both ac were responsible for collision avoidance.

Note: CAP 774 states that under a BS:

- a. If a controller considers that a definite risk of collision exists, a warning may be issued to the pilot.
- b. Whether traffic information has been passed or not, a pilot is expected to discharge his collision avoidance responsibility without assistance from the controller.

UKAB Note (4): Although the Great Dun Fell radar shows the event the Hawks were squawking standby and the CPA was between sweeps. By projection, however, the lateral separation was too close to measure with any degree of accuracy. The CPA was 4.7nm on the extended C/L of RW21. At the time there were 6 other ac displaying Linton squawks.

HQ AIR (TRG) comments that the incident occurred because the pilots of both ac did not see each other in time to adequately deconflict their flight-paths. As Mil ACC state, this remains firmly the responsibility of the ac commanders. Several factors may have affected their ability to acquire the conflicts visually. Firstly, the visibility may have contributed and is reported as 'poor' by the Tucano pilot. Only in the very late stages, when the Hawks' final approach was from S through SE, would visibility not have been a factor. The Hawks reported 45km visibility. 'Poor' visibility would therefore only have been an issue for the Hawk crews if it distracted the crews by forcing them have to spend extra time on visually acquiring the airfield and the cct traffic, which would have been approximately into-sun.

Secondly, the procedure to instruct visiting ac to switch IFF to standby on joining the circuit reduces the effectiveness of TCAS as an aid to deconfliction. However, this scenario emphasises the status of TCAS as an aid to visual acquisition. The fact that TCAS shows no conflicts does not absolve pilots from looking out and clearing their flightpaths and measures should be in place to ensure that visual lookout is not reduced in light of TCAS equipment being fitted.

Thirdly, and in a similar vein, DIR's response of "*no radar traffic to affect*", while technically accurate, would have lulled the Hawk pilots into a false sense of security. Having asked whether there was

“any traffic to affect” he would have been conditioned to accept the response as being to the question he had asked. Re-asking the question may have elicited information about the other joining traffic. Absence of information on the Hawks to the Tucano by APP also contributed by not enabling the Tucano pilot to refocus his lookout scan. It is unfortunate that this information was not passed but it is noted that the Tucano was under a BS. Upgrading to a TS in light of the reported visibility could have been a consideration.

The fact that both ac were not with the same agency at the time may also have contributed in that it denied TWR the ability to inform the Hawks that the Tucano was joining. In addition, the pilots would not have been alerted to each others' presence by their joining calls. Thus, the close proximity of the Tucano to the Initials Point, whilst not talking to TWR was also a factor.

In sum, this incident highlights the fact that all measures to reduce the chance of mid-air collisions are fallible and that crews must apply rigorous lookout scans at all times, particularly when flying under VFR.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both flights, 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.

Members noted that all ATC positions involved in this incident were very busy and specialists commented that under the circumstances they would have expected the Supervisor to consider measures to reduce the volume of non-essential traffic.

Although accepting that the respective pilots were ultimately responsible for collision avoidance when joining the cct, the Board noted that neither of the flights was provided with relevant traffic information that was available to the various controllers. Notwithstanding that he was receiving a BS, the Board considered that the Tucano pilot should have been advised about the Hawk formation joining through initial. In the event, he was passed the runway and weather information then left in 'limbo' for about 1min at a critical period while APP apparently being unaware of the Hawks while busy handling 'Practice PANs'. Similarly, the Hawks, despite having asked for information on other traffic to affect them were told there was no “*radar traffic*” which, while technically accurate, did not answer the question posed by the pilot; this, in the Board's view, misled the Hawk crews into believing there was no traffic to affect them when in reality the Tucano was potentially (at the time) and later actually in conflict. It appeared that the ADC had not assimilated the GND controller's prenoting of the inbound Tucano and therefore he, in turn, was not able to warn the Hawks about it. Controller Members observed that while in isolation the respective ATC positions did the minimum that was expected of them there was almost no information cross-flow between them resulting in none of them having 'the big picture' thus the SA of all the pilots involved was incomplete, resulting in their flying into conflict while in contact with APP/TWR and positioning to join the cct.

Members noted that from the Tucano cockpit the visibility into sun was poor and the Hawks had been descending fairly rapidly, thus they were difficult to see from the Tucano pilot's perspective. The down-sun visibility, on the other hand was good and, despite that the ac had initially been almost head-on, they were not on the same frequency and that the Hawk crews had been led to believe that there was no other traffic to affect their flightpath, Members considered that the Hawk pilots had a responsibility to clear their flightpath before they turned onto initials (5nm on the extended C/L).

Since neither of the pilots had seen the opposing ac in time to take avoiding action, a majority of Members considered that there had been a risk that the ac would have collided.

Members agreed that the SOP requiring visiting ac (but not locally based ac) to squawk stand-by when joining the visual cct had been a significant factor in this incident; it had both prevented the Tucano pilot from 'seeing' the Hawks on TCAS and had deprived the ADC of information on the

joining Hawks. That being the case the Board directed that a recommendation be made to review the procedure in the light of this incident.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Hawk pilots flew into conflict with the Tucano which they did not see.

Degree of Risk: A.

Recommendation: That RAF Linton on Ouse reviews the SOP requiring visiting ac to squawk standby when transferring to TWR.

AIRPROX REPORT No 2010158

Date/Time: 12 Oct 2010 0904Z

Position: 5252N 00024W (8nm SE of
Barkston Heath - elev 367ft)

Airspace: Lincolnshire AIAA (Class: G)

Reporting Ac Reported Ac

Type: Grob Tutor T Mk1 Grob Tutor T Mk1

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

Alt/FL: 5000ft 5000ft
RPS RPS

Weather: VMC CLBL VMC CLAC

Visibility: 10km 40km

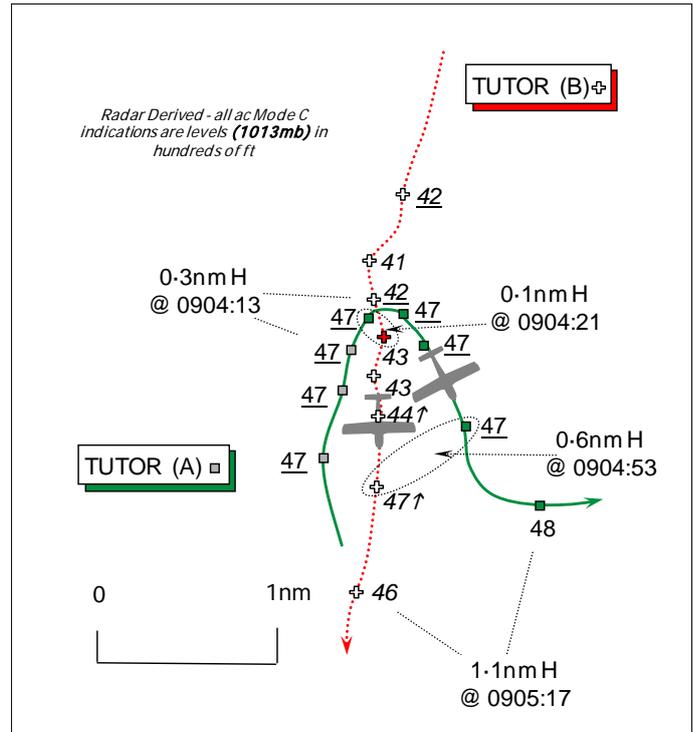
Reported Separation:

200ft V/nil H 300ft V

Recorded Separation:

Nil V @ 0.6nm H

400ft V @ 0.1nm Min H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PILOT OF GROB TUTOR T Mk1 (A) reports he was flying a local dual staff continuation training flight from Barkston Heath. He was operating on a discrete frequency not in receipt of an ATS, squawking A2637 [Cranwell] with Mode C; elementary Mode S is fitted, TCAS is not. The ac has a white colour-scheme; the HISLs, nav lights and the landing-light were on.

Flying at 100kt in a level cruise at 5000ft Barnsley RPS, he was operating VFR some 2000ft above and 20km clear of cloud, in between layers, with an in-flight visibility of 20km out of the sun. About 9½nm SSE of Barkston Heath he saw another Tutor to starboard about 200ft below his aeroplane after it crossed from L – R on an almost perpendicular flight path. The other Tutor appeared from below his starboard wing, climbing, and within 5sec had ascended to the same altitude with a 'medium' Risk of collision. At the time the other ac was spotted, no avoiding action was required as they were no longer on conflicting flight paths. After he had switched to Cranwell APPROACH, an Airprox was reported on Stud 5.

THE PILOT OF GROB TUTOR T Mk1 (B), a QFI, reports he was instructing a local dual GH sortie from Cranwell that included stalling and steep turns. He was not in receipt of an ATS, but monitoring a discrete frequency [the same frequency as the crew of Tutor (A)] plus GUARD – 243.00MHz. A squawk of A2637 [Cranwell] was selected with Mode C; elementary Mode S is fitted but TCAS is not. The ac has a white colour-scheme; the HISLs and the landing-light were on.

Operating VFR some 2000ft above and 10km clear of cloud with an in-flight visibility of 40km, after climbing 200ft and levelling off at 5000ft Barnsley RPS, heading S at 100kt, his student began the HASELL checks before commencing the stalling phase of the exercise. At this point he noticed another Tutor, previously obscured by the canopy arch, approaching from his 2 o'clock directly towards them about 300ft above his aeroplane and climbing, he thought. He was clear of the other ac and no avoiding action was necessary or taken. The sortie was continued maintaining visual contact with the other Tutor and listening out on the discrete frequency and GUARD. He assessed the Risk as 'low'.

That day the area to the SE of Cranwell was very busy and numerous ac were sighted. Adding that communication provides an element of SA with regard to the positioning of other ac, he stressed it is not in any way failsafe and good lookout discipline is essential. He had seen a Tutor operating to the S of them a few minutes earlier, but lost sight of it as it departed to the S, thus he believed the area was potentially clear of that particular ac as no further sightings had been made.

UKAB Note (1): The Claxby Radar recording shows the two Tutor ac approaching the Airprox location some 8nm SE of Barkston Heath. Tutor (A) maintains 4700ft Mode C (1013mb) as the ac close; Tutor (B) is shown flying broadly level at 4200ft Mode C (1013mb) and crosses 400-500ft directly underneath Tutor (A), in between sweeps, from L – R progressing southerly. At the point of minimum horizontal separation, Tutor (B) is shown off Tutor (A)'s starboard wing at range of 0.1nm some 400ft below, as Tutor (A) turns R SSE'ly maintaining level. Tutor (B) subsequently climbs to the same level as Tutor (A) whilst the tracks diverge and the range increases to 0.6nm before Tutor (A) hauls off to the E.

HQ AIR (TRG) comments that this was a conflict in Class G airspace. The pilot of Tutor (B) sighted Tutor (A) in time to assess that no avoiding action was required, but the resulting separation was sufficiently low to cause the pilot of Tutor (A) concern. The ongoing installation of ACAS to the Tutor II fleet should reduce the number of these occurrences. However, lookout must remain the primary means of deconfliction, assisted by such aids.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, radar video recordings and comment from the appropriate operating authority.

Neither of these two Tutor crews were in receipt of an ATS whilst operating under VFR in VMC in the 'see and avoid' environment of the Class G Lincolnshire AIAA, albeit both were 'listening out' on the same discrete frequency. The Board concurred that the crux of this Airprox was visual acquisition of each other's ac. The PiC in Tutor (A) reports that he did not see Tutor (B) until it emerged from under his starboard wing, he thought 200ft below them. The radar recording shows that this occurred at the CPA, or very shortly afterwards as Tutor (A) turned about to the R, where 400ft of vertical separation was evident, based on their verified Mode C indications. Therefore, it was plain to the Members that the crew of Tutor (A) had not seen Tutor (B) approaching from the N beforehand – effectively a non-sighting by the crew of Tutor (A) and in the Board's view part of the Cause.

For their part, the instructor and his student in Tutor (B) had not seen Tutor (A) until after their HASELL checks when the QFI spotted it emerging from behind the ac's canopy arch he reported, about 300ft above them. Although in the Board's view this was a late sighting of Tutor (A) and the other part of the Cause, the vertical separation was such that neither crew took any avoiding action and it was clear they both maintained visual contact on the other ac as Tutor (B) subsequently climbed up through Tutor (A)'s altitude and the ac diverged. The Board concluded, therefore, that the Cause of this Airprox was effectively a non-sighting by the pilots of Tutor (A) and a late sighting by the pilots of Tutor (B), but in the circumstances conscientiously reported here no Risk of a collision had existed.

The HQ Air pilot Member briefed the Board that the Tutor ACAS installation programme is progressively equipping the fleet with a version of TCAS I; the Units that were involved here are scheduled to have their ac modified from June of this year. The Board welcomed this encouraging news. Pilot Members recognised that TCAS I was not a substitute for a good lookout scan regimen, as highlighted within the Command's comments, because it will not detect ac that are not equipped with SSR. Nevertheless in the circumstances described here, TCAS I could have provided both crews with a warning of the presence of each other's ac somewhat earlier than their visual scan had done.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively a non-sighting by the pilots of Tutor (A) and a late sighting by the pilots of Tutor (B).

Degree of Risk: C.

AIRPROX REPORT No 2010164

Date/Time: 21 Oct 2010 1320Z

Position: 5048N 00136W (9nm E
Bournemouth - elev 38ft)

Airspace: Solent CTA/LFIR (Class: D/G)

Reporting Ac Reported Ac

Type: B737-500 EV97 Eurostar

Operator: CAT Civ Club

Alt/FL: 2500ft ↓ 1500ft
(QNH) (QNH)

Weather: VMC CLOC VMC CAVOK

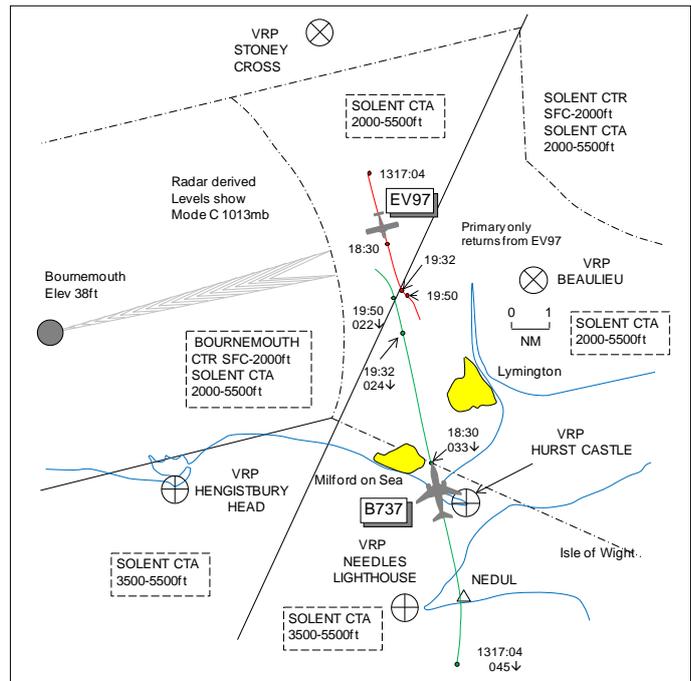
Visibility: 5nm 20nm

Reported Separation:

Nil V/3nm H 500ft V/1-2nm H

Recorded Separation:

0-4nm



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports inbound to Bournemouth IFR and in receipt of a RCS from Bournemouth on 119.475MHz, squawking an assigned code with Modes S and C. The visibility was 5nm in VMC and the ac was coloured white/red with nav, landing and strobe lights all switched on. They were under radar vectors towards the LLZ RW26 about 10nm E of BIA, heading 350°, descending to altitude 2500ft at 210kt reducing to 180kt. They received instructions to descend to altitude 2000ft and turn L heading 290° to intercept the LLZ. On reaching over to set the new values into the MCP he saw a light ac in his 1-2 o'clock at the same level. This white coloured low-wing ac with winglets remained clear and proceeded down their RHS by about 3nm. No avoiding action was needed owing to the turn being commenced. He assessed the risk as low/medium.

THE EV97 EUROSTAR PILOT reports en-route from Popham to Bembridge VFR and listening out on Bournemouth frequency 119.475MHz; no transponder was fitted. The visibility was 20nm in CAVOK and the ac was coloured silver; no lighting fitted. He had routed via Alderbury VRP and then turned onto heading 170° at 85mph and descended from 2000ft to 1500ft QNH to be level at Stoney Cross VRP, remaining clear of CAS. He heard ATC clearing a flight inbound over the Needles from the S descending to 2500ft or 2000ft, he was unsure. As he heard this clearance he was descending to 1500ft and once over Stoney Cross he turned slightly to pass W of Lymington and E of Milford-on-Sea (both of which he could see clearly) aiming then to turn direct for the Needles, which he could also see. Near to Stoney Cross he saw a large airliner on what looked to be a reciprocal heading in his 1230 to 1 o'clock position above the horizon at a distance of approximately 10-12nm. Although not on its projected flightpath when initially seen, or anytime subsequently, and by virtue of hearing the RT exchanges and anticipating the ac would turn W towards Bournemouth, he nevertheless turned to port (probably about 45°) to put additional lateral distance between them as a simple response to seeing another ac. The airliner continued to descend, presumably to its cleared height of 2000 or 2500ft QNH, but when he judged himself to be safely clear, he turned back onto a S'ly heading, watching the airliner pass 1-2nm clear down his starboard side and about 500ft above. He did not believe he was close enough to be a cause for concern. He accepted that he knew about and had seen the other ac for some time and recognised that it's a little different if you only see something as it's passing you; also, being a Microlight, his ac was probably not very easy to spot. He did not hear ATC offer avoiding action and/or any information on his presence. Whether or not ATC were

aware of his presence, he felt there was no cause for concern and he assessed the risk of collision as none.

THE BOURNEMOUTH APR reports carrying out OJTI duties and neither he nor his trainee was aware of the incident at the time. The B737 pilot did not report anything on frequency and waited until he contacted GMC. The pilot remarked about seeing an ac at a similar level as he was instructed to turn onto a closing heading for the ILS; at this stage of the approach the ac was at 2500ft and about 9nm from touchdown. Concerned that he had missed something, he contacted Solent Radar to see if they had any knowledge of an ac in that area but they did not. Later he viewed a radar replay and whilst the B737 was on base leg, no other ac was showing but when the B737 flight was told to turn. A non-squawking contact paints just to its E and then continues to track intermittently to the SE. He opined that had anything been seen on radar before this time he would have deemed the ac to be below the base of CAS (2000ft). It is common for light ac to transit in that area between Southampton and Bournemouth CTRs.

ATSI reports that the Airprox occurred at 1319:47, 9.3nm to the E of Bournemouth Airport, the B737 is within the Solent Control Area (CTA), which extends from altitude 2000ft to 5500ft.

The Airprox was reported by the pilot of a Boeing 737, inbound IFR to Bournemouth Airport from Faro. The B737 routed via airway Q41 and reporting point NEDUL, which is situated 124° at 13nm from the Bournemouth BIA NDB. The B737 was released to Bournemouth Radar in the descent to altitude 5000ft and instructed by London Area Control (Swanwick) Sector 21 to leave NEDUL on a heading of 350°.

The EV97 Eurostar was a VFR flight from Popham to Bembridge and the pilot's written report indicated an intention to underfly the Solent CTA at an altitude of 1500ft routeing via Alderbury, Stoney Cross, West of Lymington and E of Milford on Sea. This route would keep the ac approximately 9.5nm E of Bournemouth airport and E of the Bournemouth CTR, which extends from the surface to an altitude of 2000ft.

The Bournemouth Radar controller together with a trainee, was providing an Approach Control Service with the aid of the Bournemouth, 10cm primary and SSR radar systems. The Bournemouth MATS Part 2 refers to known areas of poor radar performance NE of the airfield, outside the CTR, N of VRP Stoney Cross, in the sector 020° to 040°.

Bournemouth METAR EGGH 211250Z 26007KT CAVOK 12/02 Q1024=

The B737 flight was in receipt of a RCS. At 1316:20 the B737 called Bournemouth Radar in the descent to altitude 5000ft, QNH1024mb, with an instruction to leave NEDUL on heading 350°. Radar acknowledged the call confirming the QNH and vectoring for ILS RW26. The B737 flight was given descent to an altitude of 4000ft and at 1316:34 advised it was 24nm from touchdown.

At 1317:05, whilst on base leg, the B737 flight was given descent to altitude 2500ft and then at 1319:34 instructed, *"(B737)c/s descend to altitude two thousand feet turn left heading two nine zero degrees closing the localiser from the left when established on the localiser descend on the glidepath."* This was acknowledged correctly by the B737 pilot.

At 1320:46 the B737 crew reported fully established at 6nm and Radar transferred the flight to Bournemouth TWR on frequency 125.6MHz. After landing the crew of the B737 reported the incident to Bournemouth GMC.

The Bournemouth Radar controller's written report indicates that as the B737 was being vectored towards L base, no other ac was observed on the radar display. A replay of the Bournemouth radar showed an intermittent primary contact appear, just to the E of the point when the B737 was given a L turn towards the LLZ. The intermittent contact was observed tracking to the SE.

[UKAB Note (1) At 1312:42, the NATS Pease Pottage radar recording shows a primary contact in the vicinity of Stoney Cross tracking SSE'ly. This primary contact is observed to follow the intended track of the EV97 and remains E of the Bournemouth CTR. When Bournemouth, at 1317:05, issued the B737 flight with descent to 2500ft, the B737 is seen descending through FL033 (3600ft QNH) with the EV97 in its 12 o'clock range 6nm. Later, at 1319:32, as Bournemouth issues the B737 flight with descent to 2000ft and a L turn towards the LLZ, separation had reduced to 1.2nm. The CPA occurs at 1319:50 as the ac pass starboard to starboard with about 0.4nm lateral separation with the B737 descending through FL022 (2500ft QNH).]

The B737 was allocated an altitude of 2500ft on base leg which provided 500ft vertical separation from any unknown traffic operating below 2000ft which is the base of the Solent CTA. The Manual of Air Traffic Services (MATS) Part 2, Section 1, Chapter 6, Page 4, Paragraph 9, states:

"..... controllers should not normally allocate a level to an aircraft which provides less than 500 feet vertical separation above the base of a control area or airway. This will provide some vertical separation from aircraft operating beneath the base of controlled airspace...."

The Bournemouth Radar controllers written report indicates that it is common for light ac to transit the base of the Solent CTA in this area and that if the primary contact had been observed, it would have been deemed to be below the base of CAS.

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 authorities.

Members could not resolve the apparent discrepancies between the separation distances reported by both crews. The EV97 pilot reported that he had descended to 1500ft by Stoney Cross to transit beneath the Solent CTA, base level of 2000ft, and saw the B737 pass 1-2nm clear and 500ft above. If the EV97 was cruising at 1500ft altitude it should have provided 1000ft separation at the CPA. The B737 crew were undoubtedly surprised on seeing the EV97 without warning, apparently at the same level as their ac, 2500ft, about 3nm away as they were just about to commence the L turn towards the LLZ. Both crews had, in fact, overestimated the lateral separation, the radar recording shows the ac passing 0.4nm apart at the CPA. As the EV97 is a small ac, this would have given the B737 crew the impression that the ac was further away than it actually was; however, the perceived height difference could not be explained. If the B737 was already turning, it could have lead to an erroneous judgement of the EV97's position relative to the horizon, but the radar recording shows the CPA with the B737 not having commenced its turn. It is not unusual for about 500ft vertical separation to exist when IFR traffic is flying 500ft above the CAS base level whilst VFR traffic is just below CAS, the controller deeming separation to exist unless other information indicates the VFR traffic might have penetrated CAS. One Member suggested that an altimeter subscale setting error could have led to the EV97 flying at a level higher than that indicated to the pilot. As the EV97 did not carry a transponder, there was no Mode C information to corroborate the ac's altitude; the ac could fly legitimately up to an altitude just below 2000ft whilst remaining below CAS. Leaving that hypothesis aside, in the end Members agreed that on the balance of probability, this encounter had been a perceived loss of separation where the visual sightings by both crews had ensured that any risk of collision was removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Perceived loss of separation.

Degree of Risk: C.

AIRPROX REPORT No 20100166

Date/Time: 1 Nov 2010 1955Z NIGHT

Position: 5741N 00357W (8nm
NNE of Inverness - elev
31ft)

Airspace: Scottish FIR (Class: G)

Reporting Ac Reporting Ac

Type: SAAB SF34 Tornado GR4

Operator: CAT HQ Air (Ops)

Alt/FL: 3000ft 2600ft
QNH (992mb) (1002mb)

Weather: IMC IICL VMC

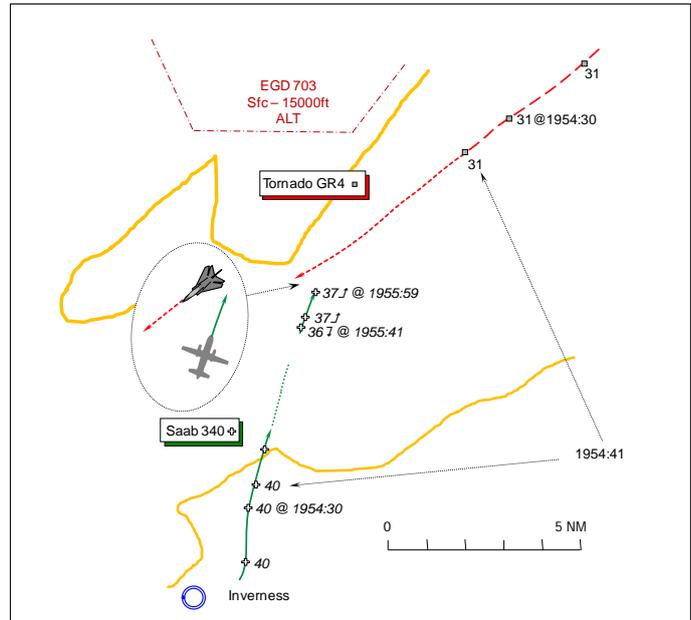
Visibility: NR 30km

Reported Separation:

400ft V/1nm H 100ft V/0.7nm H

Recorded Separation:

Not recorded



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SAAB SF340 (SF34) PILOT reports that he was inbound to Inverness from Stornoway under IFR. He was in receipt of a Procedural Service (PS) from Inverness APPROACH (APP) on 122.6MHz and a squawk of A6177 was selected with Mode C; enhanced Mode S and TCAS are fitted.

From overhead the INS VOR/DME, steady heading 025° at 210kt, established outbound for an ILS procedure for RW23 descending through 3000ft Inverness QNH (992mb), a contact first appeared on the TCAS display about 12nm away in the direction of the flightpath for the approach procedure. APP advised of a Tornado GR4 that had been in contact earlier and reported it was operating on a night flying exercise in Tain Air Weapons Range (AWR) – EGD703. Inverness ATC only provides a PS at this time of the day, but they helpfully informed them that the other ac now seemed to be only 10nm away at an altitude of 2600ft Mode C unverified. The GR4 was not working Inverness ATC. The approach procedure calls for a decent to 2000ft flying outbound to 9.5nm so he kept the RoD low as he was not sure of the GR4 crew's intentions and tried to gain visual contact with the other ac. Flying in IMC, in and out of a thin layer of clouds, at about 7nm outbound on the procedure (INS R029 D7) he initiated a slight climb away from the GR4's indicated level to avoid it. Shortly thereafter, TCAS enunciated a TA on the traffic. According to the TCAS display the GR4 passed about 1nm away in their 10 o'clock and 400ft beneath his SF34 at the closest point, after it had crossed obliquely from R – L ahead. The GR4 was not seen visually; no RAs were triggered. The approach was then continued to an uneventful landing. He assessed the Risk as 'medium'.

The HISLs, anti-collision beacons, navigation lights, logo lights and landing lights were all on.

THE TORNADO GR4 PILOT reports that he was operating as a singleton carrying out a practice night bombing sortie in Tain AWR with NVDs. When the Airprox occurred they were in contact with the AWR on Tain Range Primary UHF; a squawk of A7002 [Danger Areas General] was selected with Mode C on; neither Mode S nor TCAS is fitted. All the ac's lights were serviceable and switched on; the 'strobes' were set to red.

On arrival in the area, they had descended to 3000ft amsl with Lossiemouth APP to gain VMC before switching to Inverness ATC for further deconfliction inbound to Tain AWR. Inverness ATC confirmed that they had no traffic to affect and so they switched back to their tactical operating frequency and checked in with Tain AWR about 10min before the reported Airprox timings. Having completed 2 bombing runs at 2500ft amsl in Tain AWR, they then repositioned to conduct a further bombing run against another Target. Positioning for this attack necessitated a leg heading of 235° (T) from Tain AWR, down the Moray Firth towards Cromarty Head at 2,600ft in order to avoid the Lossiemouth SAR HNTA which was active to 2500ft amsl. Whilst on this leg the pilot and navigator both saw on NVGs the strobe lights of another ac operating at a similar height, near the base of cloud cover, about 2nm away. The SF34 passed about 0.7nm away to port and 100ft above their ac at the closest point. Having consulted on-board systems to confirm, via GPS, that they were operating within Class G airspace, and with both crewmembers satisfied that safe visual separation was maintained throughout, no avoiding action was deemed necessary. The sightline rate across the canopy also confirmed that they were not on a collision course with the SF34. Both crewmembers maintained visual contact and deconfliction with the other ac as they passed and throughout their repositioning until inbound to Tain AWR. He assessed the Risk as 'low'.

UKAB Note (1): The UKLFH promulgates details of military SAR Helicopter Night Training Areas (HNTAs) for the benefit of military crews. The Tain Range Operating Area (Class G airspace outside the AWR) abuts the Lossiemouth HNTA (2), which extends from the surface to 2000ft asl/agl. FW ac are required to overfly the area not below 2000ft, with RW traffic restricted to operating below 1500ft.

THE INVERNESS COMBINED TOWER AND AERODROME CONTROLLER reports that the SF34 crew had been cleared to carry-out the VOR/DME procedure for an ILS to RW23 under a PS. As they did so a return was observed on the ATM exiting Tain AWR on a SW'ly heading indicating 2600ft Mode C. He advised the SF34 pilot, who responded that the contact was showing on his TCAS display in his 12 o'clock. The SF34 pilot continued descent on the procedure and then at 1955 UTC advised he had received a TA on the other ac, which was believed to be a Tornado GR4. He believed the GR4 passed down the SF34's port side at a range of 1nm. The SF34 appeared to level-off but then the crew advised that the other ac had passed and they would continue on the procedure. The SF34 landed without further incident and it was then that the crew indicated that they wished to file an Airprox. The pilot later telephoned to confirm the details of the Airprox and advised that he had been flying in IMC at the time and had not seen the other ac.

ATSI reports that the Airprox occurred at 1955UTC, with the SF34 on the 029 INS VOR radial at 7D, at an altitude of 3000ft.

The SF34 was an IFR flight inbound to Inverness from Stornaway, routing via ADR W6D and the INS-VOR for an ILS approach to RW23. Inverness were operating TOWER and APPROACH (APP) combined, without the aid of surveillance equipment.

The 1950Z Inverness METAR gave: 24006KT 9999 BKN030 09/07 Q0992=.

NATS Ltd radar recordings from SAC (Prestwick) do not show both ac during the period of the Airprox. [Recorded radar coverage below 4000ft is intermittent and the GR4 is not shown after 1954:41, when the contact fades.]

At 1939:20, more than 15min before the Airprox occurred, the GR4 crew called Inverness APP inbound to Tain Range requesting traffic information. APP advised the GR4 about another ac departing from Inverness en-route to the ADN VOR, which the GR4 crew acknowledged and advised going en-route at 3000ft.

At 1946:32, the inbound SF34 called APP and reported 28nm to run, in receipt of information Lima, QNH 992mb and leaving FL135 descending to FL70. APP replied, "[SF34 C/S] *continue to the I-N-S expect no delay for the procedure from the overhead the ILS Runway 2-3 it's a procedural service for conspicuity squawk 6-1-77.*" This was acknowledged correctly by the SF34 crew who was given

further descent to an altitude of 5000ft. The SF34 crew reported at 12nm at 1950:34 and APP replied, “[SF34 C/S] *on passing 10 miles descend 3 thousand 5 hundred feet Q-N-H 9-9-2 cleared for the procedure from the overhead for [RW] 2-3 three report outbound.*” This was acknowledged correctly and APP then advised, “[SF34 C/S] *and report at any stage if you wish to continue visually.*”

At 1954:18, the SF34 crew reported beacon outbound and APP replied, “[SF34 C/S] *report established on the localiser Runway 2-3.*” Moments later at 1954:29 the APP controller advised, “*Traffic’s just appeared on the A-T-M [Aerodrome Traffic Monitor]...out of Tain Range heading southeast or rather southwest indicating 2 thousand 6 hundred feet but that’s obviously unverified.*” At this point the radar recording shows the distance between the two ac was 12.5nm with the SF34 indicating FL40 and the GR4 indicating FL31. The SF34 crew responded, “*That’s...copied we have...got something just coming into our 12 o’clock on TCAS [SF34 C/S]*”. Whereupon APP advised the SF34 crew that the traffic was believed to be a Tornado GR4 but was unable to confirm this, to which the crew replied, “*That’s copied looking [SF34 C/S]*”.

At 1955:59 the SF34 crew reported, “*Inverness [SF34 C/S] we just...we just get (sic)...a Traffic Advisory on that one it’s...gone behind us now.*” At this point the radar recording shows the SF34 8.7nm NNE of Inverness outbound on the procedure and indicating a climb at FL37. However, the GR4 has already faded from radar coverage. The APP controller acknowledged the call and instructed the SF34 to report established on the LLZ, whereupon the SF34 continued inbound for a normal approach and landing.

The SF34 was in receipt of a Procedural Service and the Inverness APP controller passed a warning regarding traffic believed to be a Tornado GR4 leaving the Tain Air Weapons Range. The Manual of Air Traffic Services MATS Part1, Section 1, Chapter 11, Page 10, paragraph 6, states:

‘A Procedural Service is an ATS where, in addition to the provisions of a Basic Service the controller provides restrictions, instructions and approach clearances, which if complied with, shall achieve deconfliction minima against other aircraft participating in the Procedural Service. Neither traffic information nor deconfliction advice can be passed with respect to unknown traffic.’

UKAB Note (2): The SF34 is shown outbound on the SAC (Prestwick) radar recording level at FL40 but fades just after coasting out. The SF34 is shown intermittently thereafter as A0000 – SSR data unreliable, before a good SSR contact reappears at 1955:41 indicating 3600ft Mode C (1013mb) – about 3270ft Inverness QNH (992mb). This is perceived to be about the point that the SF34 pilot reports that he initiated a slight climb as on the next sweep the ac is shown 100ft higher at 3700ft Mode C, but the GR4 is not shown at all. The minimum separation cannot, therefore, be determined. Radar contact on the SF34, indicating 3700ft, is lost after 1955:59, the time the SF34 pilot reported the TA to APP.

HQ 1GP BM SM reports that although the Tornado GR4 crew was operating with Tain AWR and in communication with the Range at the time of the Airprox, no mention was made on RT of the encounter with the SF34. Moreover, the Airprox occurred outside the AWR. Therefore BM SM has nothing further to add to the investigation of this Airprox.

HQ AIR (OPS) comments that the GR4 was operating VMC in Class G airspace. The crew saw the SF34 and avoided it by a safe distance.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was apparent that this was a relatively straightforward night encounter between an IFR commercial flight executing an IFR approach procedure under a PS, and the GR4 conducting a training flight in and around Tain AWR. The GR4 crew was operating under VFR without an ATS, which was entirely within the crew's remit. Thus each flight was legitimately proceeding about their respective tasks in the shared environment of Class G airspace where 'see and avoid' prevailed. A CAT pilot Member observed that the GR4 crew was assiduously avoiding the SAR HNTA and questioned whether it would have been feasible for them to avoid the airspace surrounding the Inverness instrument approach procedures as well. The Air Command fast-jet Member explained that the HNTA was active during known periods and it was simple to avoid that defined airspace vertically. Given that no CAS encompassed these instrument approaches and the GR4 crew would not know where or when commercial traffic was flying in and out of Inverness, it was impractical and unnecessary to avoid this shared airspace all the time, whilst legitimately operating under 'see and avoid'.

At this time of day the SF34 crew was only able to obtain a PS from Inverness ATC, the controller operating TOWER and APP combined being unable to proffer a radar service despite the Unit being equipped with an ASR. The Board was disappointed that a surveillance radar based ATS was not available for commercial flights throughout the Airport's operating hours, which is the Unit's ultimate aim. A controller Member postulated that some ATSUs at regional airports have difficulty training and retaining sufficient staff qualified in radar duties to provide a radar service throughout their notified hours. In the Board's view, the alert Inverness controller made sensible use of the ATM available to him in the VCR by providing an early general warning to the SF34 crew about the GR4 when he detected it routing up the Firth some 12nm away from the SF34. The SF34 crew had detected the jet on their TCAS display at about the same time. Thus forewarned, the SF34 pilot was able to assess the GR4's level and take it into account whilst descending in IMC through the thin layers of cloud. This permitted the SF34 pilot to judge his RoD such that he could afford the GR4 as wider berth as was feasible vertically, based on TCAS, whilst endeavouring to spot it visually.

Although the GR4 crew had wisely called Inverness inbound to the AWR more than 15min before the Airprox occurred to obtain traffic information, some CAT Members thought they should have called again for an update. The crew were working Tain Range on UHF and it might have been feasible to call Inverness on VHF again at this stage, prior to turning into the AWR. The Air Command Member agreed that it would have been better airmanship if the GR4 crew had called ATC, but only if they had the capacity to do so; whilst setting up for their next run on a new target within Tain range their workload would have been quite high. Nevertheless, a CAT pilot Member suggested it would have been worthwhile if the GR4 crew had called on the frequency later, when able, to advise that they had seen the SF34, which might have reassured the crew. As it was, the SF34 would have been easy to detect on NVGs; the outline of the SF34 would have been plain to see and they would have had no difficulty in keeping sight of it and maintaining SA, but the Air Command Member accepted that it would have been more difficult to assess the distance between them accurately on NVGs. The GR4 pilot reports sighting the SF34 about 2nm away and avoiding it visually by a safe distance – 0.7nm he reported - not much less than the SF34 pilot's estimate of 1nm from his TCAS display, which also showed the vertical separation was 400ft as it passed clear to port. CAT pilot Members supported the SF34 pilot's decision to reduce his RoD and then enter a slight climb away from the GR4's indicated level until the Tornado had passed, a 100ft climb being replicated by the radar recording. Given that TCAS is inherently more accurate in the vertical plane than in azimuth, this seemed wise and forestalled a closer encounter. It was unfortunate that the GR4 was not within recorded radar coverage during the latter stages of this Airprox so it was not feasible to confirm the relative geometry that obtained here to assist the Board's assessment of the Cause and Risk. Whilst some Members perceived this to be a Conflict in Class G airspace resolved by the SF34 pilot, others were of the view that no actual conflict had developed at close quarters and that the GR4 had crossed ahead of the SF34 at range and passed clear to port. Both crews had been aware of the presence of each other's ac, but whilst the SF34 pilot might not have considered the separation to be ideal, Members noted that TCAS was not called upon intercede. The SF34 crew had only received a traffic alert, which had not developed into an RA. The Board concluded, therefore, that this Airprox resulted because the GR4 crew flew close enough to the SF34 to cause its crew concern, but that no Risk of a collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The GR4 crew flew close enough to the SF34 to cause its crew concern.

Degree of Risk: C.

AIRPROX REPORT No 20100168

Date/Time: 4 Nov 2010 1226Z

Position: 5052N 00027W (2nm
NNE of Shoreham A/D -
elev 7ft)

Reporter: Shoreham ATC

Airspace: ATZ/FIR (Class: G)

Aircraft 1 Aircraft 2

Type: R44 DA42

Operator: Civ Pte Civ Trg

Alt/FL: NR 700ft
QNH (1021mb)

Weather: VMC NR VMC

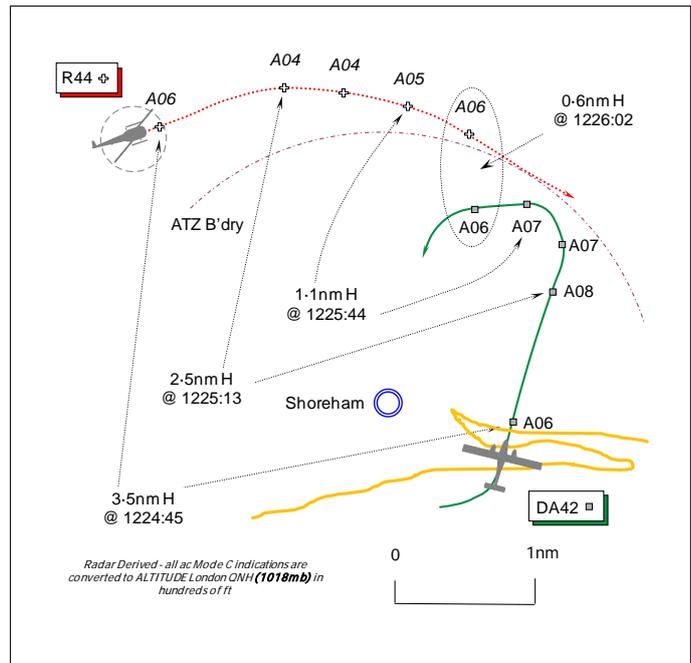
Visibility: NR 9km

Reported Separation:

NR NK

Recorded Separation:

Nil V @ 0.6nm H



CONTROLLER REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SHOREHAM AERODROME CONTROLLER (ADC) reports that the DA42 crew had completed an NDB/DME approach and joined the LH visual cct to RW20. When the DA42 was turning onto Final at about 1nm an R44 helicopter was seen from the Tower passing through the approach to RW20, he thought ahead of the landing DA42. Traffic information was given to the DA42 crew prior to their Final call, at which point the R44 was flying from W to E, ahead of and about 30ft below the DA42. Initially the DA42 crew was not visual with the R44, but then caught a glimpse of the helicopter to their L [as it cleared to the SE]. The R44 continued E'ly as if skirting the Shoreham ATZ, before turning R S'ly to intercept the coastline and continuing to the E. Subsequent blind calls to the R44 on the TOWER frequency elicited no response.

Calls to London FIS at LAC Swanwick, Farnborough Radar, Lydd, Chichester/Goodwood and Lee-on-Solent ascertained that the R44 helicopter pilot was not in receipt of an ATS from these Units.

The 1150UTC Shoreham METAR gives: 24019G29KT 9000 BKN016 15/13 QNH 1021 =

THE DIAMOND TWIN-STAR DA42 PILOT, a flying instructor, provided a comprehensive report stating that he was conducting an IFR instrument training sortie involving ILS training at Bournemouth and general handling enroute back to Shoreham. The flight concluded with a hold and NDB approach to RW20, followed by a go around into a simulated asymmetric cct to land.

Downwind on their final circuit to land, they called 'Downwind' and were told by TOWER to 'report final No 1'. He checked the area of the Base-Leg and Final, saw no other ac to conflict and turned onto Base. Because his student did not allow sufficiently for the wind, their aeroplane possibly drifted onto a slightly wider Base-leg than normal. Conditions were fairly lively and the student was focused on controlling the aeroplane. Checking Final prior to the Final turn, again he saw nothing to conflict. At the start of the Final turn, flying at 100kt descending through about 700ft QNH (1021mb), he

called 'turning Final' and on releasing the transmit switch he thought he heard '..below passing right to left' or words to that effect from TOWER. Having heard no other RT from any other ac in the cct he assumed the call was for them and applied sufficient back pressure to level his aeroplane briefly until either he caught a glimpse of the other ac or TOWER advised that they were clear of the traffic (he could not recall which came first). He did not see the other ac until they had passed – an R44 helicopter sighted ½nm away. On realising that they were clear of the traffic, he reverted to close monitoring of his student (who was finding the conditions challenging) and the final approach and landing, which were completed without further incident. His student pilot did not see the conflicting ac at any point during the cct.

He had some recollection that they may have been given traffic information by TOWER about the R44 passing W to E to the N of the aerodrome and that he scanned that area and saw nothing; however, he cannot recall at exactly which point that happened. At no time during the course of the event did he hear the R44 pilot on frequency and he believed they were the only ac airborne on frequency at the time.

LATCC (Mil) RAC reports that although the AID of the R44 helicopter was quickly ascertained from the recorded Mode S data, contacting the pilot proved somewhat more problematic. Despite checking with various aerodromes in SE England, in addition to those contacted by Shoreham, the destination of the R44 could not be established. The helicopter is registered in the US and the owner registered as a holding company in New York City. Efforts to identify the pilot through this company were completely unsuccessful. Through the helpful assistance of the local FAA Office, the R44's engineering records were checked and the identity of the engineer who last worked on the helicopter established. Telephone enquiries met with no response, so the RAC wrote to the engineer who eventually made contact and believed the R44 was based at Wycombe Air Park, which was not correct. Further enquiries suggested a name but a search of CAA records, registrations and both pilot and radio licensing, drew a blank. Through another line of enquiry the pilot was eventually contacted on 4 Mar and provided a brief response, by e-mail that day, and subsequently rendered a brief Airprox report.

THE ROBINSON R44 HELICOPTER PILOT provided a brief report stating that he was operating VFR from a private landing site. He was flying in an easterly direction at 100kt along the south coast in VMC, he thought at 800ft amsl, but not in contact with any ATSU; a squawk was selected with Mode C on. The ac was turned NE to avoid the Shoreham ATZ but the DA42 was not seen. He suggested that training ac often fly ccts outside of the Aerodrome boundary.

His helicopter is coloured Blue and the HISL was on.

ATSI reports that the Airprox occurred to the NNE of Shoreham Airport, between the DA42 circuiting inside the Shoreham ATZ and the R44 just outside the ATZ boundary, which is a circle of radius 2nm centred on the midpoint of RW12/20, extending from the surface to 2000ft aal. Shoreham ATC were providing a combined Aerodrome and Approach Control service, without the aid of surveillance equipment.

The DA42 was operating on a local flight from Shoreham Airport and at 1151:45, a BS was agreed whilst the crew completed general handling and the QNH (1021mb) passed. At 1211:10 the DA42 was cleared to commence an NDB/DME approach to RW20 and the pilot requested a go around into the visual cct. Following the go-around, at 1223:02 the Shoreham controller advised the DA42 pilot to, *"....report downwind for 2-0 left hand circuit circuits clear."*

At 1224:45, the DA42 pilot reported Downwind and the controller instructed him to report Final for RW20. The radar recording at 1225:13 shows the DA42 late downwind squawking A0401 indicating an altitude of 800ft London QNH (1018mb) with the R44 helicopter, squawking A7000 at an altitude of 400ft London QNH, 2.5nm NNW of the airport tracking E around the Shoreham ATZ. At 1225:44, the radar recording shows the DA42 inside the Shoreham ATZ, on Base-leg for RW20, indicating 700ft ALT, with the R44, indicating 400ft ALT, in the DA42's R 2 o'clock at a range of 1.1nm. The R44 continued to track E remaining just outside the Shoreham ATZ. It was at 1226:04, that the

Shoreham controller first advised the DA42 pilot of the presence of the R44, “..caution a helicopter below you not on my frequency clear now.” At this point the radar recording shows the DA42 turning onto final at 1.6nm from the Airport with the R44 passing 0.6nm behind and just outside the ATZ; both ac are indicating 600ft ALT.

The controller’s written report indicates that the helicopter passed ahead of the DA42 on Final approach and at the point the controller sighted the helicopter, it may have been perceived to have been crossing ahead and below the DA42. The radar recording, however, shows the R44 passing 0.5nm clear astern of the DA42, the latter descending through 500ft ALT on Final, with the helicopter just outside the ATZ boundary.

The Manual of Air Traffic Services (MATS) Part1, Section 2, Chapter 1, Page 1, Paragraph 2.1, states:

“Aerodrome Control is responsible for issuing information and instructions to aircraft under its control to achieve a safe, orderly and expeditious flow of air traffic and to assist pilots in preventing collisions between:

- a) aircraft flying in, and in the vicinity of, the ATZ;
- b) aircraft taking-off and landing.”

The Shoreham controller passed an appropriate warning to the DA42 pilot regarding the close proximity of the helicopter. Radar recordings show that the helicopter was operating just outside the boundary of the Shoreham ATZ in Class G airspace. No RT call was made by the pilot of the helicopter to Shoreham ATC.

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, a report from the air traffic controller involved and the appropriate ATC authority.

In a GA Member’s view the separation between ac was quite a lot and it was plain that the R44 pilot was aware of the Shoreham ATZ as he had reported he turned NE to remain clear. Whilst the recorded radar data reveals that that the R44 helicopter pilot had remained outwith the Shoreham ATZ, he did pass very close to the boundary as he flew around the NE’ly quadrant. Furthermore, it was clear that, notwithstanding the challenging wind conditions, the DA42 crew had turned onto Base-leg and Final well inside the ATZ. Controller Members thought it most unwise for the R44 pilot to fly this close to the Shoreham ATZ boundary as he crossed beneath the approach to RW20, especially without communicating with ATC. Pilot Members concurred and emphasised that better airmanship on his part would have been to make a short call to Shoreham ATC advising of his route and height, which would have provided a warning to the controller of his transit beneath the approach. This could also have improved the R44 pilot’s own situational awareness about other traffic in the vicinity, as the Shoreham controller might well have considered it prudent to advise him of the DA42 before it passed 0.6nm to the S and which the R44 pilot reports he did not see at all.

The Board had no doubt that this controller reported Airprox was filed with the best of intentions based on what the Shoreham controller believed he had seen at the time. Controller Members recognised that ac ranges were difficult to judge visually from the VCR with different types of ac of greatly varying sizes. Moreover, the ADC did not have the benefit of an ATM to help him determine the relative geometry. The ADC had perceived that the R44 was inside the ATZ and was on a heading to cross through the approach, ahead of and below the DA42, hence his conscientious warning to the crew. However, the ATSI report and radar recording show this was not the case with the R44 passing clear astern of the DA42. Whilst the warning to the DA42 crew was passed with good intent and made them aware of the other ac, it was plain to the Members that no actual conflict

had existed. The Board concluded, therefore, that this Airprox had been the result of a controller perceived conflict and that no Risk of a collision had existed in these circumstances.

The difficulties associated with tracing the pilots of the foreign registered ac based in England and operating in UK airspace was highlighted by this Airprox and discussed. The Board's CAA Flight Operations Advisor believed that this rather parlous situation will be improved in the next 2-3 years. The Board was briefed that following pressure from across Europe, EASA is progressing a requirement for operators of non-State registered ac to make a formal declaration to the State in which the ac is being operated, which should improve lines of communication.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A controller perceived conflict.

Degree of Risk: C.

AIRPROX REPORT No 2010173

Date/Time: 25 Nov 2010 1248Z

Position: 5231N 00043E
(STANTA)

Airspace: D208 (Class: G)
Reporting Ac Reported Ac
Type: DH3 UAV Tornado GR4

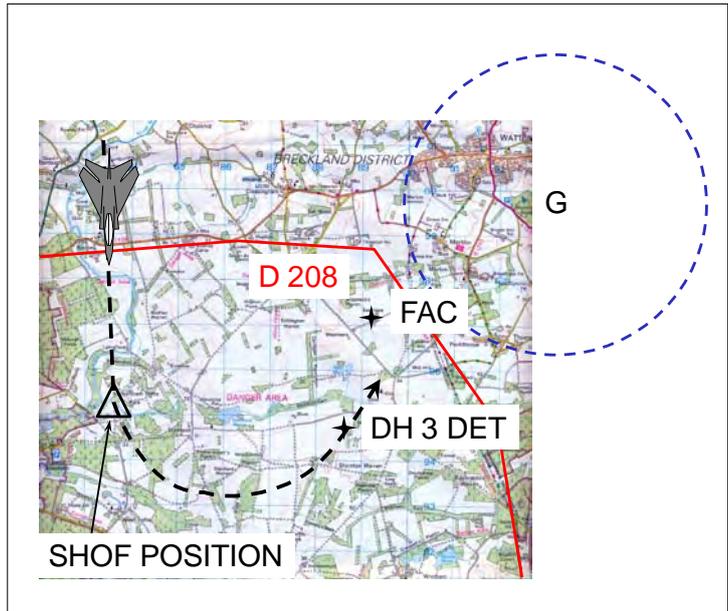
Operator: RA HQ AIR
(OPS)

Alt/FL: NR 250ft
(NK) (Rad Alt)

Weather: VMC CAVOK VMC CLBC
Visibility: 5.0km 5.0km

Reported Separation:
100-200ft V/O H Not Seen

Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DESERT HAWK flight safety officer reports that they were conducting proving flights within the STANTA training area and at the time of this incident he was located at 5km E of Buckenham Tofts with the UAV control station.

They had requested permission to fly their MUAV from the OIC (Officer in Charge) and he was instructed to wait; 5min later the OIC gave them clearance to launch as he, in turn, had been given clearance by Range Control and the FAC, so they then launched the ac. Twelve minutes into the flight the Air Sentry informed him that he had seen a jet ac S of the operating area, approaching at low altitude but the warning came too late and the jet was already over his position at about 250-500ft coming from the S to N. He then instructed the MUAV Commander to recover the ac to the landing point, the detachment conducted its landing drill and the MUAV landed without further incident.

He reported the incident to the OIC and assessed the risk as being high.

The airspace had been allocated to them by the TACP and had not changed over the previous 3 days of live flight activity.

[UKAB Note (1): The following is an extract from the HQ1 Arty Bde Operation Order:

SAFETY NOTE: If at any time the Air Sentries, or Exercising Troops see a breach of the DH3 UOA they are to immediately inform the FSO. On a breach of the UOA the FSO is to order the UAS-c to "LAND NOW". The ROZ must cover the dimensions of the UOA.

THE TORNADO PILOT reports that they were working with a Joint Tactical Air Controller (JTAC) in the STANTA in support of a ground exercise under the control of a Tactical Ops Centre (TOC). The JTAC requested a Show of Force (SHOF) near Buckenham Tofts so his WSO contacted the controlling TOC to request clearance for the SHOF at the tasked position; they were instructed to

standby while the TOC negotiated their clearance. While waiting, the crew discussed with the controlling JTAC the probability of having to return to Marham due to shortage of fuel if the clearance was delayed. The TOC then contacted them and informed them that they had clearance to ground level and were approved to carry out a SHOF. The WSO informed the TOC that the LOA would be 180°, which they acknowledged and then the WSO confirmed that they would depart to the East (left) off the target. The TOC then responded confirming that the Tornado would route East over the target and the WSO corrected them saying, *“negative, we will be heading 180 over target then turning left on to East before climbing to 10000ft”*, and they acknowledged this. They were then given clearance by the TOC down to ground level on LOA 180°, and carried out the SHOF at 250ft under control of the JTAC, egressing East off target at 250-500ft before climbing to 10000ft and recovering to RAF Marham.

After debriefing the sortie the crew was informed that they had been involved in an Airprox with a UAV that they had not seen.

RANGE CONTROL reported that Tornado GR4 was booked on to the Training Area to support a ground force pre-deployment work-up exercise. The ac was under the control of a FAC and had been ordered to conduct 3 SHOF over the Western part of the training area over the river Wissey. A UAV was flying at the same time and was allocated an area which covered the centre of the Training Area up to a height of 1100ft. The Tornado crew was aware of this restricted area and had avoided it on the first 2 passes over the river Wissey and on completion of each of the first 2 passes they broke off to the W to reposition themselves at the northern end of the Training Area for the next pass; on the final pass they broke off to the E passing through part of the airspace reserved for the UAV.

The UAV controller filed an Airprox with them as a result of this incursion.

The FAC, UAV controller and the Tornado pilot were all contacted and asked to submit reports and it was apparent that there were differing interpretations of the instructions to the Tornado crew regarding their departure from the training area.

The Supervising FAC (SupFAC) reported that he and another SNCO were overseeing the training of a number of junior FACs, who were controlling a single Tornado GR4 and were located 6km ENE of Buckenham Tofts. During the period of the sortie a detachment from the Royal Artillery (RA) was operating a DH3 2½km to the S of them and was allocated a Working Area (WA) airspace named WA1. [The dimensions of WA1 cannot be determined but, based on other reports, was probably about 2km radius of its operating position – see UKAB Note: (1) below].

During the Tornado sortie 3 SHOFs had been conducted and, as the GR4 took priority, each time the aircraft conducted a SHOF they grounded the DH3 to ensure deconfliction as agreed with DH3 Instructor Gunnery (DH3 IG) overseeing DH3 safety; however, the DH3 IG informed them that having to ground the ac so often was limiting their training opportunities.

When a further SHOF was requested near Buckenham Tofts [5k W of the DH3 location and near the W edge of the Training Area] both SupFACs were concerned about the possibility of noise complaints from civilians and further interference with the DH3 training, so they requested approval from Range Control and conducted a map appreciation to facilitate the SHOF with as little disturbance as possible to avoidance areas and to allow the DH3 to remain airborne. They decided to proceed with the SHOF routeing from the North to the South, laterally deconflicting the Tornado from the DH3, then once it was off the target climbing and turning East in the climb to avoid both avoidance areas and the DH3.

The SHOF was conducted successfully and safely at the requested height of 250ft agl and they observed the ingress and egress over target from their position but then lost visual due to terrain masking as the ac continued S. He then regained visual with the Tornado at about 2000ft on its egress to the N outside the Range Boundary.

They were then informed by the DH3 IG that his position [just to the S of the DH3 take-off/landing area] had just been overflown at 100 to 150ft agl.

Later that afternoon they received a call from Range Control informing them that the DH3 operator had submitted an Airprox report. The TACP confirmed to Range Control that WA1 had been active and that the Tornado crew had been briefed accordingly.

Further reports from the FACs were submitted but they are essentially the same as the SupFAC's above and reiterate that the aircrew were briefed that WA1 was active.

HQ AIR (OPS) comments that a lack of appreciation of the airspace allocated to the DH3 appears to have been a factor and we believe this is more of an airspace infringement than an AIRPROX, however, it is difficult to understand what avoidance criteria the GR4 had been given as the dimensions of WA1 appear to be unknown. It is not clear from the information above how close the 2 platforms got, the assessment by the DH3 IG of a 150ft agl overflight is not consistent with the report from the SHOF target site.

HQ 1 Arty Bde comments that at the time of the incident the DH3 non-operational flying was conducted in accordance with Special Flying Instruction (SFI) DH3 01-10 (AL2) and the Statement of Range Practice (SoRP). Both the SFI and the SoRP had been put in place to ensure that the DH3 remained within its dedicated airspace during non-operational flying as well as providing another layer of safety (in respect of collision avoidance) which is equivalent to that provided by the pilot of a manned aircraft as a UAS is unable to 'see and avoid'.

The OIC Practice of this ex has confirmed to HQ 1 Arty Bde that the DH3 was operating within the Safe Flying Area (SFA) and that WA1 encompassed both the Unmanned Air System Operating Area (UOA) and the SFA.

[UKAB Note (2): The diagram provided shows that for the period in which the Airprox occurred the UOA and therefore WA1 extended to the Western boundary of the Range Danger Area but the height was not stipulated. The Safe Flying Area was a 4x2km area, within the UOA, area up to 300ft agl. The SFI and HQ 1 Arty Bde Operation Order state that no other aviation activity should take place in the UOA i.e. the larger area. To avoid this area laterally the Tornado would have to depart the Danger Area to the S or W.]

There have been a number of unauthorised manned aviation incursions into notified and dedicated MUAS airspace on DTE ranges over the last twelve months; MUAS are not permitted nor authorised to fly in any other airspace. These incursions include transits and, more alarmingly, deliberate manoeuvres such as landing in the allocated MUAS airspace. As a result, Comd 1 Arty Bde has undertaken a range of actions to minimise the likelihood and impact of similar events in future. These measures include administrative action, publicity campaigns and training reviews.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots (operators) of both ac, reports from the FACs involved and reports from the appropriate operating authorities.

Members found this a very complex incident as in most cases their knowledge of such exercises is scant. Although there was a view that such incidents should be investigated by the Military authorities, the Director informed the Board that their remit included the investigation of such incidents and if possible, bearing in mind the lack of such material normally available (for instance RT and radar recordings) an investigation and report should be completed as an independent view would be welcomed by the Military authorities. Members decided that there was sufficient information available to them to decide on the cause of the incident but that since there was no information regarding the separation between the Tornado and the UAV involved or whether the Tornado had

flown over the UAV, the landing site or merely infringed the UAV area of operation, the Board could not determine the degree of risk.

Members noted that on previous SHOFs the DH3 had, in accordance with 1 Arty Bde SOPs, been 'grounded' while the Tornado was in the area, thus ensuring separation. Members opined that the reason that this had not been done on the 3rd SHOF was unclear but probably in a wish to get the most out of the limited range time available and thus complete the operational work-up. The 3rd SHOF was very close to the boundary of the UOA, but the Board considered that the decision not to land the UAV was reasonable provided that there was positive deconfliction. As it was in the heat of the moment and under pressure from the Tornado crew for a quick response to their call requesting an Easterly departure, (due to fuel considerations) it seemed that the message approving the departure was not communicated accurately to the crew or was misunderstood by them; namely they understood that they could turn E and then climb rather than the intended climb then turn E. A Member familiar with current Close Air Support procedures opined that positive deconfliction/integration by height, area or time is essential to ensure the safe operation of multiple air assets in an often small area; the crew should have been given specific instructions for their ingress and egress, and been required to read back these instructions. In this case, the Tornado crew's read back of their intention to turn East then climb was not assimilated by the TOC.

Without an RT recording (not available in Military Tactical communication systems) the Board could not determine the actual departure clearance passed to the Tornado or whether the clearance had been inappropriate or misunderstood; nor could the Board determine whether the Tornado crew's transmission was ambiguous. However, the Board was satisfied that the Tornado crew both understood that they were 'cleared' to depart to the E. The Tornado crew had been operating not below 250ft (Rad Alt) and, assuming that they turned E without climbing, they had flown through the area of the UAV operation below the top height of 300ft. The Tornado's flight path through the UOA had caused the DH3 Safety Officer justifiable concern. Members were not able to determine from the reports or data available how close the Tornado had come to the DH3. The Tornado crew did not see the UAV, neither the DH3 nor the Tornado showed on radar at the time and the DH3 operators' reports did not assess the miss-distance either horizontally or vertically, stating only that it had flown over the landing site. Members also observed that there was confusion over the position of the flight line as the position given in the DH3 operator's report was significantly in error and the corrected position did not accord with that detailed in the 1 Arty Bde Operation Order. On considering all the information and expert opinion presented, on balance Members thought it unlikely that the Tornado had been very close to the DH3 but agreed unanimously that they were unable to substantiate this view and so could not determine the degree of risk.

Having considered the incident fully, the Board agreed that such incidents should continue to be reported as Airprox but, bearing in mind the paucity of supporting data and that many participants are frequently 'out of area', urged as comprehensive reporting as possible. The Director informed the Board that he would write to HQ Air (Ground Air Liaison) on the topic.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Tornado flew close enough to the UAV to cause its operators concern.

Degree of Risk: D.

AIRPROX REPORT No 2010176

Date/Time: 9 Dec 2010 1432Z

Position: 52.52N 000.10E
(Holbeach AWR)

Airspace: D 207 (Class: G)

Reporting Ac Reported Ac

Type: Tornado GR4 C120

Operator: HQ AIR (OPS) Civ Pte

Alt/FL: 200ft NR
(Rad Alt)

Weather: VMC NR NR

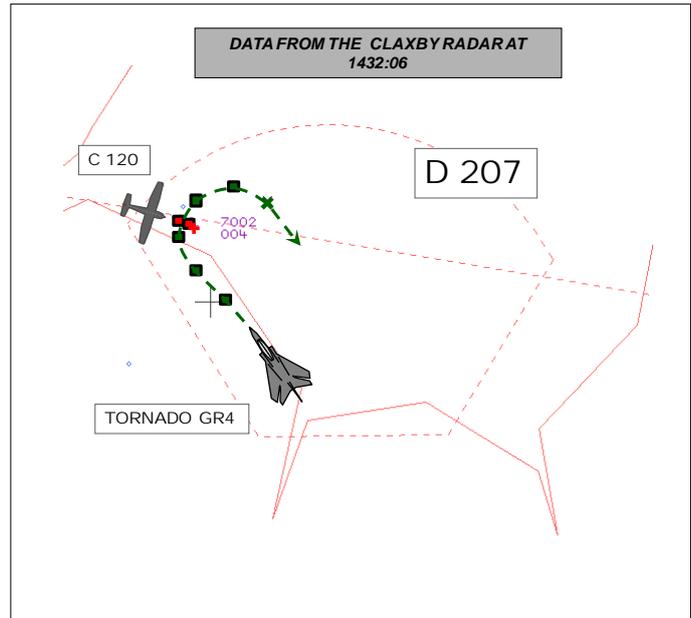
Visibility: 30km NR

Reported Separation:

V 800ft/H 200ft NR

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO PILOT reports flying a grey ac with all lights switched on, on a practice weaponry sortie in Holbeach AWR, squawking 7002 with Mode C. They had joined Holbeach AWR from Marham and on initial RT contact they were advised of a light aircraft just outside the AWR to the W of the targets. Following a level attack at 200ft, heading 330° at 480kt, they were in a shallow climb and turning right onto a reciprocal heading, in a medium workload situation, when they saw a light coloured (possibly orange) high-wing, light ac flying straight and level on an opposite track, about 800ft above them and 200ft laterally spaced; they continued the turn to increase the separation.

They assessed the risk as being Medium and reported the Airprox to Range Control.

Despite being contacted several times, although confirming that he was in the area, but [he thought] outside the range, the C120 pilot did not provide a report.

THE RANGE SAFETY OFFICER (RSO) reports that range traffic consisted of a single Tornado GR4 which was conducting low level bombing runs on target 7 at about 150ft amsl. At 1435Z after pulling off target the pilot reported a light civil aircraft inside the Range Danger Area tracking from N to S. Neither this ac or any other had called reporting in the vicinity of the range so he immediately contacted both RAF Coningsby and Marham radar; both confirmed they could see a radar return inside the range danger area but had no height information. He asked Marham radar to track the ac and inform him if the pilot contacted them.

The ac continued to operate in the local area clearing the range to the S and after some time it routed towards Fenland airfield and disappeared from radar. He contacted Fenland and explained the situation to the pilot who agreed that he had been operating in the area but did not believe that he had infringed the range. The RSO then explained that he would be reporting the incident and took his contact details for future reference.

About 2hr later the Tornado pilot contacted the RSO and it emerged that he had seen the ac about 500ft directly above him.

HQ AIR (OPS) comments that comments that the dimensions of an Air Weapons Range are not designed to protect the aircraft operating within them; crews must remain vigilant to the potential for

incursions from other air platforms. Good airmanship, however, should make the avoidance of notified danger areas by non-users a priority.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the Tornado pilot, radar recordings, a report from the RSO involved and from the Tornado operating authority.

Members observed that the investigation had been hampered by the C120 pilot not providing a report. They were informed that anecdotally he had thought that he had remained clear of the Danger Area but the radar recording showed clearly that he was over 1nm inside the Western boundary. It was pointed out that, while there was no Statutory Instrument covering the Holbeach Range Danger Area (D207) (therefore penetration is not actually 'illegal') it remains poor airmanship and in some circumstances could endanger the penetrating ac. The HQ Air Ops Member went on to say that the Tornado crew would have been in a high workload situation, manoeuvring their ac aggressively in two planes as they came off the target, making range RT calls, checking and changing weaponry switches and analysing their attack and would have not expected an intruder.

While accepting that lookout by aircrews flying Range details is most important (as stated by HQ Air Ops), Members agreed that in these circumstances, due to their focus on the bombing attack until coming off the target, the Tornado crew could not have reasonably been expected to see the C120 any earlier, despite that they had previously seen it in the vicinity of the Range. Although the Tornado crew saw the C120 well above them it was fortuitous that they had not been climbing more rapidly, say for a subsequent dive attack, and this, Members agreed, had prevented any conflict of flightpaths and therefore any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The C120 pilot entered a notified and active danger area.

Degree of Risk: C.