

ASSESSMENT SUMMARY SHEET FOR UKAB MEETING 22 September 2010

Total: 18 Risk A: 1 Risk B: 4 Risk C: 12 Risk D: 1

<u>No</u>	<u>Reporting</u>	<u>Reported</u>	<u>Airspace</u>	<u>Cause</u>	<u>Risk</u>
2010001	C172 (CIV)	C680 (CIV)	G	The ADC cleared the C680 for take off without giving appropriate TI and it flew into conflict with the C172 joining the circuit.	B
2010010	EMB145 (CAT)	PA28A (CIV)	D	The PA28 entered the Class D Newcastle CTA without clearance.	C
2010015	Grob Tutor T Mk1 (MIL)	BE200 King Air (MIL)	G	The King Air formation leader did not integrate his formation into the circuit safely.	B
2010017	Cessna C510 (CIV)	Diamond DA40 (CIV)	G	A non-sighting by the DA40 pilot and a late sighting by the C510 pilot.	B
2010018	B737-800 (CAT)	F15E (Foreign MIL)	A	<p>The F15E pilot entered CAS without clearance and flew into conflict with the B737.</p> <p>Recommendation:</p> <p>The CAA is recommended to review the advice to pilots and controllers so that:</p> <p>1) Pilots minimise the possibility of misleading controllers about TCAS contacts and reactions.</p> <p>2) Controllers seek clarification when they are uncertain whether pilots are responding to RAs.</p>	C

2010020	Grob Tutor T Mk1 (MIL)	Tornado GR4 (MIL)	G	Conflict in the Lincolnshire AIAA.	C
2010024	DHC-8 (CAT)	Hawk (MIL)	A	The Hawk pair climbed above their cleared level.	C
2010030	Merlin HC3 (MIL)	C172 (CIV)	G	Conflict in the Oxford AIAA resolved by the C172 pilot.	C
2010034	MD82 (CAT)	Untraced ac (N/K)	A	Conflict in Class A airspace with an untraced ac.	D
2010036	E3D Sentry (MIL)	Harrier (MIL)	G	Sighting Report (TCAS).	C
2010038	Sea King HAR3 (MIL)	Hawk (MIL)	G	Sighting Report.	C
2010039	Puma (MIL)	PA28 (CIV)	G	Unaware that the PA28 had joined the circuit downwind, the Puma crew turned into conflict with it.	C
2010040	Sea King HAR3 (MIL)	Rockwell 112 (CIV)	G	The Rockwell 112 pilot flew close enough to the Sea King to cause its crew concern.	C
2010041	C172 + T67M Formation (CIV)	Beagle Airedale (CIV)	G	A non-sighting by the Airedale pilot, effectively a non-sighting by the T67M pilot and a late sighting by the C172 formation leader.	A
2010043	Squirrel (MIL)	PA38 (CIV)	G	Late sighting by the Squirrel crew. UKAB note: Removed "...of the PA38, whose pilot had them in sight" for consistency with previous practice. It is implied.	C

2010045	Puma (MIL)	Untraced Glider (N/K)	G	A probable non-sighting by the glider pilot and a late sighting by the Puma crew.	C
2010048	Slingsby Cadet (CIV)	Rockwell 114 (CIV)	G	The Rockwell 114 flew through the circuit of a promulgated and active glider launch site, below winch launch height, and into conflict with the Slingsby Cadet.	C
2010049	Typhoon (MIL)	Untraced Glider (N/K)	G	A probable non-sighting by the glider pilot, a non-sighting by the lead Typhoon crew and a late sighting by the No 2 Typhoon pilot.	B

- end -

AIRPROX REPORT No 2010001

Date/Time: 17 Jan 2010 (Sunday) 1304Z

Position: 5119N 00001E (Biggin Hill A/D - elev 599ft)

Airspace: Biggin Hill ATZ (Class: G)

Reporting Ac Reporting Ac

Type: C172 C680

Operator: Civ Club Civ Comm

Alt/FL: 1000ft 1000ft
QFE (999mb) QNH (1018mb)

Weather: VMC N/R VMC N/R

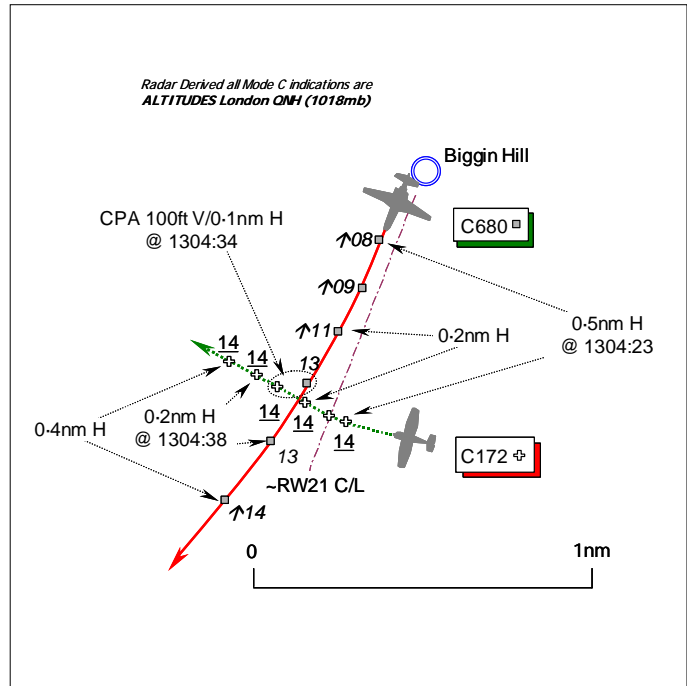
Visibility: 10km +10km

Reported Separation:

<500ftV/<500ftH 100ftV/100mH

Recorded Separation:

100ft V @ 0.1nm H [~200yd]



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C172 PILOT reports he was conducting a local VFR flight from Biggin Hill and was in receipt of a BS, he thought, from Biggin Hill TOWER (TWR) on 134.8MHz. A squawk of A7047 was selected with Mode C on.

Approaching the Biggin circuit from the deadside, he was instructed by TWR to follow a Robin, which was also approaching to join the RH cct (RHC) for RW21. He was visual with the Robin some distance to his R and slightly ahead so he continued his approach, monitoring the Robin, so that he could join the downwind leg behind it.

As he approached the crosswind leg at the upwind end of RW21 RHC, TWR asked him to report his altitude (sic), as the controller said he looked a little low. He checked his altimeter that was indicating a height of 1000ft with the QFE (999mb) set, reported this to TWR and continued his approach. However, he did notice that the Robin had looked slightly higher than his C172.

When he looked out again he had lost visual contact with the Robin and so concentrated on regaining visual contact. He crossed over the upwind end of RW21 heading 300° at 90kt and heard TWR ask a business jet, which was taking off from RW21, if he was 'visual with the Cessna'. He looked out of his right hand window and saw the jet about 1000ft away climbing rapidly directly towards him (the jet having drifted to the R of the RW21 centreline). The jet pilot shouted 'whoaa' over the RT and banked to port to avoid his C172. There was little he could have done by way of avoiding action, except push full throttle, which he did for a moment or two until it was clear that the jet would pass astern. He estimates the separation was less than 500ft both vertically and horizontally.

It is not clear to him how this incident happened. He was approaching the cct at the correct height and in a standard manner, trying to maintain visual contact with the traffic that he had been instructed to follow. ATC was clearly aware of his position, as they asked him to check his altitude. The jet appeared to be climbing very rapidly, but he did not know if this is standard or if it was climbing more steeply than normal. The jet had drifted to its R and was slightly over the grass to the R of RW21, but he does not think that was a major factor - they would have been too close for comfort even if he had been flying directly on RW heading - he had just passed over the runway.

He would like to know what might have been done differently in order to avoid this incident. He was very shaken by this and it took a great effort to stay calm while he completed his cct and landing.

The only personal factor that he can identify which might have influenced this, is his interpretation of TWR's instruction to follow the Robin into the cct. He wonders if ATC expected him to actually turn to his R and re-position directly behind the Robin. This would have meant a substantial re-positioning for him and he did not do so - he continued his standard approach to the cct whilst maintaining visual contact with the Robin, intending to position behind him on the downwind leg. This he had done many times before in similar situations. On the other hand, ATC must have been visual with his C172, as they asked him to report his altitude, so they clearly knew exactly where he was. He also had his transponder on, as instructed, so ATC presumably knew his altitude from his Mode C indications anyway. He assessed the Risk as 'high'.

His aeroplane is coloured white and the HISL was on.

THE CESSNA CITATION C680 SOVEREIGN CAPTAIN, the PF, reports departing Biggin Hill for E Midlands on an IFR Flight Plan following the SID from RW21 whilst in receipt of a 'Control Service' from Biggin TWR on 134.8MHz. The assigned code of A5424 was selected with Mode C on; TCAS II is fitted.

After being held for a few mins at the D2 holding point for their departure clearance, TWR instructed him to line-up and issued their clearance to take-off from RW21. No information was given about other possible traffic in their departure clearance or the subsequent take-off clearance. Climbing out at 130-150kt passing about 1000ft they heard TWR say 'have you seen the 172'. In the cockpit he was transitioning from 'pilot handling' to the A/P at this point so he looked up and immediately saw the C172 ahead about 20° to their R and heading away to the R about 200ft higher than his ac. To avoid the C172 he immediately disengaged the A/P and levelled-off as he flew 100ft below and 100m astern of the C172 with a 'low-medium' Risk. Once clear, he rejoined the SID. Neither a TA nor an RA was enunciated by TCAS.

Upon landing at E Midlands he telephoned Biggin ATC and asked why they had cleared him to take-off IFR with the C172 crossing their 'departure', to be told the C172 was not where TWR asked the pilot to be.

His ac has a white and blue livery and all the lighting was on, including the HISL and landing lamp.

THE BIGGIN HILL AERODROME CONTROLLER (ADC) reports that the departing C680 came into conflict with the C172 that was joining from the deadside for RW21. The C172 pilot was asked on two occasions to check his height/altitude as it appeared to be lower than normal. The pilot replied on both occasions that he was at the correct level whereas the Aerodrome Traffic Monitor (ATM) indicated that the C172 was 200ft below the normal cct level. The departing C680 crew were airborne extremely quickly upon receipt of their take-off clearance and proceeded to adopt a very high ROC on departure. It was predicted that the C172 would have passed overhead the runway to the W by the time the C680 had got airborne. However the expeditious departure of the C680 placed it in potential conflict with the C172.

ATSI reports that this Airprox occurred within the Class G airspace of the Biggin Hill ATZ, which is the airspace bounded by a circle radius 2.5nm centred on RW03/21, from the surface to 2000ft above the aerodrome elevation of 599ft. Both flights were receiving an Aerodrome Control Service, with the Aerodrome and Approach functions being split at the time. The ADC was operating as mentor to an experienced trainee, who was shortly to take his Certificate of Competence in Aerodrome and Approach Control at Biggin Hill. All the RT transmissions from TOWER leading up to the incident [but not afterwards] were made by the trainee. The Mentor described his workload as low-medium in the period leading up to the Airprox. Biggin Hill ATC is not equipped to provide any surveillance [radar] services. It is, however, equipped with an ATM in the VCR, which displays radar data provided by LTC Swanwick.

The Biggin Hill 1250UTC METAR was: 280/11kt 240v310; 9999; SCT020; 08/03; Q 1018.

The outbound IFR C680 pilot was cleared to taxi for a RW21 departure at 1254. About 3 minutes later, the ADC issued the flight's departure clearance "*Brookmans Park 2 departure with a right turn at 1 mile inbound Delta Echo Tango climb to altitude 2 thousand 4 hundred feet squawk 5-4-2-4*". The pilot read back the clearance correctly. The UK AIP, at AD 2-EGKB-1-9, states the Standard Departure Routes. Departures to the N are designated Brookmans Park 2 (BPK 2), the route being DETLING-BPK. A note to the routes states, 'Departures from Runway 21, follow Noise Abatement Procedure turning right to pass overhead BIG VOR at 2400ft ALT'. The Noise Preferential Route (NPR) applicable to the C680 flight is: 'As soon as practicable turn right to make good a track of 220°MAG. At 1.0 DME BIG commence right turn to the BIG VOR/DME or establish on track at 2400ft ALT. Remain within 4 DME BIG.' BIG VOR is situated at the centre of the airport, to the E of RW21/03.

At 1257:29, when the C680 crew was receiving its departure clearance on the TOWER frequency, -- the C172 pilot established communication with Biggin Hill APPROACH (APP) to request his rejoining instructions. The pilot reported "*overhead Sevenoaks at 2 thousand 1 hundred feet on 1-0-1-8 [QNH] request rejoin instructions and Basic Service please*". APP replied "*Basic Service you have with me report with 3 miles to run deadside join for 2-1 right hand circuit the 2-1 Threshold QFE 9-9-9 millibars squawk 7-0-4-7*" - A7047 is the LTC THAMES RADAR Biggin Hill SSR conspicuity code. The threshold QFE is issued as the threshold elevation for RW21 is 517ft – the A/D elevation being 599ft. The C172 pilot read back the pressure and clearance correctly confirming that he would report at 3nm. The radar recording, timed at 1257:30, shows the C172, squawking A7000 at 2100ft ALT Mode C, 8-9nm ESE of Biggin Hill airport. Shortly afterwards, TI was passed about an inbound Robin ac, whose pilot had last reported abeam the Brands Hatch area at 2200ft. The C172 pilot later reported sighting the Robin and was instructed to follow it; at 1300:58 the C172 was transferred to the TOWER frequency. The radar photograph, timed at 1301:00, shows the C172, now squawking A7047 as instructed, 4-2nm ESE of the airport at an altitude of 1500ft. The Robin it is following, is to its NW.

At 1258:30, the C680 crew requested their departure clearance to be read again. The ADC complied this time adding "*overhead*" after "*the right turn at 1 mile*". The pilot read back "*I've got that..Brookmans Park 2..after departure right turn overhead and then Detling climbing 2 Thousand 4 Hundred feet...*". The C680 pilot reported ready for departure at holding point D2 at 1259:20 and was informed that a departure release was awaited from THAMES RADAR. Just over 2 min later the C680 was instructed to taxi to D1.

The C172 pilot contacted TWR at 1302:04 reporting, "*..with you 2 point 7 miles DME we..have the..traffic in sight ahead of us and following it in*", whereupon TWR instructed the pilot to, "*continue to join following the traffic ahead*". At 1302:55, the C680 crew was cleared, "*right turn 1 mile report overhead clear to take off 2-1 surface wind 2-8-0 degrees 1-0 knots*". The radar photograph, for this time, shows the Robin ac just passing overhead the centre of the airport. The C172 at an altitude of 1400ft, is 1-8nm SE of the airport, tracking W. The ADC later explained that he had been discussing the traffic situation between the subject ac with his trainee prior to the C680's take-off clearance being issued. He confirmed that both he and his trainee were aware of the position of the C172, both visually and on the ATM. It was calculated that the C172 pilot would have passed overhead the threshold of RW03 and been clear of the RW21 climb-out, before the C680 crew had taken off. Consequently, it was not considered necessary to pass TI about the C172 to the C680 or vice versa.

The UK AIP describes the Biggin Hill cct procedures as:

'Aircraft joining or re-joining the circuit for landing are to fly across the upwind end of the runway in use at 1000ft QFE at 90° to the runway heading, a left turn or right turn (as appropriate) should be made onto the downwind leg'.

Additionally, 'Circuit heights are 1000ft QFE (1600 ft QNH) at all times'.

The ADC mentor commented later that he had observed that the C172 was slightly lower than expected. This was confirmed on the ATM, where the Mode C of the C172 pilot displayed an altitude of 1400ft, rather than 1600ft as expected. Accordingly, the pilot was asked to, “*check your level you should be a thousand feet on the Q-F-E 9-9-9*”. The pilot immediately confirmed he was complying with the level instructions at 1303:50: “[C/S] *at 1 thousand feet on 9-9-9 millibars*”.

The mentor remarked that he and the trainee observed that the C680 commenced rolling quickly and became airborne earlier than expected about half way down the runway. He added that it then appeared to climb quite steeply. Concerned about the relative positions of the subject ac, the C680 crew was asked, “[C/S] *do you have the Cessna in sight*”. The mentor said that as he was about to issue a warning to the C680 crew, the trainee transmitted the information. He commented that the information message was shorter than ideal but in the circumstances, due to the close proximity of the traffic, there was no time to pass a full traffic information call. He believed that the C680 was passing about 600/700ft at about the time the information message was initiated. In any case, both the mentor and trainee believed that the pilot of the C680, by now, would have seen the C172. The C680 crew responded, “*negative [C/S] oh affirm [C/S]*” [before uttering “*whoaaa*” at 1304:30 and then asking, “*what were you doing there sir?*”]. The mentor then commented on the frequency that the C172 should have been at 1600ft on the QNH and the pilot of the C680 stated “*he came straight through our departure*”. The C172 pilot reported, “*just turning downwind at 1 thousand feet on 9-9-9 millibars continuing approach as instructed*”. The mentor commented that, despite being operational at Biggin Hill for a number of years, he had not experienced the type of departure carried out by the C680 crew.

[UKAB Note (1): The radar recording of the incident shows that when the C172 was crossing through the climb out at the upwind end of RW21 (RW03 threshold), its Mode C indicated 1400ft London QNH (1018mb) with the preceding and succeeding radar returns indicating that the C172 was maintaining a constant altitude. Just before the C172 crossed the C680’s 12 o’clock at 0.2nm, the latter indicates an altitude of 1100ft Mode C – some 300ft below the C172. The next sweep, which reveals that the 2 ac have passed each other, shows they are 0.1nm apart, with the C680 indicating 1300ft and the C172 at 1400ft Mode C.]

The UK AIP Biggin Hill entry also states, under the title of ‘Circuit Procedures’ that: ‘Aircraft taking off, ‘going around’ or making ‘touch and go’ landings are to remain at or below 500ft QFE until the upwind end of the runway in use has been passed, when a left or right turn (as appropriate) should be initiated’. Apparently, this procedure is generally only used for training flights and would not have applied to the departure of the C680. Local ATC management report that the information printed in the AIP has been reviewed (see below). Some years ago, there was a restriction, which limited departing jets to an altitude of 1100ft and a speed of 180kts. This restriction was considered unsuitable and removed.

The MATS Part 1, Section 2, Chapter 1, Page 1, states the responsibilities of Aerodrome Control:

‘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: aircraft flying in, and in the vicinity of, the ATZ’.

Accordingly, TWR should have passed appropriate instructions/information to the pilots of the subject ac that would have assisted in preventing any conflict between the two ac. On this occasion, neither pilot was informed about the details of the other flight. If, for example, the C680 crew had been informed about the presence of the C172 prior to departure, it would have allowed them to take appropriate action to avoid the C172. Although the trainee had cleared the C680 crew for take off, the mentor was responsible for the operating position. However, a number of unexpected factors caused the situation to develop. Namely, the C680 crew rolled quicker than anticipated, which meant that it arrived in the vicinity of the upwind end of RW21 before the C172 pilot had cleared the climb-out path. Additionally, the C680 crew rotated earlier than predicted and this was followed by a higher than anticipated ROC.

As a result of this Airprox, a Biggin Hill Supplementary Operating Instruction (SI 01/2010) was issued on 20th January. This states: 'With immediate effect, specific traffic information shall be provided to departing jet and other high performance ac prior to being issued with a take-off clearance with joining ac at or within 3nm approaching from the dead side to that runway - after this specific traffic information has been acknowledged a take-off clearance may be issued'. Additionally, 'A new warning highlighting to departing pilots of the potential for a confliction was sent for publication in the Biggin Hill AIP entry and published in line with the routine AIRAC cycle (25 Mar 2010).

The publication of Biggin Hill SI 01/2010, addresses the type of situation, which occurred on this occasion and should help to prevent it happening in the future.

UKAB Note (2): The UK AIP at AD 2 EGKB AD 2.20 - Local Traffic Regulations - now includes at Para 4 a warning:

'Pilots of departing aircraft are warned of the presence of other aircraft joining the visual circuit from the 'Deadside'. The joining aircraft will fly across the upwind [end] of the runway in use at altitude 1599ft (1000ft aal) at 90° to the runway heading before turning left/right onto the downwind leg. Pilots of high performance fast climbing aircraft should be particularly alert.'

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 reports from the appropriate ATC authority.

The Board agreed that the C172 pilot had followed the joining instructions given and had done all that was asked of him by TWR, albeit he was concentrating on re-establishing visual contact with the Robin as he was crossing into the live side from the dead side. Whilst it was evident from the radar recording that the C172's unverified Mode C indicated his ac was at 1400ft London QNH (1018mb) and apparently 200ft low on the preceding cct ac, this was within the allowable tolerance even for verified Mode C. Although TWR might rightly question it, ADCs should not be basing any form of separation within the visual cct on the ac's indicated altitude. It was not feasible to determine independently his exact height in the cct apart from what was displayed by Mode C; the C172 pilot had reported that his altimeter was showing his ac to be at the right height with the correct QFE set, but it seems from his own account and the ADC's visual observation that he might well have been a little low compared to other cct ac. However, if the ADC Mentor had been at all concerned he should have warned the departing C680 pilots before he issued a take-off clearance. An experienced controller Member did not believe that the C172's height was intrinsic to the Airprox; the operation of the visual cct relied upon traffic information from ATC to pilots joining the cct or about to depart so that they could integrate into the cct correctly, coupled with appropriate control instructions. However, it was clear to Members that TWR had not passed any traffic information to these two pilots about each other's ac.

The controller had cited the departing C680's quick take-off and very high ROC when airborne, and this Airprox was a salutary example of the difficulties that can ensue when ac of widely contrasting performance operate in the same aerodrome cct. One Member, himself a Citation pilot, believed it was incumbent on pilots of high-performance business jet ac to exercise extreme care when operating in a mixed traffic environment and take due regard of slower piston ac types operating in the cct, but pilots needed to be told about them first in order to avoid them. The operation of business jets such as the C680 from GA A/Ds such as Biggin Hill was commonplace and controllers should be well aware of their slick high performance characteristics; not only does this incident provide a reminder that they needed to be treated with care, but it highlights an issue that will be exacerbated by the introduction of Very Light Jets, many of which have even better take-off/climb performance. Notwithstanding whether the C680's take-off was more expeditious than usual or the climb steeper, and the RoC shown by the radar recording did not seem unduly excessive, with an ac about to cross the climb-out there was a potential for a conflict. In the Board's unanimous view the

ADC should have ensured that TI was passed about the C172 to the C680 crew before their take-off clearance was issued. The Board discussed whether this was an unconscious omission by the trainee that had not been detected by the Mentor. However, it appeared from the ADC's report that it was a misjudgement since they both expected that the C172 would have passed overhead the runway to the W by the time the C680 was airborne. CAT pilot Members also believed that neither of the pilots would have been able to gain SA solely from the RT transmissions and needed TI to highlight the presence of this traffic to them. With TI issued before the take-off clearance, the C680 crew could have judged for themselves whether it was safe to take-off at that point. In concluding the Cause, the Board agreed that this Airprox had resulted because the ADC cleared the C680 for take off without giving appropriate TI and it flew into conflict with the C172 joining the circuit.

Turning to the inherent Risk, the C680 crew were clearly surprised and unprepared when the C172 was first sighted during the climb-out after the trainee ADC's short warning. From the C680 flight deck it seems the C172 was already through the ac's 12 o'clock and drawing to starboard when first seen. Nonetheless it was clear from the radar recording that the C680 PF had also levelled-off to avoid it. He reports passing 100m astern at the CPA, about half of that recorded, but at about 200yd still too close for comfort. The C172 pilot in his slower piston aeroplane was undoubtedly in a vulnerable position and there was little he could do to get out of the way of the fast twin-jet as it climbed up towards him, subsequently passing astern and a little below. Thus despite neither pilot being aware of the other ac before the Airprox occurred, the final geometry and prompt avoiding action taken by the C680 pilot was enough in the Board's view to remove the actual Risk of a collision. Nonetheless, Members agreed unanimously that the safety of these two ac had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The ADC cleared the C680 for take off without giving appropriate TI and it flew into conflict with the C172 joining the circuit.

Degree of Risk: B.

AIRPROX REPORT No 2010010

Date/Time: 2 Mar 2010 2011Z NIGHT

Position: 5501N 00158W (10nm W of Newcastle- elev 266ft)

Reporter: Newcastle APR

Airspace: Newcastle CTA (Class: D)

Ac 1

Ac 2

Type: EMB145

PA28A

Operator: CAT

Civ Trg

Alt/FL: 4000ft↓

3000ft
QNH (1018mb)

Weather: VMC NR

VMC NR

Visibility: NR

30km

Reported Separation:

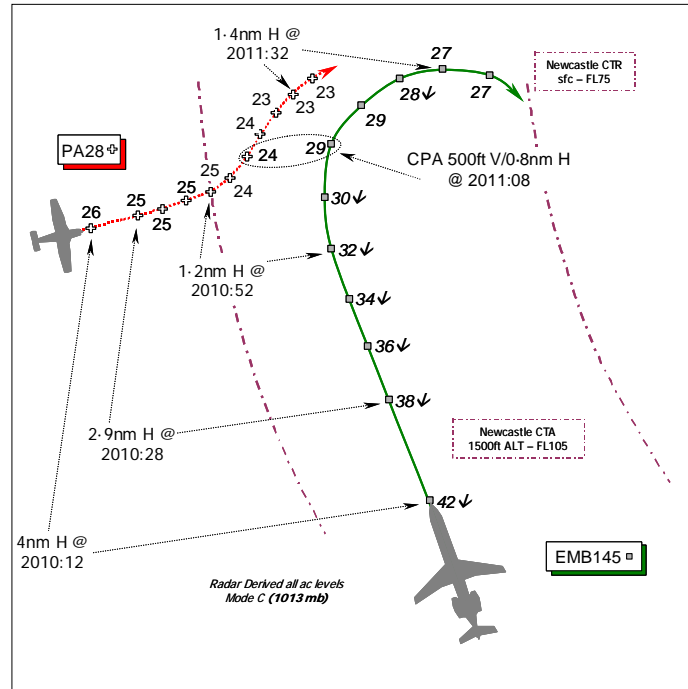
Not seen 1000ft V/½nmH

Newcastle APR

700ft V/1nm H

Recorded Separation:

500ft V @ 0.8nm H



CONTROLLER FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE NEWCASTLE APPROACH RADAR CONTROLLER (APR) reports that she was vectoring the EMBRAER145 (EMB145) to the ILS for RW07 from the S under a RCS. Due to survey traffic underneath she was unable to give a standard descent profile, so planned to take the EMB145 through the LLZ to close from the L. Once the EMB145 was clear of this traffic, descent was given to 2200ft QNH (1026mb). Meanwhile a PA28 pilot flying N of Hexham outside CAS asked for a SVFR rejoin, but due to traffic was told to standby. The PA28 was orbiting just to the W of the CTA boundary. Although intending to turn the EMB145 to close the LLZ just as the ac crossed the final approach, she transmitted the instruction to the wrong callsign. At this point the PA28 infringed the CTA boundary without clearance. The EMB145 crew was instructed to stop descent at 3000ft QNH and given a R turn; the PA28 pilot was passed TI and told to make a L turn to keep clear of the EMB145. At this point STCA was triggered but the SSR labels had merged so she was unable to see the respective Mode C indications. Minimum separation was 700ft vertically and 1nm horizontally.

The Newcastle 1950UTC METAR was: 250/02kt; 30km; FEW3500 Temp M01/M03; QNH 1026mb. TYNE RPS: 1021mb.

THE EMB145 PILOT provided a brief account. He reports flying inbound to Newcastle under IFR and in receipt of a RCS from Newcastle APPROACH (APR) on 124.375MHz. A squawk of A5763 was selected with Mode C on.

Whilst in receipt of radar vectors towards a long right hand base leg to RW07 at 210kt, the controller advised of VFR traffic [the PA28] approaching from the NW and issued a R turn to intercept the LLZ RW07 for a normal approach. The other ac was shown on TCAS, but he did not provide an estimate of the minimum separation. The Risk was not assessed.

THE PIPER PA28 PILOT reports he was on a local instructional flight from Newcastle to Bamburgh and return, whilst in receipt of an ATS from Newcastle APP. The assigned squawk was selected with Mode C on.

Flying at an altitude of 3000ft in VMC, he advised APP that he would be routeing around the northern perimeter of the Newcastle CTR/CTA, outside CAS, to Hexham [a VRP situated 257°NEW15nm] and was instructed by ATC to report at Hexham. About 3nm N of Hexham he called APP to report his position, but was instructed to 'standby' so he commenced a rate 1 (3°/sec) LH orbit. He could see a northbound passenger jet [the EMB145] above his ac, which he had spotted at a range of about 15nm and whose crew had asked the controller if his PA28 was under the control of APP. The controller advised the EMB145's crew that his PA28 was orbiting outside CAS. No avoiding action was taken as he assumed there was sufficient vertical separation and the EMB145 passed about 1000ft above his PA28 and ½nm away to starboard. He assessed the Risk as 'none'. Still flying at 3000ft, he subsequently routed back around the northern edge of the CTR changed to TOWER and then landed at Newcastle.

His ac has a white colour-scheme and the HISL was on.

ATSI reports that the Newcastle Approach Radar positions were combined. Although the controller described the traffic loading as medium at the time of the Airprox, the workload was considered as high, mainly due to the presence of a survey ac in the airspace close to final approach of the runway in use - RW07.

The EMB145 crew established communication with Newcastle APP at 2002, passing FL163 descending to FL90, towards NATEB (Newcastle Airport), within Class G airspace some 10.6nm ENE of Durham Tees Valley Airport. The flight was identified and the pilot was informed that it would be vectoring to the ILS for RW07, under a DS, which was read-back correctly. Subsequently, the aircraft was turned left heading 295° and issued with descent to FL70. The radar recordings show the EMB145, passing FL92, entering CAS (Class D of Airway P18) at 2006:10. The vertical dimensions of the airway in the vicinity, 16nm SSE of the airport, are notified as FL55-FL125. The pilot was not advised he was entering CAS or the ATC service was being changed. The MATS Part 1, Section 1, Chapter 5, Page 1, states:

'Pilots must be advised if a service commences, terminates or changes when; a) they are operating outside controlled airspace; or b) they cross the boundary of controlled airspace'.

It is not considered that this omission was a causal factor to the Airprox. The aircraft remained within Class D CAS for the remainder of the flight i.e. respectively P18, the Newcastle CTA and CTR. A further change of heading to 310° and descent to an altitude of 5000ft was instructed at 2006:50. By now, the EMB145 was passing FL82 14.3nm S of the airport. The survey ac, referred to earlier was routeing SW from the airport at 3500ft. The controller's plan was to position the EMB145 above this ac and issue further descent when the two ac had passed each other.

At 2007:58, the pilot of the PA28 called the APR reporting "*2 miles north of Hexham request rejoin*". The ac had previously departed from Newcastle squawking A3750 and had routed around the northern boundary of the CTR, retaining the allocated Newcastle code. The APR replied, "[PA28 C/S] *stand by*". The MATS Part 1, E (Attach), Page 2, states the appropriate phraseology:

'Remain outside controlled airspace. Time is (minutes). Expect joining clearance at (time).'

The APR stated that she would normally instruct an aircraft to remain clear of CAS if it was not possible to issue an entry clearance straight away. On this occasion, she did not carry out this action because her intention was to issue a joining clearance soon afterwards. She commented that she just needed a short time to formulate a suitable routeing to ensure that the PA28 would remain separated from the inbound EMB145. In the event, the APR became occupied with other traffic and did not return her attention to the PA28 as intended. The radar photograph, timed at 2007:58, shows

the PA28 - squawking A3750 - tracking SW some 13nm W of Newcastle airport indicating 2600ft Mode C (1013mb) [equating to an altitude of about 2990ft QNH (1026mb)].

In view of the survey traffic, which would be crossing the EMB145's track, the APR advised, "[EMB145 C/S] *I do have traffic in your 3 o'clock 2 miles which is affecting your descent I'll take you through the final approach track to close from the left turn right heading..3-4-0 degrees*". The pilot reported sighting the traffic on TCAS. Once clear of this traffic, the EMB145 crew was instructed, at 2009:42, to descend to 2200ft QNH. The radar recording shows the aircraft 10.5nm SW of the airport at 4700ft (1013mb) [5090ft QNH], within the Newcastle CTA, where the base is 1500ft amsl. The PA28 is shown tracking E, 2nm from the boundary of the same part of the CTA, indicating 2600ft (1013mb) [about 2990ft QNH]. The controller considered that, although the EMB145 would have to be taken through the LLZ to position the ac from the N, it would only be for a short distance and it would not conflict with the PA28. The APR intended to instruct the EMB145 crew to turn onto a closing heading for the ILS, however, at 2010:16, she passed the instruction to another ac, which was tracking S, further to the W. Both aircraft were squawking Newcastle assigned SSR codes that were not callsign converted. Realising her error, the APR cancelled the clearance with the other ac and at 2010:33, instructed the EMB145 crew to, "*stop descent altitude three thousand feet right heading 1-1-0 degrees report established*". However, she realised that this was not an appropriate heading to position the EMB145 to final approach and later amended it to heading 160° for a base-leg. Explaining that she had just repeated the instruction issued to the incorrect flight, she realised that the EMB145 would route further through the FAT than originally considered and that the PA28 was entering CAS in its vicinity.

[UKAB Note (1): The radar recording at 2010:28, shows the EMB145 passing through the FAT, descending through 3800ft (1013mb) [about 4190ft QNH], 9.9nm from the airport. The PA28, which was still outside CAS but tracking E, 0.6nm from the CTA boundary, at 2500ft (1013mb) [about 2890ft QNH] and 2.9nm NW of the EMB145.]

The APR assumed, incorrectly, that the pilot of the PA28, expecting the usual clearance to join Special VFR of not above 2500ft ALT, would have descended to that altitude already. Consequently, to achieve at least 500ft vertical separation, she decided to stop the EMB145's descent at 3000ft ALT. She did not notice that the PA28 was at an equivalent altitude of about 2890ft. With hindsight, she realised that she should have instructed the EMB145 to stop its descent as soon as possible. At 2011:00, just after the PA28 crossed the CTA boundary at 2500ft (1013mb) [about 2890ft QNH], the PA28 pilot was advised, "*you may see inbound IFR traffic in your 12 o'clock if you can make a left turn just to keep out the way please he is stopping descent*". The pilot replied "*wilco*". The phrase 'avoiding action' was not used to either flight and the pilot of the EMB145 was not informed about the presence of the PA28. The controller commented that the SSR returns of the two ac were overlapping. Although it is possible on the radar display to centre-in to an area at an expanded scale, which would allow the SSR returns to be segregated, she did not carry out that process.

[UKAB Note (2): At 2010:52, the subject ac were on conflicting tracks 1.2nm apart, the EMB145 descending through 3200ft (1013mb) [about 3590ft QNH], 700ft above the PA28 which was crossing the CTA boundary indicating 2500ft (1013mb) [2890ft QNH]. The CPA of 0.8nm occurred at 2011:08, as the EMB145 was turning R indicating 2900ft (1013mb) [about 3290ft QNH], crossing ahead of the PA28 from R – L, which was in a L turn at 2400ft (1013mb) [about 2790ft QNH]. Both ac were within the CTA at the CPA; the EMB145 being just over 1nm from the western CTA boundary. Newcastle ATC has been authorised by the CAA to use 3nm horizontal radar separation.]

The MATS Part 1, Section 1, Chapter 5, Paragraph 13.1.14, states the following guidance:

'Although aircraft operating in controlled airspace are deemed to be separated from unknown aircraft flying in adjoining uncontrolled airspace, controllers should aim to keep the aircraft under their control at least two miles within the boundary. Controllers should be aware of the operation of aircraft in adjacent uncontrolled airspace, particularly if circumstances have made it necessary to vector an aircraft to be less than two miles from the boundary.'

The APR was undoubtedly busy in the period leading up to the Airprox. Another controller was available alongside in the Approach Room and had asked if she required a second radar position to be opened. The APR explained that she had only recently achieved a Certificate of Competence. Whilst training, her mentors had encouraged her not to hand off ac to a second controller, to enable her to practice with more ac on the frequency. She commented that this made her unsure when it was necessary to open another radar position. The RTF recording showed the APR made some uncharacteristic errors in the period, including transmitting an incorrect direction of turn and contacting and responding to incorrect ac. It was reported that another controller had tried to pass advice but the APR did not believe that she had heard his comments, as she was concentrating her attention on resolving the situation. The ATSU have reminded controllers to open the second RADAR position as a matter of course.

A number of factors led to this Airprox. Although the PA28 pilot had not been instructed to remain outside CAS, he did enter the CTA without a clearance. The APR was busy at the time, which meant that she did not return her attention to the PA28 to issue a clearance as intended. This high workload could also explain why she transmitted the turn onto a closing heading, intended for the EMB145 crew, to another flight. Consequently, the EMB145 proceeded further through the LLZ than intended, resulting in a confliction with the PA28, close to the boundary of the Newcastle CTA. It would have been prudent to issue an avoiding action turn and traffic information to the EMB145 crew, which might have led to a speedy resolution of the situation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear from the ATSI report that the APR was working under a high workload, albeit perhaps, self-imposed. It was also apparent that assistance was available from her colleague in the ACR if she had chosen to accept his offer to open up another RADAR position. Whilst experienced controller Members recognised that there are occasions when it is counter-productive to split a position because it could increase the need for co-ordination, if the build up of traffic is recognised early enough then it is good practice to split a Sector before it gets too busy. In hindsight, this would have been worthwhile here, especially when unusual flights such as the survey ac are involved that was evidently an added complication. It had been reported that the APR had only recently achieved a Certificate of Competency, so Members questioned whether she was able to judge accurately when help was needed. Here was a reminder to Supervisors/ATCOs-in-charge to guard against situations where newly validated controllers might, inadvertently, allow themselves to be drawn into a difficult situation when it got very busy. A controller Member suggested that better teamwork would have been for another controller to open up the other position without waiting to be asked; the PA28 might then have been simply free-called across earlier, thereby relieving the APR of this added complication.

When the PA28 pilot requested his rejoin from Hexham although the APR was unable to issue a clearance immediately she did not advise him to 'remain outside controlled airspace', but she did not return to the PA28's situation as intended because her attention became focused on other traffic. Some Members questioned the worth of this phraseology, but at face value, it could have prevented this Airprox. The DAP advisor explained that this expression had been debated at great length and was specifically aimed at GA pilots to reduce the potential for inadvertent infringements of CAS; if the APR had not been so busy it she might well have added this caveat.

A significant factor within this Airprox was the APR inadvertently issuing the turn instruction intended for the EMB145 crew to another flight. In human factors terms, the Board considered that this was a sign of a hard-pressed controller and evidently the precursor to this Airprox. Despite the evident Mode C level of the PA28, the APR stopped off the EM145's descent at a level that did not ensure standard vertical separation above the light ac. The PA28 pilot was evidently a local operator and

thus should have been entirely familiar with the Newcastle CAS. Having flown to Hexham VRP and despite not being told to remain clear of CAS, the pilot should have recognised that he should not set course eastbound into the CTA without being given a specific clearance to enter under Special VFR. No matter that a squawk might be issued and flights identified on radar, pilots must be in no doubt that unless a specific clearance has been issued to enter the CTA/CTR using the words “cleared to enter controlled airspace” pilots must not cross the boundary. As it was, the radar recording revealed that the PA28 pilot crossed into the CTA at about 2890ft QNH at 2010:52, where the base is 1500ft ALT, without a clearance and flew eastbound into conflict with the inbound EMB145 inside Class D airspace. Pilot Members were adamant that there was no room for a mistake here - this was a fundamental principle which should be readily understood by every pilot and especially every instructor. Members agreed unanimously that the cause of this Airprox was that the PA28 pilot entered the Class D Newcastle CTA without clearance.

If the PA28 pilot had remained outside CAS, the APR could have deemed separation to exist between the light ac and the EMB145 that was legitimately manoeuvring inside the CTA. When the conflict became apparent to the APR, the controller merely advised the PA28 pilot, *“you may see inbound IFR traffic...if you can make a left turn just to keep out the way please he is stopping descent”*. It was unfortunate that the APR did not use the phrase ‘avoiding action’ when the respective turn instructions were issued; a controller Member highlighted that this was significant and stressed that controllers must use this phrase when such action was warranted – it can engender a faster response and ensures pilots are appraised of the reason for the turn which, together with TI, can ameliorate a difficult situation more rapidly. The EMB145 pilot, operating IFR, was not overtly concerned at the situation as he turned in onto the LLZ. The PA28 was shown on TCAS, probably as proximate traffic, but with 500ft of vertical separation at a range of 0.8nm turning L away from the airliner, and no RA was reported. Importantly, the PA28 pilot reported that he had been visual with the EMB145 from a range of about 15nm and, despite the eventual separation being less than ideal, it was clear to the Board that no Risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA28 pilot entered the Class D Newcastle CTA without clearance.

Degree of Risk: C.

AIRPROX REPORT No 2010015

Date/Time: 8 Mar 2010 1258Z

Position: 5301N 00029W
(Cranwell - elev 218ft)

Airspace: Cranwell MATZ/ATZ (Class: G)

Reporting Ac Reported Ac

Type: Grob Tutor T Mk1 BE200 King Air

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

Alt/FL: 400ft 600ft
QFE (1024mb) QFE (1024mb)

Weather: VMC CLNC VMC CLNC

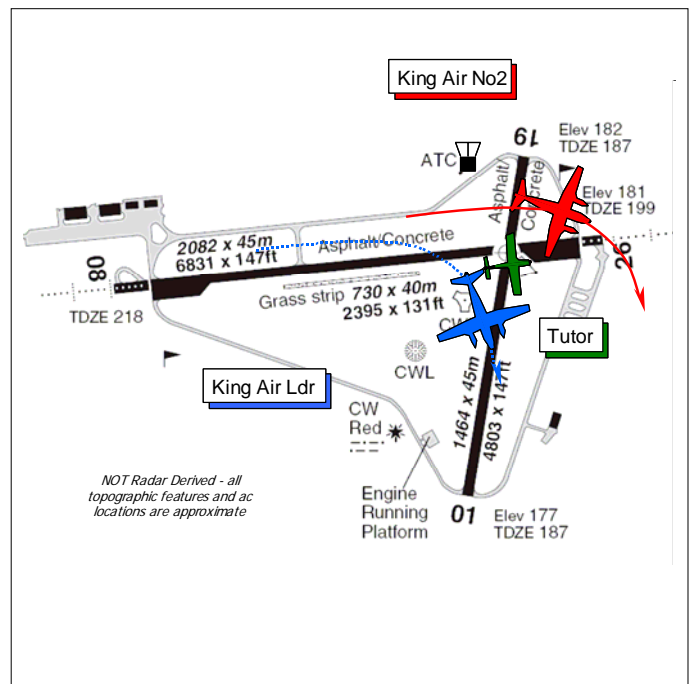
Visibility: 10km+ 10km+

Reported Separation:

Nil V/300m(No1) 100m(No2) NR

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GROB 115E TUTOR T Mk 1 PILOT, a QFI, reports he was conducting a VFR instructor-training sortie in the cct at Cranwell whilst in communication with TOWER on 125.05MHz. They were flying in the RH cct (RHC) and using the RW08 grass strip. As P-I-C he was seated in the R seat with his student instructor in the L seat. His ac has a white colour-scheme and the HISLs and landing lamp were both on. Mode S is fitted, but SSR was selected to 'standby' in accordance with unit cct procedures.

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

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

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

THE BE200 KING AIR PILOT reports he was flying as No2 of a formation of two ac inbound to Cranwell under VFR and in communication with TOWER on 125.05MHz. His ac has a white and blue colour-scheme and the HISLs were on; Mode S is fitted but SSR was selected to 'standby'.

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

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

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

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

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

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

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

This AIRPROX is not shown on the Claxby Radar recording.

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

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

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

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

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

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

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

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

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

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

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

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

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

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

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

PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: B.

AIRPROX REPORT No 2010017

Date/Time: 25 Feb 2010 1521Z

Position: 5212N 00010E (4nm NE of Cambridge A/D - elev 47ft)

Airspace: London FIR (Class: G)

Reporting Ac Reported Ac

Type: Cessna C510 Diamond DA40

Operator: Civ Comm Civ Club

Alt/FL: 1600ft 2000ft
QNH QNH

Weather: VMC CLBC VMC CAVOK

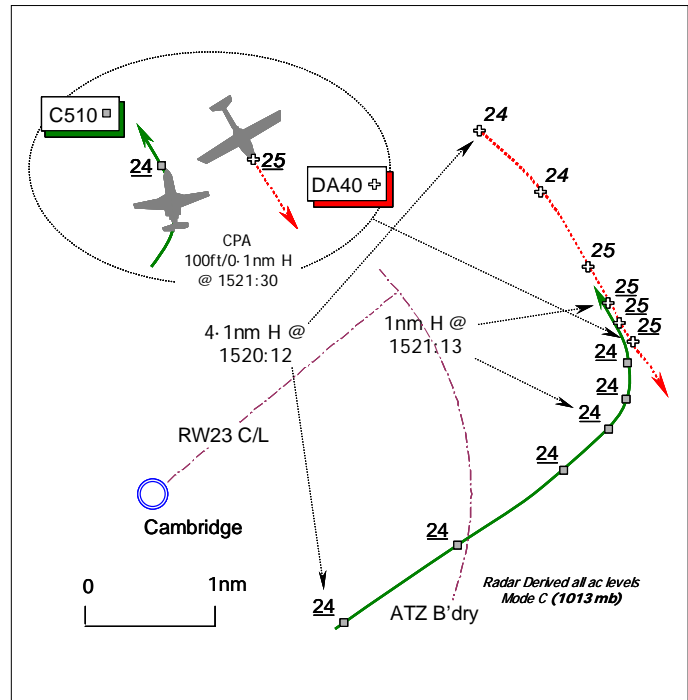
Visibility: 10km+ 10nm

Reported Separation:

100ft V/300ft H 500ft V/1-2nm H

Recorded Separation:

100ft V/0.1nm H (200yd H)



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CESSNA CITATION 510 PILOT reports he was conducting a local VFR training flight from Cambridge and in receipt of an Aerodrome Control Service from Cambridge TOWER on 122.2MHz. The local Cambridge conspicuity squawk was selected with Mode C; a Traffic Information System (TIS) – a form of TCAS I - is fitted which provides TAs only. His ac is coloured white and the HISLs and landing lights were on.

Flying at 140-150kt in VMC some 400ft below cloud at 1600ft QNH, at the end of the downwind leg for RW23 whilst turning onto L base, about half way through the turn another ac – that he thought was a PA28 but actually the DA40 - was observed flying close by in the opposite direction. He did not take avoiding action as he recognised that the other ac was not on a collision course and a T.I.S. 'avoidance alert' was heard, which indicated it was 100ft+ above them. He estimated the DA40 was 100ft above his ac as it passed on a reciprocal heading 300ft away safely down their starboard side with a 'low' Risk. He informed TOWER of the occurrence on RT, and later by phone, and he was told the other ac was working Cambridge Radar.

UKAB Note (1): The C510 cct training flight was simulating the steep London City airport approaches with the PAPIs set at a 5° glide-path.

THE DIAMOND DA40 PILOT reports he was en-route from Gamston to Biggin Hill via Earls Colne under VFR whilst in receipt of a BS from Cambridge APPROACH (APP) on 123.6MHz. The assigned squawk was selected with Mode C on; elementary Mode S is fitted.

En-route in a level cruise at an altitude of 2000ft in CAVOK, heading 120° at 110kt, he saw a twin-engine business jet to his R (West). It was first seen about 5nm away below him – he thought it was climbing - and he was a little surprised that he had not received any notification from APP that a fast jet was travelling in an opposite direction to him, near to his position. He was not aware of the Airprox until contacted by the RAC at LATCC (Mil).

UKAB Note (2): The DA40 pilot initially reported seeing a jet passing at least 1–2nm away well clear to the SE of Cambridge, which he did not consider to be an Airprox. Given the significant disparity in horizontal separation, in a subsequent conversation with UKAB Staff when the geometry of the

encounter was described in detail, the DA40 pilot opined that he had not seen the C510 when it passed 0.1nm to starboard in a position some 4nm NE of Cambridge airport.

UKAB Note (3): Both the Cambridge Aerodrome Controller (ADC) and the Cambridge Approach Radar Controller (RADAR) completed brief reports; however, as the C510 crew had not mentioned it would be reported as an Airprox at the time, they were unable to recall any additional details.

ATSI reports that the controllers' memory of events was vague. This is reflected in both of their written reports completed at a later date. Their workload was reported as being moderate.

The Airprox occurred in Class G airspace 3-9nm NE of Cambridge Airport, which has an ATZ, bounded by a circle 2½nm radius centred on the mid-point of RW23 extending to a height of 2000ft aal. The standard cct direction for RW23 is left hand. The Cambridge RW23 instrument approaches conflict with the Lakenheath & Mildenhall CMATZ and co-ordination is required with Lakenheath for each instrument arrival.

The ADC was mentoring a trainee and ATC equipment includes VDF and an ATM. The ATM provides a primary radar picture without SSR and the standard configuration is a fixed range setting of 12nm, orientated S [the RW is to the S of the Control Tower], with the runway centreline extended to 10nm. Shown on the ATM are the Duxford and Fowlmere ATZs together with Newmarket Heath and Lakenheath/Mildenhall CMATZ.

The primary radar is situated on the aerodrome and was being affected by clutter in the north-eastern quadrant, due mainly to breakthrough of permanent echoes. Consequently instrument inbounds were in receipt of a 'Traffic Service with reduced information due poor radar performance'. The SSR is supplied from the Debden Radar head and provided the RADAR controller with a stable SSR picture. The clutter also affected the aerodrome ATM display.

The 1520 Cambridge METAR was: 14009KT 9999 FEW020 09/06 Q0985.

MATS Pt1, Section 1, Chapter 11, Page 10, Para 6.1.1- comments that

Pilots flying in the vicinity of aerodromes, ATS routes, or navigational aids where it is known that a Procedural Service is provided, are strongly encouraged to attempt to establish RTF contact with the notified ATS provider.

MATS Pt1, Section 3, Chapter 1, Page 5, Para 8.2 states:

A particular watch should be kept for situations where a VFR flight may approach the aerodrome in a sector in which other aircraft are letting down on an instrument approach aid, or where sequencing is in operation. D/F indications, where available, will assist in this respect. In these circumstances the pilot of the VFR flight should not be given clearance for a straight-in approach and should be advised to avoid the initial and final approach areas.

[UKAB Note (4): The higher cct altitude, combined with a late descent for the 5° approach resulted in the C510 extending downwind for a 4nm final thereby taking the jet outside the ATZ.]

At 1459 the C510 was given take-off clearance into a left hand cct to RW23 and during the cct detail the ac was squawking A6161. Three other ac were operating in the cct, with additional activity on the aerodrome.

The DA40 was en-route on a VFR flight from Gamston to Biggin Hill with a Cottesmore squawk of A3721 set when the pilot established contact with Cambridge RADAR at 1513:45, requesting a BS. At 1514:02, the DA40 pilot advised, "[C/S]..D-A 40 1 P-O-B from Gamston to Biggin Hill via Earls Colne..1 thousand 6 hundred feet on 9-7-0 will remain clear of your zone but requesting a basic

service for transit... Cambridge RADAR agreed to provide a BS, passed the Cambridge QNH (986mb) and requested the pilot select a squawk of A6174.

The Cambridge RADAR controller could not remember the precise events but recognised that the route followed by the DA40 would take it NE of the aerodrome. The controller does not recall there being any potential conflict with traffic on the ILS. There were 4 inbound ac expected and the RADAR Controller reported that due to the trainee Tower Controller, inbound flights were being provided with tactical vectors with appropriate speed control, allowing the Tower Controller sufficient time to integrate the C510 between the instrument arrivals.

The track of the DA40 crossed through the RW23 approach 3-9nm NE of the aerodrome. The RADAR controller agreed that under normal circumstances such traffic would be notified to the ADC, however, on this occasion he could not remember doing so and was not aware that the DA40 had passed close to the ATZ. The RADAR controller believes that this may have been due to the increased workload and co-ordination required with Lakenheath, together with poor radar performance due to clutter and the garbling of SSR labels in the vicinity of the aerodrome. Radar recordings show two of the other cct ac displaying a squawk of A7000. The Radar Controller was aware of the C510 cct and agreed that passing the DA40 pilot pertinent information on the aerodrome activity and cct status would have aided the pilots SA.

At 1519 the QNH changed from 986mb to 985mb. The C510 crew had completed 3 ccts and at 1520:12, reported, "[C/S]..is..late downwind for full stop". TOWER responded, "[C/S]..roger report final number 2 following Cessna 1-7-2 short final". Traffic inbound on the ILS was now at 11.7nm and TOWER asked the C510 crew, "...are you able to keep the circuit tight - traffic on the ILS approximately 10 miles." The pilot of the C510 replied, "...we have to go out to about..4 miles to get to pick up the steep approach [C/S]", which TOWER acknowledged "Roger report final." Because the C510 was extending downwind TOWER cleared another circuiting ac to final and at 1521:30 instructed the C510 crew to, "...report final number 2 following a Cherokee turned inside you tight left base". The C510 crew responded at 1521:40, with "...roger we just passed an aircraft on the right hand side there..by about..3 hundred feet and he's at the same level." At 1521:46, TOWER acknowledged with "...roger I'll just speak to RADAR". The ADC reports that they were monitoring the cct visually and the unknown ac had not been seen. The workload in TOWER was now increasing from moderate to busy. The C510 crew did not use the term Airprox or avoiding action and neither of the controllers was aware of the close proximity of the two ac.

At this point a conversation was initiated by the RADAR controller, interrupted a number of times by RT calls. RADAR advised TOWER that another inbound ac was about 3nm to the S [actually to the SW] routing to the overhead. TOWER [incorrectly] assumed this to be the aircraft reported by the C510 pilot and advised RADAR that the C510 crew had seen this ac at about 300ft away laterally. RADAR responded that the pilot of the other inbound ac [approaching from the SW] had been asked to climb and agreed to transfer the other ac to TOWER. Before the call was ended, the RADAR controller passed the range on 2 further inbounds - at 8nm and 13nm.

The radar recordings at 1521:30, show the C510 3-9nm E of the aerodrome in a L turn onto base leg, indicating FL024 [about 1560ft QNH (985mb)], with the DA40 100ft above it on a reciprocal track passing 0.1nm [200yd] to starboard, indicating FL025 [about 1660ft QNH (985mb)]. Neither controller was aware of the close proximity of the 2 ac. The C510 continued within the cct and landed at 1524 with no further mention of the incident. The pilot of the DA40 did not mention on RT another ac being in close proximity and at 1527:45, the DA40 pilot switched en-route - "Cambridge RADAR [C/S]..well clear of your Zone now request..frequency change to Earls Colne 1-2-2 decimal 2-5", which was approved without further comment.

TOWER was not aware of the DA40 transiting close to the ATZ and reports that no traffic information had been passed by the RADAR controller. In addition, the ATM does not have SSR capability and the primary return of the DA40 would not have been detected easily because of the 'clutter' from permanent echoes. At the time of the Airprox, TOWER's attention was concentrated on the busy

visual cct. The Cambridge MATS Pt2 states that controllers must always be mindful that when operating as ADC the primary method of observation is visually from the VCR.

RADAR did not notice the C510 or DA40 in close proximity either before or after the Airprox and considered that clutter on the display, together with garbling of the SSR labels and additional workload may have prevented detection of the potential confliction.

MATS Pt1, Section 1, Chapter 11, Page 4, Para 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.’

MATS Pt1, Section 1, Chapter 11, Page 4, Para 3.5.1 states:

‘Pilots should not expect any form of traffic information from a controller, as there is no such obligation placed on the controller under a Basic Service outside an Aerodrome Traffic Zone (ATZ), and the pilot remains responsible for collision avoidance at all times. However, on initial contact the controller may provide traffic information in general terms to assist with the pilot’s situational awareness. This will not normally be updated by the controller unless the situation has changed markedly, or the pilot requests an update. A controller with access to surveillance derived information shall avoid the routine provision of traffic information on specific aircraft, and a pilot who considers that he requires such a regular flow of specific traffic information shall request a Traffic Service. However, if a controller considers that a definite risk of collision exists, **a warning may be issued** to the pilot.’

MATS Pt1, Section 3, Chapter 1, Page 3, Para 4.1.1 states:

Approach Control shall co-ordinate with Aerodrome Control:

- a) Aircraft approaching to land, if necessary requesting clearance to land;
- b) Arriving aircraft which are to be cleared to visual holding points;
- c) Aircraft routeing through the traffic circuit.

TOWER was not aware of the DA40 passing through the final approach and was, therefore, not in a position to pass appropriate TI to the pilot of the C510. The ADC was monitoring a busy cct visually and would only have referred to the ATM occasionally in order to correlate an impending inbound and assess the distance from touchdown. The ATM was displaying a primary radar picture that was itself cluttered with permanent echoes that would have made it difficult to notice another moving primary contact. If SSR had been available on the ATM, then TOWER with the short-range display would have been alerted to the potential conflict. An upgrade to provide the ATM with SSR capability is scheduled before the end of 2010.

It is unfortunate that the RADAR Controller did not provide the DA40 pilot with pertinent information on the aerodrome cct activity, as this would have aided the pilot’s SA considerably. The RADAR Controller cannot recollect the exact events but believes that clutter on the radar displays and garbling of the SSR labels around the aerodrome made it difficult to monitor the DA40. The additional co-ordination required with Lakenheath may have been distracting at a time when the DA40 was passing NE of the aerodrome. Inbounds were being advised about reduced TI due to poor radar performance. Radar recordings provided by Swanwick do not reflect the Cambridge primary radar picture on the day, although the SSR feed would be the same. It is difficult to assess the impact that these factors had on the RADAR controller’s ability to monitor the progress of the DA40 as it passed through the final approach, close to the ATZ. It is considered probable that the human factors issues associated with radar performance, distraction and workload priority, resulted in the DA40, in receipt of a BS, passing close to the ATZ unobserved by the RADAR Controller.

The Radar controller was familiar with the general route to be flown by the DA40. Pilots flying in the vicinity of aerodromes are strongly encouraged to attempt to establish RT contact with the notified ATS provider. It would therefore, have been appropriate, on initial contact, for the controller to have provided TI, in general terms, to assist with the pilot's situational awareness regarding aerodrome activity. This was a missed opportunity on the part of the controller that could have provided an early warning to the pilot and thus influenced the routing and flight profile of the DA40 pilot. Both flights were operating VFR in Class G airspace and were ultimately responsible for their own separation and collision avoidance.

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 authority.

It was evident that the unusual cct pattern flown by the C510 to achieve the steep angle of approach had necessitated the ac flying well outside the conventional downwind cct area to pick-up the desired glide path. Thus well outside the normal sanctuary afforded to cct traffic by the ATZ, in unregulated airspace, the C510 crew had to rely on visual acquisition of transiting traffic in addition to any information on aerodrome traffic provided by TOWER. The ATSI report makes it clear that the ADC had not been apprised of the DA40's transit in the vicinity of the aerodrome by RADAR. Neither was the ADC aware of the potential conflict to the NE of the airport from the ATM. Consequently, the ADC was unable to provide any warning about the other ac before the C510 pilots spotted the DA40 themselves, passing an estimated 300ft to starboard during their base-leg turn. The C510 pilots were thus unaware of the DA40 until that point, so whatever separation that did exist was purely fortuitous. The Board agreed unanimously that this late sighting by the C510 pilots was part of the Cause.

The ATSI report highlighted that the DA40 had apparently passed close to the ATZ unobserved by the RADAR Controller. Aware that the DA40 pilot's intended routing would take it close to the aerodrome, it should have been plain to RADAR that the DA40 would potentially conflict with the C510's extended ccts downwind that he was sequencing other IFR traffic around. Whilst RADAR might have been distracted by other higher priority tasks, and the reported radar clutter had possibly masked the conflict, if the opportunity had been available, it would have been appropriate for RADAR to co-ordinate the DA40's routing through the extended visual traffic circuit with the ADC.

Under the provisions of a BS there was no obligation upon RADAR to pass radar-derived TI to the DA40 pilot about the C510 and Members were keen to emphasise that if such radar assistance was required then a TS should be requested. Here, however, RADAR's priorities might have been the other IFR inbounds and he might not have had the capacity to offer a TS to transit traffic. Nonetheless, a general warning about visual cct traffic extending 4nm downwind at 1600ft QNH would have been beneficial; it was unfortunate that RADAR did not pass such a warning as it might well have prevented this Airprox.

The Board was apprised of the DA40 pilot's subsequent comments that he did not consider that the weather conditions were such that a TS was warranted and that he expected to be able to fulfil his responsibilities to 'see and avoid' other ac in Class G airspace without radar assistance from ATC. A GA pilot Member noted that when passing close to an aerodrome it was always worthwhile looking into the cct area to try and see arriving or departing traffic. Indeed pilots in transit close to aerodromes are encouraged to call for an ATS and here the DA40 pilot did just that. Therefore, it was unfortunate that he did not receive any benefit from it and he flew by unaware of the close quarters situation with the C510. The Members agreed that the non-sighting by the DA40 pilot was the other part of the Cause.

Turning to Risk, it seemed that the C510's TIS had not alerted the pilots beforehand and, although they had spotted the other ac late, in the reporting pilot's view it had passed safely down their

starboard side with a 'low' Risk. As he was unsighted, neither was the DA40 pilot able to affect the outcome of this close quarters encounter. At these distances with only 100ft of vertical separation as the two ac passed a mere 200yd apart the Board concluded that the safety of the ac involved had certainly been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the DA40 pilot and a late sighting by the C510 pilots.

Degree of Risk: B.

AIRPROX REPORT No 2010018

Date/Time: 5 Mar 2010 1150Z

Position: 5155N 00255W (18nm NE BCN)

Airspace: N862 (Class: A)

Reporter: Cardiff APR

Type: 1st Ac B737-800 2nd Ac F15E

Operator: CAT Foreign Mil

Alt/FL: FL160 (N/K)

Weather: VMC CLOC VMC

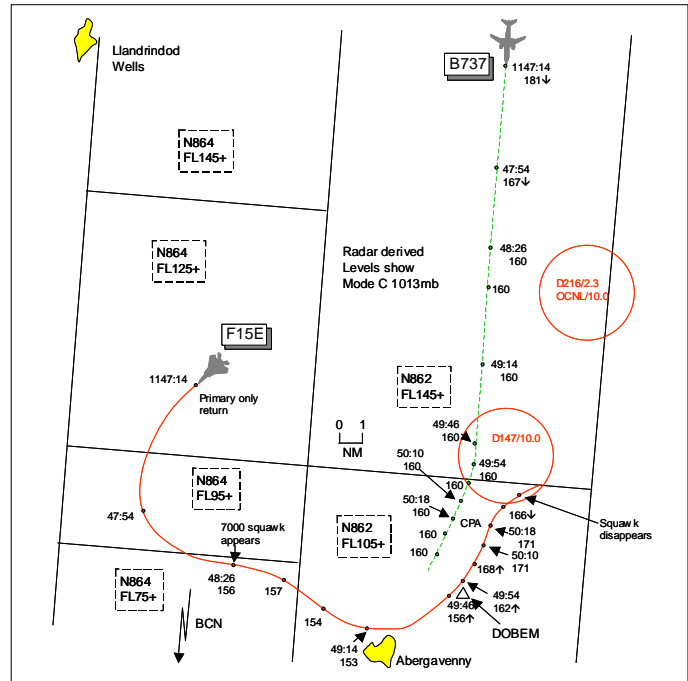
Visibility: 25km

Reported Separation:

ATC 1000ft V/2nm H
500ft V/2nm H 1000ft V/2nm H

Recorded Separation:

1100ft V/1-6nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CARDIFF RADAR CONTROLLER reports that he was instructing a low time trainee and, just before the incident, had taken over the RT from the trainee to resolve an unrelated situation developing near BCN. The B737 was inbound to Bristol from the N and was placed on a radar heading against outbound traffic from Bristol that was joining airway L9 W'bound. As the B737 passed RILES an unknown intermittent contact appeared on radar about 8nm SW of the B737 tracking E'bound at >300kt and it briefly indicated FL150. At this point he thought the ac might have been infringing CAS but that it posed no hazard to the B737 owing to its E'ly track. He left the B737 on its present heading as he thought it was the best course of action at this stage. The unknown contact was then observed to turn NE'bound still at FL150 (intermittent Mode A and C) so he turned the B737 R onto heading 210° to take it away from the unknown contact's predicted track. When about 6nm S of the B737 the unknown traffic then turned towards the B737 and began to climb, the B737 pilot reporting that he had 'TCAS' traffic range 5nm and then an unintelligible phrase relating to 'avoiding'. He believed this reference to 'avoiding' and 'TCAS' meant that the B737 was following his own response to a TCAS RA so he told the pilot that it was unknown traffic, possibly military, and to continue as required to avoid. The pilot elected to continue on the assigned heading and remained at FL160 before reporting visual with the other ac, commenting that it was a military type. There were intermittent Mode C readouts as the unknown traffic passed 2nm E and 1000ft above the B737, before it then descended about 3nm behind the B737, indicating FL166. After this the Mode A and C readout from the unknown traffic were no longer visible and the primary contact also disappeared shortly thereafter.

THE B737 PILOT reports inbound to Bristol IFR and in receipt of a RCS from Cardiff on 125.85MHz, squawking an assigned code with Modes S and C. During the level phase of their arrival about 25nm N of Bristol at 250kt and FL160 Cardiff issued a radar heading 180° before they noticed traffic on TCAS at FL150 about 6nm ahead of them closing relatively quickly. The target then proceeded to climb and then it generated a TA but they only saw the other ac, a grey coloured twin-tailed military ac, probably an F15, as it passed their 9 o'clock position range 2nm about 500ft above. At the time the visibility was 25km flying clear of cloud in VMC. They queried the traffic but radar did not know who it was so they confirmed to ATC that it was a military jet. ATC asked whether they had had a

TCAS RA to which they replied 'negative'. No avoiding action was required as the TA never became an RA and the jet had manoeuvred away from their flightpath before any avoiding action was required. He assessed the risk as high as the controller was not aware of the other ac.

THE F15E LEAD PILOT reports flying a 2-ship incentive flight with a briefed plan to conduct low flying and general handling in Wales. The visibility was >10nm in VMC and the ac was coloured dark grey with HISLs switched on. Since this was an incentive flight for non-aircrew members in the back seats of both ac, the normal electronic maps and airspace overlays were not available to the pilots in flight, nor were there the normal tapes or recorders to review the flight after landing. Positional SA was only from the paper maps carried. After low-flying the formation split to conduct separate General Handling and on conclusion they were executing a flight rejoin when the Airprox occurred. His ac was in the Llandrindod Wells area whilst the No2 ac's pilot reported his position N of turning point 5 (N of Abergavenny), which was about 20nm to his SE, so he headed in that direction for the rejoin. Enroute to the position stated by the No2 pilot at 300kt, he looked at the chart to reference the green airspace lines; however, he wrongly identified the Western boundary of CAS and was flying above the 12500/9500ft base in the Western half of CAS. During this period he was using radar to locate the No2 ac and he had radar contact with other ac in the area. One of these was the subject B737 at 15nm radar range followed by visual acquisition at 5-7nm; visual separation was maintained with the B737, which passed 2nm away and 1000ft below, whilst he manoeuvred to rejoin with the No2. Approaching Abergavenny he recognised the airspace error and commenced a descent back into the low-flying structure. He completed the rejoin and proceeded W along the planned route towards turning point 6 (10nm N of Carmarthen). Approaching point 6 the flight reached 'bingo' fuel and began a climb to RTB, which was completed uneventfully. He assessed the risk as low.

ATSI reports that the Airprox was reported by the Cardiff Radar controller and occurred at 1150:18 on Airway N862, Class A CAS, at FL160 in the vicinity of DOBEM. The B737 was in receipt of a RCS from Cardiff Radar on frequency 125.85MHz. The B737 was inbound to Bristol from Belfast City and was released by London TC on a heading to provide separation from a Bristol outbound joining the airway. Shortly before the B737 flight called Cardiff, radar recordings (Clee Hill) show a number of unknown contacts operating in the area. Three of significance are high speed with one displaying 7000 Mode A only and two others showing as primary radar contacts without SSR. The subject F15E, an unknown ac at the time, is one of the primary contacts.

MATS Pt1, Section 1, Chapter 5, Page 11 states '*...aircraft operating in controlled airspace are deemed to be separated from unknown aircraft flying in adjoining uncontrolled airspace...*'. At 1147:10 the B737 flight called Cardiff Radar, "*Cardiff good day from B737 c/s descending one six zero AMRAL*" and ATC replied, "*B737 c/s roger*". At this point the radar recordings show the subject F15E as a primary only contact 18nm to the SW of the B737 tracking away to the SW. The Cardiff Radar controller reports observing the contact turn onto an E'y track and briefly indicate FL150 with intermittent Mode A and C at a speed of approximately >300kt. The controller determined that the ac might be an infringer, but on the E'y track it posed no hazard. At 1148:26 radar recordings show the unknown contact displaying a squawk of 7000 indicating FL156, 17nm SW of the B737 indicating FL160.

At 1149:10, in the belief that the unknown contact was not a threat, the controller instructed the B737 flight to, "*...continue present heading*" but then observed unknown traffic turn onto a NE'y track and at 1149:45 instructed the B737 flight to, "*...turn right heading two one zero degrees*". This was correctly readback by the B737 crew followed by, "*Confirm er we got TCAS traffic in front five miles....?????..avoiding*". The transmission from the pilot using the term 'TCAS' followed by an 'unintelligible word' and 'avoiding', led the controller to believe that the B737 was responding to a TCAS RA. The controller replied, "*B737 c/s roger that's unknown traffic and continue as you wish.*" The B737 crew advised, "*Okay er two one degrees err we're keeping an eye on him B737 c/s*". At 1149:54 radar recordings show that the required separation had been lost with a minimum distance of 4.9nm and 200ft, with both ac closing. At 1150:08 the controller updated the B737 flight, "*B737 c/s yeah tha - that's unknown traffic believed to be military traffic just climbing now through flight level one seven zero*" and the B737 pilot replies, "*Yeah we got err the traffic in sight now thanks*".

[UKAB Note (1): At 1150:10 radar recordings show the 2 ac on opposite direction but parallel tracks a range of 2nm with the B737 at FL160 and the unknown contact indicating FL171. The CPA occurs on the next sweep at 1150:18 as the subject ac pass port to port at a range of 1.6nm in level flight with vertical separation of 1100ft. The next sweep 8sec later shows the unknown ac commencing a R turn and a descent before the SSR disappears on the next sweep.]

The B737 was then given descent for a normal approach into Bristol. Tracing action was taken and it was later confirmed that the unknown traffic was an F15E.

The controller had considered that the pilot of the B737 was following a TCAS RA. This may have caused the controller to allow the pilot to continue as he wished rather than give what would have been appropriate avoiding action in order to achieve the required separation minima.

MATS Pt1, Section 1, Chapter 5, Page 9, Use of Mode C for Vertical Separation states '*Aircraft Under a Radar Control Service: If the intentions of Mode C transponding aircraft are not known, the minimum separation must be increased to 5000 feet. Unverified Mode C data may be used for separation purposes provided a minimum vertical separation of 5000 feet is maintained and radar returns, however presented, are not allowed to merge.*'

MATS Pt1, Section 1, Chapter 5, Page 13, Unknown Aircraft states: '*The action to be taken by controllers when they observe an unknown aircraft, which they consider to be in unsafe proximity to traffic under their control, in various types of airspace is as follows: in Class A, C and D airspace - If radar derived, or other information, indicates that an aircraft is making an unauthorised penetration of the airspace, is lost, or has experienced radio failure – avoiding action shall be given and traffic information shall be passed.* *'When avoiding action is issued to an aircraft under a Radar Control Service, controllers must seek to achieve the required minima and pilots must comply with the instructions given, even if they report visual with the other aircraft. It is recognized that it may not always be possible for controllers to achieve the required separation minima against unknown traffic infringing controlled airspace due to the potential for their sudden appearance and/or unpredictable manoeuvres; however, controllers shall apply all reasonable endeavours.*'

HQ 3AF comments that the Airprox, thanks to the F-15E lead pilot's candid report, would appear to be the result of a basic navigational error by a pilot accustomed to having a WSO in the back seat. Moreover, a WSO, in addition to operating the ac's suite of navigation aids, adds significantly to the overall SA of the crew. Nevertheless, and notwithstanding his unauthorised penetration of Class A CAS, the pilot acquired the B737 on radar at 15nm and subsequently kept it in sight until clear but understandably, neither the Cardiff APR nor the B737 crew was aware of the fact.

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.

Although Members agreed unanimously that the cause was the unauthorised penetration of CAS by the F15E pilot, the Board discussed at length some underlying points uncovered during the investigation. First, the Cardiff Radar Controller had placed the B737 on a tactical heading, which was changed to 210° when he saw the F15E radar return turn NE'ly. However, after receiving the B737 crew's transmission mentioning 'TCAS' and 'avoiding' with an unintelligible word between, the Cardiff Radar Controller had believed that the B737 crew were responding to a TCAS RA so he had deliberately elected not to issue any positive control instructions when separation was lost. Members agreed that some phraseology used by aircrew when mentioning TCAS could be potentially misleading particularly if coupled with poor RT. Examples mentioned, which are routinely used/heard during RT exchanges, are when TI is passed by ATC and the response from aircrew is 'TCAS contact' or 'we have traffic on TCAS'. Standard ACAS/TCAS phraseology only mentions the word TCAS in 2 phrases - 'TCAS RA' or 'unable, TCAS RA'. Members believed that if there was any doubt

about the crew's intention, the controller should have asked for clarification. A commercial pilot Member opined that pilots reacting to RA demands might be unable to provide immediate clarification. In this incident the controller could have issued 'avoiding action' against the F15E and if the crew were unable to comply owing to a TCAS RA event, they would have reported it. As Members were concerned that pilots could potentially mislead controllers and there appeared to be a need for controllers to be able to clarify the TCAS status of a flight, Members agreed that a recommendation should be addressed to the CAA and MoD to remind pilots of the need to comply with correct phraseology and to remind controllers of the need to seek clarification of any RT transmission that is unclear.

It was unfortunate that the F15E pilot had not taken due regard of the airspace prior to climbing out from low-level, something that military pilot Members opined should have been taken into account during the pre-flight planning process. The pilot was flying in the area he had planned to be in and the CAS boundaries/base levels are clearly depicted both on the UK Military low-flying charts as well as on the RAF enroute chart.

Turning to risk, the Radar Controller had noticed the CAS penetration very quickly after the F15E's SSR appeared on his display and had monitored its track, giving tactical headings intended to keep the B737 clear of the F15E's predicted flightpath. Members could not reconcile why the F15E's squawk only appeared for 2min when it was thought that it should have been showing for some time both before and after the CPA. However, when the B737 flight was given its second radar heading and the crew informed the Radar Controller of their TCAS contact and 'avoiding', the controller advised the crew that it was unknown traffic and to "...continue as you wish". The B737 crew had acquired the F15E on TCAS and monitored its flightpath which generated a TCAS TA and did not require 'avoiding action' to be taken, the F15E being visually acquired as it passed 2nm away to their L and 500ft above. The F15E pilot had established radar contact on the B737 at 15nm as he manoeuvred his ac to rejoin with his No2, sighting the airliner at 5-7nm and taking visual separation against it, climbing 1000ft above it and 2nm clear. Although this had had the potential for being a more serious conflict, the visual sighting by the B737 crew and the action taken by the F15E pilot was enough to allow the Board to conclude that any risk of collision had been quickly and effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The F15E pilot entered CAS without clearance and flew into conflict with the B737.

Degree of Risk: C.

Recommendation: The CAA and MoD are recommended to:

- 1) Remind pilots to comply with standard phraseology in order to minimise the possibility of misleading controllers about TCAS contacts and reactions.
- 2) Remind controllers to seek clarification whenever a received transmission is ambiguous.

AIRPROX REPORT No 2010020

Date/Time: 1 Mar 2010 1604Z

Position: 5253N 00023W (7½nm
SE of Barkston Heath -
elev 367ft)

Airspace: Lincolnshire AIAA (Class: G)

Reporting Ac Reported Ac

Type: Grob Tutor T Mk1 Tornado GR4

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

Alt/FL: 3500ft↓ 3500ft
QFE (998mb) QNH (1012mb)

Weather: VMC VMC

Visibility: >20km 20km

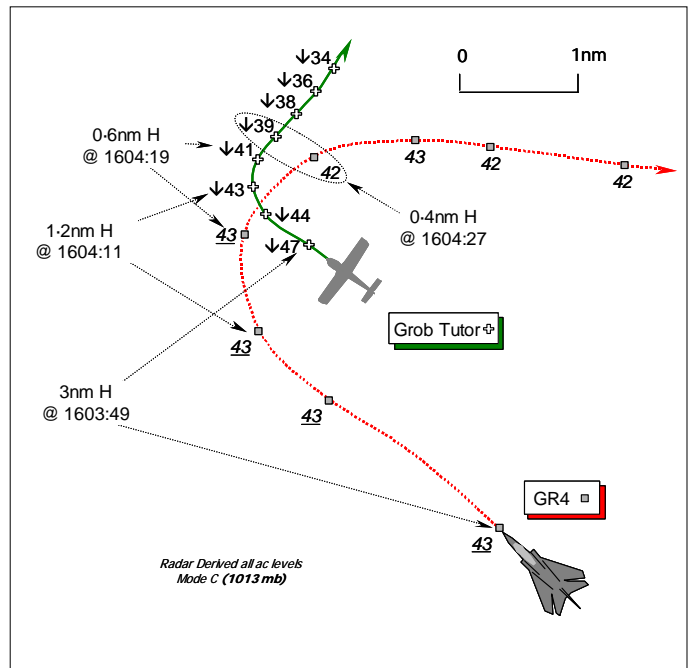
Reported Separation:

50ft V/100-150m H Not seen

Recorded Separation:

300ft @ 0.4nm Min H

1.2nm H @ nil V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GROB 115E TUTOR T Mk1 PILOT, a QFI, reports he was flying VFR in CAVOK conducting an instrument training sortie under simulated IFR for his student who was flying the Tutor for a radar recovery to Barkston Heath for an SRA. They were in receipt of a TS from Cranwell APPROACH (APP) on UHF and the assigned squawk of A2620 was selected with Mode C on; elementary Mode S is fitted.

During the recovery they complied with an instruction from APP to descend from 6000ft to 1800ft Barkston QFE. About 8nm SE of Barkston Heath heading 030° at 100kt, descending through 3500ft QFE (998mb) [about 3950ft (1013mb)], he identified a fast-jet closing from astern, which passed to starboard at the same height whilst banking hard to the R in a descending turn. He took control of the aeroplane from his student and advised APP of the Airprox. The jet – a grey Tornado – was first seen 100-150m away and passed some 50ft above his Tutor at the closest point with a 'high' Risk of a collision. He did not take avoiding action himself as the Tornado was seen to be taking action, he thought. The SRA into Barkston Heath was then completed without further incident.

The ac has a white colour-scheme; the HISLs and landing light were on.

THE TORNADO GR4 PILOT reports they had transited the Cranwell/Coningsby gap, VFR and in receipt of a TS from Waddington APP. During this transit they received TI on a contact in their 12 o'clock (due south), which they identified as a Tutor ac, northbound and well above them [not the subject Tutor]. Having completed the low-level portion of the sortie they climbed the ac whilst they discussed the pre-requisites of conducting a 'Show of Force' (SoF) into Holbeach Range - EGD 207. During the climb, they terminated the TS from Waddington APP and free-called Holbeach on Range Secondary prior to range entry. They circled [L] at 4000ft QNH (1012mb) at 350kt in VMC, whilst RT and pre-range/SoF checks were completed, before turning R and heading eastbound into Holbeach Range, descending to 2000ft in the process. At no stage were they aware of their proximity to any other traffic during the transition from Waddington APP to Holbeach Range Secondary or whilst descending from 4000 to 2000ft amsl.

UKAB Note (1): The GR4 crew had already switched from Waddington APP, and subsequent to loitering some 12-15nm SSE of Barkston Heath - and SSE of the Airprox location - the Airprox occurred as they were setting course eastbound towards Holbeach Range.

THE CRANWELL APPROACH CONTROLLER (APP1) reports that he was handing over the operating position to the relief controller, having been on console for 2 hours. He was acting as a mentor to a trainee controller who had been working within his capacity, the IFR traffic having decreased from 3 tracks to 2. His trainee was concentrating on another ac close to the Tutor operating at a similar level, but not a threat. [UKAB Note (2): At about the time of the position handover at 1604:18, another Tutor is shown 1½nm E of the subject Grob Tutor, westbound maintaining FL88.] He – the mentor - completed the hand over of the position to the relief controller. At no time was the conflicting ac seen prior to the Tutor pilot declaring an Airprox.

THE CRANWELL APPROACH CONTROLLER (APP2) reports that he was in the process of taking over the Approach position from an experienced mentor (APP1) and his trainee controller. Prior to plugging in, APP1 provided a brief of the traffic situation: a King Air downwind in the Cranwell radar pattern and a Tutor about 10nm SE of Barkston Heath, heading 030° in the descent to 1800ft QFE. Once content with the overall scenario, APP1 unplugged and he plugged in. As the trainee was unplugging he sat down whereupon the Tutor pilot reported a close Airprox with a Harrier and asked if he had seen anything. At the time of the handover there was no traffic that was deemed to be conflicting with the 2 ac on frequency, and therefore he did not ascertain whether any TI had been passed to the Tutor crew. There was a considerable amount of garbling of squawks and label overlap and he had to rotate the SSR labels prior to being able to respond with TI on what he perceived to be the reported ac (the only fast moving contact in that vicinity) which was wearing a range squawk and tracking away to the E indicating FL41 Mode C. At this point the Tutor was indicating FL31 Mode C.

THE CRANWELL ATC SUPERVISOR reports that the Watchman ASR and MSSR were fully serviceable; the Watchman Ground Clutter Filter (GCF) was selected on. The Cranwell Aerodrome Weather State Colour Code (CC) was: BLU – min 8km; lowest cloud SCT 2500ft agl; the workload on the Unit was assessed as 'low'. After arranging a controller change for APP, at the time of the position handover he was dealing with an administrative issue. After this had been dealt with the UHF APP RT frequency - Stud 5 - was then selected for monitoring purposes, whereupon the Grob Tutor crew immediately reported the Airprox. The other ac – the GR4 - appeared to be a fast moving contact, well above and passing behind him.

HQ AIR ATM SAFETY MANAGEMENT reports that the Tutor was recovering to Barkston Heath under a TS from Cranwell APP on UHF 280.775MHz. The initial vectoring for the Tutor crew was given by a trainee controller under instruction from an experienced mentor – APP1. At 1602:26, the Tutor crew called Cranwell APP, "*Cranwell APPROACH [C/S] request radar recovery to Barkston with Juliet*". The Tutor crew was asked to report their position, to which they responded "*squawking 2-6-2-0 [C/S] a Tutor 2 P-O-B currently 5 miles south east of Barkston heading 3-0-0 flight level 5-0 request traffic service radar to SRA*". At 1603:02 a TS was applied and the Tutor crew was instructed to descend to a height of 1800ft QFE (998mb). The conflicting ac – the Tornado GR4 - was about 6½nm SSE of the Tutor in a L turn at this point, squawking A7002 [Danger Areas General that was selected at 1600:26 - 4min before the CPA] and indicating FL49 Mode C [deemed verified]. At 1603:42, when the GR4 was about 5nm SE of the Tutor heading NW, the Tutor crew was instructed to turn R onto a heading of 030°. Between 1603 and 1604:18 various transmissions were made in relation to the SRA but no TI was given. At 1604:11 the conflicting Tornado was 1.2nm S of the Tutor just commencing a R turn. The handover of the APP control position was carried out at about 1604:18, when another experienced controller – APP2 - took over responsibility for the position from APP1. At 1604:19, the radar recording shows the Tornado GR4 turning R through NE indicating FL43 – 0.6nm astern and 200ft above the Tutor – the latter descending through FL41. [UKAB Note (3): The CPA occurred at 1604:27, as the Tornado GR4 passed 0.4nm abeam the Tutor that had steadied on 030°; vertical separation of 300ft Mode C was apparent, the Tornado GR4 indicating FL42 some 300ft above the Tutor that was descending through FL39.] From this point the range opens but still no TI was given. At 1604:30 the Tutor crew reported "[C/S] *we've just had a..close*

Airprox..with a Harrier [sic – but actually the GR4] did you see him on radar?’. APP responded “[Tutor C/S] traffic now indicating East of your position 3 miles tracking East 4 thousand feet descending”, whereupon the Tutor crew reported the Airprox on the RT.

This Airprox occurred in Class G airspace between traffic under a TS and the GR4 operating VFR without an ATS. The incident was further complicated by the controllers involved conducting a position handover in the time frame of the Airprox - initially by the trainee as part of his training and then completed by his mentor. No TI was passed on the fast moving VFR traffic. From the controllers’ accounts, it would appear that the CPA and turn that caused the Airprox happened during the handover. This Command believes that there was ample time before the handover to call the traffic and, given the speed and direction of the GR4 towards the Tutor, would have been best practice. It is clear that the process of a trainee handing over a control position was a contributory factor to this Airprox. It is also noted that due to the difference in performance of the ac involved and the geometry of the encounter, it would have been difficult for the crew of the Tutor to take effective avoiding action against the fast-jet, even with accurate and timely TI. Shortly before the CPA the much faster jet turned directly at the Tutor and passed close enough to cause concern.

SATCO Cranwell has highlighted the issues surrounding this Airprox in a recent Unit Standards Bulletin; controllers have been reminded to pay particular attention to the traffic situation during the handover of operating positions. This Command has also recommended that this scenario is incorporated into Unit training simulations.

HQ AIR (TRG) comments that under a TS the Tutor crew could have expected TI on the Tornado. The GR4 crew were going about their business VFR and it seems that they did not see the Tutor. With a recorded minimum horizontal separation of 0.4nm there was little Risk of collision but as the Tornado approached from behind the Tutor, the crew may have been concerned by the fast moving GR4 passing close aboard.

HQ AIR (OPS) comments that, while it is disappointing that TI was not passed to the Tutor concerning the GR4, it would not have materially changed the circumstances of the reported Airprox. The GR4 maintained a traffic service until required to change to the range frequency; the reported position of the Airprox is less than 2min flying time from the range boundary and the crew would have needed to be talking to the range. It is unclear whether the GR4 saw the subject Tutor or not; they report seeing a northbound Tutor and avoiding it but there is no certainty that the Tutor they saw was the subject aircraft. Additionally the GR4 crew were not aware of a proximate pass. However, just inside ½nm is not unreasonable if visual and this may be a matter of perception. If the subject Tutor was indeed seen by the GR4 then there was no risk of collision, and the Tutor perceived the proximity of the GR4 to be too close.

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.

It was clear from the radar recording that the Grob crew were not able to see the GR4 approaching from astern without any prior warning from APP, until it overtook them on the starboard side. A military controller Member was disappointed that the controllers had not spotted the GR4 and that TI had not been passed in this situation. With three pairs of eyes focusing on the display at various stages during the handover of the operating position it was surprising that none had detected the GR4 closing steadily on the Tutor from the S. The Board was briefed that no fewer than 6 other Tutor ac were operating to the E of the Airprox location at the time, so there was a lot to look at and assimilate, plus significant potential for SSR label overlap to mask the presence of the GR4 after the CPA, but the GR4 was readily discernable as it approached from the S. Moreover, the GR4 had spent over 4min loitering to the S of the Airprox location before heading N and then E into the range, so the effectiveness of the controllers’ scans and consequently the TS provided to the subject Tutor

crew was questionable. Clearly there is plenty of scope for distraction during a position hand-over by a trainee controller, but this should not be detrimental to the overall provision of the ATS and a lesson to all Mentors who must guard against this.

The HQ Air Member explained that the GR4's holding position was not an unusual location prior to range entry for a SoF exercise. Whilst recognising that the crew would need to be speaking to the Range Controller before entry, an HQ Air Member opined that holding at about 4000ft ALT adjacent to the southern boundary to the Lincolnshire AIAA, with the preponderance of training ac operating in the vicinity, it might have helped the GR4 crew's SA if they had obtained a TS, but clearly it remained the crew's responsibility in this Class G environment to 'see and avoid' other ac. The HQ Air Trg Member reinforced the Command's view that with the GR4 approaching from astern of the Tutor, even if Cranwell APP had passed TI then it might have had little impact on the outcome. There was not a lot the Tutor QFI could do if he could not see the traffic beforehand apart from request further updates as any sudden manoeuvre to help acquire the jet visually might have placed him in a worse predicament. Nevertheless, if the Tutor crew had been forewarned, when they eventually sighted the jet to starboard, it would not have been so much of a surprise. The HQ Air pilot Member opined that fast-jet pilots might not necessarily be concerned at the separation distances replicated by the radar recording here. The CPA of 0.4nm was not in his view a close call and it was not entirely clear if the GR4 crew actually saw the Tutor and discounted it as being too far away to be of concern, or alternatively, they did not see it at all. With a very small cross-sectional area Tutor ac are notoriously difficult to see and even more so when viewed stern-on. The consensus was that the GR4 crew probably had not seen the small white training ac, initially tail-on with little crossing motion to draw attention to it, as throughout their R turn to the E they would have been 'belly-up' to the Grob. The Board agreed that this Airprox had stemmed from a conflict in the Lincolnshire AIAA, but at the distances recorded here no risk of a collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the Lincolnshire AIAA.

Degree of Risk: C.

AIRPROX REPORT No 2010024

Date/Time: 24 Mar 2010 1706Z

Position: 5244N 00135W
(Lichfield Corridor)

Airspace: Y53 (Class: A)

Reporting Ac Reported Ac

Type: DHC-8 Hawk

Operator: CAT HQ AIR (TRG)

Alt/FL: FL170 FL160

Weather: IMC CLAC IMC KLWD

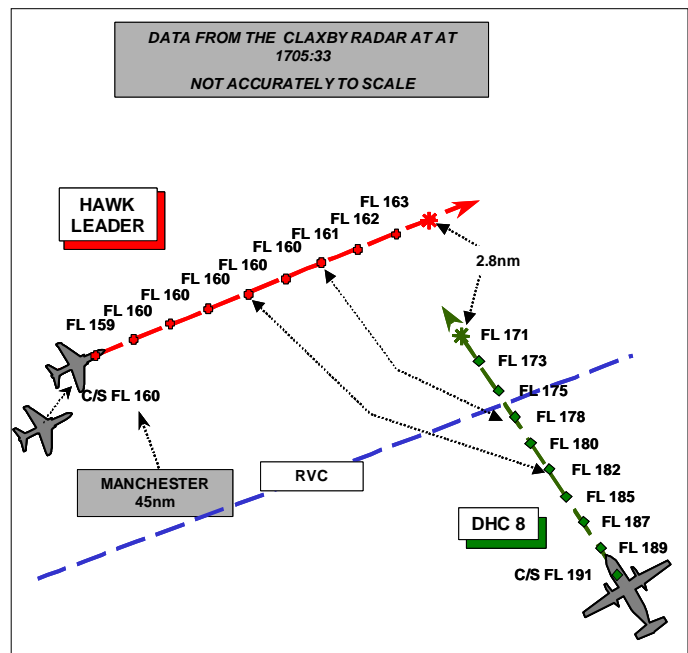
Visibility: 10km 0.5km

Reported Separation:

NR NR

Recorded Separation:

800ft V/2.8nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DHC-8 PILOT reports flying a scheduled passenger flight under IFR, squawking as directed. Shortly after levelling at FL170, heading 325° at 240kt under RC from ScACC, about 50nm SE of MAN, the crew noted on TCAS an ac crossing about 5nm ahead and 1000ft below. Shortly afterwards the TCAS displayed a TA with "Traffic, Traffic" and it was noted that the ac had commenced a climb; by then the lateral separation was less than 5nm. Shortly thereafter ATC issued an instruction "avoiding action turn left 280 degrees" so the Captain disengaged the autopilot and made a level left turn and satisfactory separation was quickly attained. The minimum separation was estimated to have been 1nm and 600ft. ATC commented that the traffic was in the Lichfield RVC and did not have permission to climb above FL160. He believed that the traffic was a formation of 2 Hawk ac but only one was seen on TCAS.

The weather conditions were such that while they were in clear air, they were only just above cloud and were therefore IMC.

He assessed the risk as being low.

THE HAWK PILOT reports flying a training sortie; the handling pilot was an advanced flying training student pilot in the front cockpit with a QFI in the rear seat. They were heading 075° at M0.73 and they were cleared to FL160 by London Mil having climbed due to weather. During this period their No2, also being flown by a student pilot but with a QFI on board, was closing in to close formation due to weather, from a loose position swept at 75yds. Both the Captain and handling pilot were concerned that their No2 was not going to attain a close formation position before they went fully IMC and the QFI was looking over his shoulder to keep the ac visual. At this time the student pilot had, through distraction, allowed their ac to creep up to FL162, which the Captain noticed and promptly told the student pilot to recover to FL160; they peaked at FL163, which the QFI noted at the time.

Obviously this was enough to cause the avoiding action to be taken by the ac above at FL170 and they accept responsibility, but there was never any actual danger as the QFIs would not have allowed the situation to develop any further.

He considered it noteworthy that on their return flight at approx 2215 the same day, this time as a singleton, they also deviated from their cleared height. Again, the student pilot was flying and the

instructor prompted him to 'check height' as they climbed through FL161; he recovered and having topped at FL162. The controller informed him that they had indicated FL164, some 200ft above their indicated level. Whilst this is not an excuse for their poor height control it indicated that their IFF [Mode C] might have been over reading slightly. Unfortunately the avionics in the Hawk Mk1 are dated and they do not have an autopilot or 'height hold' facility, which means the ac is flown manually at all times.

Controller Reports. For brevity the ScACC Controller's report, the NATS Unit investigation and the London (Mil) controller's reports have not been included as the information they contain is included below.

HQ Air BM Safety Management reports that a pair of Hawk TMk1 ac were being flown as a formation by Advanced Flying Training student pilots with QFIs in the rear seats. They were transiting the Lichfield Radar Corridor (RVC), from W to E at FL160, within Class A CAS under RC from London Mil. The LIC RVC was booked for transit by the London Mil Cent TAC controller and the Hawks were coordinated through the corridor at FL160. Meanwhile a DHC-8 was routing to Manchester in Class A CAS under RC from ScACC at FL170. The corridor would normally be flown at FL140 Eastbound but, due to a previous ac experiencing icing at that level, a higher level was requested and agreed by ScACC.

The Hawks reported on frequency at 1656 saying, "*Er London C/S with you flight level one four zero*" and the controller responded, "*C/S London MIL good afternoon identified flight level one four zero traffic service own navigation through the Lichfield corridor*". At 1658 the controller instructed, "*C/S climb flight level one six zero to transit the Lichfield corridor, previous aircraft have been experiencing icing at flight level one four zero*".

At 1700, prior to the start time of the radar replay, London (Mil) transmitted, "*C/S check your level you are showing one six three*" and leader responded, "*Flight level one six zero C/S apologies*". Just after 1705 Hawk Leader requested a climb FL170. At 1705:12 the Hawks are shown indicating FL161 and on subsequent SSR updates they indicate FL162 and FL163. After the request the controller once again stated, "*C/S Er roger maintain flight one six zero until coordinated and check your level you are showing flight level one six three*" and leader responded "*Descend one six zero C/S*". At 1706 leader transmitted "*C/S now happy to maintain flight level one six zero*".

[UKAB Note (1): At 1659:50 the recording of the Clee Hill radar shows the Hawks to be level at FL161. At 1700:50 the Hawk leader ballooned for 1 sweep to FL163 in a left turn onto a heading for the RVC before returning to FL160 and remaining level until 1705:12 when it climbs to FL163 for 2 sweeps before again descending to FL160 as described above.]

The CPA occurred at 1705:37 and the Hawks passed 2.8nm ahead and 800ft below the DHC-8. After the Hawks were clear of the coordinated traffic, with no other traffic to conflict they were given a climb to FL170 as requested and released own navigation direct to RAF Marham.

LATCC (Mil) Cent TAC complied with the procedures for the Lichfield RVC and was proactive in seeking to use FL160 to overcome a reported icing level at FL140. The ac were also correctly placed under RC on entering Class A CAS. The controller monitored the flight and instructed the ac to check altitude prior to the incident. On seeing that the ac had again deviated from the coordinated level, the controller asked the crew to check their level. In a situation where a cleared level has been contravened, standard practice is to give avoiding action descent or climb; however in this situation the first indication of the ac operating outside the recognised Mode C limits (200ft) was coincidental to the CPA.

ATSI reports that the pilot of a DHC-8 reported an Airprox while at FL170 in Class A CAS, 19nm SE of TNT.

The DHC-8 was inbound TNT descending to FL200 when it called the ScACC STAFA Sector at 1702:20 while 41nm SE of TNT and the controller instructed the aircraft to route TNT-DAYNE. At this time a formation of 2 Hawks was transiting the Lichfield RVC, coordinated at FL160, and was 11nm SW of LIC. The transit had previously been co-ordinated by London (Mil) with the STAFA sector at 1656.

A review of the recording of the Clee Hill radar showed that the formation, while transiting the RVC prior to the incident, had been displaying Mode C level information of between FL160 and FL163, but mainly alternating between FL160 and FL161.

At 1703:20, as the DHC-8 was passing FL210 in the descent, the ScACC controller instructed the DHC-8 to “*descend flight level one seven zero*” and the clearance was read-back correctly and the Mode S Selected Flight Level was seen to change accordingly. The Hawk formation was then 4.5nm SE of LIC and in the DHC-8’s 10 o’clock position at a range of 26nm. At 1704:44 the DHC-8 and Hawks were 10nm apart, still in the DHC-8’s 10 o’clock. The DHC-8 was passing FL184 and its rate of descent was between 2 and 3000 fpm and the Hawks were reporting FL160.

As the Hawk formation came into the DHC-8’s 12 o’clock at 1705:16, range 4.7nm, the level of the formation increased to FL161; the DHC-8 was then passing FL175. On the next radar update at 1705:25, the formation had climbed to FL163 and the DHC-8 was passing FL172 (900ft vertical separation) thus the required separation of 5nm/1000ft had been eroded. The formation passed through the DHC-8’s 12 o’clock at a range of 3.7nm indicating FL163 and at this time the STAFA controller issued the DHC-8 with an avoiding action turn to the left and passed TI. The DHC-8 pilot reported seeing the formation on TCAS - but did not report an RA - and stopped his decent at FL171 (800ft vertical separation); the ac were 2.9nm apart. Minimum distance between the ac was recorded as 2.8nm/800ft at 1705:40 and at 1705:56 the required separation was restored when the Hawk formation descended back to their cleared level of FL160. The avoiding action turn of the DHC-8 and faster speed of the formation also rapidly increased the lateral distance between the ac.

Following the encounter the DHC-8 was instructed to resume its own navigation to DAYNE.

There are considered to be no implications for civil ATC as a consequence of this incident.

HQ AIR (TRG) comments that this Airprox was the result of distraction by the Hawk Lead crew who were concerned that their No2 was not going to attain a close formation position before they went fully IMC. Consequently, as soon as the QFI saw the level deviation, he told his student to ‘check height’ but not until they had climbed and triggered a TCAS TA in the DHC-8. From the position and levels of the aircraft involved there was no risk of an actual collision. The avoiding-action turn issued by the STAFA controller very quickly regained separation between the DHC-8 and Hawk formation.

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

The Board observed that, although there were a number of factors underlying this incident, it was essentially an altitude deviation by the Hawk formation leader, unnoticed by the No2. Members noted that the deviation had taken place just after the formation had passed through the descending DHC-8’s 12 o’clock, over 3nm away. Nevertheless, there was a breach of the stipulated separation but this did not cause a TCAS RA in the DHC-8. Furthermore, the alt deviation was noted almost instantaneously by both the ScACC and London (Mil) Controllers and both reacted quickly and, in the

Controller Members' opinion, correctly. Their respective actions ensured that separation was restored quickly and had prevented any risk of collision.

Pilot instructor Members observed that when instructing many aspects of flying, instructors are often faced with conflicting priorities. In this case the imperative for both instructors was ensuring that the No2 Hawk student closed from loose formation to close expeditiously but safely before the formation entered cloud. While the instructors' attention was focused on this aspect, the Lead student pilot allowed his ac to climb slightly, topping at FL163, before his instructor spotted this, simultaneously with the Controllers, and warned his student to return to their cleared level. Although, almost certainly a feature well known to student pilots, the lack of an autopilot and outdated altitude/SSR instrumentation in the Hawk T Mk1, make accurate manual flying even more important, as any unintentional climb/descent may cause unnecessary TCAS warnings in other ac.

There was extensive discussion regarding whether or not any TI to the Hawk formation regarding the DHC-8 would have contributed to the outcome. Current Military Controller Members agreed that providing TI regarding co-ordinated traffic is not considered necessary even if it were practicable for aircraft crossing these busy airways. Pilot Members, however, agreed that such TI would enhance significantly their SA regarding relevant airways traffic. Further, both pilot and Controller Members agreed that several years ago TI would have been provided routinely. A current NATS Controller Member agreed that TI would be beneficial and stated that, when it was possible to do so, passing TI would be considered best practice in terms of 'Defensive Controlling'.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Hawk pair climbed above their cleared level.

Degree of Risk: C.

AIRPROX REPORT No 2010030

Date/Time: 12 April 2010 (Monday) 1618Z

Position: 5146N 00114W (11nm
NNW of Benson A/D -
elev 203ft)

Airspace: Oxford AIAA (Class: G)

Reporting Ac Reported Ac

Type: Merlin HC3 C172

Operator: HQ JHC Civ Pte

Alt/FL: 1900ft 2000ft

QFE (1017mb) (NK)

Weather: VMC In Haze VMC CAVOK

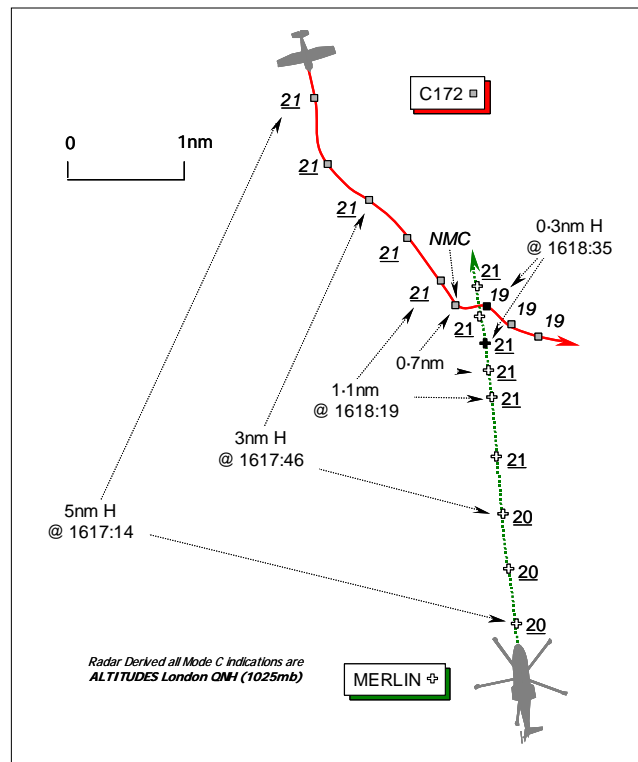
Visibility: 3000m 10km

Reported Separation:

100ft V/nil H 200ft V/¼nm H

Recorded Separation:

200ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MERLIN HC3 CAPTAIN, a QHI, reports that on completion of a training sortie in North Wales the crew were carrying out a routine IF recovery at Benson in VMC. As the ac captain and QHI he occupied the centre seat with trainee pilots in both L and R seats; the RH seat occupant was the PF on instruments.

Whilst under a TS from Benson APPROACH (APP) on 376.65MHz, they were in receipt of radar vectors for an ILS approach to RW19 at 1900ft Benson QFE (1017mb). The allocated squawk of A3672 was selected with Mode C on; neither TCAS nor any form of CWS is fitted. The crew were operating in haze, which reduced slant visibility; however, they were flying well clear of cloud.

Approaching a position 10nm NNW of the A/D – to the NE of Oxford – on a vector of 360° at 120kt to position for the ILS, the RH seat PF sighted another ac as it emerged from directly beneath their helicopter and cleared into their 2 o'clock. From the centre seat the Captain also spotted the other ac at the same time through the front-right chin window. The white single-engine C172 high-wing monoplane had passed an estimated 100ft below his Merlin with a 'high' risk of collision before heading away on an easterly track. There was no time for evasion, but if the C172 had been seen earlier, avoiding action would definitely have been taken. At this point both ac were flying straight and level. The pilot of the other ac took no avoiding action, he thought. No other traffic had been reported in the vicinity by ATC who were immediately informed about the other ac, but the controller stated that no other squawks were observed. The instrument recovery was continued without further incident.

On landing he managed to contact the C172 pilot, who stated that he would never routinely contact Benson ATC.

The captain perceived the flight safety risk as high; although there was some vertical separation, a collision was avoided purely by chance. The incident highlighted the lack of primary radar cover at Benson and the need to maintain an effective lookout at all times when receiving a radar service.

The helicopter has a green camouflage scheme but the white upper & lower HISLs were on.

THE C172 PILOT reports that after take-off from RW01 at Oxford/Kidlington he departed downwind VFR to begin his flight detail under a BS from Oxford APP on 125.325MHz. A squawk of A7000 was selected on, with Mode C.

He was advised by APP that there was no traffic on frequency to affect his flight SE of the airport and he took up a heading of about 120° at 110kt to follow the A40 Oxford Ring Road toward Headington, climbing to an altitude of 2000ft Oxford QNH in CAVOK conditions. About 3½nm SE of Oxford Airport, as he levelled out and was in the process of trimming his ac, the Merlin helicopter was spotted about 1nm away in the right forward quadrant, at an approximate angle of 50°, in close proximity. The helicopter was at almost the same altitude, but he estimated slightly above and it was immediately apparent that his aeroplane had not been seen by the Merlin's crew. A rapid descent to the left was initiated to avoid a collision with the helicopter, which passed 200ft above and ¼nm away to starboard with a 'medium' risk of a collision as he descended to 1500ft ALT. The descent was stopped when visual contact was gained with the Merlin in his rear left quadrant, at this point, well clear above his aeroplane.

UKAB Note (1): In a subsequent telephone conversation with UKAB Staff, the C172 pilot confirmed that a week after the Airprox occurred a fault was confirmed within his ac's SSR transponder. This was subsequently rectified with a replacement unit.

THE BENSON APPROACH CONTROLLER (APP) reports that a formation of 2 Merlin helicopters was recovering to Benson for individual instrument approaches following a radar handover from Brize Norton. He was operating with SSR only to RW01RH. The lead helicopter crew wanted an ILS approach, against the stream, to RW19 and the No2 crew wanted a PAR to RW01RH. After the formation split, the No2 was vectored S for RW01RH, whilst the lead Merlin was vectored to the N, his intention being to delay the lead Merlin with a racetrack circuit while the No2 completed his approach and the PAR was swung [to monitor the ILS approach]. Both ac were turned eastwards, the No2 onto base leg and the lead [subject] Merlin for delay. Then the lead Merlin pilot reported that he had just passed very close to a civilian Cessna, about 100m away and about 100ft below. The pilot was informed that there was no contact on radar. He did not say at that point that he wanted to file an Airprox; it was only a few hours afterwards when the aircraft captain telephoned ATC to discuss the incident that he said he would be filing an Airprox.

THE OXFORD COMBINED AERODROME/PROCEDURAL APPROACH CONTROLLER, who is not equipped with radar, provided a short report stating that: no comment was made by the C172 pilot about any incident with another ac during his departure or before switching to Farnborough LARS at 1625.

HQ AIR CMD ATM SAFETY MANAGEMENT reports that the Airprox occurred in Class G airspace within the Oxfordshire Area of Intense Aerial Activity (AIAA). The Merlin crew was under a TS from Benson APP on 376.650 MHz; however, only a reduced service [previously termed a limited service] was provided using SSR only (data supplied by the Brize Norton SSR head), because of the un-serviceability of the Benson Watchman ASR. APP reports operating under a low workload with only 2 ac under control. The Merlin was initially the lead ac of a pair that had been split for individual approaches. The subject helicopter was being vectored NW of Benson for an ILS to RW19, while the other Merlin was vectored to the SW for a PAR to RW01RH, which was the duty RW. Consequently APP was working with a wide geographical split.

The APP RT transcript shows one traffic call made at 1615:31, which was to another ac not involved in the Airprox. The remainder of the transmissions were exclusively connected to the vectoring of ac and none included TI. The radar recording shows the Merlin transiting N, as vectored by APP for the ILS, with another contact transiting SE from Oxford Kidlington squawking A7000 and indicating an altitude of 2100ft London QNH (1025mb). At 1618:45 the Merlin crew reported, "[C/S] *we just came very close to a civilian Cessna approximately a hundred metres at about a hundred feet below us and he's going away at our 4 o'clock*". APP replied, "[C/S] *roger no contact on radar*"; the controller reaffirmed in his written account that there was no contact on radar. The radar recording utilises a

different source to that of the Brize Norton MSSR, which was the source of the SSR data displayed to the controller at Benson.

APP was quiet and had separated the Merlin formation for vectors to different runways under a limited radar service, without the Watchman ASR that was unserviceable. APP did not see the confliction arising and no TI was passed to the Merlin crew. The geographical split of the traffic under service meant the controller's scan was spread over a wide area, however, at the time he reported no other contact on radar. With the ASR out-of-service, coupled with the apparent lack of SSR contact on the C172 on the Benson display, the controller was unable to provide adequate TI to the Merlin crew about the confliction. Since this Airprox, Benson has regained full use of the Watchman primary ASR.

ATSI reports that the Airprox occurred in Class G airspace 5nm SE of Oxford Airport. The C172 was operating on a VFR flight and in receipt of an ATS from Oxford ATC. The Oxford controller was providing a combined Aerodrome and Approach Control service, without the aid of surveillance radar equipment.

The C172 departed from RW01 at 1614 and at 1615:40 the pilot and Oxford controller agreed the provision of a BS. At 1615:42, the Clee Hill radar recording shows a radar return ½nm NE of Oxford Airport tracking SE. The radar return from this transponder is intermittent and alternates between a squawk of A0000 with no Mode C indicated and a squawk of A7000 with Mode C. At 1618:38, the radar recording shows this contact, 5nm SE of Oxford, southbound, squawking A7000, indicating 1900ft Mode C reported altitude.

Oxford APP did not receive any reports from the pilot of the C172 regarding the close proximity of another ac and at 1625:07, the pilot advised switching en-route to Farnborough on 125-250MHz.

The Oxford controller was not aware of the conflicting traffic and MATS Pt1, Section 11, Page 4, Para 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.

UKAB Note (2): The Clee Hill Radar recording shows the Merlin as a good primary contact, identified from its A3617 squawk, northbound maintaining a level cruise at 2000ft Mode C London QNH (1025mb). The C172 – shown only as a secondary return about 90% of the time with no supporting primary – is squawking A7000 and indicating 2100ft London QNH unverified Mode C, in the helicopter's 11 o'clock at a range of 5nm. The ac close to 3nm and thereafter the Merlin maintains an indicated 2100ft QNH on a steady course. The C172 flies a generally SSE'ly course to a range of 1.1nm from the Merlin at 1618:19, at the same altitude. On the next sweep when the ac had closed to 0.7nm, A0000 (SSR data unreliable) is shown by the C172 with NMC, coupled thereafter with a sharp L turn, which is indicative of the C172 pilot's reported avoiding action L turn. The descent is confirmed on the successive return at 1618:35, where the C172 indicates 1900ft QNH, some 200ft below the Merlin, just as the aeroplane has crossed ahead of the helicopter at the CPA directly over the A40 dual-carriageway. However, the horizontal separation of 0.3nm based on the SSR return of the C172 may be questionable as the C172's course is somewhat erratic and may be subject to 'track jitter'. The C172 clears to starboard of the Merlin, which on a steady track passed 0.3nm astern of the C172 as the range increased.

Neither of the Heathrow Radar heads detected the C172's SSR, but they did pick up the primary contact from over 30nm away.

HQ JHC comments that the C172 was under a BS and therefore responsible for separation, which ultimately he maintained by taking avoiding action. The Merlin was under a TS and would therefore expect to be passed information on conflicting traffic. As the C172 did not appear on Bensons SSR and the primary radar was U/S, ATC were unable to report on it. The Class G Oxford AIAA airspace is particularly busy and often has non-transponding ac. Whilst ATC were unable to pass information on the unseen ac, the Merlin crew may have reasonably been expected to see the C172 operating at the same height, despite the reduced slant visibility. Being on the same frequency might have added to the situational awareness of both ac, increasing the likelihood of seeing each other. JHC crews will be reminded of the need for particularly good lookout within the Oxford AIAA, especially when the primary radar is U/S.

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.

It was plain to the Board, from the Merlin Captain's commendably frank account, that none of the three pilots aboard his helicopter had seen the C172 closing on a steady relative bearing in the prevailing haze before the aeroplane was spotted clearing to starboard. There was no time for evasion, so this was, effectively, a non-sighting on their part and the conflict had passed by the time they saw the reported ac. The Board noted that the Merlin crew were in receipt of a 'reduced' TS and a civilian pilot Member questioned whether the crew would have been advised of this caveat or aware of the significance of it. Whilst the RT transcript provided did not encompass the period when notification of this reduced radar service might have been transmitted to the crew, a military controller Member advised the Board that it was SOP for controllers to include the word 'reduced' whenever appropriate in advising crews about the level of service being provided. The MAA Advisor explained to the Board that the ASR had been a long-term unserviceability at the Merlin's base that had been NOTAM'd and thus the crew should have been aware of the nature of this limitation. However, there were periods when Benson ATCOs had deployed to Brize Norton to provide a radar service to Benson aircraft in an attempt to mitigate the loss of Benson's primary ASR; therefore it was not always the case that crews would receive a reduced service during the period of the NOTAM. On balance, the Board accepted that while there was some scope for crews to be confused about the exact nature of the service they were receiving, in this Airprox the Merlin Captain's report makes it clear that he fully understood the reason for the reduced TS provided.

The Board noted that installation of a mobile ASR had been planned but the situation had been resolved prior to the installation of portable equipment. Nevertheless, Members were of the view that this Airprox highlighted the importance of provisioning back-up equipment at the earliest opportunity to Units that operate in a high-density Class G environment where non-transponding traffic will routinely be encountered.

It was evident from the C172 pilot's account that he was squawking the SSR conspicuity code, which should have made the aeroplane evident on the Benson APP controller's 'secondary only' display. The C172 shows plainly on the recording of the Clee Hill Radar source over 50nm away, but the Board was aware that this did not necessarily replicate what was displayed to Benson APP at the time. Members recognised that the SSR data provided to Benson was from the Brize Norton head, which nonetheless should still have readily detected the C172 at an altitude of 2000ft as it passed within a range of 15nm. However, it was evident that the C172's SSR was only apparent about 90% of the time and occasionally displayed A0000 – data unreliable. The Board therefore acknowledged the Command's view that the C172's SSR contact was absent from the Benson controller's display. Moreover, it was subsequently confirmed that the C172' SSR transponder had proved faulty, which was indicative of why the controller was unable to provide any TI about the C172 to the Merlin crew beforehand.

The C172 pilot lacked any radar assistance from Oxford APP, which is not provisioned with such equipment. It had been suggested that he should have called Benson but there was no compunction on him to do so and he later switched directly to Farnborough - the nominated LARS unit to the E. Nevertheless, in the GA Member's view it would have been worthwhile if the C172 pilot had called Benson ATC to advise of his transit adjacent to their instrument approach pattern and a general warning might well have ensued before he free-called Farnborough. From the C172 pilot's perspective, he had sighted the Merlin ahead at a range of about 1nm away and, in a pilot Member's opinion, in good time. The radar recording illustrated both ac were at the same level at about this point but the C172 pilot's avoiding action turn to the L was executed just after horizontal separation had reduced to 0.7nm. This L turn surprised some pilot Members as it took the aeroplane across the nose of the Merlin but as the C172 pilot was following the A40 – presumably in compliance with the right-hand traffic rule – it might be that from his perspective at these close quarters this was the safer option. Notwithstanding any reservations over the accuracy of the C172's indicated unverified Mode C readout because of the unserviceability reported later, a descent of 200ft was apparent and in-line with the C172 pilot's visual estimate of the vertical separation that pertained, who was better placed to judge the vertical separation here. As it was the radar recording showed that the C172 passed about 0.3nm ahead and 200ft below the Merlin. Therefore, the Members concluded unanimously that this Airprox had resulted from a conflict in the Oxford AIAA resolved by the C172 pilot. Moreover, in the Board's view the C172 pilot's avoiding action was effective and had ensured that there was no risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the Oxford AIAA resolved by the C172 pilot.

Degree of Risk: C.

AIRPROX REPORT No 2010034

Date/Time: 25 Apr 2010 1418Z (Sunday)

Position: 5139N 00016E (5nm E LAM)

Airspace: LTMA (Class: A)

Reporting Ac Reported Ac

Type: MD82 Untraced ac

Operator: CAT N/K

Alt/FL: ↓FL160 (N/K)

Weather: VMC NR NK NR

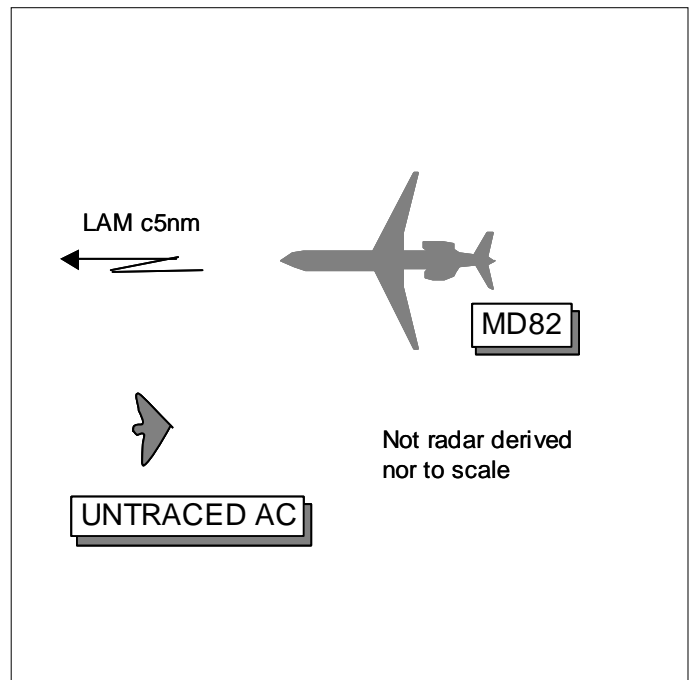
Visibility: NR NR

Reported Separation:

50-100m H

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MD82 PILOT reports descending towards LAM to enter the hold while looking for the preceding ac. Suddenly, in front and a little to the L, there appeared a dark object coming in their direction. As it got closer it appeared to resemble a green/white coloured parachute/hang-glider, which was much bigger than a Wx balloon. It passed about 50-100m to their L. No action was required but ATC was informed.

RAC MIL reports extensive procedural tracing action was carried out but the identity of the object/ac remains unknown. Adjacent glider sites, airfields and private strips were contacted but no ac fitting the description could be identified at these locations. AUS were contacted regarding permission notices issued for balloon releases for that geographical area but none were issued.

THE LTC NE DEPS/LAM RADAR CONTROLLER reports operating in bandboxed mode with the MD82 inbound to Heathrow maintaining FL170, he thought. About 3nm E of LAM the crew reported that they had observed a small ac or possibly a glider about 30sec prior to levelling at FL170; they considered it had passed very close. A number of primary and secondary contacts were observed in the area but this was nothing out of the ordinary. No CAIT warning had been activated on any of the secondary contacts. The crew reported that they would be filing an Airprox. He requested that other traffic keep a good lookout in the area but nothing was observed.

NATS UNIT INVESTIGATIONS reports the Airprox occurred approximately 5nm east of LAM at 1418 UTC. The MD82 was inbound to Heathrow Airport via LAM. At 1418:41, when the ac was 3nm E of LAM, the MD82 flight was instructed to descend to FL160. The read back to this instruction was garbled with another ac's transmission and so the controller asked the crew to confirm the cleared level as FL160. The following transmissions then took place.

MD82: "Confirming FL160, MD82 c/s, and we actually had some foreign object up here. It looked like a hang-glider, parachute or something".

Controller: "OK, at your level now?"

MD82: "It passed us just around 30 seconds ago".

Controller: "OK, and was that at your level?"

MD82: "That's right".

Controller: "OK, we'll get that reported".

The controller then continued with other tasks for the next minute before making the following transmission to the MD82 flight:

Controller: "MD82 c/s, what did you say it looked like?"

MD82: "Like a parachute to a hang-glider. It was green and white and very close to us".

On questioning, the Capt of the MD82 confirmed their intention to file an Airprox report. The controller subsequently passed details of MD82's report to the next inbound flight (AC3) and the crew were asked to report if they became visual. No further sightings were reported by the crew of AC3 or any other flight. At the time of this event the controller was using the Debden Radar. There was no traffic displayed on radar or known to the controller that could be readily attributed to the object described by the crew of the MD82.

Following this event, Swanwick Investigations contacted the MD82's company to request a further description from the crew regarding the object seen. The Capt reported: -

"In descend towards LAM VOR we were looking for preceding aircraft when we saw a dark shadow coming towards us a little from the left. I first thought it was a military aircraft because it had a shape of two wings. Getting closer it turned out to be a hang-glider/parachute object, the long and thinner type with green and white square markings. No letters or other markings as I could see. I think it came approximate 50-100 meters close to us, maybe closer because I could see it perfectly on my left side. When I first observed the object it looked like a normal distance for a preceding aircraft but it was much smaller and darker and was coming in our direction".

This incident was reported to ATC at 1418:41 with the MD82 crew reporting that the event occurred approximately 30sec beforehand. The position of the MD82 was reviewed at this time on the radar replay system using several different radar sources (Debden, H23, S10 & MRT). There was no surveillance data to support the presence of an object in the position described by the crew although both the Debden and MRT pictures displayed an intermittent primary return approximately 2nm S of the MD82's track. Further analysis of the surveillance data was undertaken by the Surveillance Asset Investigations Team at NATS. Although some slow moving primary returns were detected in the vicinity of the MD82 at the time of the reported event, the lack of a definitive track did not support these returns as being genuine and are considered to have been radar "clutter".

ATSI endorsed the NATS Unit report.

BHPA comments that it is physically extremely unlikely to have been an unpowered hang glider or paraglider at that location and height as either would have had to be launched from/by another ac at a greater height. As powered hang gliders and paragliders do tend to show up on primary radar due to the engine and propeller, and that it would have taken a specialist modified and in-flight tuneable engine, and that it would still have taken a considerable time to both climb to that height and descend from it (the UK record climb of 17,500ft took 92min on the way up and 46min on the way down), it also seems very unlikely to have been one of these.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilot of the MD82, 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.

The Capt's description of a green/white ac, possibly a hang-glider/parachute, passing 50-100m down their LHS at their level was explicit enough for Members to be in no doubt that something was encountered. However, the radar recording does not show any target that could be correlated with an ac-type radar return and the crew of an ac following behind the MD82 did not visually acquire the

untraced ac. Members noted the comments made by the BHPA and added that, although possible, it would have been extremely unusual for a hang-glider or microlight pilot to fly his ac at high level, particularly above 10,000ft where oxygen would be needed for safe operation. On the limited information available and with tracing action not revealing the origin, type or size of the conflicting ac, Members were left with little option other than to classify this as a conflict in Class A airspace but were unable to assess the risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class A airspace with an untraced ac.

Degree of Risk: D.

AIRPROX REPORT No 2010036

Date/Time: 29 Apr 2010 (Thursday) 1058Z

Position: 5220N 00010E
(7NM N CAM)

Airspace: Lon FIR (Class: G)
Reporting Ac Reported Ac

Type: E3D Sentry Harrier

Operator: HQ AIR (OPS) HQ AIR (OPS)

Alt/FL: FL180↑ FL90

Weather: IMC CLBL VMC

Visibility: 2000m 5.0km

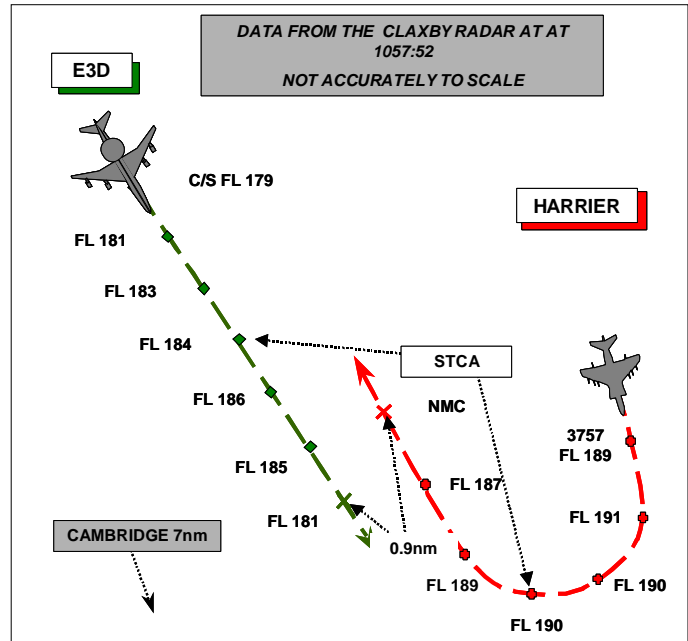
Reported Separation:

NK NR

Recorded Separation:

NR V / 1.0nm H at 1057:52 (100ft V /1.0 H on previous sweep at 1057:49)

UKAB Note (1): Several radars were checked, but all showed that the Harrier Mode C dropped out at the CPA, reappearing about 20-30sec later several hundred feet lower.



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE E3D PILOT reports flying an exercise support mission from RAF Waddington. During the climbout they were handed over to London (Mil), given a TS, cleared to FL190, while heading 180° at 280kt, given their airways joining clearance, via a point NE of BKY, and were routing direct to that point. As they approached top of climb a TCAS contact was observed overtaking them to their left, on a similar heading and climbing, appearing to maintain about 1000ft above them. The range of the contact increased to about 7nm in their 11 o'clock. London (Mil) called a contact in their 1 o'clock at a similar range, so he called their TCAS contact to them; London (Mil) reported that they now had this contact 'on radar' and that it was 'a Harrier'. As they were passing FL185 about to level off, the TCAS contact also seemed to level and then to manoeuvre towards them. London (Mil) called again reporting that the traffic was manoeuvring as they received first a TA ('Traffic, Traffic') followed by an RA 'monitor vertical speed', first directing a level off and then rapidly a RA descent, which they followed and called the RA to London (Mil). The confliction cleared from TCAS as they transitioned from a climb to a descent and they levelled at FL180 before once more climbing to FL190 and continuing to their airways joining point. London (Mil) confirmed via landline that the other ac had been squawking 3737 and was believed to be working with Cottesmore ATC. Their in-flight conditions were IMC as they were climbing through thin cloud layers and they did not see the other ac at any point during the incident.

The resolution of the TCAS display does not allow an accurate assessment of the closest distance between ac, nor of accurate plotting of the manoeuvring of the other ac relative to them.

He assessed the risk as being low.

THE HARRIER PILOT provided a brief report 2 months after the incident stating that he was carrying out a local dual GH from RAF Wittering in the Lincolnshire MTA, he thought, in receipt of a TS from Wittering APP, he thought, squawking as directed with Mode C. While at FL90, [actually F/L190], heading 350°, out of sun, at 350kt, he was passed TI on an E3D, which he saw immediately. He continued his turn, which was taking him clear of the E3, and he assessed the risk as being low.

THE LONDON MIL CONTROLLER reported that he was controlling as the GP14 position with a UT assistant and assistant mentor. The E3D was cleared on his own navigation to 16 miles NE of BKY climbing to FL190, en route to join CAS under a TS. At 1057, the E3D pilot requested TI on traffic in his 11 o' clock, at 4nm, indicating 1500 feet above on TCAS. The conflicting traffic was called to the E3D as tracking SE at FL190 and appeared to be on a diverging heading from the E3D. The conflictor then executed a 'sharp' right hand turn to track N and began to descend, passing about 1nm to the east of the E3D. The E3D reported taking a TCAS RA and descended to FL180. The conflictor was called once more and the RA acknowledged. Once clear of the traffic, the E3D resumed his climb and joined CAS. The conflicting aircraft was squawking 3757 [Cottesmore].

THE LONDON MIL SUPERVISOR reported that he did not witness the incident.

HQ AIR ATM Safety Management reports that an E3D departed RAF Waddington and was handed to London (Mil) to transit to CAS and join N of BKY. At 1053 the pilot reported, "*London military good morning C/S out of Waddington in the climb passing flight level nine five cleared one nine zero*"; the ac was identified and placed on TS. The controller then confirmed that the E3D was to join airways at BKY and released it saying, "*own navigation fifteen miles North East of Barkway*". At 1054 the pilot was asked his estimate for BKY, enabling the controller to obtain a joining clearance. At 1055:17 the conflicting traffic, the subject Harrier, can be seen SE of the E3D indicating FL93, 4100ft below the E3D, and 8sec later its Mode C drops out but it continues to track SE, diverging from the E3D. At 1055:46 the E3D is tracking SE, indicating FL144, climbing, and the Harrier is about 5nm SE and still on a diverging track, indicating 700ft below. London (Mil) then passed TI at 1056Z on a contact 10nm S of the E3D, which was tracking NE with no Mode C and the pilot replied, "*C/S has got TCAS traffic eleven o'clock for five miles*". The TCAS contact was the subject Harrier and London (Mil) then reported, "*C/S previously reported traffic is now five miles south er manoeuvring no height information*" to which the pilot replied, "*C/S shows at fifteen hundred feet above*". This discrepancy would appear to have made the controller scan again and he reported, "*Apologies C/S er traffic now on radar in your twelve o'clock five miles tracking southeast at FL one eight five*".

Based on the SSR code, LATCC Mil reported the ac as a Harrier and the E3D pilot, "*C/S R A we're levelling this level*". Then, as the Harrier appeared to start a right hand turn towards the E3D at FL 191, the latter reports, "*C/S following TCAS descent*"; simultaneously the Harrier tightens the right hand turn and passes to the E of the E3D. Once clear of the conflicting traffic the E3D continues its climb to FL190 towards BKY.

This Airprox happened in busy Class G airspace with the E3D receiving a TS from London (Mil) and, although the conflicting traffic was displaying a Mode 3A code allocated to RAF Cottesmore, investigation showed that the ac was operating VFR and not receiving a service from Cottesmore at the time.

The London (Mil) controller passed TI on an ac S of the E3D as at that time it looked like the most likely conflicting traffic, having a course which would cut across E3D's track. When the controller was passing this TI the Harrier was SE of the E3D and heading away from it; therefore this would have excluded it from the controller's initial scan. Even when the E3D pilot later requested an update, it was heading away and would not have been considered to be a hazard. The controller had already called the Harrier before it turned towards the E3D at a similar altitude. That being the case, it is considered that the controller acted IAW requirements for the provision of a TS.

HQ AIR (OPS) comments that as the Harrier was manoeuvring VMC in Class G airspace, was visual with the E3D and did not get closer than 1 nm it is unsurprising that his recollection of this non-event was vague. TCAS II equipped ac operating in class G airspace will occasionally be subject to RAs, which should continue to be followed to maximise separation and enhance visual lookout.

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 recordings, reports from the air traffic controller involved and reports from the appropriate ATC and operating authorities.

The Board noted the significant errors in the report provided by the Harrier pilot and observed that reports made immediately after the event are generally significantly more accurate as detail fades with time and it is that detail that can be significant.

In this case both ac had been operating legitimately and conducting their respective tasks in Class G airspace, one joining CAS and the other apparently conducting GH. The E3D had been receiving a service from London (Mil) but, despite that he reported otherwise, the Harrier pilot had not been in receipt of a ATC service from any unit; had he been, he would most likely have been warned of the E3D's presence behind him. The HQ Air (Ops) Member pointed out that TCAS can be very valuable as an aid to assist pilots with their responsibility to see and avoid other traffic in class G airspace. If this avoidance is as a result of following a TCAS RA, it is nonetheless avoidance and, as in this case, the safety of both ac is assured.

Although procedures and practices for the operation of TCAS in Class G airspace can be problematical, the Board welcomed reports of such occurrences as they can contribute to a fuller understanding of the operational difficulties.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report (TCAS).

Degree of Risk: C.

AIRPROX REPORT No 2010038

Date/Time: 26 Apr 2010 (Monday) 1527Z

Position: 5525N 00137W (0.6nm
SW of Boulmer HLS -
elev 75ft)

Airspace: Scottish FIR (Class: G)

Reporting Ac Reported Ac

Type: Sea King HAR3 Hawk

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

Alt/FL: 3000ft 3000ft
QNH (1016mb) QNH (1022mb)

Weather: VMC CLOC VMC NR

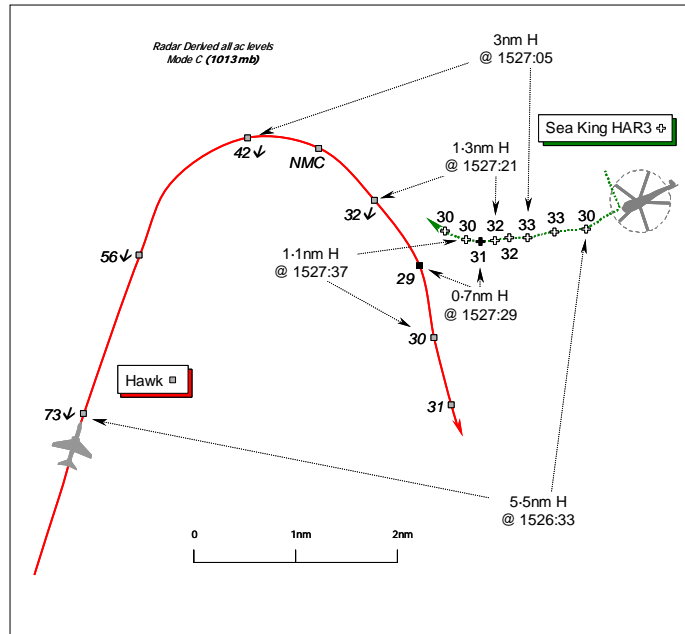
Visibility: 20km 35km

Reported Separation:

Nil V/<1nm H 1.5-2nm H

Recorded Separation:

200ft V @ 0.7nm Min H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE WESTLAND SEA KING HAR3 PILOT reports that he had departed from Boulmer VFR to conduct an air test with a crew of 2 pilots and was in receipt of a TS from Newcastle RADAR (RAD) on VHF - 124.375MHz. A squawk of A3760 was selected with Mode C; neither Mode S nor any form of TCAS is fitted. The helicopter has a yellow high-conspicuity colour-scheme and the upper and lower HISLs were on.

The Airprox occurred whilst executing the 'maximum contingency portion' of the air test, flying level at 3000ft QNH (1016mb) in VMC, heading 300°(T) at 70kt. They were just about to complete the check for the No 1 ECU, with one engine driving at close to maximum, when they heard RAD calling a Hawk pilot. The Hawk pilot was advised of the location of his helicopter - to the SE of the Hawk at close range. He and his co-pilot looked to their 12 o'clock and saw a black Hawk ac about 1nm away at about the same altitude that appeared to be flying straight towards them on a reciprocal heading. The Hawk pilot then told RAD he was visual with his helicopter and made a sharp turn onto S and crossed less than 1nm ahead from R - L and descending with a 'high' Risk of a collision. No avoiding action was taken and he maintained his NW'ly heading due to the very late sighting, the configuration of his helicopter for the air test and confirmation that the other aircraft was manoeuvring to deconflict. He added that the cockpit workload was 'high' because of the demands of the air test, which required the crew be 'heads-in' rather more than normal. The minimum crew was carried because of the nature of the flight but a TS had been obtained to assist the reduced lookout and increase the crew's SA. However, they had not been given any TI nor made aware of the Hawk by RAD at any time, he thought.

THE HAWK T1 PILOT, reports he was conducting an advanced instructional sortie VFR whilst in receipt of a TS from Newcastle RAD on UHF - 284.6MHz. An allocated squawk of A3751 was selected with Mode C; neither Mode S nor any form of TCAS is fitted. His ac has a black colour-scheme and the upper and lower HISLs were on.

He was descending VMC under 'own navigation' to below cloud about 6nm NW of Boulmer on a northerly heading at 400kt, with an in-flight visibility of about 35km. When clear below cloud descending through an altitude of about 3500ft, a RH turn was initiated. Turning through 090°, RAD

informed them of rotary-wing traffic 3nm E of their position at a similar altitude, which was the first information about the possible confliction. The rear seat pilot sighted the yellow Sea King about 3nm away as they turned; no avoiding action was taken as the R turn had resolved the confliction. The R turn was continued onto a SE'ly heading and the helicopter passed 1½-2nm away to port with no Risk of a collision.

THE NEWCASTLE APPROACH RADAR CONTROLLER (RAD) reports that the Hawk pilots were receiving a TS and requesting a low-level letdown in Northumberland; the Sea King pilots were also receiving a TS operating just NW of Boulmer. The Hawk pilot said that he wished to descend towards Amble and then route northwards, so an initial descent was given to an altitude of 5000ft to keep the ac terrain-safe and above some other ac – including the Sea King. He was just about to pass TI on the Sea King to the Hawk pilot when the latter requested a L turn. The Hawk then tracked northwards passing about 4nm W of the Sea King descending through FL70. At this point he believed the Hawk was flying away from the Sea King so he gave a further descent instruction to the Hawk pilot and advised him to maintain his own terrain clearance below 4300ft. Very soon after this the Hawk turned hard R, whereupon he issued TI, first to the Hawk pilots and then to the Sea King pilots. After passing 1nm W of the helicopter the Hawk routed to Amble.

The Newcastle 1520 Weather was given as: 270/15kt; >10km nil Weather; FEW at 4500ft; QNH 1022mb.

ATSI reports that the Airprox occurred in Class G airspace. The town of Amble is situated on the coast, 6nm SSE of Boulmer. The Sea King was operating VFR, conducting an air test in the vicinity of Boulmer. The Hawk was routing from the SW and intended to carry out a let down from medium to low-level. The crews of both ac were in receipt of a TS from Newcastle RAD on cross-coupled frequencies: 124.375MHz (VHF) for the Sea King and 284.6MHz (UHF) for the Hawk. [This allows all VHF transmissions to be heard on UHF and vice versa.]

The Sea King pilots first contacted Newcastle RAD at 1452:50 to operate VFR in the Boulmer area in receipt of a BS. At 1512:24, the Sea King pilots made a request to Newcastle, "...[Sea King C/S]..would it be possible to get a Traffic Service please we'll be operating..about 3 thousand feet in the local Boulmer area". Newcastle replied, "[Sea King C/S] for Newcastle then squawk 3-7-6-0 ident" which the Sea King crew read back correctly. At 1515:25 Newcastle advised, "[Sea King C/S] you're now positively identified 2-5 miles to the 2-4 miles north of Newcastle it is a Traffic Service with your own terrain clearance the Tyne pressure..setting is still 1-0-1-6". The Sea King pilot read back, "Traffic Service..with our own terrain clearance 1-0-1-6 copied [Sea King C/S]".

At about 1520 the Newcastle controller handed over responsibility for the provision of the radar service to another radar controller.

At 1521:34, radar recordings show the Hawk 16nm SW of Durham Tees Valley Airport tracking towards Newcastle displaying a code callsign converted SSR label indicating FL230. After a radar handover from London Military, the Hawk descended to FL190 and changed to the Newcastle assigned SSR code of A3751. At 1523:45 the Hawk crew called Newcastle, "...[Hawk C/S] on handover flight level 1-9-0 Traffic Service". The controller replied "[Hawk C/S] Newcastle RADAR good afternoon you're identified Traffic Service report ready for further descent", to which the pilot then responded, "...ready for descent ". Newcastle enquired, "[Hawk C/S] are you hoping to go..low level in Northumberland" and the Hawk pilot replied, "[Hawk C/S] VMC at Amble and moving north." Newcastle then instructed the Hawk crew to, "[C/S] descend initially altitude 5 thousand feet on the Newcastle Q-N-H 1-0-2-2", which was read-back accurately. The controller's written report states that the Hawk was given initial descent to 5000ft to remain terrain-safe and also to keep the Hawk above some light ac in the vicinity, including the Sea King.

The controller was now aware that the Hawk crew was intending to let down in the Amble area and also aware of the Sea King in that vicinity. RAD reported that he was about to pass TI to the Hawk when, at 1524:55, the pilot requested "[Hawk C/S] request..left turn through 10 degrees", whereupon Newcastle replied, "...own navigation approved". At 1526:33, the radar recording shows the Hawk

was 5.5nm SW of the Sea King, passing FL73 in the descent. The controller states that the Hawk passed 4nm W of the Sea King at about 7000ft. In the belief that the Hawk would continue on the northerly track, at 1526:40 Newcastle advised, “[Hawk C/S] *there’s no traffic to affect your further descent so descend further but anything below altitude 4 thousand 3 hundred feet you’re taking your own terrain clearance report V-M-C below*”, to which the reply was, “[Hawk C/S] *V-M-C below*”. Newcastle then sought clarification “..[Hawk C/S] *apologies was that V-M-C below now*”; at this point a transmitter is switched but with no modulation.

As the Hawk passed 3.7nm WNW abeam the Sea King, the controller observed the Hawk commencing a R turn and immediately passed TI on the Sea King at 1527:10, “[Hawk C/S] *Newcastle RADAR see you turning right traffic is a helicopter 3 miles southeast of you slightly below*”. The Hawk pilot responded, “[Hawk C/S] *looking*”. There is a further transmission believed to be from the Hawk [words doubtful but possibly] *“got it”* and then another believed to be from Newcastle *“roger”*, before Newcastle passed TI to the Sea King pilots at 1527:20, “...[Sea King C/S] *traffic is a Hawk has you in sight 2 miles northwest of you 1 mile west*”. At 1527:21 radar recordings show the Hawk converging 1.3nm NW of the Sea King with both ac indicating FL32 Mode C [about 3470ft Newcastle QNH (1022mb)]. The Sea King pilot reported, “..*crossing right to left in front of us now..visual.*” At this point radar recordings show the Hawk passing 0.7nm SW of the Sea King and 200ft below it. Newcastle advised the Sea King pilots, *“has you in sight as well”*. Shortly afterwards the Sea King pilot advised at 1527:30, *“Hello Newcastle...we’re air testing so we’ve got a slightly limited lookout at the moment”*, which was acknowledged, *“roger”*.

About 3min after the Airprox occurred the Sea King pilot enquired about the minimum separation that had obtained. Newcastle advised that there was about 1nm separation as the Hawk passed ahead, whereupon the Sea King pilot advised that he would contact Newcastle when back at base.

The Hawk pilot reported VMC below, routeing low-level W and then N. Newcastle advised the Hawk about the helicopter, now just to the NW of Boulmer. The Hawk pilot reported switching en-route at 1530:46 and was instructed to squawk A7000.

MATS Pt1, Ch11, P5, 4.1.1 states that a traffic service is:

‘..a surveillance based ATS, where in addition to the provisions of a Basic Service, the controller provides specific surveillance derived traffic information to assist the pilot in avoiding other traffic. Controllers may provide headings and/or levels for the purposes of positioning and/or sequencing; however, the controller is not required to achieve deconfliction minima, and the avoidance of other traffic is ultimately the pilot’s responsibility.’

MATS Pt1, Ch11, P6, 4.5.1 states that:

‘The controller shall pass traffic information on relevant traffic, and shall update the traffic information if it continues to constitute a definite hazard, or if requested by the pilot. However, high controller workload and RTF loading may reduce the ability of the controller to pass traffic information, and the timeliness of such information.’

‘Traffic is normally considered to be relevant when, in the judgement of the controller, the conflicting aircraft’s observed flight profile indicates that it will pass within 3 NM and, where level information is available, 3000ft of the aircraft in receipt of the Traffic Service. However, controllers may also use their judgement to decide on occasions when such traffic is not relevant, e.g. passing behind or within the parameters but diverging. Controllers shall aim to pass information on relevant traffic before the conflicting aircraft is within 5 NM, in order to give the pilot sufficient time to meet his collision avoidance responsibilities and to allow for an update in traffic information if considered necessary. Distances displayed on ATS surveillance systems can be at variance to the actual distances between aircraft due to the limitations in accuracy of surveillance systems. Furthermore, some aircraft may not be displayed at all by ATS surveillance systems.’

MATS Pt1, Ch11, P6, 4.6.1 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. The controller shall make all reasonable endeavours to accommodate this request as soon as practicable and provide deconfliction advice at the earliest opportunity.'

'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. However, the controller is not required to achieve defined deconfliction minima.'

During the Hawk's descent from medium to low-level the controller had asked the pilot if he was hoping to go low-level in Northumberland. In response the Hawk pilot had reported his intention to be flying in VMC at Amble moving N. The controller's written report stated that he was about to pass traffic information on the Sea King, when the Hawk requested a L turn. At this point the controller judged that the Hawk would continue N to pass 4nm W of the Sea King and would continue to fly N away from the Sea King. The Hawk, having already passed well to the W of Amble, was advised that there was no traffic to affect further descent and the Hawk reported VMC below. However, as the Hawk passed 3.7nm WNW abeam the Sea King, the controller observed the ac making a turn to the R. The controller recognised that the two ac were now in potential conflict and passed late TI, which may have assisted both pilots in achieving collision avoidance. Had the controller passed TI earlier, the situational awareness of both pilots would have been significantly improved.

HQ AIR (OPS) comments that the Hawk pilots were made aware of the Sea King in good time to see and avoid it, which they did. If an air test cannot be conducted whilst manoeuvrability and a good lookout is maintained, perhaps an area of sanitised airspace should be booked for the purpose.

HQ AIR (TRG) comments that the unannounced R turn by the Hawk appears to have caught out the Newcastle Controller regarding the timing of the TI. However, both ac were being operated VMC in Class G airspace. The relatively late sighting of the Hawk by the Sea King crew caused them concern particularly as their flight regime at that time limited their manoeuvrability. On the other hand the Hawk crew did not consider flying avoiding action because their turn had already broken the conflict. As the Sea King crew were conducting an air test requiring the crew to be 'heads-in' more than normal obtaining a DS may have been a more appropriate ATS.

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 controller involved and reports from the appropriate ATC and operating authorities.

The HQ JHC Members confirmed that it was normal to reduce the crew compliment on an air test and thus, commonly, no aircrewman was carried for such flights. Although this reduced their lookout capability, the Sea King Captain had taken this into account and obtained a TS to supplement the lookout scan of the two pilot crew. He was mistaken in reporting that they had not been given any TI nor made aware of the Hawk by RAD at any time; the Hawk was called to the helicopter pilots by RAD, *"..2 miles northwest of you 1 mile west"*, albeit after the Hawk pilot reported the helicopter in sight and when the range was closing fast. Therefore for all practical purposes the earliest the Sea King pilots were aware of the Hawk was when it crossed into their 12 o'clock about 1nm away at about the same altitude. The Sea King crew would undoubtedly have received TI earlier if RAD had not misconstrued the Hawk crew's intentions from their requested 10° L turn. It was plain to controller Members that RAD did not expect the Hawk to turn sharply in the opposite direction towards the Sea King and when it did just that, with both flights under a TS from the same controller, RAD had a choice of which to call first. Without doubt, the controller's choice of priorities at this late stage were

correct and the agile Hawk could more easily avoid the slower helicopter. Thus with the benefit of TI, the Hawk pilots were able to judge that their intended manoeuvre towards Amble would take them clear of the Sea King without more robust avoiding action being needed.

In the clear light of hindsight it was evident to the Members that the Newcastle RADAR controller had not anticipated the Hawk crew's R turn towards Amble. It appeared that the Hawk crew's L turn reinforced an assumption by RAD that, although the Hawk crew had declared that Amble was the intended low-level entry point, as the jet had already flown past this point northbound, the crew would not be turning towards it and thus would not fly close to the helicopter. The advice that there was no traffic to affect further descent also subsequently proved to be misleading. With further traffic in the vicinity perhaps a more cautious choice would have been to check the Hawk crews intended heading before releasing the crew to continue under their own navigation. Plainly RAD was endeavouring to provide a helpful TS during the Sea King crew's air test, but unbeknownst to RAD the Hawk crews requested L turn had belied their actual intentions. Nevertheless, the alert controller detected the jet's turn very swiftly and almost as soon as it had started RAD quickly issued TI to the Hawk crew, which enabled them to sight the helicopter, albeit perhaps later than ideal, but thereby ensuring they could steer clear of it. On balance, the Board considered that the controller had done a good job in providing TI to the Hawk crew once their intentions became clear.

Whilst some controller Members considered this to be a commonplace encounter in Class G airspace, it was readily understood that with a Hawk jet at close quarters, not knowing exactly what the crew was doing, the helicopter pilots would have felt quite vulnerable. With a myriad of test functions to perform and for which the resultant figures needed to be noted accurately, the air test was undoubtedly concentrating their minds inside the cockpit. Consequently, controller Members suggested that a DS would be the more appropriate ATS under these circumstances, which would assist the crew in fulfilling their mutual responsibility for maintaining separation against other Class G traffic. Other pilot Members agreed, but whether a DS was compatible with the flight parameters of this air test only the crew could gauge.

In determining the Cause and Risk, the Board noted that whilst the Sea King crew were informed about the presence of Hawk, it was at very short notice as it crossed ahead. However, the Hawk crew had been warned about the helicopter and had descended below it at a range of 1-3nm, closing to a minimum of 0.7nm laterally, albeit by a margin that the Sea King crew might have considered less than ideal. The Board concluded therefore, that this was a sighting by the Sea King crew of traffic manoeuvring clear, with no inherent Risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting Report.

Degree of Risk: C.

AIRPROX REPORT No 2010039

Date/Time: 30 Apr 2010 1434Z

Position: 5137N 00105W (Benson
Circuit - elev 203ft)

Airspace: ATZ (Class: G)

Reporting Ac Reported Ac

Type: Puma PA28

Operator: HQ JHC Civ Club

Alt/FL: 1000ft 800ft
(QFE 1002mb) (QFE 1016mb)

Weather: VMC CLBC VMC

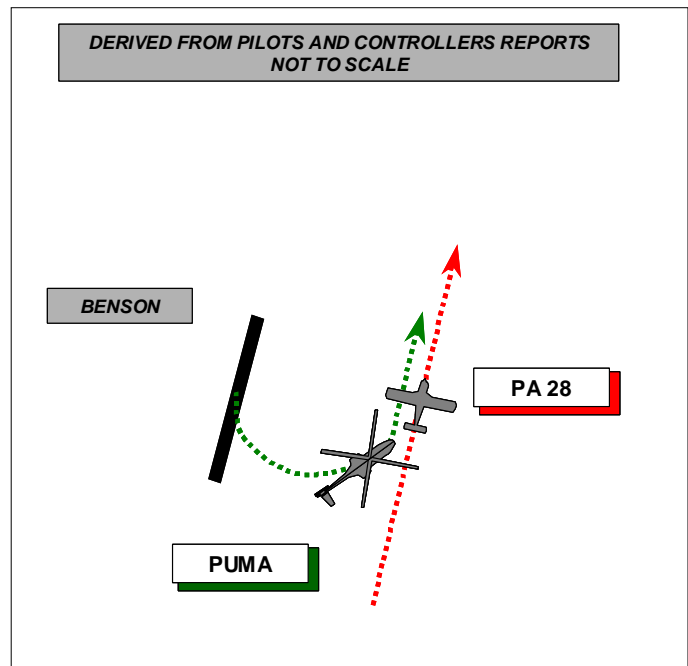
Visibility: 25km 10nm +

Reported Separation:

NR V/50/75m H 200ft V/0.6nm H

Recorded Separation:

~0.1nm



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PUMA PILOT reports flying a training sortie in the Benson Circuit for RW19LH, in communication with Benson TWR. While levelling downwind at 1000ft QFE, passing through heading 060° at 100kt, another ac called to join the Benson circuit downwind and a blue and white low-wing light ac was seen simultaneously, 50-75m ahead and at the same height virtually in the circuit. He decelerated to increase the separation and assessed the risk as being medium.

THE PA28 PILOT reports that his departure from Kemble was delayed due to squally showers and a strong crosswind. Once airborne and squawking with Mode C, a BS was obtained from Brize Norton and a direct route to Benson was planned but a heavy shower over the Abingdon/Didcot area necessitated routing to the S and around P106. He notified Brize of his intentions and shortly after was given a handover to Benson. He did not call Benson immediately as he was concentrating on remaining clear of P106 but Benson ZONE then called him on VHF to see if he was on frequency. They passed him joining instructions including approval for a downwind join for RW19 so he positioned the ac for the downwind join. He was concentrating on ensuring his height and position were correct for the circuit at Benson and he did not get any further calls or requests from ZONE.

As he approached the circuit heading 010° at 90kt, still on the ZONE frequency, he called joining downwind RW19 and ZONE requested him to make the downwind call to Tower and he assumed that ZONE had co-ordinated with Tower. Tower clearly had not been expecting his call but he was cleared to join. Abeam the upwind position he noticed a Puma on climbout and kept his eye on it as it was not clear whether it would pass behind him and it continued to climb towards him apparently not having seen him. If the Puma had continued on its intended path he would have to take avoiding action by climbing above circuit height. When it became clear that the Puma had seen him he continued to final approach and landed.

After landing he called the ATC Supervisor and discussed the late downwind call to Tower and why it had happened; he suggested to him that he should have called Tower earlier. He felt that although a downwind join was not standard procedure a simple request to call 'field in sight' and a transfer to Tower several miles out would have given everyone better situational awareness. He believes that he complied completely with ATC instructions.

THE BENSON ADC reported that at the time the Benson Watchman radar was U/S but the HiBrite was serviceable; TWR was band-boxed with GND and he had been in position for about 35min. He was warned by APP that a PA28 was 10nm SW and would join the CCT downwind for RW19 LH. The circuit had been very busy but the traffic level had just reduced leaving 3 ac in the circuit comprising of another light ac going around on the dead-side, the reporting Puma had just completed a slow approach to touch and go (T&G), and a Heli-Med ac on approach to point west; in addition there was one ac on a PAR approach for a low approach for further PAR, one or two aircraft on the GND frequency and one other warned in. He saw the PA28 on the HiBrite to the SW at 10nm and then again at 6nm slightly later. The next time his attention was drawn to the ac was when the pilot called downwind.

About 5min previously he called the Supervisor up to local and informed her that the Puma concerned had been flying non-standard circuits. It had been flying tighter circuits than normal and looked to be turning early and below 500ft, routing just to the S of the houses on the SE corner of the airfield in the climb. Also, on his last approach the pilot asked for a touch and go (T&G); however, when cleared for a T&G he had actually stopped on the RW for 5 to 10sec while radar traffic was approaching 4nm as he stopped and then got airborne again into the circuit, technically without permission. Both Assistants and the Controller noted the Puma stopping and considered it wrong as a less experienced ADC controller may have released the traffic lights and allowed vehicles to cross when the aircraft had stopped. The supervisor decided that he should monitor the Puma's next approach and she would contact the pilot on landing. That being the case his attention was focused on the Puma's next approach when he called finals for a T&G. At that time he had PAR traffic on approach, the second light ac going around due to the slow approach, radar traffic and the Heli-Med approaching Point West. At that point the Puma had completed a standard T&G and, as it was in forward motion and clear of the RW, he gave the radar traffic, which was at 3nm permission for a low approach. The Puma once again turned early and below 500ft. As he completed the 3-mile call broadcast, the PA28 called joining downwind and he noted its position as approaching the mid-downwind point, slightly ahead of the Puma. Although the ac looked to be at a similar height, he considered there to be sufficient lateral separation, enabling him to give the PA28 full joining instructions, before asking him if he was visual with the Puma, which he replied that was. When asked, the Puma pilot reported visual with the PA28 and then complained about the PA28 pilot not making an early downwind call.

With hindsight he thought that he should have informed the circuit traffic about the downwind joiner and maintained a closer watch on the HiBrite. However, he was informed that the PA28 would be conducting a downwind join when it was 10 miles out. He made a decision at that time not to inform the busy circuit as 10 miles was too far out to be of any relevance to the circuit traffic and he expected the PA28 to make a standard joining call 3 miles from the airfield. He thought that his attention being focussed on the Puma that was flying unusual circuits might have added to his lack of monitoring of the downwind joiner.

UKAB Note (1): The recording of the Heathrow radar shows the PA28 throughout and the Puma intermittently. The PA28 joins the circuit as described by its pilot, descending to be at 1000ft at the beginning of the downwind leg. The Puma appears as a primary only contact almost abeam the ARP converging with the PA28 and closing to 0.1nm (the minimum radar resolution) before the separation increases as the Puma decelerates in the PA28's 6 o'clock.

HQ AIR BM Safety Management reports that the Benson ADC was working under a medium to high loading without a GND controller. The Puma was flying non-standard circuits, turning straight onto the downwind leg rather than continuing upwind prior to turning not below 500ft IAW the Flying Order Book; further it was stopping on the RW after asking for a touch-and-go procedure. These actions distracted the ADC and therefore increased his workload; further the SUP reported that the initial pre-note from ZONE to TWR was not evident on the tape transcript [since it was agreed that there was a pre-note it probably took place before the transcript commenced]. The transfer of the PA28 from ZONE to TWR was not prompted by ZONE before the ac entered the circuit area and was therefore late; this compounded the poor SA of both the ADC and the circuit traffic. As the PA28 was mid-point

downwind the Puma got airborne and turned below 500ft, which put it into conflict with the PA28 at 800ft.

OIC Flying Club has briefed members of the importance of being conversant with local procedures; in addition the unit is reviewing the Flying Club Orders. Best practice remains for Supervisors to roster a GRD Controller when busy periods are expected in TWR, thus reducing the workload on ADCs.

HQ JHC comments that the actions of the Puma in the build-up to the incident were far from satisfactory. By flying non-standard circuits and, in particular, remaining on the RW during a Touch and Go, the Puma caused an unnecessary increase in workload for the controller. This Airprox highlights the importance of timely radio calls - both by the controller and joining traffic - but it could have been wholly prevented by better airmanship on the part of the Puma.

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 recordings, reports from the air traffic controller involved and reports from the appropriate ATC and operating authorities.

Both Controller and Pilot Members alike found this a challenging incident to analyse as there were so many elements and because it highlighted significant differences between civil and military regulations and practices regarding clearances to enter an ATZ and to join a visual circuit. The Board agreed that since there were so many factors that contributed to this incident, they should not be enumerated formally below as 'Contributory Factors'.

Members agreed that in this high-workload situation, the ADC had become distracted to such an extent by the Puma's non-standard circuits, that he had temporarily overlooked the approaching PA28. Had the ADC not been distracted, Members agreed that he would most likely have paid more attention to the PA28, of which he was previously aware having agreed with ZONE that it could join downwind and noted it on the HiBrite on 2 occasions; he could then have prompted the ZONE Controller to transfer it to him in an unrushed and timely manner. The ZONE Controller too, Members agreed, had contributed to the incident by not instructing the PA28 pilot to report 'visual' with the airfield, as is normal procedure, and then to call TWR before entering the circuit area; Controller Members agreed that although civil and military procedures differed, in this situation such a call would have been best practice and might have prevented the incident. It was also unanimously agreed that if a controller does not instigate a handover to TWR, then the pilot should take the initiative and request it before nearing the airfield, for example by saying 'would you like me to contact TWR?'

Civil and military Controllers also noted the discrepancy between civil and military procedures regarding circuit joining clearances; although the PA28 was a civilian ac being operated by the local flying club, it was operating from a military airfield and flying club members are required to comply with local Flying Orders and military procedures. That being the case, only the ADC had the authority to clear the ac to join the circuit. Although perhaps harsh, and despite the mitigating circumstances, Members agreed that the PA28 pilot had not been cleared by the ADC to join the circuit until well after the ac had entered it. This breakdown of Flying Order Book procedures had not been the cause of the incident as the PA28 pilot had seen from the upwind end of the runway the Puma climbing out directly towards him; the non-standard circuit had apparently also caused confusion in the PA28 pilot's mind as to the Puma pilot's further flight-path and intentions. The Board discussed the responsibility of the PA28 pilot to integrate safely with traffic already established in the circuit. With the Puma just airborne and no other aircraft in the circuit, there was no established circuit pattern for the PA28 pilot to conform with, and he would have expected the Puma to climb to 500ft before turning. With the PA28 in the downwind position and probably ahead of the Puma, albeit only just, it was the Puma pilot's responsibility to see the PA28 and integrate behind it. Clearly the Puma crew had no indication from the RT that there was traffic downwind when they turned short and saw the PA28 at a very late stage (50-75m ahead).

In determining the Cause of the Airprox, the Board struggled to establish a consensus of where the balance of responsibility lay between the controllers and aircrew involved. Therefore the Board agreed to make a factual statement indicating what had happened.

A Member familiar with both GA and Military operations commented that this incident was a good example of how an incident could occur basically through poor communication by all those involved – one transmission from any of the participants, he opined, could have broken the chain of events. In the event, however, by monitoring the Puma's flightpath continuously, and thereby being in a position to manoeuvre should it be required, the PA28 pilot ensured that there was no risk of the ac colliding.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Unaware that the PA28 had joined the circuit downwind, the Puma crew turned into conflict with it.

Degree of Risk: C.

AIRPROX REPORT No 2010040

Date/Time: 28 Apr 2010 (Wednesday) 1144Z

Position: 5216N 00127E (20nm
ENE of Wattisham A/D -
elev 283ft)

Airspace: London FIR (Class: G)

Reporting Ac Reported Ac

Type: Sea King HAR3 Rockwell 112

Operator: HQ Air (Ops) Civ Pte

Alt/FL: 2000ft 1500-2000ft
QFE (1010mb) QNH (1021mb)

Weather: VMC Sleet VMC NR

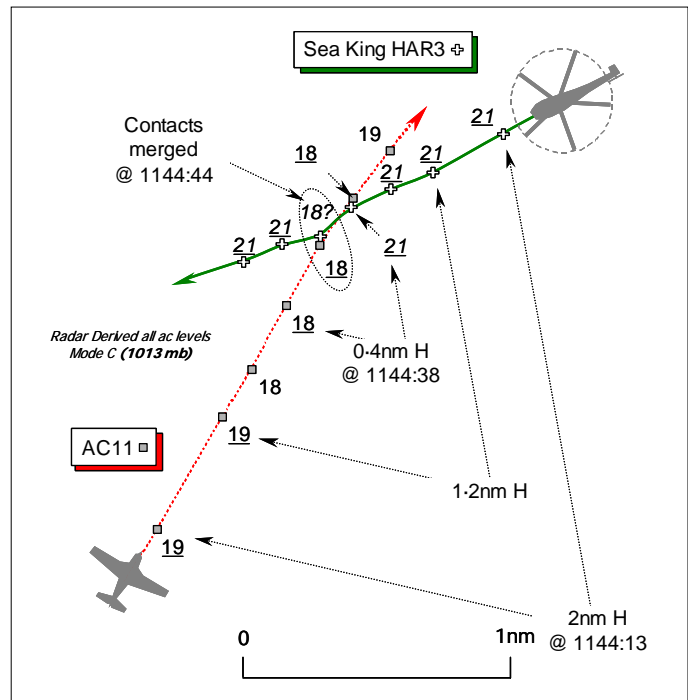
Visibility: 10km >10km

Reported Separation:

200ft V/100m H NR

Recorded Separation:

Nil V – contacts merged see UKAB Note



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE WESTLAND SEA KING HAR 3 CAPTAIN reports he was conducting a local VFR training flight from Wattisham and in receipt of a TS from Wattisham APPROACH (APP) on UHF 277-725MHz. His ac has a yellow colour-scheme and the HISLs were on. A squawk of A4523 was selected with Mode C.

The PF was using an IF visor and flying the helicopter from the RHS, whilst being vectored for an instrument approach to RW23 at Wattisham in VMC at 2000ft QFE (1010mb). APP passed TI about an ac in their 11 o'clock, 6nm, some 200ft below, also working Wattisham APP, which they acknowledged with, 'copied, looking'. About 1min later, heading 245°(M) at 105kt, whilst the pilot in the LHS was carrying out the instrument approach cockpit checks in accordance with the Flight Reference Cards (FRCs), the ac captain saw an aircraft passing 100m to port and 200ft below his Sea King flying straight and level on a reciprocal heading with a 'high' Risk of a collision. The low-wing single-engine aeroplane, predominantly blue in colour, was spotted 100m away but no avoiding action was taken as the other ac was abeam and drawing aft when first seen. He queried if APP had the traffic on their radar; the controller confirmed it was the ac that TI was passed about earlier. The instrument approach was then completed.

THE ROCKWELL COMMANDER 112 (AC11) PILOT reports that he was in transit to Beccles under VFR at 1500-2000ft amsl. A BS and MATZ penetration approval had been obtained from Wattisham APP on VHF 125-8MHz and the assigned squawk was selected with Modes C and S on.

Wattisham APP informed him of an approaching helicopter, but gave no warning to take avoiding action. Heading 020° in the vicinity of Framlingham at about 110kt, he saw the bright yellow helicopter from a good distance away, which passed to port and above his ac but he could not remember the distance. He did, however, have a clear sight of the helicopter at all times, felt no rotor wash or down draft and no avoiding action was taken. He assessed the Risk as 'low'.

His ac has a blue/gold & white colour-scheme.

THE WATTISHAM APPROACH RADAR CONTROLLER (APR) reports that the Sea King was recovering to Wattisham for an ILS approach on UHF 277.725MHz. The ac was identified and placed under TS at 2000ft Wattisham QFE (1010mb). The AC11 was transiting to Beccles under BS at 2000ft Wattisham QNH (1020mb) on VHF 125.8MHz. The trainee Approach controller accurately called the AC11 to the Sea King crew as - 'traffic L 11 o'clock, 6 miles, northbound, a Commander with me at 2000ft Wattisham QNH', to which the Sea King replied, 'looking'. The trainee then became involved in a radar handover to London Military. As soon as this handover was completed the trainee advised the AC11 pilot about the, 'Sea King traffic on his nose approx half a mile 300ft above'. The AC11 pilot reported that he was just passing that traffic with it in sight; the Sea King pilot then advised that traffic had passed about 100ft below, some 300ft away down his port side and asked if anything was shown on radar. The trainee controller advised that it was the traffic that had been called to him earlier - the AC11. After he had landed the Sea King pilot advised he was filing an Airprox; no Airprox report was made on RT by the AC11 pilot. The APR estimated the minimum separation to be ¼nm horizontally and 200ft vertically.

ATSI reports that the Wattisham Approach Radar position was being operated by a mentor and trainee, using both UHF and VHF frequencies. All the RT transmissions by the controllers were made on both frequencies. However, the RT recording confirms that any transmissions from the pilots were only made on the respective frequencies; i.e. the Sea King on UHF and the AC11 on VHF. Consequently, the ATC transmissions were received by both pilots but they would not have been able to hear the calls made by the other pilot.

The AC11 pilot established communication with Wattisham APP at 1133, requesting a BS, *"A-C 11 out of Earls Colne inbound to Beccles presently just coming up abeam the Orwell ????? re-checking the 0-6-0 I'm level at 2 thousand feet on 1-0-2-0 four souls on board and request a Basic Service"*. The controller confirmed the provision of a BS and issued the Wattisham QNH (1021mb).

The Sea King crew returning from a local VFR flight contacted Wattisham APP at 1138 to, *"request..radar pick up for an I-L-S before our crew drop off..."*. The helicopter was identified, placed under a TS, with the proviso that the crew were responsible for their own terrain clearance and instructed to climb to 2000ft Wattisham QFE (1010mb) [about 2330ft QNH (1021mb)]. The height and ATS were read back correctly by the Sea King pilot and shortly afterwards he reported reaching a height of 2000ft, heading 235°. About 2min later, at 1142:45, TI was issued to the Sea King crew, *"traffic left 11 o'clock 6 miles crossing left right indicating..2 hundred feet below your level is a..Commander 11 with me at 2 Thousand feet on the Regional on the Wattisham QNH 1-0-2-1"*. The pilot responded *"copy looking"* at 1143:00.

The trainee controller then became busy dealing with an ac routeing out to the NW of Wattisham on the VHF frequency, which involved carrying out a handover to London Military. As soon as the radar handover was completed, the pilot of the AC11 was warned, at 1144:39, *"Sea King traffic on your nose about half a mile..indicating 3 hundred feet above your level"*. The pilot replied, *"Yeah seen him he's just gone past sir"*.

[UKAB Note (1): Just after 1145:00, the Sea King crew enquired on UHF, *"[C/S] we had a..puddle jumper white aircraft pass us about..1 hundred feet below about 3 hundred feet down our port side..did you have any [radar] return on him?"*. The APR replied *"[Sea King C/S] affirm that was the traffic called about a minute ago"*.]

At 1144:38, the radar recording shows the 2 ac on conflicting tracks, 0.4nm apart. The AC11, indicating 1800ft Mode C, is 300ft below the Sea King, which is maintaining 2100ft Mode C. The next frame at 1144:44, shows that the Sea King has descended to the same level as the AC11, 1800ft (1013mb) [about 2040ft QNH (1021mb)] and the radar contacts of the two ac have merged. At 1144:50, the Sea King indicates 2100ft (1013mb) [2340ft QNH], with the AC11 in its 6 o'clock, at 0.3nm, 300ft below it.

[UKAB Note (2): The validity of the Sea King's Mode C indication, based on the foregoing Debden Radar data, when the contacts merged at 1144:44 is questionable. Once level, the helicopter

consistently maintains 2100ft Mode C, from 4min before the Airprox until the end of the available data, with the exception of two returns – one being at the CPA and the other well after the event. The Sea King pilot's report does not mention any descent nor was any avoiding action taken in the time available. Moreover, he states that the AC11 passed abeam some 200ft below his helicopter. The Debden Radar gives consistently 'valid' data throughout that is replicated by the Cromer Radar recordings, but analysis of the Stansted 10cm Radar recording shows that the Mode C return for 1144:46, was an invalid indication (---). Notwithstanding the tolerances applicable to verified Mode C, it is feasible, therefore, that the Sea King maintained 2100ft (1013mb) and that the close proximity (<200yd) of the two ac has resulted in a spurious Mode C indication being displayed – the SSR processor possibly taking the more reliable altitude data from the enhanced capability Mode S equipped AC11 and relating it, incorrectly, to both ac.]

The MATS Part 1, Section 1, Chapter 11, Paragraph 4, defines a Traffic Service:

'A Traffic Service is a surveillance based ATS, where in addition to the provisions of a Basic Service, the controller provides specific surveillance derived traffic information to assist the pilot in avoiding other traffic. Controllers may provide headings and/or levels for the purposes of positioning and/or sequencing; however, the controller is not required to achieve deconfliction minima, and the avoidance of other traffic is ultimately the pilot's responsibility. The controller shall pass traffic information on relevant traffic, and shall update the traffic information if it continues to constitute a definite hazard, or if requested by the pilot. However, high controller workload and RTF loading may reduce the ability of the controller to pass traffic information, and the timeliness of such information'.

A Basic Service is:

'.....an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. Basic Service relies on the pilot avoiding other traffic, unaided by controllers. It is essential that a pilot receiving this service remains alert to the fact that, unlike a Traffic Service and a Deconfliction Service, the provider of a Basic Service is not required to monitor the flight. Pilots should not expect any form of traffic information from a controller, as there is no such obligation placed on the controller under a Basic Service outside an ATZ, and the pilot remains responsible for collision avoidance at all times. A controller with access to surveillance derived information shall avoid the routine provision of traffic information on specific aircraft, and a pilot who considers that he requires such a regular flow of specific traffic information shall request a Traffic Service. However, if a controller considers that a definite risk of collision exists, a **warning** may be issued to the pilot'.

Timely TI was issued to the Sea King crew about the AC11. Ideally, the information could have been updated as both ac approached each other. However, the controller was occupied handing over another ac and up to the last moment they were 300ft apart vertically. Although there was no requirement under a Basic Service to pass TI to the AC11 pilot, a warning was issued by the controller about the Sea King, albeit at a late stage.

HQ AIR (OPS) comments that once informed about the conflicting traffic the Sea King crew appears to not have assimilated the implications and had then become focused on internal cockpit husbandry. Fortunately the AC11 pilot was visual throughout and passed the Sea King by what he considered a safe margin; a wider berth would have been more comfortable and, arguably, demonstrated better airmanship.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts 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 evident that APP had passed accurate TI about the AC11 to the Sea King crew under the TS when the ac were 6nm apart, including the relative bearing, the fact that the AC11 was on a crossing track and that it was only 200ft below the helicopter's indicated level; the TI did not, however, include the AC11's heading. A CAT pilot Member opined that the Sea King crew would not have been able to spot the AC11 at this range and it seemed that the trainee controller's transmission had either not 'painted' a satisfactory picture for the Sea King crew, or they had apparently not absorbed the full gist of the TI nor understood that the AC11 posed a significant conflict. A controller Member, himself an experienced instructor, opined that if APP had emphasised this or that it was closing steadily it might have had more impact on the Sea King crew. Nevertheless, after acknowledging the TI, the Sea King crew started their cockpit checks, which may have detracted from their lookout. The radar recording reflected that the AC11 continued to constitute a definite hazard after the TI had been passed and there was widespread agreement amongst controller Members that a second transmission of TI would have been helpful and should have been issued, which would likely have prompted the Sea King crew to redouble their efforts to see the other ac. A Member emphasised that controllers should take into account other traffic when issuing vectors and not inadvertently generate a conflict by steering an ac under their control towards another; however, in this instance APP had not issued a vectoring instruction before the Airprox and had merely asked the Sea King crew to report their heading. The ATSI report shows that the controllers were busy with a radar handover after TI was issued, but any requirement for an update must take precedence and an experienced area controller Member stressed that Mentors should take care to ensure that priorities are allocated correctly without detriment to the overall ATS provided. Clearly the Sea King crew had a mutual responsibility to 'see and avoid' the other ac under the TS and could have asked for an update of TI themselves as they had not acquired the AC11 beforehand at a suitable range. A CAT pilot Member suggested that the Sea King pilots might have had different expectations under the TS and stressed that pilots receiving a TS should request updates on notified traffic that they cannot see. Nevertheless, pilots are expected to discharge their collision avoidance responsibilities under a TS without assistance from ATC; generally, the controller would proffer no form of deconfliction advice and if the pilots required deconfliction advice they should ask for an upgrade to a DS.

The AC11 pilot was transiting under a BS from APP and it was clear that APP had passed a warning to him of the presence of the Sea King at a range of ½nm. This was about 5sec before the contacts merged so this was barely in time, but the RT transcript revealed that the AC11 pilot had already seen the helicopter before it flew above him. As it was, the horizontal separation that did obtain was minimal as the contacts merged with, it would seem, the AC11 no more than 300ft vertically beneath the Sea King. The Board accepted that the Sea King's recorded Mode C data at the merge, which suggested that it was at the same level as the AC11, in all probability was incorrect.

In determining the primary cause of the Airprox, one Member considered that 300ft vertical separation did not pose a definite hazard and this Airprox had stemmed from the late sighting of the AC11 by the Sea King crew, who had not assimilated the TI provided. However, it was clear from his own account that the AC11 pilot had seen the helicopter from a good distance away and had watched it as the two ac converged. He was therefore, able to give the Sea King a wider berth if he chose to do so, and the Board routinely recommends pilots to avoid other aircraft both laterally and vertically. The Board concluded, therefore, that the cause of this Airprox was that the AC11 pilot flew close enough to the Sea King to cause its crew concern. However, as the AC11 had the Sea King continually in sight and could have manoeuvred if necessary, the Board agreed that no risk of a collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The AC11 pilot flew close enough to the Sea King to cause its crew concern.

Degree of Risk: C.

AIRPROX REPORT No 2010041

Date/Time: 3 May 2010 1026Z

Position: 5129N 00053W (2.5nm WOD)

Airspace: LFIR (Class: G)

Reporting Ac Reporting Ac

Type: C172+T67M Beagle Airedale
Formation

Operator: Civ Pte Civ Pte

Alt/FL: 2000ft 1900ft
(QNH 1024mb) (QNH)

Weather: VMC CLBC VMC CLOC

Visibility: >30km/Unltd >10km

Reported Separation:

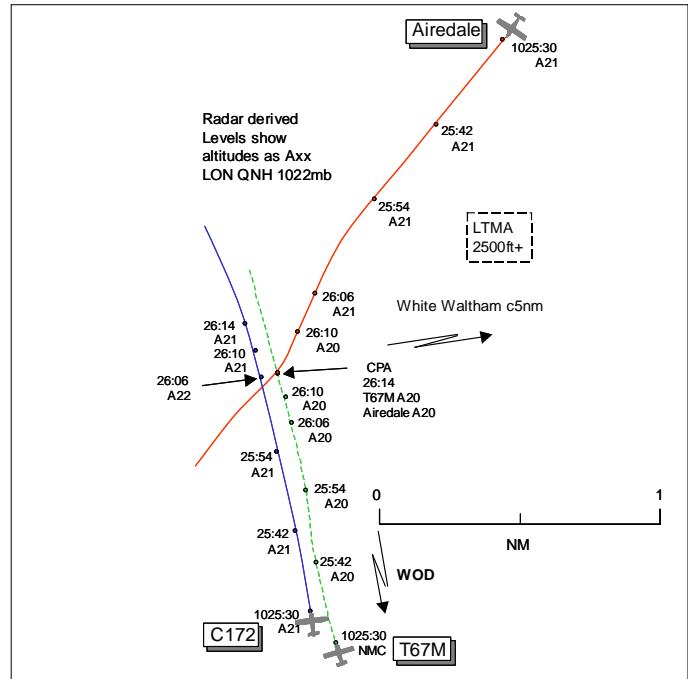
C172 50ft V/100m H 100ft V/400m H

T67M 30ft V Not seen

Recorded Separation:

C172 v Airedale 50-100ft V/0-2nm H

T67M v Airedale Nil V>Returns merge



ALL THREE PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C172 PILOT reports en route to Wellesbourne VFR and in loose formation with a T67M whilst under a BS from Farnborough W on 125.25MHz, squawking an assigned code with Modes S and C. The visibility was >30km flying 1000ft below cloud in VMC and the ac was coloured white/blue with strobe lights switched on. The route flown was via Guildford, WOD NDB and then on towards WCO whilst the T67M was flying slightly behind and to starboard. In the vicinity of WOD heading 355° at 100kt and 2200ft he saw another ac, a high-wing single-engine type coloured white/blue, about 200m away to his R and 50-100ft below on a near collision course. The other ac was very close to his R windscreen pillar, so he thought it had been concealed behind it previously, which would have contributed to his late sighting. He quickly determined that the other ac, although close, would pass behind him with no risk of collision which it did about 2sec later about 50-100ft below and 100m laterally. His attention turned immediately to the T67M which was going to get much closer to it. He considered whether he could alert the T67M pilot to the other ac by making an RT call but there was too little time to say anything that could have helped without making things worse. It was difficult to see exactly how the other ac would appear to the T67M pilot – below/above or relative position. The T67M did have 2 pilots onboard so he hoped 1 of them would see the conflicting ac; however, they did not until they were very close. With the visibility being excellent and having a pax who was new to light ac flying, he had not wanted too much radio work so did not consider a higher level of service. However, he later realised that he had omitted to tell Farnborough that he had another ac in formation. The T67M pilot then reported the Airprox to Farnborough a few minutes later. He assessed the risk of collision as low.

THE T67M FIREFLY reports en route to Wellesbourne in two-ship loose formation with a C172 and listening out on the Farnborough W frequency, squawking 7000 with Modes S and C. The visibility was unlimited flying 1000ft below cloud in VMC and the ac was coloured yellow/black with strobe lights switched on. The C172 was responsible for navigation whilst he concentrated on holding formation 300m R echelon with his co-pilot providing a general lookout for traffic and handling the radio. The C172 flight was in communication with Farnborough; however, he missed the C172 pilot's

initial call owing to finger trouble selecting the frequency after transferring. It later became apparent that the C172 pilot had not made it clear to Farnborough that they were in formation and, as he missed that point, he didn't call to make his presence known. However, 2min before the Airprox Farnborough asked the C172 pilot if he was in formation and was given a positive response. When 2nm N of WOD heading 350° at 100kt and 2000ft, his co-pilot saw a conflicting ac, a high-wing single-engine ac, only as it passed directly underneath, possibly because the ac had been obscured by the windscreen hoop or the ac's wing. He, the handling pilot, saw it about 1sec before the CPA, the ac appearing as a white flash below and to the R before it passed about 30ft below, too late to take any avoiding action. The other ac appeared to be tracking 240° and climbing but without having taken any avoiding action. He assessed the risk as high. He reported the Airprox to Farnborough a minute after the CPA, this being his first call on frequency.

THE BEAGLE AIREDALE PILOT reports en route to Popham VFR and in receipt of a BS from Farnborough W on 125.25MHz, squawking an assigned code with Mode C. He had been transferred from Farnborough N as he approached Marlow, which he then passed O/H avoiding the Wycombe Air Park ATZ and Heathrow CTR. He had passed his flight details and was given another squawk; the area was usually busy so he kept a good lookout. When in the Henley area heading 215° at 90kt and 1900ft he saw a Cessna in his 2 o'clock about 1nm away on a reciprocal heading slightly above. He turned slightly towards the S to maintain separation and watched it pass 100ft above and 400m clear to his R with no risk of collision; no TI had been received from Farnborough on this traffic. Only after being contacted by RAC Mil was he informed that a Firefly [T67M] had been in loose formation with the Cessna. He had not seen the T67M as at the time he was pre-occupied with watching the Cessna; he had not been told about any ac flying in formation.

THE FARNBOROUGH W CONTROLLER reports operating at medium intensity with a relatively high turnover of traffic and with a significant number of contacts seen on radar throughout the service area. The C172 was receiving a BS routeing OCK Bagshot at 2100ft QNH 1022mb. When the ac was 1nm NW of Bagshot Mast he told the pilot that he had manoeuvring traffic in his immediate vicinity which he acknowledged. A few miles later he noticed that this contact appeared to be following the C172 so he told the Cessna pilot about it again and asked if he was flying in company with another ac, which he confirmed. The Cessna pilot had not told him previously of this fact nor had the identity of the other ac been offered. As there was no requirement to obtain a c/s for the second ac he did not do so. At about 1026 a pilot called using an unfamiliar c/s [T67M] stating that an Airprox had occurred. He scanned his fpss but did not have an ac with that c/s so he asked the pilot if he was receiving a service from Farnborough as he was concerned that he may have discarded the fps. The T67M pilot replied that he was in company with the C172 and that the Airprox occurred W of White Waltham at 1025. At that time the C172 was N of Henley tracking N and the T67M pilot reported the other ac was high-wing, possibly a C152. The reported ac was not on frequency, he thought, and as there were multiple radar returns in the area it was not possible to identify the ac. He took some details down and then transferred the C172 and T67M to LARS N. The C172 pilot did not file an Airprox on frequency.

ATSI reports that the Airprox occurred 4nm SW of White Waltham below the London TMA in Class G airspace. The Beagle Airedale was VFR en-route to Popham and in receipt of a BS from Farnborough LARS W. The Slingsby T67M (Firefly) was not talking to Farnborough at the time of the incident, but called afterwards to report an Airprox. A C172 en-route to Wellesbourne Mountford was VFR and also in receipt of a BS from Farnborough LARS W. It later emerged that the Firefly was following this C172.

METAR EGLF 031020Z 36016KT 9999 VCSH SCT031 08/01 Q1022=

At 1008:30 the C172 pilot reported 3nm NW of Dorking at 2000ft and Farnborough agreed to provide a BS, issuing a squawk of 0436 and QNH 1022mb.

At 1020:05 the Airedale flight called Farnborough and a BS was agreed. Farnborough provided a squawk of 0433 and QNH 1022mb. The radar recording shows the Airedale tracking SSW and indicating an altitude of 2100ft. At 1023:32 the Farnborough controller observed that an unknown ac

is following the C172 and asked, "C172 c/s are you in company with another aircraft". This was confirmed by the C172 pilot but no other details were provided. At this point radar recording shows the C172 tracking N approximately 8nm SSW of the Airedale.

[UKAB Note (1): The 3 ac continue to converge, the radar recording showing at 1026:06 the C172 tracking 350° and indicating 2200ft QNH, crossing from L to R 0.3nm ahead of and 100ft above the Airedale, which is tracking 205° having just turned L about 15°. Meanwhile the T67M is in the Airedale's 11 o'clock also crossing from L to R at a range of 0.4nm indicating 100ft lower. Four seconds later the C172 is seen diverging away from the Airedale at a range of just under 0.2nm with vertical separation of 100ft whilst the T67M closes to a distance of just over 0.2nm in the Airedale's 1130 position at the same level. The CPA occurs on the next sweep at 1026:14 as the T67M and Airedale's radar returns merge with both ac indicating 2000ft QNH. The normal radar picture range shows the ac labels overlapping and garbling.]

The T67M flight then contacted Farnborough radar at 1028:10 and advised "T67M c/s Slingsby T67 we're following the C172 c/s and we've just had an Airprox". The controller's written report states that he was unable to find any flight details for this ac and asks, "Roger are you receiving a service from me". The T67M pilot replied, "negative not at this time". Farnborough responded "Roger in that case stand by" and this was acknowledged. At this point the distance between the 2 ac involved is 6nm and the controller was not aware that the Airedale was the other ac involved.

The T67M pilot reported that the Airprox occurred at approximately 1025 abeam White Waltham and that the other ac was a high wing Cessna, possibly a C152. Shortly afterwards the C172 and T67M were transferred en-route.

The Farnborough controller reported multiple contacts in the area. The radar recording set at the normal operational range shows a number of contacts in the area, together with Heathrow arrivals on RW09L, resulting in a complex picture with a degree of label overlap and garbling.

The controller was providing a BS to the Airedale and C172, but not to the Firefly. MATS Pt1, Section 1, Ch 11, Pg4, para 3.1 defines: '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'.

Due to the multiple contacts in the area and garbling of SSR labels, the controller was not aware that the ac had passed in close proximity and was unable to pass any warning to the pilots. MATS Pt1, Section 1, Ch 11, Pg4, para 3.5.1, states: 'Pilots should not expect any form of traffic information from a controller, as there is no such obligation placed on the controller under a Basic Service outside an Aerodrome Traffic Zone (ATZ), and the pilot remains responsible for collision avoidance at all times. However, on initial contact the controller may provide traffic information in general terms to assist with the pilot's situational awareness. This will not normally be updated by the controller unless the situation has changed markedly, or the pilot requests an update. A controller with access to surveillance derived information shall avoid the routine provision of traffic information on specific aircraft, and a pilot who considers that he requires such a regular flow of specific traffic information shall request a Traffic Service. However, if a controller considers that a definite risk of collision exists, a warning may be issued to the pilot'.

MATS Pt1, Section 1, Ch 11, Pg5, para 3.6.1, states: 'Whether traffic information has been passed or not, a pilot is expected to discharge his collision avoidance responsibility without assistance from the controller'."

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of all 3 ac, transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

Although the C172 and T67M pilots reported flying in loose formation Members wondered whether they had had any formal training. This discipline is an item covered extensively in military flying training but is not covered in the PPL syllabus; however, it is offered as a post PPL training course by a few flying establishments in the UK. Apart from the actual flying aspects – maintaining/moving formation position and pilot's responsibilities within the formation including lookout - RT discipline, including check-in and loss of RT procedures, is a crucial element. It is not difficult, but it needs to be thought about beforehand and briefed thoroughly. SOPs for each of the flying elements is to check-in on frequency before the formation leader communicates with ATC to pass the formation's flight details. In the event the C172 pilot did not do this and the T67M pilot, who was slow to come up on the new frequency and did not check in, missed the C172 pilot's initial RT exchange with the Farnborough controller, who was unaware of the ac being in formation. Later the controller noticed the T67M flying close to the C172 and eventually the formation situation was revealed. Phraseology to be used for inter-formation exchanges is another aspect of this discipline so the C172 formation leader should have been aware of the appropriate calls to make to warn the T67M pilot of the conflicting traffic. The UKAB will examine the possibility of writing a guide for GA pilots highlighting the tasks and responsibilities associated with leading and flying as a wingman in a formation.

As this incident occurred in Class G airspace below the LTMA, the pilots were responsible for maintaining their own separation from other ac through 'see and avoid', irrespective of the ATS being provided. Under a BS, pilots should not expect any specific TI on other ac. The controller was under no obligation to monitor the flight, and did not see the conflict on radar so no warning was passed. Members were acutely aware of the possible blurring of services, which could lead to pilots under a BS provided by a radar equipped ATSU believing that they may be getting a 'better' service than they actually are. The formation pair and Airedale had approached each other on a constant relative bearing, a situation where an ac appears as a stationary target in the pilot's field of view with no relative movement. Both the C172 and T67M pilots believed that the converging Airedale had probably been hidden by ac structures. These known blind spots should be taken into account during the lookout scan and can be alleviated by either moving the ac's flightpath or the pilot's head to clear the blind areas. Members agreed that the cause of the Airprox was that the C172 formation leader had, for whatever reason, seen the Airedale late whilst the T67M pilot, whose lookout scan was degraded owing to his attention being drawn towards the leader for his station keeping, only saw the Airedale as it passed beneath, effectively a non-sighting, whilst the T67M passed unsighted to the Airedale pilot. Under the Rules of the Air, the T67M pilot should have given way; clearly this was not possible owing his non-sighting of the conflicting Airedale.

Turning to the Risk, the C172 pilot saw the Airedale late and quickly judged that it was going to pass close, estimated separation 50-100ft vertically and 100m horizontally, but with no risk of collision with his aircraft. The Airedale pilot had seen the C172 and had manoeuvred his ac to the L ensuring adequate separation margins were maintained, his estimated separation distances being borne out by the radar recording. However, the T67M and Airedale had then passed each other purely by chance, the T67M pilot seeing the Airedale as a white flash passing 30ft below with the Airedale pilot unaware of this close call; the radar recording at the CPA indicated nil separation. These facts left the Board in no doubt that a definite risk of collision had existed during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the Airedale pilot, effectively a non-sighting by the T67M pilot and a late sighting by the C172 formation leader.

Degree of Risk: A.

AIRPROX REPORT No 2010043

Date/Time: 8 Mar 2010 1152Z

Position: 5257N 00230W (5nm
N Tern Hill)

Airspace: Shawbury AIAA (Class: G)

Reporting Ac Reported Ac

Type: Squirrel PA38

Operator: HQ Air Trg Civ Trg

Alt/FL: 1900ft ↑ 2200ft
(RPS 1028mb) (RPS 1028mb)

Weather: VMC HAZE VMC NR

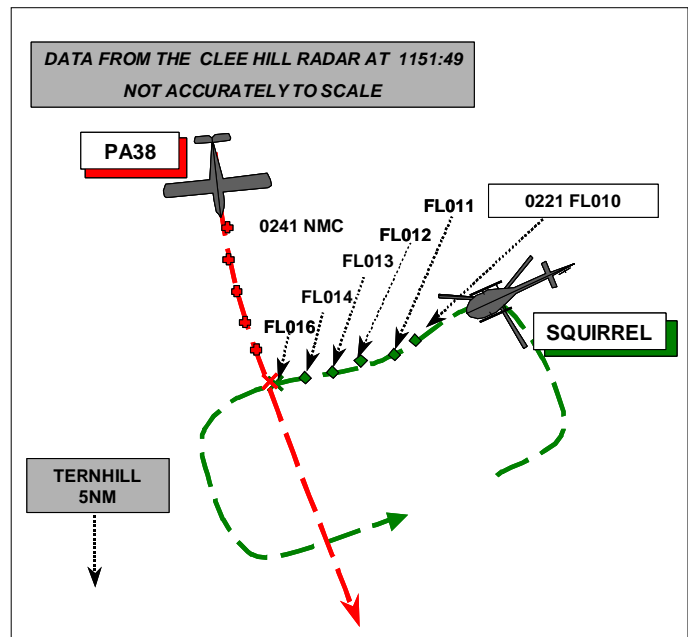
Visibility: 5.0 30

Reported Separation:

150ft V/50ft H 400ft V/ 0 H

Recorded Separation:

NR V/0 H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SQUIRREL PILOT reports flying a yellow and black helicopter with nav lights and strobes switched on, on a training flight, squawking a Shawbury conspicuity code with Mode C and operating on a Shawbury monitored quiet frequency and booked into the LFS. Half an hour into a sortie of advanced autorotations, using the canal north of Market Drayton as a line feature entry point for comparison, the ac was being repositioned at 70kt in a left-hand racetrack to re-cross the canal on a notional into-wind heading of 070° for a further autorotation. Climbing through 1900ft with about 30° to go and the ac starting to level off, the NHP student became aware of a light ac in close proximity through the overhead window and warned the HP [instructor] who levelled off. Having levelled off and rolled 'wings level' the HP then also saw the ac, a white coloured, light fixed-wing ac similar to a Grob Tutor, continuing along the right-hand side of the canal towards the S. The fixed wing ac had made no apparent attempt to take evasive action and appeared to be following the line feature of the canal into sun. At the closest point the ac was assessed to have been about 50ft above and five 'spans' clear. The student noted that the white ac had a blue flash down the side, was being flown by a single pilot and carried a registration that they only partly noted.

He assessed the risk as being high.

THE PA38 PILOT reports flying a white ac with blue lettering with nav lights and strobes switched on in receipt of a BS from Shawbury LARS squawking as directed with Mode C, he thought, on a training flight. He was heading 151° at 90kt, tracking from Oulton Park to Wolverhampton and just S of Nantwich and level at 2200ft on the RPS when he heard an RT exchange with traffic tracking from his left to right. He then saw a black and yellow Twin Squirrel helicopter 45° left of his nose, about 2km away and lower than himself. As he was positioned to the right of the traffic he maintained speed/direction iaw Rule 17 [RoA]; the traffic passed below him by about 400ft and then passed to the right, appearing to maintain level/direction throughout his observation. At no time did he lose sight of the helicopter or consider the separation to be an issue, assessing the risk to be none.

UKAB Note (1): The recording of the Cleve Hill Radar shows both ac. At 1150 the PA38, squawking 0241 (Shawbury) but with no Mode C, is tracking 170° 3nm to the NNW of the Squirrel, squawking 0221 (Shawbury), which is tracking 080° indicating FL000 climbing. At 1150:17 when the PA38 is 2.8nm NW of the Squirrel, the latter commences a tight left turn rolling out on 230° and climbing

through FL007 at 1150:48 with the PA38 in its 0230 at 1.8nm. The Squirrel continues to climb now on 250° and the PA38 tracks 170° until the ac cross at 1151:44 with the Squirrel contact climbing through FL016 coincident with the PA38, which is apparently directly above it. After the ac cross the Squirrel turns hard left onto a NW track still at FL016 passing 0.4nm behind the PA38.

HQ Air (TRG) comments that the PA38 pilot had the Squirrel in sight throughout and did not consider the separation to be an issue. However, the relatively late sighting by the Squirrel crew seems to have caused them concern. The PA38 pilot controlled the separation distance throughout this occurrence and with hindsight it may have been prudent for him to have given a wider berth even though he had right of way iaw Rule 17.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, radar recordings and report from the Squirrel operating authority.

Members agreed that ATC had played no part in this incident and that both ac had been operating legitimately in Class G airspace conducting their respective activities. That being the case, the pilots of both ac had an equal and shared responsibility to see and avoid other ac. The PA38 pilot reported that he saw the Squirrel about 2km away. Members agreed that he had seen the Squirrel involved (there were several Squirrels in the area) since the geometry was consistent, and that seeing the small helicopter climbing up from low level at 2km was reasonable in the circumstances (the Squirrel pilot reported the conditions as being HAZE).

The Board examined the Squirrel crew's participation and discussed the suitability of the area selected for the practice autorotation; bearing in mind that it was in a promulgated AAIA and that DHFS need to conduct a large number of such practices, a majority of Members agreed that there was not a more suitable alternative. That being the case, and that the majority of DHFS Squirrel flying is instructional, lookout, particularly by instructors, is most important. While accepting that the cross-cockpit view from the Squirrel is restricted, particularly when looking above, this is a known factor for which provision should be made, if necessary by manoeuvring one's head, or the ac. It was also pointed out that many civil light ac fly at or about 2000ft, ironically in order to avoid the majority of Military traffic, therefore even more attention should be paid to that height band.

The Board noted that although the PA38 pilot had right of way under the rules of the air, it is always wise to assume that the pilot(s) in the other aircraft have not seen you until their actions prove otherwise. Whenever possible an adjustment of heading to provide lateral as well as vertical separation will reduce the alarm factor of a late sighting and may assist the other pilot's acquisition. Members agreed that, as the Squirrel crew had not seen the PA38 until about the time the ac had crossed, they had not had time to take any avoiding action; however since the PA38 pilot had seen the Squirrel at 2km, monitored it continuously, and considered that it was not a threat and had been in a position to increase the separation if necessary, it followed that there had been no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sighting by the Squirrel crew.

Degree of Risk: C.

AIRPROX REPORT No 2010045

Date/Time: 10 May 2010 1440Z

Position: 5140N 00105W (3nm N
Benson - elev 203ft)

Airspace: MATZ/Oxford (Class: G)

AIAA

Reporting Ac Reported Ac

Type: Puma Untraced Glider

Operator: HQ JHC N/K

Alt/FL: 1900ft N/K
(QFE 1006mb)

Weather: VMC CLBC N/K NR

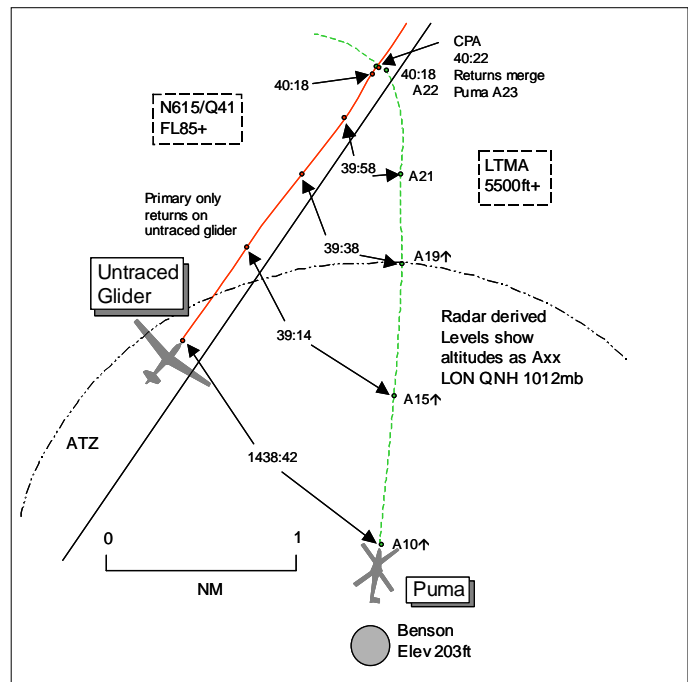
Visibility: 30km NR

Reported Separation:

100-200ft V/Nil H NR

Recorded Separation:

returns merge



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PUMA PILOT reports flying a local sortie from Benson and in receipt of a DS, he thought, from Benson Director, squawking 3610 with Mode C. The visibility was 30km flying 2500ft below cloud in VMC and the ac was camouflaged green with HISLs, nav and landing lights all switched on. After completing an overshoot from a PAR RW01 they were being re-positioned for a further approach, an ILS RW19. When commencing a level L turn on to heading 290° [actually 310°] at 1900ft QFE 1006mb and 100kt about 3nm N of Benson, iaw ATC instructions, the handling pilot in the LH seat spotted a glider out of the corner of his eye approaching from the LHS at the same level. He immediately initiated a rapid climb to avoid the glider which was seen to pass about 100-200ft below. He informed ATC that the glider was at 1900ft and 3nm on the extended C/L of RW01. He assessed the risk as high.

RAC MIL reports that despite extensive tracing action the identity of the glider remains unknown. The glider's primary only contact could not be tracked from a point of departure nor to a destination. Procedural tracing action through numerous gliding sites did not produce any likely gliders, so the reported ac remains untraced.

THE BENSON DIRECTOR reports acting as the screen controller for a trainee on consul for 1hr and 10min with a steady flow of radar training cct traffic. As the Puma was climbing out on RW track (RW01RH) for a PAR, the supervisor informed the trainee that the Puma could now have an ILS [previously requested] against the stream if required (RW19). The trainee instructed the Puma flight to climb to 1900ft QFE [1438:35] and then correctly spotted that the pilot had read back his instructions incorrectly. The trainee then called traffic [1439:39] i.e., R 1 o'clock 5nm crossing R to L 800ft above. The trainee then did some admin with the Puma [procedure minima and intentions] until the pilot called level and then turned the Puma onto 310° [1439:58] to position the ac for the ILS. Shortly after the turn the Puma pilot called visual [1440:18] with "...previously called traffic 3 o'clock 200ft below". The trainee replied that the traffic was not the ac he had called and that the ac was not visible on radar. The Puma pilot then told us that the ac he had seen was a glider. The trainee then correctly informed the Supervisor & Approach controller about the glider's approximate position and altitude and then continued to vector the Puma for its approach.

HQ AIR ATM Safety Management reports that the Puma was conducting IFR radar training in the Benson radar training cct under a TS from Benson DIR. After completion of a PAR, whilst repositioning for further approach, the Puma came into conflict with a glider. The TS was being provided using SSR only (primary radar was unserviceable). The controller was under low to medium workload and had called TI on an ac which was operating SSR shortly before the incident. SO2 SM Spt ATM believes the lack of primary radar at the time of the Airprox was the contributing factor in the incident. The glider was not displaying SSR at the time and was therefore not seen by Benson DIR. On initial report of the glider's proximity to Benson, the controller correctly reported this to the supervisor and other ac receiving a service from Benson ATC. RAF Benson has subsequently regained the primary Watchman radar.

HQ JHC comments that the lack of primary radar at the time of the Airprox meant that neither the controller nor the Puma were aware of the proximity of the glider in question. The glider demonstrated a lack of airmanship by flying through the extended centreline of a busy airfield without transponder or notifying ATC. It appears that the Puma was confused about previously notified traffic and may have been concentrating his lookout away from the direction of the conflicting glider. It is fortunate that the Puma eventually spotted the glider and took avoiding action.

UKAB Note (1): Analysis of the Heathrow 23cm and 10cm recorded radars, not available to Benson ATC, at 1438:42, when the Puma pilot acknowledges the trainee Director's climb, first shows the Puma 0.3nm N of Benson tracking 005° climbing through altitude 1000ft QNH 1012mb (800ft Benson QFE). At the same time a primary only return, the untraced glider, shows 2nm NW of Benson tracking 035° in the Puma's 1030 position. The subject ac continue on converging headings with separation reducing to 0.7nm at 1439:38, the time when the trainee Director passes TI to the Puma pilot on traffic to the NE. Separation reduces further to 0.4nm at 1439:58 when Director instructs the Puma flight to turn L onto heading 310°. As the Puma pilot's transmission starts, reporting his sighting of the glider, the ac as separated by <0.1nm before they merge 4sec later at 1440:22, the Puma indicating a climb of 100ft to altitude 2300ft QNH, in accord with the pilot's reported avoiding action.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the Puma pilot, transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

Members noted the glider's track, which had taken it close to the ATZ and converged with the FAT for Benson's main RW. Any pilot intending to pass close to or through a FAT should take into account the instrument approach path profile and endeavour to fly clear (above/below or laterally spaced) from it. Although the Puma flight was receiving radar vectors from Benson Director within the MATZ, the Puma crew, as well as the glider pilot, were required to maintain separation from other traffic through 'see and avoid' as the airspace was Class G. The glider pilot had not called Benson so it was unknown traffic. However the situation was further complicated owing to the reduced level of radar services as the primary radar was oos; the glider was not squawking so it was invisible to Director. Taking these points into account Members agreed that the cause of this Airprox had been a sighting issue. Considering the geometry, Members were surprised that the glider pilot had not filed a report. The Puma had approached it from behind and then turned, just before the CPA, to pass O/H the glider. There appeared to be no track deviation on the radar recording and the Puma crew made no mention of the glider manoeuvring during the encounter. On the balance of probability, Members surmised that the Puma had probably passed unsighted to the glider pilot. The Puma handling pilot, who was heads-in instrument flying, fortunately had seen the glider, albeit late, out to his L at the same level, and had immediately climbed to avoid it, watching it pass 200ft below and then diverge out to their R. One pilot Member thought that in the circumstances that pertained, with the Puma crew unaware of the glider's presence and the late sighting, safety had been compromised. This view was not shared by the majority who believed that the visual sighting and prompt actions taken by the Puma crew had been enough to remove any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A probable non-sighting by the glider pilot and a late sighting by the Puma crew.

Degree of Risk: C.

AIRPROX REPORT No 2010048

Date/Time: 15 May 2010 (Saturday) 1528Z

Position: 5249N 00043W (Saltby
Airfield - elev 480ft)

Airspace: Lon FIR (Class: G)

Reporting Ac Reported Ac

Type: Slingsby Cadet Rockwell 114

Operator: Civ Club Civ Pte

Alt/FL: 1000ft 1500ft
(QFE) (NK)

Weather: VMC CAVOK VMC CLBC

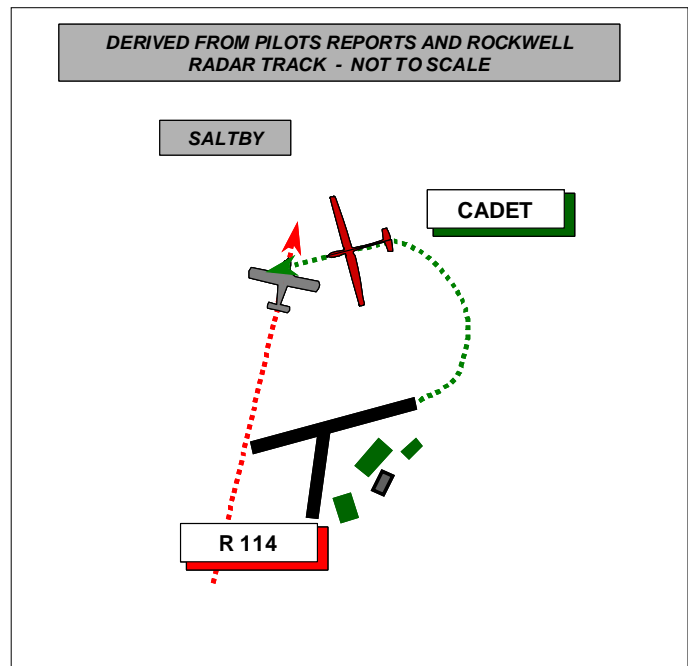
Visibility: 20km >10km

Reported Separation:

150ft V/500m H 500ft V/400m H

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SLINGSBY CADET PILOT reports that he had completed a normal glider winch launch to a height of 1200ft AAL at Saltby airfield in a silver ac with no SSR, radio or lights. Turning crosswind into the cct (RWY08 LH cct) he noticed a white low wing, single-engined, ac with a green stripe on a heading of about 300° about 3-4nm away, approaching the airfield, very slightly above the horizon. Initially, he believed the ac to be the glider tug returning to the airfield. On turning downwind, however, heading 260° at 30kt, he remained visual with the ac and assessed that there was a risk of collision so he commenced a shallow descent to increase the vertical separation and completed a normal landing. The ac passed about 500m in front of him, from left to right and about 150ft above, while he was descending through 1000ft AAL. The ac flightpath did not deviate and it flew directly through the airfield overhead.

He reported the incident to the Duty Instructor on landing and assessed that although, in the event, the risk of collision was low, he believed that had the ac flown that track one minute earlier it would have flown into the winch cable or his ac on the launch.

THE ROCKWELL 114 PILOT reports flying a white ac with a green stripe on a VFR private flight squawking with Mode S. He had attempted to contact Cottesmore for a service but there was no response. While heading 005° at 140kt, 5nm NNW of Cottesmore, his passenger in the right-hand seat saw a glider 500m away in their 2 o'clock and estimated it to be 500ft below them. It passed below them and to the starboard and the pilot eventually saw the white glider when it was behind and below them. He thought that he did not see it initially as it would have been outside his field of vision as they approached, being below the sight line over the engine cowl.

Since he did not see the glider until after it passed he was unable to take any avoiding action but nevertheless assessed the risk of collision as being none.

He was avoiding Cottesmore ATZ as he had not been able to establish radio contact with ATC. He assumed they were closed but the ATZ was active, otherwise his track would have been through the ATZ. His course would have taken him close to the Glider Site where the Airprox was reported.

UKAB Note (1): The recording of the Claxby radar shows the Rockwell 114 tracking 005°, squawking 7000 with Mode C (no Mode S) throughout but the glider does not show at any time. The Rockwell passes over Saltby Airfield at 1528:03 at FL015 (1560ft amsl or about 1080ft agl). (There are also two other contacts squawking 7000 with Mode C, one 1½ nm W at FL028 and another 1½ nm E at FL026.)

UKAB Note (2): Saltby is promulgated in the UKAIP as a glider launch site (winch/ground tow and tug aircraft/motor glider) 2000ft agl (Mon-Fri) and 4000ft agl Sat, Sun.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac and radar recordings.

The Board noted that the Rockwell pilot had taken the correct action by avoiding the Cottesmore ATZ when de got no response from their ATC; a Military Member observed that the hours of operation of Military airfields are widely published but, although MATZ are often closed at weekends, the majority of Military ATZs are H24. Having re-routed to avoid the Cottesmore ATZ, it seemed to Members that the Rockwell pilot had most likely overlooked that his new routeing put him closer to the Saltby glider launch site than he had planned on the ground and that he might not have noticed its presence on his map in the cockpit. Nevertheless, the BGA Member pointed out that it is wise to avoid glider launch sites by a wide lateral margin as winch launch cables, if collided with, can have a 'chain saw' effect on the ac wing as well as a catastrophic result for the launching glider.

In this case, however, the glider pilot saw the approaching Rockwell and monitored its position throughout the incident, judging that only a measured and small descent was required, thus removing any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Rockwell 114 flew through the circuit of a promulgated and active glider launch site, below winch launch height, and into conflict with the Slingsby Cadet.

Degree of Risk: C.

AIRPROX REPORT No 2010049

Date/Time: 13 May 2010 (Thursday) 1718Z

Position: 5307N 00005W (3nm
ENE Coningsby - elev
24ft)

Airspace: Coningsby MATZ (*Class: G*)

Reporting Ac Reported Ac

Type: Typhoon Untraced Glider

Operator: HQ AIR (OPS) NK

Alt/FL: 2000ft ↓ NK
(QFE 1011mb)

Weather: VMC NK

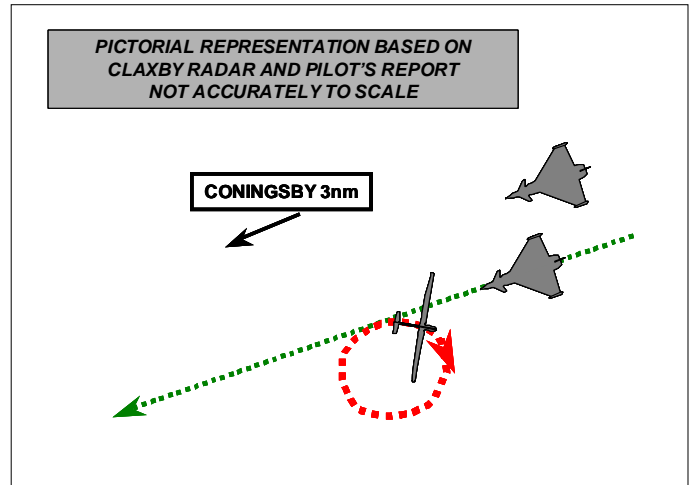
Visibility: 30km

Reported Separation:

200ft V/ NR H

Recorded Separation:

NK (See UKAB Note (2))



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TYPHOON PILOT reports flying dual, leading a pair of Typhoons recovering visually to Coningsby RW27 (L) in echelon formation, from a routine training sortie in contact with Coningsby TWR squawking as directed with Mode C. As the formation approached initials [070°/3nm@2000ft QFE] the No2 pilot called 'Bunt, Bunt, Bunt' in order avoid a [white] glider [which he saw 0.25nm away]. The lead Typhoon bunted aggressively and the No2 subsequently called that the collision risk had been averted. The lead Typhoon pilot did not see the glider at any stage.

The formation then recovered normally. The pilot assessed the risk as being high.

Subsequent analysis of the mission recording system revealed that the glider was on the extended centreline at 3nm and 2000ft, well within the MATZ.

UKAB Note (1): Despite extensive procedural tracing action the glider could not be identified.

UKAB Note (2): The recording of the Claxby Radar shows the Typhoons on the approach to Coningsby but they drop out in the left turn onto the centreline, reappearing 2 sweeps later with NMC. There is a primary-only return for 1 sweep only at 2.2nm on the approach, which might be the glider, coincident with Typhoon Leader. There is another intermittent primary contact 2min later, 2nm S of the position of the original primary contact but it again disappears and cannot be tracked. The Cromer and Debden radars only show the Typhoons intermittently with no primary contacts in the area.

HQ AIR BM ATM Safety Management comments that Coningsby APP then TWR were providing a TS to the Typhoon formation for a visual recovery. APP called traffic to them prior to releasing them to TWR; although not visual with the traffic, the formation reported that they were happy to continue and would keep a good look out. The Coningsby SUP reported seeing a contact on the HiBrite radar display in the VCR only after the Airprox was reported. The contact correlated with the position of the glider reported by Typhoon Leader.

Further investigation indicated that the contact seen on radar(s) was intermittent and therefore not assimilated as a threat. The lack of solid radar return presented to ATC at the time of the incident reduced the perceived threat level; however, best practice remains to pass TI in this situation if time permits.

HQ AIR (OPS) comments that this is another event caused by a non-SSR equipped ac flying in inappropriate airspace. The see and avoid principles applied in class G airspace will continue to break down while non-SSR equipped ac continue to fly in busy approach lanes to airfields without contacting the relevant controlling agency.

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

The Board agreed that soaring in the vicinity of or, as in this case, actually on the approach to a busy airfield is poor airmanship, particularly without making radio contact with them. Members were briefed by the Secretariat that an intermittent primary contact, probably the glider concerned, can be seen on the radar recordings flying in the Coningsby area for about 1 hour around the incident time, at one time just on the ATZ boundary (height not determined). That being the case, and given the time of day, the BGA Member suggested that it had probably been locally based.

It was not clear to the Board whether the TI passed by APP to the Typhoon formation prior to their handover to TWR concerned the glider they encountered or another ac; they presumed, however, that it was the subject glider. Members also concurred the HQ Air view that, in these circumstances with an intermittent primary return, most likely a glider, the passing of incomplete or HiBrite based TI can be most helpful to aircrews.

In this instance the lead Typhoon crew did not see the glider; however, possibly as result of the previous TI generating an enhanced lookout, his wingman did see it, albeit late, and issued a correct 'bunt' instruction to his leader. The timing of the wingman's call could not be correlated with the (presumed) glider radar response and therefore the separation when the call was made could not be determined. Similarly, it was not possible to measure the increased separation as a result of the bunt manoeuvre. However, the Board considered that the manoeuvre had been effective in increasing the separation between the leader's aircraft and the glider, thus mitigating any risk that the ac would have collided. As is the usual procedure in the case of untraced ac having a close encounter, since the glider pilot did not submit a report, the Board assumed that he did not see the opposing ac.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A probable non-sighting by the glider pilot, a non-sighting by the lead Typhoon crew and a late sighting by the No2 Typhoon pilot.

Degree of Risk: B.