

ASSESSMENT SUMMARY SHEET FOR UKAB MEETING ON 25 APRIL 2012

Total	Risk A	Risk B	Risk C	Risk D	Risk E
18	2	3	8	0	5

No	Reporting	Reported	Airspace	Cause	Risk
2011135	SF340(A) (CAT)	SF340(B) (CAT)	G (SFIR)	1. Stornoway APP did not reiterate the altitude restriction of 3000ft to the crew of SF340(B) as required by MATS Part 2. 2. SF340(B) crew descended below 3000ft without clearance.	C
2011166	Dauphin x2 (Mil)	C425 (Civ)	G (Lon FIR)	A conflict in Class G airspace resolved by the Dauphin crews.	B
2011167	SF340 (CAT)	BE200 (Foreign Mil)	G (SFIR)	Having set the incorrect pressure on the altimeter subscale, the BE200 crew descended below their cleared altitude and into conflict with the SF340. Recommendation. The CAA is recommended to issue a Safety Notice reminding controllers and pilots of the potential for confusion over units of pressure, which could lead to incorrect altimeter subscale setting when the barometric pressure is below 1000hPa (or 30.00inHg). The UKAB Secretariat will ensure that the US FAA and Dept of Defense are made aware of the issue.	C

2012001	DHC-8 (CAT)	JS41 (CAT)	G (SFIR)	The TAC N controller climbed the JS41 into conflict with the DHC-8.	C
2012002	C150 (Civ)	Model ac (Civ)	G (N Weald A/D)	Pilot-perceived conflict. Recommendation. The North Weald Aerodrome Operator is recommended to update the Aerodrome Operating Manual and ensure the relevant Flight Guides reflect the update.	E
2012004	PA34 (Civ)	SR22 (Civ)	G (Oxford AIAA)	A conflict in Class G airspace between IFR traffic.	C
2012006	DR400 (Civ)	PA18 (Civ)	G (VoY AIAA)	A non-sighting by the DR400 pilot and effectively a non-sighting by the PA18 pilot.	A
2012008	AS355 (Civ)	C130 (Foreign Mil)	G (Lon FIR/LFA7)	Sighting Report.	E
2012010	Hawk TMk1 (Mil)	BE200 (Civ)	G (VoY AIAA)	In the absence of TI from Linton Zone, the BE200 crew descended into conflict with the Hawk.	C
2012011	ASK13 (Civ)	A109 (Civ)	G (Lon FIR)	The A109 pilot flew overhead a promulgated and active glider launching site below the maximum height of the winch cable and into conflict with the ASK13 which he did not see.	C

2012013	Tutor (Mil)	C152 (Civ)	G (Lon FIR)	Conflict in Class G airspace resolved by the Tutor crew.	E
2012014	Gazelle (Mil)	TB9 (Civ)	G (Lon FIR)	Late sightings by the pilots on both ac.	C
2012015	Sea King (Mil)	Hawk TMk2 (Mil)	G (Valley MATZ)	By flying underneath the Sea King on a PAR approach, the Hawk crew caused its crew and the Talkdown controller concern.	E
2012016	Merlin (x2) (Mil)	Puma (Mil)	- (SPTA)	1. A non sighting of the Puma by Merlin 1 crew. 2. While avoiding Merlin 1, the Puma crew flew into conflict with Merlin 2, which they did not see.	B
2012017	AS365 (Civ)	P68 (Civ)	G (Liverpool Bay HTZ)	Sighting Report in a HTZ.	E
2012027	Hawk TMk1 (Mil)	Tornado GR4 (Mil)	G (UKDLFS)	A conflict in the UKDLFS resolved by the GR4 pilot.	C
2012033	Tornado GR4 (Mil)	Untraced ac (NK)	G (SFIR)	A probable non-sighting by the untraced ac pilot and effectively a non-sighting by the Tornado crew.	A
2012039	Squirrel (Mil)	Tiger Moth (Civ)	G (Lon FIR)	A non-sighting by the Tiger Moth pilots and a late sighting by the Squirrel crew.	B

AIRPROX REPORT No 2011135

Date/Time: 5 Oct 2011 0726Z

Position: 5818N 00620W
(6nm N Stornoway
Airport)

Airspace: Scot FIR (Class: G)
Reporting Ac Reporting Ac

Type: SF340 SF340

Operator: CAT CAT

Alt/FL: 2000ft 2000ft
QNH (993mb) NK

Weather: IMC KLWD IMC KLWD

Visibility: 0 0

Reported Separation:

200ft V/1nm H 0ft V/NK H

Recorded Separation:

500ft V/0.1nm H



BOTH PILOTS REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SF340 (A) PILOT reports that they were cleared for the [LOC/DME/NDB (L)] procedure for RW18 and were inbound heading 180° at 160kt under a P S from Stornoway, squawking 7000 with Modes C and S. Just before, as they were turning base, another ac was cleared for the same procedure but instructed to maintain 3000ft until informed. They [ac A] were level at 2000ft and as they approached the descent point at about 7nm, traffic was seen on TCAS at the same level. The crew had a quick discussion to prepare for any following TCAS command; a TA was issued, followed by a RA 'descend descend' now at a commanded rate of 2000fpm. ATC was told of the RA and they replied, "that should be a company ac at 3000ft".

They received a 'clear of traffic' at 1300ft and then performed a go-around to re-join the hold.

He assessed the risk as being high.

THE SF340 (B) PILOT reports flying a scheduled passenger flight inbound to Stornoway under IFR and in receipt of a PS from them while squawking 7000 with Modes C and S. They were No2 behind another scheduled passenger ac, were heading 315° at 200kt, on the STN (VOR) 321° radial to join the RW18 LLZ NDB DME approach. The ac ahead had followed the same initial approach for RW18 and was established inbound on the Localiser at 2000ft. They [ac B] had been cleared for the procedure from the STN at 2000ft by Stornoway ATC and had descended to 2000ft (he suggested that the ATC tapes be checked as he was unsure as to whether ATC, the pilot or both had made the error) as (with hindsight) he realised that they should have been at 3000ft until the preceding ac had landed; he could not recall how he got to that position.

Initially they observed the other ac on TCAS as proximate traffic (blue) then TCAS enunciated 'traffic'; they were yellow 01 [TA 100ft relative alt], becoming 02 and then they received an RA. The RA was 'do not descend' (red arc, lower VSI) and the other ac had an 'RA climb'. Both ac followed their respective RAs; the other ac then commenced go around climbing to 3000ft, he thought, and they (SF340 (B)) were instructed to continue as No1.

He was uncertain of the range of the other ac as he was aware of it only from its TCAS indication.

He submitted an ASR to the company FSO and an Airprox report, assessing the risk as Medium to High.

UKAB Note (1): The pilot included a copy of the Approach Plate in use at the time.

ATSI reports that SF340 (A) was inbound Stornoway from Aberdeen and in receipt of a PS from Stornoway APP; meanwhile SF340 (B) was inbound Stornoway from Inverness also in receipt of a PS from Stornoway APP on the same frequency.

The Stornoway controller was providing a combined PS and ACS, had been on duty for 1:50 and was assisted in the Tower by an ATSA. The controller had been at the unit since January and, although previously validated elsewhere, was validated as a controller at Stornoway on 21 June.

The controller considered the operational duty as a 'normal' day and the workload, complexity and RTF loading were all described as 'moderate'. RW18 was in use, the surface was declared as 'wet' with no equipment unserviceabilities affecting the operation and there were no noted distractions.

ATSI had access to both pilots' reports, the controller's report and unit investigation, a transcription of the RT frequency in use and a radar recording of the Prestwick Multi-Radar Tracking system.

The METARS were:

METAR EGPO 050650Z 21014KT 9999 FEW009 SCT024 13/12 Q0993=
METAR EGPO 050720Z 21012KT 9999 FEW009 SCT012 BKN020 13/12 Q0993=

The controller stated that a functioning DF was available in the tower and that he did not recall any 'visibility' to the NW i.e. neither ac was visible as they approached or left STN (VOR/DME).

SF340 (A) called Stornoway at 0713:08 descending to FL070 with 11nm to run to STN; a PS was agreed and the QNH was confirmed.

Inbound estimates for the STN are provided by Prestwick Centre (PC) about 7min in advance of the estimate for the beacon; a release is agreed and PC will ensure inbound ac are level separated. On receipt of the estimates for the two SF340s, the controller stated that he performed a mental check of all the details: level, release point, time; and ensured that the details were correct.

When determining which approach procedure to allocate the controller stated that ac order, QNH, and RW in use are all factored in. Commercial SF340s approaching from the SE generally fly the 'Initial Procedure' via STN when the weather precludes visual manoeuvring.

The controller stated that when two or more ac are presented in succession and their estimates are less than 10min apart, the second and successive ac are issued with an EAT. The landing interval at Stornoway is 1 every 10 min. The controller also stated that he perceived a need for expediency. This, he stated, came from the local operators who are reluctant to enter the hold if it is for only one hold. The controller noted that it remained at the controller's discretion as to whether or not successive ac are 'brought in' at intervals of less than 10min.

At 0713:38 the controller cleared SF340 (A) for the 'Initial Approach' and instructed the pilot to descend to altitude 2000 ft. The Stornoway Initial Approach VOR STN RW18 procedure is promulgated as:

Arrival not below MSA. Overhead VOR/DME STN (IAF) at **3000** or as instructed by ATC (lowest altitude to start procedure from hold is **2000**). Fly outbound on VOR STN R330 (CAT A,

B); VOR STN R321 (CAT C, D) descending to **2000**. At STN D14 turn right onto VOR STN R338 (QDM 158°) inbound to intercept and establish on LOC or FAT. When established continue with appropriate LOC or NDB(L) procedure.

SF340 (B)'s first call was at 0714:14, descending FL85 with 25nm to run to STN; a PS was agreed and the QNH confirmed.

The controller calculated that the two ac would arrive at STN with only 3min separation, which would have the effect of 'taking away the option of building in expediency' and the second ac [to arrive] would have to hold; therefore, he asked SF340(A) pilot for his STN estimate, which was given as 'minute 17'. The controller then asked SF340 (B), "*if you can reduce your speed what will be your estimate for the S T N*"; the pilot replied with an estimate of minute 24 and the controller informed him that, based on that estimate, there would be no delay.

The controller explained that the requesting a speed reduction by SF340(B) had the effect of increasing the time separation (based on estimates) to 7 min and created a 'different scenario' to manage, stating that, with only 7min between the ac there was still a option to send SF340(B) around the hold once; however, he judged that he could manage both the flights 'without delay' by making use of vertical separation and a "MATS Part 2 local separation, whereby the second ac could be descended once 5 DME or more from the STN outbound". (The unit report states that the second ac should not be descended until the first ac has landed).

At 0716:39 the controller instructed SF340 (B), "*not below flight level 85 initially you are cleared the initial approach from the S T N runway 18.*" This was read-back correctly by the pilot.

The controller stated that it was quite normal to have two ac in the approach procedure during the first morning rotation; he also observed that the operator's schedule had four ac arriving at the aerodrome within 15min of each other (3 commercial passenger flights and one newspaper flight). However, all 4 corresponding departures were timed as being at 10 minute intervals.

At 0717:41 SF340 (A) reported overhead STN passing at 5200ft and beacon outbound. The controller instructed SF340 (A), "*you're number one report localiser established or visual*"; SF340 (B) was then given descent to FL065 and SF340 (A) was instructed to report passing 3000ft.

At 0720:37 SF340 (A) reported passing 3000ft. The controller then instructed SF340 (B) to descend to altitude 3000 ft. [UKAB Note (2): This was correctly readback by the pilot at 0721:00.] The controller requested a level check from the SF340 (B), which was given as passing 5900ft, and instructed SF340 (B) to report beacon outbound.

SF340 (B) reported beacon outbound at 0723:41 and the controller replied, "*Roger you are number two report localiser established*" and the pilot replied, "*Wilco*". [ATSI Note: Based on actual report times, there was then 6min between the ac].

The unit MATS Part 2 states:

'If there is a need to restrict descent, this should be stated **before** issuing a clearance for the IAP e.g. 'not below altitude 3000 ft until advised, cleared LLZ/DME/NDB Runway 18, report Beacon outbound.' And stated **AGAIN** once the pilot has reported 'commencing the procedure' e.g. 'not below altitude 3000ft, report LLZ established'.

The radar replay showed that at 0723:41, SF340 (A) was at FL026 (altitude 2060ft) [Mode S SFL020] turning right to intercept the localiser and SF340 (B) was less than 1 nm from STN descending through FL040 (altitude 3460ft) [SFL030].

At 0724:00 SF340 (B)'s SFL changed to 020 as the ac descended through FL036 (A3040).

SF340 (A) reported, “*localiser established nine and a half miles*” at 0724:01; the controller cleared the ac to land and at that point he assimilated that it would take it a further 3 min to land. Estimating SF340 (B) as having with a speed of 4nm/min, he calculated that it would then be at about 12nm on the outbound leg. The controller stated that he was comfortable with this situation as, should the first inbound require a go-around, the unit’s MATS Part 2 local separation standard would allow the second ac to be level changed with the first if the second ac was more than 5nm outbound.

At 0725:03 the radar replay showed SF340 (A) at 7.5nm on the final approach indicating FL026 (A2060) with SF340(B) in its 11 o’clock at a range of 5.3nm converging, also at FL026 (A2060). By 0725:24 the distance between the two ac had decreased to 3.2nm, the relative bearing and level being unchanged.

At 0725:32 SF340 (A) commenced a descent, passing FL024 (A1860) 6.5nm from touchdown with SF340 (B) at FL025 (A1960) converging from the left at a range of 2.5nm.

At 0725:48 SF340 (A) was 6nm from touchdown passing FL023 (A1760), SF340 (B) was still in its 11 o’clock, range 1.1nm at FL025 (A1960).

At 0725:49 SF340 (A) called, “*TCAS RA*” and the controller replied, “*It’s a company Saab er in descent to altitude 3000 feet*” and gave a further wind check.

The controller recalled his mental checklist: he was particularly aware that in TCAS RA situations the controller response is ‘Roger’ (MATS Part 1). The controller looked at his strips, which again gave him procedural confirmation that SF340 (A) was at 2000 ft and SF340 (B) was at 3000 ft. The controller felt that his knowledge of the situation must be incomplete and that it was important for him to re-establish control of the situation using standard phraseology.

When the controller heard SF340 (A) call “*TCAS RA*” he recalled that his initial thoughts were ‘from what?’ his mental picture told him that he only had one other ac under his control, which was separated from SF340 (B) by 1000ft. He stated that it is common for pilots to request information on ac in the vicinity showing on their TCAS display. He also pointed out that, being in Class G airspace, there *could* have been other traffic in the vicinity but that this would be highly unusual in such a position on the final approach. The controller noted again that so far, the day had been ‘normal’ but yet there might be traffic that he did not know about.

The controller recalled that his immediate actions included using the binoculars to look out the window to obtain any visual information. The RTF was on loud speaker in the tower and the ATSA, also aware of SF340 (A)’s statement, was also looking out for any visual clues. No visual sightings were apparent and both staff were left wondering ‘what’ had happened.

At 0726:00 surveillance replay showed SF340 (B) pass behind SF340 (A) by less than 0.1nm. SF340 (A) was at FL020 (A1460): SF340 (B) was at FL025 (A1960). Four sec later SF340 (A) reached FL019 (A1360) before starting a climb along the final approach track in reaction to the RA. SF340 (B)’s reported Mode C remained constant at FL025 (A1960) before, during and after the encounter.

At 0726:12 the controller requested SF340 (A)’s intentions, the pilot replied, “*going around,*” and the controller instructed a standard missed approach.

The controller recalled saying to the assistant “with TCAS, don’t the ac talk to each other”; this he recalled was a confirmatory statement in his own mind that he would have expected a similar call from the second ac.

The controller noted that he had received no notification from either pilot that they were ‘clear of conflict’.

At 0726:38 the controller requested a level report from SF340(B) pilot who replied, “*My mistake we’re now at we’re at 2000 feet climbing to 3000 feet...we’re one one miles outbound to the northwest.*”

When the controller heard SF340 (B) report its level as 2000ft, he immediately thought ‘have I given him any indication that he can go to 2000ft?’ The controller also decided that, given the ac position, he would use the local separation standard (see above) and instruct the ac to remain at 2000ft. At 0726:58 the controller instructed the ac to descend to altitude 2000ft and report localiser established. SF340 (A) had been instructed to climb to 3000ft and the controller judged that by the time SF340 (A) was in the left hand turn back to the SAY [Locator], the ac would be at 3000ft thus restoring separation.

The controller stated that the duty of care he had towards ac under his control was important and during the incident it was important for him to establish that both ac were ‘OK’ and to try and establish if there was a third unknown ac in the equation. His plan was then to land SF340 (B) and hold the SF340 (A), thereby ‘settling the situation’.

The controller believed that the SF340 (B) pilot must have believed he was cleared for the full procedure with no vertical restriction i.e. the previous restriction of 3000ft had become non-applicable.

At 0727:12 SF340 (A) was instructed to continue RW track and climb to alt 3000ft. The pilot requested entry into the SAY hold [overhead the airfield] and he replied, “initially report reaching altitude 3000 feet”.

At 0727:53 the controller instructed SF340 (B) to report reaching 2000ft, to which the pilot replied that the ac was maintaining alt 2000ft; he then instructed SF340 (A) to take-up the SAY hold at 3000ft.

SF340 (B) continued its approach and was cleared to land from a 10nm final.

SF340 (A) remained in the SAY hold for a short period before commencing the alternate NDB procedure and landing without further incident.

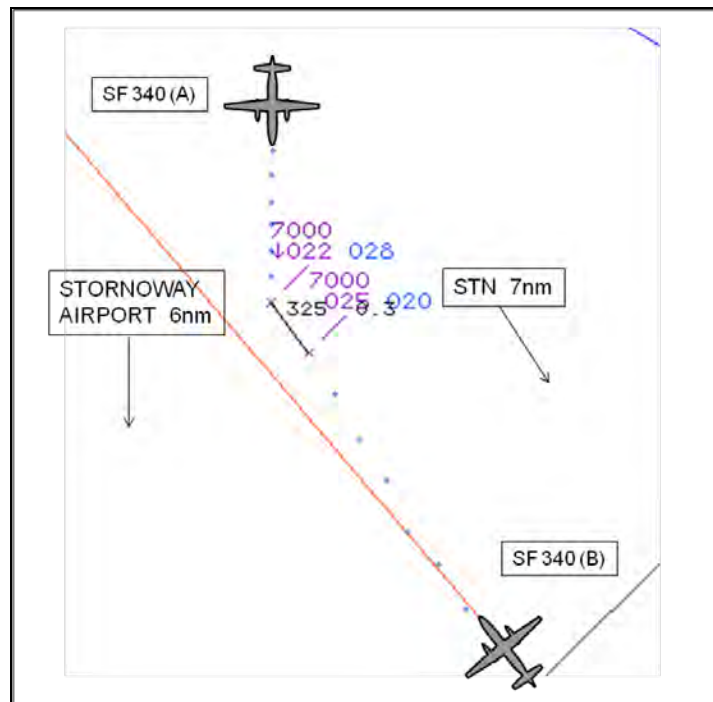


Fig (2): Four sec before the CPA.

When discussing ways of preventing a re-occurrence the controller stated that re-iterating the 3000ft restriction was a possibility but he considered that pilots were ‘aware’ of their place in the arrival sequence. He also stated that during his training with various OJTIs, only 1 had practiced the

repetition of level instructions and the other 2 had not. He noted that it was not normal at the unit and was perceived as increasing RTF traffic.

The controller observed that there was potential for 'tonal' feedback by pilots when previously stated clearances were re-iterated; and this too fostered a reluctance to re-iterate clearances.

The controller stated that he was familiar with the 'voice' of the SF340 (B) pilot and considered that this particular pilot's RTF, being of a highly standard nature, gave him confidence in the pilot's actions. The controller described an implicit feedback of 'trust', as opposed to a pilot that he was unfamiliar with, or a pilot that was unfamiliar with the aerodrome. The controller stated that he was used to hearing this particular pilot on 3 or 4 mornings each week.

The controller was presented with two commercial IFR inbound flights without the standard arrival time separation of 10min. He formulated a plan based on increasing the time separation between the two flights. He would then use vertical clearances to maintain procedural separation until such time as he considered he could use a local separation standard to descend the second ac for an approach.

Having extended the arrival interval between the two ac from three to seven minutes and calculating that his proposed plan would work, the controller cleared SF340(B), "*not below flight level 85 initially you are cleared the Initial Approach from the S T N runway 18*". This clearance contained a vertical restriction.

It is assumed that SF340 (B) crew were aware of SF340 (A) ahead. This should have been re-enforced by the controller's provision of sequence information and that the ac was then descended procedurally following the first arrival.

After SF340 (B) went outbound from the STN the sequence of events on the flight deck is unknown as no comprehensive investigative interview was available to ATSI. However, from the evidence provided, it is assumed that there was a likelihood of some degree of automaticity on the flight deck with regard to selecting altitude 2000ft once outbound. This is supported by:

- (i) The SF340(B) pilot's recognition on the RTF that an error had been made;
- (ii) His subsequent report statement, '...3000ft is where my ac should have been...', and;
- (iii) His reporting '...I can't state without doubt how I got to this position.'

The Stornoway controller was operating in the belief that SF340 (B) would adhere to the level instructions given sequentially: i.e. 'not below FL085', amended by 'descend FL 065' and then 'descend to altitude 3000ft'.

HERA Analysis [see ATSI note below] of the incident determined that the main Error Mode on the part of the controller was in planning and decision making: in so far as the controller's decision not to re-iterate the 3000ft level restriction removed a warning to the SF340 (B) crew that they should not descend when outbound from the STN. In mitigation the controller had taken several factors into consideration when he chose to state, "*...number two,*" to SF340 (B) when it went beacon outbound:

- (i) The trust he gained from familiarity with the pilots known voice and demeanour;
- (ii) The professional balance of 'restating' previously issued instructions, and;
- (iii) All the indications that, so far, the controller's plan was working to its desired effect.

[ATSI Note (1): Eurocontrol HERA-JANUS analysis on file including ICAO Human Factors issues affecting human performance in ATS proforma.]

It is not known what the SF340 (B) crew's actual interpretation/understanding of the subsequent level clearances was: or if this was allied to or contrary to the controller's belief that the levels assigned (FL065 and 3000ft) were not to be descended below until further instructed. There may therefore

have been an inherent miss-match of the controller's expectations and pilot's actions in this Class G non-surveillance Approach - PS environment.

The Airprox occurred when SF340 (B) went outbound from STN and descended from 3000 ft to 2000ft and crossed the RW18 final approach in conflict with SF340 (A).

The controller made a judgement not to re-iterate the level restriction when SF340 (B) was beacon outbound based on several factors; however, the MATS Part 2 required that, if there was a need to restrict descent, it is reiterated once the pilot has reported commencing the procedure.

The controller's provision of a PS was predicated upon his belief that, having formulated a safe, orderly and expeditious plan for the benefit of the arriving ac, SF340 (B) would adhere to the previously issued 3000ft level instruction until further advised.

The exact human factors sequence of events on the flight deck of SF340 (B) was not able to be determined by this investigation.

Recommendation:

It is recommended that the CAA's Regional ATS (Northern) Inspectorate in conjunction with the unit should ensure that MATS Part 2 procedures for management of multiple ac in the approach pattern are reviewed and followed as prescribed.

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 authorities.

Members were concerned that flexibility and expediency appear to have led the use of non-standard procedures at Stornoway. A Controller Member observed that, while standard procedures can at times appear unwieldy or inefficient, they are in place almost without exception to ensure ac safety. In assessing this incident, controller and pilot Members alike noted instances of non-standard RT and procedures that they would have expected to have been identified and corrected during routine checks.

The Board noted that the operator's arrival schedule required [and on a further check on 27 Apr still requires] arrivals at intervals closer than the I MC separation on RW18 of 10 minutes between landings. Clearly, on the many occasions when visual approaches can be conducted this is not a problem, but controllers should not allow themselves to feel pressurised into accepting a greater flow rate than (MATS Pt 2) procedures permit. Similarly, recognition of pilot's voices must not be allowed to prompt abbreviated RT.

Members considered that although the instrument approach procedure for the approach being used is satisfactory and allows for both full instrument and instrument-to-visual approaches from the VOR, it is lengthy and complex and its full use necessarily restricts traffic flow and may require following ac to hold or, as in this case, reduce speed; however, a pilot Member observed that in this case even this speed reduction achieved only 6min separation rather than the 10 required by MATS Pt 2.

Pilot Members (including one with experience of operating in the Highlands and Islands) observed that from 0716:39 the controller passed an ambiguous series of instructions to the crew of SF340 (B), beginning with "*not below flight level 85 initially you are cleared the initial approach from the STN runway 18...*", followed shortly by, "*SF340 (B) callsign descend Flight Level Six Five*" and then "*(SF340 (B) callsign) descend to altitude Three Thousand Feet on the QNH ...*". Since the clearances to FL65 and altitude 3000ft did not re-clear the SF340 (B) for the Initial Approach, the

crew could have inferred that they were cleared to descend to the relevant FL/alt, but no longer cleared for the procedure. The pilot of SF340 (B) apparently, and also some Members, interpreted the instructions to mean that the ac was cleared to the STN at 3000ft, and also cleared for the 'Initial Approach Procedure', as per [and descending in accordance with] the Approach Plate, without any altitude restriction after the procedure had been commenced at the VOR. Some Members considered that, since the pilot was familiar with Stornoway and being aware of SF340 (A) ahead of him, he should have known about the MATS Pt 2 requirement to maintain 3000ft outbound until the ac ahead had landed. Certainly, he immediately realised what had happened when the TCAS RA was reported by the other pilot. Further, a pilot Member opined that there might have been a CRM/HF issue whereby the 1st Officer did not question the altitude restriction before changing the SFL to 2000ft. Notwithstanding this, Members agreed that the crew should have been reminded that they were not cleared below 3000ft by ATC when they called 'Beacon Outbound' in accordance with the MATS Pt 2.

Due to the complexity and crossing of flightpaths on the instrument approach procedures, the situation whereby two consecutive ac follow the same approach, requires careful monitoring and positive procedural deconfliction by the controller. MATS Pt 2 requires the preceding ac to have landed before that following one is cleared to descend below 3000ft; controller Members observed that this is clear, unambiguous and inherently safe. Further, a pilot familiar with the SF340 pointed out that there is no difficulty in descending such ac relatively quickly from 3000ft to attain the glidepath as soon as cleared to do so. This rule (procedure) was however, not fully assimilated by the controller who had a different perception of the descent profile and this had (apparently) not been identified and corrected during routine checks.

One pilot Member opined that the Instrument Approach procedure is unnecessarily complicated but another (familiar with Stornoway) considered it flexible in that it facilitated a 'cloudbreak' close enough to the airfield to be followed by a visual approach should conditions permit. There was also discussion regarding the provision of radar at Stornoway and although Members agreed unanimously that this would enhance safety and flexibility, an Advisor informed the Board that he thought the NATS SSR at Stornoway was unsuitable for use as an Approach Radar.

[Post Meeting Note: It is understood that the airline, the airport operator and DAP are examining, with a view to revising, clarifying and simplifying the instrument approach procedure for RW18. Until a revised procedure is introduced company pilots have been instructed to maintain 3000ft outbound in the procedure until they are clear of any inbound traffic ahead of them.]

Members agreed unanimously that clear and concise RT, as promulgated in CAP413 almost always removes ambiguity in the minds of controllers and pilots alike; all too frequently, as in this case, non-standard RT leads to incidents.

PART C: ASSESSMENT OF CAUSE AND RISK

- Cause:
1. Stornoway APP did not reiterate the alt restriction of 3000ft to the crew of SF340 (B) as required by MATS Part 2.
 2. The crew of SF340 (B) descended below 3000ft without clearance.

Degree of Risk: C.

AIRPROX REPORT No 2011166

Date/Time: 5 Dec 2011 1958Z (Night)

Position: 5140N 00007W
(5nm W of Lippitts Hill)

Airspace: Lon FIR (Class: G)

Reporting Ac Reported Ac

Type: Dauphin X 2 C425

Operator: HQ JHC Civ Exec

Alt/FL: 2000ft NR
Lon QNH

Weather: VMC CLBC VMC CLBC

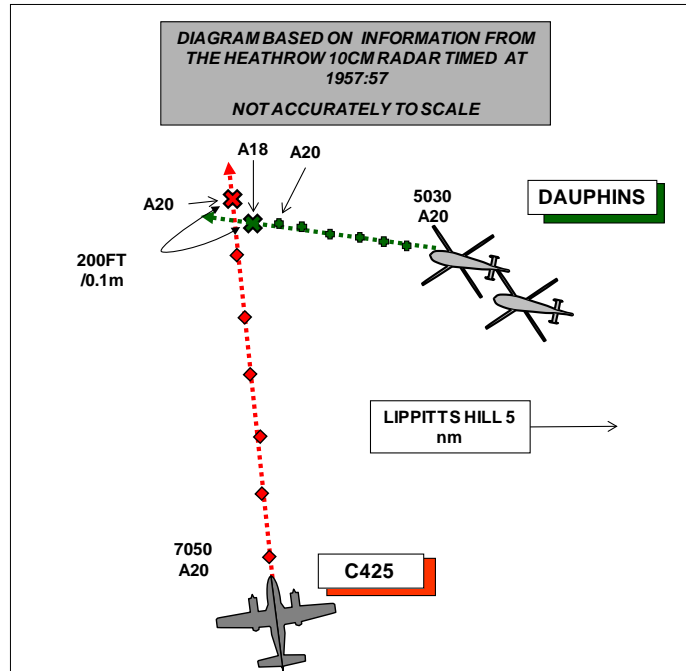
Visibility: >10km NR

Reported Separation:

NR V/0 H NR

Recorded Separation:

200ft/0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DAUPHIN PILOT reports that he was leading a pair of helicopters that had departed Lippitts Hill heading 270° en-route under VFR to the South Coast for a routine exercise. They were in fairly close line-astern formation with No2 slightly offset to the left, flying with the leader displaying reduced lighting compliant with NVG ops and No2 displaying full lighting as required by the ANO, including nav lights and a beacon. They were squawking with Modes C and S but TCAS was not fitted and were in receipt of a BS from Farnborough North who informed them of a contact in their left 11 o'clock at the same level. The pilots of both ac had visual contact with the ac in their 9 o'clock about 4nm away. The ac closed and both ac had to take major avoiding action by entering an autorotation and a hard bank to the right to avoid a collision; the other ac did not deviate from its track or height.

He reported the incident to Farnborough on the RT and assessed the risk as being high.

THE C425 PILOT reports that he was flying an executive flight solo under IFR from Biggin Hill to Leeds Bradford. He was squawking as directed with Modes C and S and TCAS 1 was fitted. While heading N in the cruise to the E of London under a TS from Thames then Farnborough N as he left CAS, he was advised of conflicting traffic namely 2 helicopters in formation but he could not recall by which unit. He only saw one helicopter and flew above and behind it as it crossed ahead of him from right to left. He was more than 180m [the distance on the radar recording and passed to the pilot by the UKAB] from the helicopter that he saw so he assumes that the [recorded] separation was from the ac that he did not see. He did not receive any TCAS indications.

THE FARNBOROUGH LARS NORTH CONTROLLER reports that at 1953 he was called by the leader of a pair of Dauphin helicopters routeing from Lippitts Hill to a training area near Bournemouth. He gave them a squawk of 5030 and passed the London QNH, 1007hPa. He identified the ac and offered them a BS. About 2min later he saw an ac squawking 7050 leaving the London Control Zone tracking N towards his formation. He considered there to be a risk of collision so he called the traffic to the Dauphins. About 1min later he updated the TI and the leader stated that he was visual with the traffic. Once the tracks had crossed the Dauphin leader stated that his

wingman had to descend to avoid a collision. He called Thames Radar and obtained the details of the ac, which was a C425 en-route from Biggin Hill to Leeds Bradford.

At 2000 he closed the frequency and transferred the Dauphins to Farnborough LARS West.

The Dauphin pilot rang the following morning to say that he was filing an Airprox report.

UKAB Note (1): NATS provided a unit investigation report but for brevity it has not been included.

THE THAMES CONTROLLER reports he was requested to submit a report six days after the event.

A C425 departed Biggin Hill squawking 7050; he issued the pilot a clearance to transit the London City CTR via the London Eye not above an alt of 2000ft.

As the ac was leaving the Zone Northbound he issued either a BS or TS, he could not recall which without reference to the recordings. However, he does recall issuing TI with regard to a radar return that he considered to be in conflict, N of the C425 and tracking to the W. As the ac neared the return, he reiterated the TI and at that point the pilot reported visual. He was observed to pass very close to the traffic before going en-route.

Farnborough LARS called the controller shortly after and asked for details, stating that his traffic had to make a turn to avoid.

He did not take any reporting action because, as far as he was aware, he performed the necessary actions required of his role with regard to the passing of appropriate TI with regard to the service being provided, and again as far as he is aware, in this instance, he was not responsible for the pilot's actions outside CAS.

ATSI reports that an Airprox was reported by the lead pilot of a Dauphin, when the ac came into proximity with a C425 to the E of Elstree at alt 2000ft.

The Dauphins departed Lippitts Hill for a VFR flight to the South Coast and were in receipt of a BS from Farnborough LARS North on 132.8MHz. The C425 departed Biggin Hill for an IFR flight to Leeds Bradford and was initially in receipt of a TS from Thames Radar on 125.325MHz. The Farnborough Controller was providing services in the Farnborough LARS North area of responsibility and the position was closed after the Dauphin was transferred to LARS West; the controller reported that he was using the Heathrow 10cm radar.

The Thames controller was operating using Swanwick Multi Radar Tracking (MRT) surveillance data (verified by replay of the 'slave' picture). Services were being provided to ac within and around the London and London City CTRs.

On 5 December 2011 sunset was 1553. Meteorological information for airfields in the vicinity of the incident was:

METAR EGLC 051950Z 25011KT CAVOK 05/01 Q1007=
METAR EGLL 051950Z 27013KT CAVOK 05/01 Q1007 NOSIG=

The C425 departed Biggin Hill at 1949 and the pilot called Thames Radar at 1950:20; the ac was identified and issued a transit clearance for the London City CTR. A TS was assigned while outside CAS and a RCS assigned while inside the London City CTR; the [London] QNH 1007hPa was passed and read-back.

At 1952:40 the lead Dauphin pilot called Farnborough LARS North when the ac were approximately 1nm N of Lippitts Hill and Swanwick MRT surveillance replay shows the two ac as two distinct primary targets with associated Mode A and Mode C readouts. A BS was assigned and the QNH 1007hPa passed and read-back.

At 1953:30 the Mode A code of the lead Dauphin changed to that assigned by the Farnborough controller: 5030; thereafter, the Farnborough controller requested that the second Dauphin to squawk standby; at 1954:23 the SSR of the second Dauphin disappeared and both position indication symbols became resolved as one target, associated with the lead Dauphin's SSR information.

The Dauphin's SSR indicated that the ac had climbed to alt 2000ft and, at 1955:10, the pilot reported, "we're gonna adjust to two thousand two hundred one zero zero seven as once we clear the zone it'll keep us out of the night region" and the Farnborough Controller acknowledged. The Dauphin was 10nm E of Elstree aerodrome in Class G uncontrolled airspace, underneath the London TMA, the base of which in that area is 2500ft.

The second Dauphin's SSR then began to show again on the MRT replay and, at 1955:40, the Farnborough controller reported this to the lead Dauphin pilot. By 1956:00 the position indication symbols of the two ac had amalgamated as one and were associated with the lead Dauphin's SSR information.

The C425 exited the London City CTA at 1956:15 and was Northbound maintaining alt 1900ft. The C425 was 5.3nm south-southwest of the lead Dauphin which was westbound at alt 2000ft.

At 1957:00, immediately after dealing with another ac, the Thames Controller passed TI to the C425, "...you've left controlled airspace look out for traffic coming into your right one o'clock right to left same alt westbound", the pilot acknowledged the TI and was then instructed, "not above 2400 feet traffic service" and this was read-back by the pilot.

The Farnborough Controller passed TI to the Dauphin flight, "traffic... south of you [1957:10] two miles northbound similar alt"; the C425 was in the Dauphin's 10 o'clock at a range of 2.4nm, both ac an alt of 2000ft. As later reported, the Farnborough controller considered that there was a risk of collision.

At 1957:25 the lead Dauphin pilot called visual with the traffic; at that time the C425 was at a range of 1.6nm, same relative bearing at alt 1900ft while the Dauphin was at 2000ft. The Thames Controller passed updated TI to the C425 at 1957:37 and asked the pilot if visual and he replied affirm; both ac were displaying a Mode C converted alt of 2000ft.

At 1957:54 the ac were 7nm E of Elstree with the C425 was in the Dauphin's 11 o'clock at a range of 0.2nm, crossing left to right; the C425 was at 2100ft and the Dauphin at 2000ft (see Figure 1).

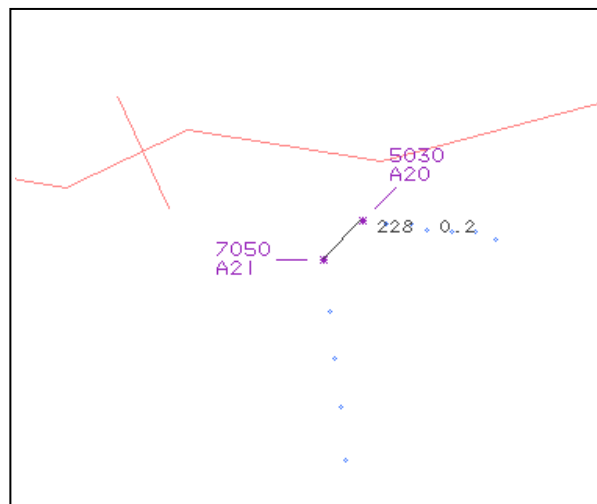


Figure 1: Swanwick MRT at 1957:54

The C425 crossed through the Dauphin's 12 o'clock, left to right, at 1957:58. The C425 was at 2100ft, 0.1nm ahead of the Dauphin, which was at 1900ft (see Figure 2).

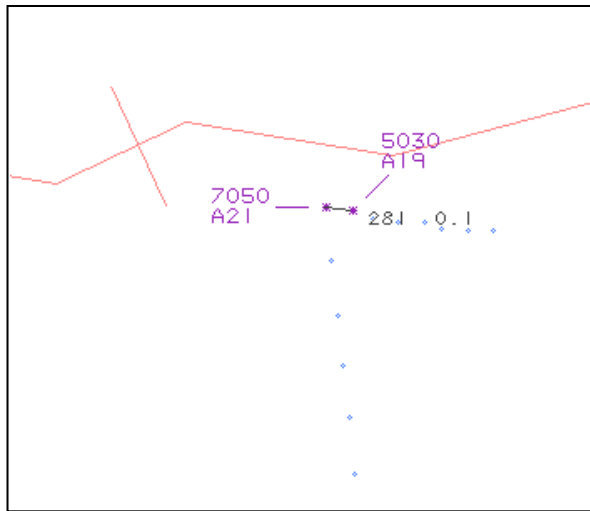


Figure 2: Swanwick MRT at 1957:58

The next update of the MRT replay, at 1958:02, showed the C425 in the Dauphin's 3 o'clock, range 0.2nm (see Figure 3).

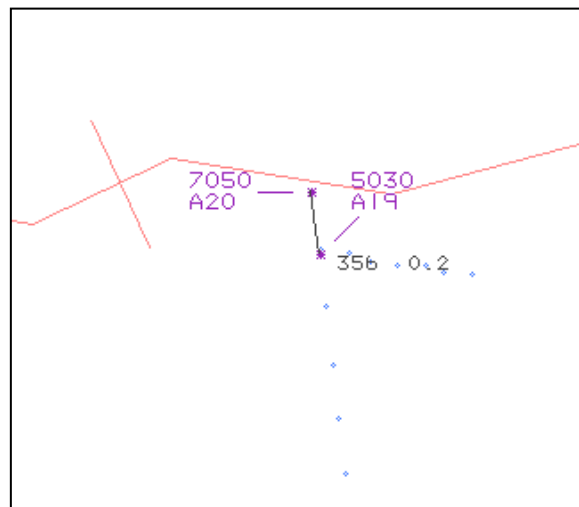


Figure 3: Swanwick MRT at 1958:02

At 1958:20 the Thames controller terminated the service to the C425 and the pilot was instructed to freecall Luton Radar; at the same time, the Dauphin pilot reported to Farnborough, *“that er traffic just flew straight across our path”*. The Dauphin pilot also reported that the second Dauphin of the pair had had to, *“descend quite dramatically to avoid him”*. The Dauphin was then transferred to the Farnborough LARS West frequency.

At 2000 the Farnborough Controller called the Thames Controller, the incident was discussed and details of the ac involved exchanged.

In accordance with the Service Principles for a TS, the Thames Controller provided specific surveillance derived TI to assist the C425 pilot in avoiding other traffic. Under a TS the avoidance of other traffic is ultimately the pilot's responsibility.

The TI provided by the Thames Controller was based upon the surveillance information available i.e. the pair of Dauphins were resolved on the controller's display as a single position indication symbol. There was no information available to the Thames Controller to indicate that the traffic was a pair of ac and there is no requirement upon controllers providing a TS to ascertain the nature of traffic upon which they pass information.

In accordance with the Service Principles of a BS, the Farnborough controller considered that a definite risk of collision existed and therefore issued a warning, in the form of TI, to the Dauphin pilot. Under a BS the pilot remains responsible for collision avoidance at all times.

The encounter took place at night in Class G uncontrolled airspace. The C425 was flying IFR; however, the Rules of Air applicable to IFR flights outside controlled airspace (RoA Rule 34) contain no specific level requirement for an ac flying at the alt chosen by the C425 i.e. 2000ft. The Dauphin reported operating VFR.

Before, during and after the encounter, surveillance evidence shows that neither the C425 nor Dauphin altered their lateral courses. Both pilots reported visual with each other at approximately the same time, 20 to 30sec prior to the CPA. Any vertical manoeuvre executed by the second Dauphin was not seen as the ac's transponder was not transmitting.

The Dauphin pair and the C425 came into close proximity at alt 2000ft when the minimum recorded distance between the C425 and lead Dauphin was 0.1nm and 200ft. TI was provided to both pilots by the Thames and Farnborough Controllers. There was no discernable surveillance evidence to indicate avoidance manoeuvres by either ac but both pilots reported visual.

HQ JHC comments that contrary to the Dauphin's pilots opening statement, both of the Dauphins were apparently displaying normal lighting. That is upper red strobe with navigation light on bright, this is a standard configuration and in accordance with current regulations. The crews were also using Night Vision Goggles (NVG). Even with the use of NVG it would have been difficult identifying an ac against the background of the cultural lighting. This would also apply to the pilot of the C425.

It is disappointing to note that the Dauphin crews were not utilising the benefits of a TS but it is noted that timely TI was given by Farnborough whilst providing a BS. HQ AAC assesses the incident as a 'late sighting by both' and the confliction was resolved by the Lead Dauphin pilot.

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.

UKAB Note (2): Since the actual geometry at the CPA was unclear, the Board was shown a snapshot of the Stansted 10cm (single source) radar. They were also informed that prior to the CPA, this radar clearly showed the SSR of the trailing Dauphin being switched to standby when the pilot was requested to do so by Farnborough; at the time the ac was just over 240m behind the leader (within the bounds of the SSR accuracy). The Stansted radar also verified the snapshot at Figure 2 above, in that the C425 passed ahead of the lead Dauphin by an estimated 60m and that the lead Dauphin descended by an estimated 200ft as it approached the CPA; the No2 Dauphin did not paint at any time after its SSR was switched to standby. Although the leader reported that he was squawking with Mode S, no Mode S info was seen on the Radar recordings from either ac.

The HQ AAC Advisor informed the Board that he had contacted the Lead pilot to clarify some aspects of the incident. He informed the Board that both helicopters had been displaying full lighting, which includes nav lights and anti-collision beacons. Since the ac were not operating in the UKNLFS or under a NOTAM this lighting regime is considered mandatory; however he opined that the (military) lighting regulations for ac operating VFR and not in the NLFS are unclear, therefore crews comply with the ANO. He also informed Members that the norm is for trailing ac to formate on their lead 3 rotor spans apart (36m) and suggested that, after he switched his SSR to standby, the No 2 Dauphin had been closing to achieve this. He went on to remind Members of the limitations of NVGs, particularly when operating in areas where there is substantial cultural lighting.

Members discussed the ATC services used by both ac. The C425 had just exited CAS (at 1956:15) and had limited time to agree a service and build his SA of other traffic. The pilot had, however, agreed a TS with Thames at 1957:00, over 45sec before the CPA. In addition, he was passed TI on the Dauphins, controller Members agreed, as early as the situation permitted. The Dauphins requested a BS but in reality were passed the same information they would have received had they requested a (more appropriate, Members thought) TS due to the risk of collision perceived by the Farnborough controller. Despite the inadequacy of their NVGs when looking towards the built-up area, this TI enabled the crew to see (reported at 1957:20) the C425 at distance estimated by the pilot to be 4nm (at 1957:20, 2nm on the radar). They monitored the C425 for a short period before initiating a descent which can first be identified on the radar recording at 1957:53.

The Board observed that they had reviewed several incidents where ac left CAS and almost immediately flew into conflict with traffic avoiding it either laterally, vertically or, as in this case both. Members urged caution by pilots and controllers in such circumstances.

Members considered the route and alt selected by the C425. Although quite legally operating IFR at 2000ft, a controller familiar with operating Thames, opined that a slightly higher alt would have been available had it been requested.

The incident took place about 4nm to the N of the London City CTR boundary and under the base of the CTA, which is 2500ft amsl, in Class G airspace where 'see and avoid' pertains. Members noted the under the RoA the Dauphins had right of way being on the C425's right despite that they were operating under VFR and the C425 under IFR.

In assessing the Risk, Members considered the hazards associated with 'see and avoid' at night using NVGs and by eye alone. Despite effective TI and both flights gaining visual contact as early as their circumstances allowed, it was late contact and the C425 pilot only ever saw one of the helicopters. Although the Dauphins had reacted to the C425 crossing their flight path, the lack of action by the C425 pilot and the limited separation at the CPA persuaded Members that normal safety margins had been eroded.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class G Airspace resolved by the Dauphin crews.

Degree of Risk: B.

AIRPROX REPORT No 2011167

Date/Time: 31 Dec 2011 1146Z

Position: 5818N 00621W (5nm N
Stornoway - elev 26ft)

Airspace: SFIR (Class: G)
Reporting Ac Reported Ac

Type: SF340 BE200

Operator: CAT Foreign Mil

Alt/FL: 2000ft NK
QNH (990hPa) QNH

Weather: IMC KLWD NK

Visibility:

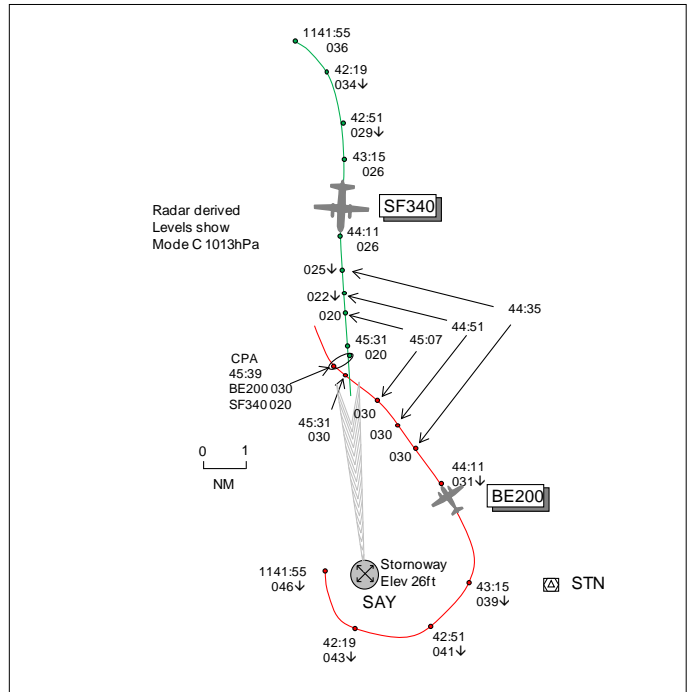
Reported Separation:

300ft V/4nm H TBC

Recorded Separation:

1144:35 400ft V/4-7nm H

OR 1145:39 1000ft V/0-4nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SF340 PILOT reports inbound to Stornoway, IFR and in receipt of a PS from Stornoway Approach on 123.5MHz, squawking 7426 with Modes S and C. They were approaching Stornoway at the same time as 3 foreign military ac which were using the same c/s prefix with different suffix numbers. As they started their approach the first of these ac had landed, the second ac was on the LLZ RW18 and their SF340 was initially restricted to 3000ft whilst the third ac, the subject BE200, was behind [to the S approaching the SAY] and above them. As they approached the LLZ they were now at 2000ft on QNH 990hPa and the BE200 following them was cleared outbound in the procedure not below 3000ft until advised. Several times during all radio calls the QNH was given as "990 hectopascals or millibars". On their TCAS display they could see that the BE200 traffic 12nm away following them in the procedure did not level-off 1000ft above but kept on descending. Heading 190° at 160kt level at altitude 2000ft flying in cloud in IMC, they were now opposite direction with the distance between them quickly reducing. They asked ATC to confirm the BE200's cleared altitude and ATC replied 3000ft before asking the BE200 flight to confirm their altitude. The BE200 crew confirmed that they were at 3000ft; however, TCAS showed the BE200 as 300ft above their ac. By now separation was around 4nm and reducing so he decided to leave 2000ft early to ensure more vertical separation; this descent was initiated probably 1nm early. Having local knowledge of flying in and out of Stornoway he knew that terrain separation would be alright, with terrain up to 800ft on their L but only a few hundred feet elevation between their ac and the airport. It so happened that there was an opening in the clouds just as the BE200 passed over their ac. They saw it for only a few seconds but judging the separation visually they thought it was 1000ft above; they were passing 1300ft. After landing they told the BE200 crew to check their QNH as 990. An altimeter setting of 1013hPa or 29.90in would result in an ac flying 700ft too low.

RAC MIL reports the BE200 was transiting through Stornoway en-route to the USA. Assistance was requested through HQ3AF to contact the pilot concerned; however, no report has been forthcoming.

ATSI reports that the Airprox was reported by the pilot of a SF340 against a BE200, as the SF340 approached to land at Stornoway, RW18.

The SF340 had departed Edinburgh on a flight to Stornoway and was in receipt of a PS/Aerodrome Control Service (ACS) from Stornoway ATC on 123.5MHz. The BE200 had departed Prestwick on a flight to Stornoway and was in receipt of a PS from Stornoway ATC.

The Stornoway controller was providing a combined PS and ACS. When the SF340 and BE200 flights initially called Stornoway, service was provided by an outgoing controller. A handover/takeover of the operational position took place and at the time of the incident both flights were being controlled by the second controller.

Meteorological Information:

METAR EGPO 311120Z 20019KT 6000 -RADZ FEW005 SCT009 BKN011 10/10 Q0990=
 METAR EGPO 311150Z 20018KT 9999 FEW008 SCT022 11/10 Q0990=

[UKAB Note (1): The UK AIP at AD 2-EGPO-8-1 promulgates the Stornoway LOC/DME/NDB(L) for RW18 as O/H NDB(L) SAY at 3000ft track QDR 360° descending to 2000ft until 6.5D and then carry out a procedure turn L before turning R inbound to establish on FAT 180°. The SAY hold is 1min RH racetrack QDM 180°. The alternate procedure (extended holding pattern) is O/H NDB(L) SAY at 3000ft extend the outbound leg of the RH holding pattern descending to 2000ft, at STW DME 9 (CAT A,B) STW DME 10 (CAT C,D) turn R onto LOC and continue as for the basic procedure.]



The SF340 flight called Stornoway Approach at 1123:20 (UTC) maintaining FL100, 46nm from the STN (VOR/DME). A PS was assigned and an EAT of 1140 was issued. The SF340 flight was instructed to route to the SAY (NDB) to hold. Further descent to FL085 was given.

The BE200 flight called Stornoway Approach at 1125:30 passing FL130 for FL110. A PS was assigned, an EAT of 1150 was issued and the flight was instructed to route to SAY to hold. The BE200 pilot responded, "*Roger at one one thousand c/s.*"

At 1130:10, the SF340 crew was cleared, "*descend to altitude three thousand feet the QNH niner niner zero hectopascals.*" This was read-back correctly by the pilot. After the SF340 had left FL085, the BE200 flight was cleared, "*(BE200 c/s) when ready descend flight level eight five.*" The pilot responded, "*(BE200 c/s) out of one one zero for eight five.*"

Between 1131 and 1134 there was a handover/takeover of the Stornoway Approach controller position.

At 1135:50, following a discussion about speed reduction and the prevailing traffic situation, the SF340 flight was instructed, "*...you're clear for the localiser NDB DME procedure runway one eight from the Sierra Alpha Yankee not below three thousand until advised...*"

At 1136:40, having confirmed that altitude 4000ft had been vacated by the SF340, the controller instructed the BE200 to, "*...descend to altitude four thousand feet on the QNH niner niner zero hectopascals.*" This was read-back by the BE200 pilot as, "*Roger down to four thousand nine nine zero for (BE200 c/s).*"

The SF340 crew called beacon outbound at 1137:40 maintaining altitude 3000ft and was instructed to report localiser established. The Prestwick Centre Multi-Radar Tracking replay displayed the SF340 and BE200 levels in relation to Standard Atmospheric pressure, i.e. as FL. QNH was 990hPa, therefore (23hPa x 27ft/hPa) there was a level difference of 621ft between the displayed FL and the ac's actual altitude. When the SF340 crew called beacon outbound the ac was at FL037.

[UKAB Note (2): The radar recording at 1137:40 shows the BE200 carrying out a parallel entry into the SAY hold from the S tracking N descending through FL080. The ac then turns L at 1139:00 5.5nm N of SAY rolling out on a S'ly track 1min later.]

At 1138:30 the controller requested a level check from the BE200 flight. The BE200 pilot responded, "*Roger seven thousand two hundred...*" Replay showed the BE200 at FL072. The controller requested a further report when the BE200 was, "*...passing altitude six thousand.*" The BE200 pilot reported, "*...(BE200 c/s) is six thousand*", at 1140:30.

The SF340 flight became number one to land at 1142:00 and was cleared to continue descent, report leaving altitude 3000 feet and report when localiser established. The SF340 was at FL036 (~A3000ft). The SF340 pilot replied that the ac was localiser established and that the ac was now descending to 2000ft at 11nm. The ac was observed to descend and level at FL026 (~A1979ft).

At 1142:50 the controller instructed the BE200 crew to, "*...descend to altitude three thousand feet on the QNH niner niner zero hectopascals and report your position in the procedure now, in the hold I should say*". The BE200 pilot replied, "*descending through four thousand for three thousand and we are turning back to sierra alpha uniform currently*".

Between 1142:59 and 1143:07 the BE200 was observed momentarily to be maintaining FL040 (~A3379ft) as it made a L turn outbound from the SAY, having passed 1nm W abeam the NDB. The BE200 flight was then cleared, "*(BE200 c/s) there's er one aircraft ahead on the localiser approximately ten miles at this er time on er passing overhead the sierra alpha yankee overhead the airfield you are clear to commence the alternate procedure that's the er extended holding pattern procedure er from the Sierra Alpha Yankee but not below three thousand feet until advised.*" The BE200 pilot replied, "*(BE200 c/s) roger er we'll extend our holding pattern.*"

The SF340 flight was cleared to land at 1143:50. After the SF340 crew read-back the landing clearance the following RT exchanges took place:

SF340: *"Er Stornoway confirm cleared altitude for the number two aircraft"*
Controller: *"(BE200c/s) [1144:10] you may descend to altitude three thousand feet but to continue not below three thousand feet until advised"*
BE200: *"(BE200 c/s) roger we are levelling at three thousand."*

At 1144:20 the controller asked the BE200 pilot if he was familiar with the procedure for extending the holding pattern and then turning onto the localiser. The BE200 pilot responded, *"(BE200 c/s) yes sir I'm completely er we're we're fighting this wind right now we're trying to get back over on that side."* After this exchange the SF340 again enquired as to the altitude of the BE200:

SF340: *"Can we just double check that aircraft's altitude we've got him as yeah he's about four miles about eight hundred above [1144:50]"*
Controller: *"That er that's er level at three thousand feet for the BE200 c/s (SF340c/s)" [1145:00]*
Controller: *"(BE200 c/s) just confirm that you're level at altitude three thousand feet on the QNH of niner niner zero hectopascals"*
BE200: *"Yes sir [1145:10] level three thousand two nine nine zero".*
Controller: *"Roger."*

At 1144:35 the SF340 commenced a descent from altitude 2000ft (FL026) approximately 7nm N of the Aerodrome Reference Point (ARP). The BE200 was in the SF340's 11 o'clock, range 4-7nm maintaining FL030 (~A2379ft), converging from the L.

At 1145:07 the SF340 had descended to maintain FL020 (~A1379ft) with the BE200 in its 11 o'clock, from the L, range 2-3nm maintaining FL030 (~A2379ft).

The SF340 crew reported at 4nm at 1145:30 and was again cleared to land. The BE200 passed through the SF340's 12 o'clock, L to R, at 1145:31 at a range of 0-7nm, the ac are maintaining FL030 and FL020 respectively. The ac are approximately 5nm N of the ARP. The SF340 is observed to continue its descent at 1146:20.

[UKAB Note (3): The CPA occurs 1145:39 as the BE200 passes 0-4nm SW of the SF340 with vertical separation still 1000ft.]

At 1147:20 the BE200 pilot requested when permission would be given to, *"...turn back inbound... and descend to two thousand."* The controller instructed the BE200 flight to turn inbound and establish on the localiser and that further descent would follow in approximately 30sec.

As the BE200 continued its approach the following RT transmissions took place:

SF340: *"And (BE200 c/s) check your QNH nine nine zero"*
Controller: *"(BE200 c/s) that's affirm er niner niner zero hectopascals er or niner niner zero millibars that's what it used to be [1148:50]"*
SF340: *"Yeah that's what we thought thanks".*

The BE200 flight was cleared to land at 1149:50.

Both controllers that spoke to the BE200 flight passed the pressure in the correct manner, i.e. when pressures are below 1000hPa; "hectopascals" is appended to the QNH value in RT transmissions.

Neither controller challenged the pilot of the BE200 on the quality of read back information, e.g. "one one thousand", "down to four thousand nine nine zero". The BE200 crew never included the word 'hectopascals' in any read back of pressure setting.

At 1145:10 the BE200 pilot gave a read-back of the pressure as, *"two nine nine zero."* This went unchallenged by the controller. It is not known if the controller fully heard this read-back; however,

the absence of a challenge likely indicates the controller had not assimilated what had just been said.

29.90 inches of Mercury is equivalent to 1013hPa – Standard Atmospheric Pressure. Allied with the surveillance replay, it can be seen that the BE200 was flying in relation to Standard Atmospheric Pressure, and not the local QNH.

The SF340 crew was fully aware of the developing situation and most likely understood the error that had been made on the flight deck of the BE200. The SF340 pilot adjusted the level of his ac so that the BE200 passed ahead and above by 1000ft.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of the SF340, transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

Members were disappointed that a report from the BE200 crew had not been received, which denied Members an insight of the crews perspective on the incident. From the thorough ATSI report and the recorded radar data it was clear that the BE200 crew had erroneously set an incorrect pressure on their altimeter subscale, which had led to the crew descending below their cleared altitude and into conflict with the SF340, causing the Airprox.

In the UK it is incumbent on flight crews to ensure that the pressure passed by ATC is assimilated and set correctly on the altimeter subscale, taking into account the units passed and any conversion that needs to be applied for it to be set on the altimeter subscale. The potential for confusion arises when the atmospheric pressure falls below 1000hPa as the value, in this incident 990hPa, was taken as (2)9.90inHg. Procedures in the UK specifically address this issue by requiring the controller to include the unit of hPa with the actual pressure value.

Conversely, CAT pilot Members, familiar with flying operations abroad where inHg are used, stated that careful attention is paid when the atmospheric pressure is given in inHg to ensure the correct conversion is made to hPa from a conversion table, if needed, on the flightdeck. Modern flightdecks with glass cockpits have the ability to set either pressure on the appropriate MFD. Also, UK ac that are manufactured in countries where inHg is the standard pressure unit usually have dual subscales on the altimeter. CAT Members also stated that it is common in the USA that if the pressure is <30.00inHg the value passed by ATC omits the leading 2 from the 4 figure value and no units are mentioned, i.e. "altimeter 990" (29.90inHg).

From the ATSI report it is evident that the Stornoway APP had on several occasions passed the QNH with hPa units however the BE200 crew did not include the word 'hectopascal' in any read back of the pressure setting. Military controller Members advised that Mil ATC units have conversion tables readily available to controllers and routinely pass the pressure in both hPa and inHg to visiting flights from countries where inHg is SOP. Members noted that the APP did have 1 opportunity to break the chain when, just 30 sec before the CPA, on being asked to confirm their altitude on 990hPa, the BE200 crew had read back "level 3000 2990", the incorrect pressure setting. Without knowing the clarity of the RT read back, it was not known if the numbers "2990" were clear enough for the APP to have heard the initial 2 ahead of the 990; up until then the BE200 crew had only ever read back "990" with no mention of units. For whatever reason this incorrect value was not assimilated by the APP who appeared to be unaware of the potential for confusion between units of pressure when the barometric pressure is <1000hPa. Members believed that this potential for confusion needed to be highlighted to controllers and pilots and agreed that a recommendation should be made to the CAA to this effect. Apart from it leading to this Airprox, setting an erroneous pressure setting does have the potential for CFIT with an ac flying below MSA whilst positioning towards the FAT in IMC - a salutary lesson for all aviators.

Members agreed that the SF340 crew had shown excellent SA and correctly alerted APP that they had seen on TCAS the BE200 descending below 3000ft. However, this warning did not have the desired outcome, as the BE200 crew was convinced they were flying at the correct altitude on the correct barometric pressure and the incorrect pressure read back went unchallenged by the APP. In the end, cognisant that the BE200 was flying 600-700ft too low, the SF340 crew elected to descend early to increase vertical separation. This prevented any TCAS alerts/warnings, the ac eventually passing with 1000ft of vertical separation at the CPA with the SF340 crew in visual contact with the BE200 well above. The Board considered that had the SF340 crew maintained 2000ft, their TCAS would almost certainly have generated an RA 'descend' or 'maintain v/s', depending on where the LOC procedure descent profile had occurred, but probably only for a short duration owing to the 300-400ft of separation that pertained initially. Members discussed the wisdom of this early pre-emptive descent and agreed it was the correct thing to do. It was done in exceptional circumstances by a crew with excellent SA, familiar with the local terrain in an ac equipped with GPWS. This had placed the ac marginally below the nominal GP initially but the actions taken had removed any risk of collision between the subject ac.

Members noted that the BE200 crew had not flown the alternate procedure (extending the downwind leg of the hold) but had erroneously turned L at the NDB instead of turning R; this had the effect of reducing the lateral separation at the CPA but vertical separation would have still been lost.

Director UKAB was directed to ensure that the US FAA and DoD are made aware of this incident

PART C: ASSESSMENT OF CAUSE AND RISK

- Cause: Having set the incorrect pressure on the altimeter subscale, the BE200 crew descended below their cleared altitude and into conflict with the SF340.
- Degree of Risk: C.
- Recommendation: The CAA is recommended to issue a Safety Notice reminding controllers and pilots of the potential for confusion over the units of pressure, which could lead to incorrect altimeter subscale setting when the barometric pressure is below 1000hPa (or 30.00inHg).

AIRPROX REPORT No 2012001

Date/Time: 4 Jan 2012 0910Z

Position: 5606N 00150W (6½nm S of NEXUS [17nm NE of ST ABBS VOR])

Airspace: Scottish FIR (Class: G)

Reporter: Prestwick Centre – TAY Sector

1st Ac 2nd Ac

Type: DHC-8 JS41

Operator: CAT CAT

Alt/FL: FL180 SAS ↑FL210 SAS

Weather: VMC NK VMC CLAC

Visibility: 'Good' CAVOK

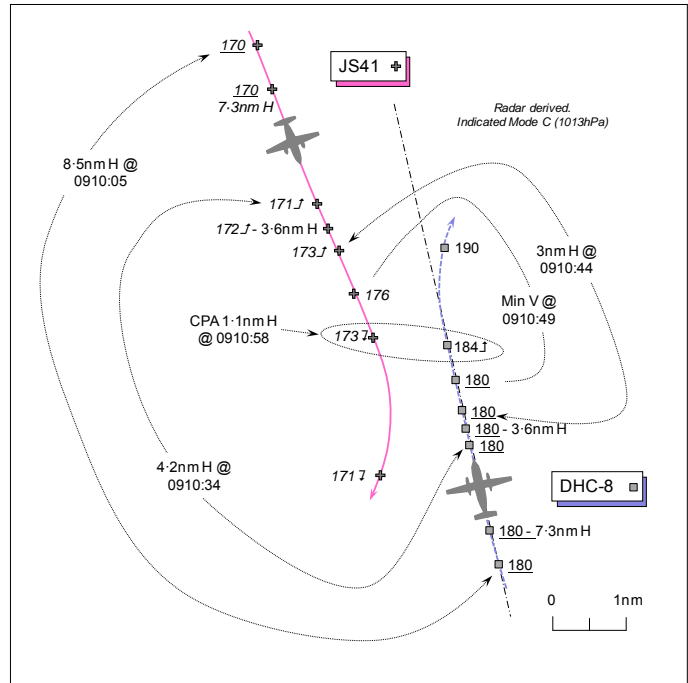
Reported Separation:

600ft V 1000ft V/1nm H

Recorded Separation:

1.1nm Min H @ 1100ft V

400ft Min V @ 1.9nm H



CONTROLLER REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PRESTWICK CENTRE TAY SECTOR COMBINED TACTICAL & PLANNER CONTROLLER (TAY SC) reports that he was working with a trainee on the combined Sector, which was busy with GAT inside CAS and multiple ac in Class G airspace between NATEB and Aberdeen. PAPA18 had just closed for the morning, so they pre-noted Scottish MILITARY about the 3ac southbound from Aberdeen and kept the single northbound DHC-8 inbound to Aberdeen. The southbound JS41 was co-ordinated not above FL170 against the northbound DHC-8 not below FL180. At 0910, when the two ac were head-on to each other, the DHC-8 crew reported a TCAS RA and climbed. STCA was triggered and an avoiding action turn onto a heading of E was immediately given to the DHC-8 crew to avoid the JS41. As there was further traffic affecting the DHC-8 when it began to climb, when 'clear of conflict' was reported the DHC-8 crew was told to maintain FL190. Horizontal separation was eroded to 3nm and vertical separation reduced to 700ft.

UKAB Note (1): PAPA18 is a Class D Category 1 Conditional Lower ATS route (CDR) active between 0530 and 0900 UTC, which then reverts to Class G outwith notified hours.

THE DHC-8 300 PILOT-IN-COMMAND reports she was the PF under a RCS, she thought, from Scottish CONTROL [actually a DS], IFR, in a level cruise at FL180, whilst inbound to Aberdeen from Leeds/Bradford. Approaching a point about 22nm NE of ST ABBS VOR, heading 355° at 210kt, they were advised of traffic they might see 1000ft below them. Flying out of the sun, the crew were visual with the other ac – a JS41 – some 1000ft below their ac, but then their TCAS display indicated the JS41 was climbing. A TA was enunciated by TCAS - TRAFFIC TRAFFIC - and with the JS41 about 600ft below them a CLIMB RA was demanded, which was complied with after disconnecting the AP. The PNF advised ATC of the TCAS RA, who then issued a new heading of 090° and told them to maintain a new level of FL190. When the CLEAR OF CONFLICT was enunciated by TCAS they advised ATC and resumed their course to Aberdeen. Minimum vertical separation was about 600ft below them and the Risk assessed as 'medium'.

THE BAe JS41 PILOT-IN-COMMAND reports that he was in transit from Aberdeen to Humberside under IFR and in receipt of a DS from Scottish MILITARY in VMC, some 5000ft above cloud, with unlimited visibility and the sun on the beam. Heading 165° at 290kt at about 85nm S of Aberdeen, he instructed his 1st Officer to request a climb from FL170 to FL210 to make better use of the tailwind at higher level. This was done and they were cleared by Scottish MILITARY to climb to FL210, with opposite traffic ahead co-ordinated. Commencing the climb they received a TCAS TA on traffic at 11 o'clock, which he and his 1st Officer started to look for. On sighting the other ac they then received a TCAS DESCEND RA demanding a descent at 500ft/min, which they complied with. The other ac – the DHC-8 - was sighted during the TCAS TA and they were visual with it throughout the descent with very little chance of collision. He assessed the Risk as 'low'.

THE ScATCC (MIL) PRIMARY TACTICAL NORTH (TAC N) CONTROLLER [ScATCC (Mil)] reports that she was controlling her first controlling session following the Christmas break. She took a pre-note from TAY Sector on 2 south bound CAT ac, the JS41 routeing to Humberside and another in transit to Norwich. At the same time she co-ordinated with the TAY controller against one of their ac that was routeing northbound - the DHC-8 - that would be maintaining FL180 against the JS41 not above FL170 and another company ac not below FL190. Both flights called on frequency and were identified. As the JS41 and DHC-8 approached each other she passed TI on the co-ordinated DHC-8 to the JS41 crew; this was the only ac under her control that would now affect it. The JS41 crew was then given own navigation towards OTR. As the JS41 turned she realised the new track would take the ac too close to the D323 complex, which was active, so the crew was placed under their own navigation towards UMBEL. The JS41 crew then requested a climb to FL210 and so she instructed them to climb to FL210 before correcting this to a climb to FL215, the correct quadrantal. Realising immediately that this instruction would breach the co-ordination agreement, she instructed the JS41 crew to stop climb and then issued an avoiding action turn onto 270° to try and get lateral separation. The SUPERVISOR was immediately informed of the incident.

THE ScATCC (Mil) SUPERVISOR (SUP) reports that during the period of the Airprox the Unit was operating at close to capacity because two controllers had called in sick and one other was on an approved absence. Whilst capacity was momentarily reached, it was never exceeded and traffic did not have to be refused. They were aware that the USAF had requested the activation of the Vale of York Spider towline from 0830Z-1030Z for up to 16 F15s, and had been monitoring the tanker's location in ARA8 and a number of F15s that were general-handling in TRA3. Once it became clear that the tanker intended to route into the Vale of York to establish the Spider towline, and that a number of F15s would follow, the Northern ICFs were removed from the Southern Primary Planner (PLN) (who was bandboxing N and S) and the Northern PRI-TAC position was opened. A TAC controller and PLN had also been established on Console 2, which was to become the tanker console. In all, this meant 3 consoles were open (PRI TAC and PLN S, Console 2 TAC and PLN, and TAC N). As per the Local Order Book, capacity would be up to 5 ac working console 2, and up to 2 being able to be worked by the PRI-TAC S (more at the SUP's discretion). TAC N had no traffic before the prenotes from TAY at about 0905L for the two southbound CAT ac; these tracks would be within the capacity guidelines laid out in the LOB.

He did not witness the incident as he was dealing with the details of a Spider Towline - as stated, this had required the opening of Console 2 TAC and PLN to augment the controllers already in position. As PRI-PLN S was busy taking prenotes and Console 2 was already working 4 speaking units with more to come, his attention was taken away from the Northern AOR. He deemed the subject TAC N controller sufficiently experienced not to require close attention or monitoring but he was not aware that she had taken two ac from TAY Sector following the routine closure of P18 at 0900L. The first he knew of the incident was when the PRI-TAC N informed him that she had just broken co-ordination with TAY. After receiving a quick brief from her the controller, she was relieved from the console, he spoke to the SAC Local Area Supervisor and reviewed the radar replays and frequency recordings with the Civil Watch Supervisor, whereupon he was informed that the civil controller intended to classify the incident as an Airprox.

NATS EN-ROUTE LTD - PRESTWICK CENTRE reports that this report was written with the full co-operation of ScATCC (Mil) as part of a drive towards joint investigations. ScATCC (Mil) and Prestwick Centre have fully consulted and agreed the outcomes.

The two flights had been on Temporary Airway P18 receiving a Radar Control Service from Scottish CONTROL. P18 reverts to Class G airspace at 0900 local whereupon Scottish MILITARY provide ATSOCAS to these flights subject to workload and task priority. Both the DHC-8 and the JS41 crews were being provided with a DS from TAY Sector prior to the JS41 being transferred to Scottish MILITARY.

At 0902:41, P18 had been closed for just over 2min when TAY Sector called Scottish MILITARY to enquire about them providing an ATSOCAS service to 3 flights. Scottish MILITARY agreed to provide a service to the JS41 cruising at FL170. A Scottish MILITARY squawk A6111 was allocated and the Scottish MILITARY controller requested that the aircraft climb to FL175 the correct quadrantal level. This was agreed at first by the TAY controller who then corrected himself, co-ordinating the JS41 to remain at FL170 stating, "*can you see opposite direction to him the [DHC-8 C/S]?*" The response from Scottish MILITARY was, "*Yea, are you going to keep him?*" Following this there were a few moments of discussion as to who would work the DHC-8 but it was agreed that TAY Sector would retain the DHC-8. The agreed co-ordination was then re-iterated and a transfer frequency to Scottish MILITARY was given for the JS41. Further co-ordination then ensued relating to another company aircraft that was following behind the JS41. At 0906:33, the telephone call ended with both co-ordination agreements being emphasised again. The TAY controller stating "[JS41 C/S] *not above FL170*" to which the Scottish MILITARY controller responds, "*Affirm*". It should be noted at this stage however, that despite the co-ordinations being re-iterated and apparently being clearly understood by both controllers the actual level of the DHC-8 - FL180 - was not mentioned.

At 0907:42, the JS41 was transferred from TAY Sector to Scottish MILITARY. At 0907:52, the DHC-8 crew was given TI on the opposite direction JS41 that had just been transferred to Scottish MILITARY. At 0908:10, the JS41 crew called Scottish MILITARY and requested a DS, which was provided.

The Scottish MILITARY controller provided the JS41 crew with TI on the DHC-8 at 0908:58, "*.....traffic 12 o'clock 1-5 miles opposite direction co-ordinated above*" that the JS41 crew acknowledged. At 0909:22, Scottish MILITARY advises the JS41 crew to route direct OTR. Later at 0909:49, Scottish MILITARY apologises to the JS41 crew stating that Danger Area D323 is active and that they can route towards UMBEL. This is acknowledged by the JS41 crew who then request a climb to FL210 to cruise. The Scottish MILITARY controller responded saying, "*...roger. Climb FL210*".

A few seconds later at 0910:12 the Scottish MILITARY controller changes that instruction and states "[JS41 C/S] *can you make it flight level 2-1-5 for the correct quadrantal?*", which is accepted by the JS41 crew.

The following RT exchanges then occurred between the JS41 crew and ScATCC (Mil) controller from 0910:38: ScATCC (Mil) to JS41 - "[JS41 C/S] *apologies stop climb immediately for co-ordination*". JS41 to ScATCC (Mil) - "[garbled/unclear] *standby [JS41 C/S]*". A few seconds later the ScATCC (Mil) controller instructed the JS41 crew "*...avoiding action turn right heading 2-7-0 degrees*", which was acknowledged. The JS41 crew advised at 0911:08, "*clear of traffic*" and that they would like to proceed direct UMBEL at FL215. Whereupon the Scottish MILITARY controller instructed the JS41 crew to maintain FL170.

During this same period the following exchanges were made between the DHC-8 crew and the TAY SC from 0910:45: DHC-8 crew to TAY SC - "[DHC-8 C/S] *TCAS R-A*". Some 4sec later TAY SC responded, - "[DHC-8 C/S] *Scottish...amm...avoiding action turn right immediately heading 0-9-0 degrees*", which was acknowledged by the DHC-8 crew. At 0911:04, the TAY SC advised the DHC-8 crew that they are clear of traffic and explain who the conflict was with.

STCA activated red at 0910:43, 5sec after the Scottish MILITARY controller initiated the stop climb instruction and 2sec before the DHC-8 crew reported the TCAS RA.

Analysis

The TAY Sector was manned with a trainee monitored by an OJTI. The trainee had already been valid on TAY Sector for about 6 years but after an extended period of absence from duty (due to non operational reasons causing validations to lapse) was being retrained, with approximately 20 hours on the Sector since August.

The trainee was aware that the workload was beginning to increase and had called for the assistance of a Planning controller. When the Planning controller arrived she began to brief him on the Sector and was 'heads down' in the fps bay highlighting to the Planning controller what was needed to be done with certain ac.

The trainee recalls hearing the DHC-8 crew call a TCAS RA and looked up at the radar. She immediately saw the conflict with the STCA flashing red. Although she had heard 'TCAS RA' her reaction to seeing the STCA red alert was instinctive. Since this event was so sudden she had not – cognitively - fully absorbed the implications of the RA and reacted to seeing the STCA. Following a momentary pause/hesitation an avoiding action turn to the R was issued. Although the ac were almost abeam each other at the time of the avoiding action the radar display was selected to 60nm range, which would have made the assessment of conflict distance more difficult.

Regarding the turn issued when the TCAS RA was called, the trainee realised that there should have been a 'hands off' approach although there was some debate about taking action in the horizontal plane following a TCAS RA.

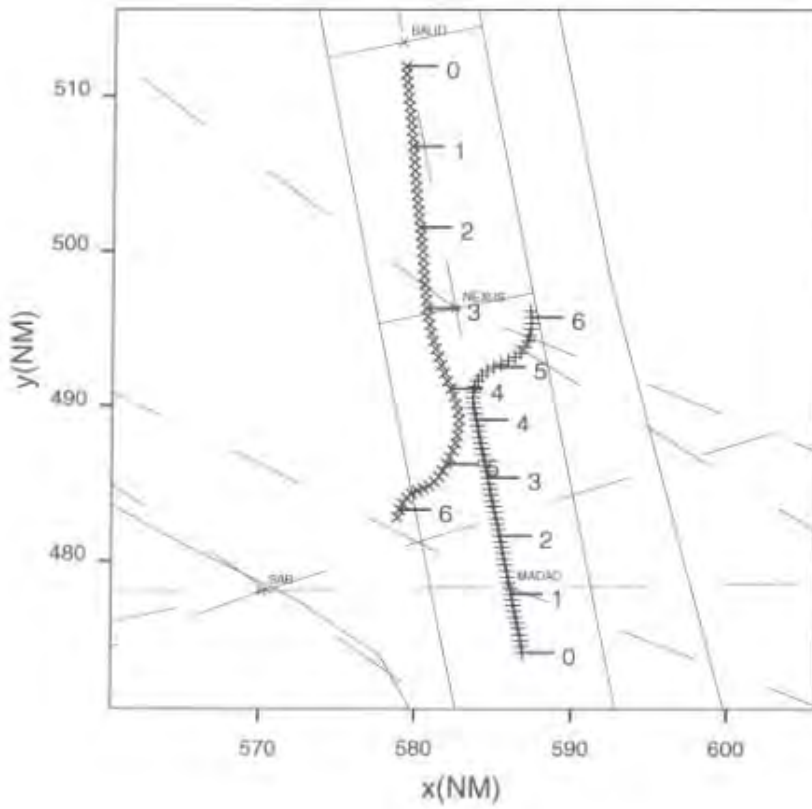
Both the trainee and the OJTI were asked what factors in the event could have prevented it from occurring then or in the future. They both made the following points:

P18 could be made a permanent airway or the hours extended beyond the 0900 local closure.
With hindsight one controller (either civil or military) keeping all relevant traffic may have prevented the incident.

SMF data

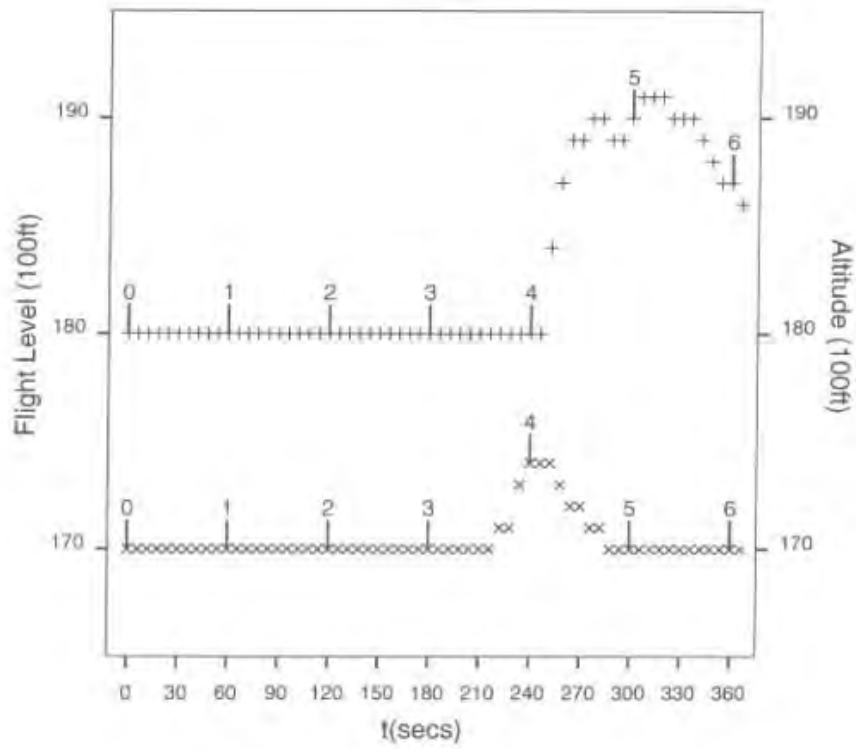
The following data was produced by SMF (Separation Monitoring Function) which supports the minimum separation already assessed.

HORIZONTAL



SMF data 1

VERTICAL



SMF data 2

Radar and RT replay

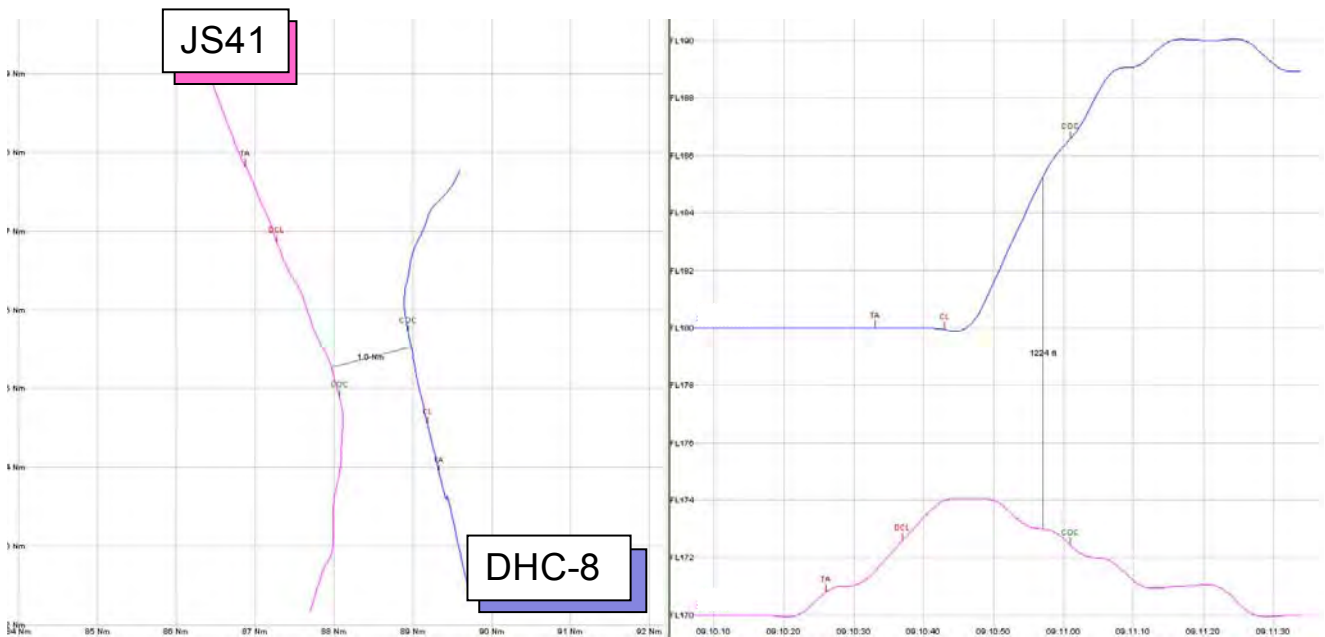
It was also confirmed during RT playback that despite there being clear co-ordination between both controllers which was re-iterated and that both controllers appeared to have a full situational awareness, there was never a specific mention of the level that the DHC-8 was at i.e. the words “FL180” were never actually spoken. See “Extract from MATS Part 1” section.

STCA/TCAS Simulation Report

Following data is sourced from both TCAS simulations and STCA. Table 1 below relates to the TCAS Simulation data.

CODE	DESCRIPTION		CODE	DESCRIPTION
TA	Traffic Alert		AVS	Adjust Vertical Speed
RA	Resolution Advisory		CL	Climb
COC	Clear of Conflict		DCL	Don't Climb

Table 1



TCAS Simulation Data

This gives the closest lateral and vertical points as follows:-

Minimum Lateral Separation		
<i>Min. Latsep Time</i>	<i>Horizontal Sep. (NM)</i>	<i>Vertical Sep. (ft)</i>
09:10:57	1.05	1224

Minimum Vertical Separation		
<i>Min. Vertsep Time</i>	<i>Horizontal Sep. (NM)</i>	<i>Vertical Sep. (ft)</i>
09:10:45	2.29	581

Assessment of TCAS Performance

EUROCONTROL’s automatic safety monitoring tool (ASMT) recorded three resolution advisory (RA) messages, one from the downlinked Mode S data of the JS41, the other two from the DHC-8. The JS41 received an *adjust vertical speed* within one second prior to 0910:38. The DHC-8 then received a *climb* within four seconds of 09 10:42 followed by an *adjust vertical speed* within one second of 0910:53.

Simulation of this encounter suggests that both aircraft received a traffic alert (TA); the JS41 at approximately 0910:26, followed by the DHC-8 about 7sec later. The JS41 then received the first RA at 0910:37. The RA was a *don’t climb* (enunciated “Adjust vertical speed, adjust”) and the ac levelled off 8sec later. The DHC-8 then received its first RA which was a *climb* (“climb, climb”) at 0910:43 and started to climb 4sec later.

Information regarding the flight path of an aircraft is available in roughly 4-second intervals based on radar data, whilst TCAS uses a 1 -second update cycle based on SSR interrogations. Hence, for simulation purposes, the period of time between consecutive radar points is interpolated to give a reasonable estimate of the flight path of the ac. The time of the initial *adjust vertical speed* and the *climb* RA messages in simulation is in good agreement with the downlinked times based on Mode S data. The ASMT recorded an *adjust vertical speed* RA for the DHC-8 at 09 10:42 which was not generated in the simulation - this is probably due to the interpolation between radar points. The *clear of conflict* message was issued at a simulated time of 0911:01.

Time	Cycle	L(Nm)	dZ(Ft)	Alert
09:09:59	18	9.92	1000	
09:10:03	19	9.32	1000	
09:10:07	20	8.69	1000	
09:10:11	21	8.09	1000	
09:10:15	22	7.48	1000	
09:10:19	23	6.86	1000	
09:10:23	24	6.25	975	
09:10:27	25	5.64	975	
09:10:31	26	5.02	950	
09:10:35	27	4.41	875	
09:10:39	28	3.83	800	
09:10:43	29	3.21	707	Y
09:10:47	30	2.67	590	Y
09:10:51	31	2.10	471	Y
09:10:55	32	1.60	601	Y CCPA
09:10:59	33	1.19	987	Y
09:11:03	34	0.94	1190	
09:11:07	35	1.20	1401	
09:11:11	36	1.60	1630	
09:11:15	37	2.15	1755	
09:11:19	38	2.67	1862	

STCA Cycle

The above data shows the STCA cycle with the alert beginning at 0910:43 and confirms the radar observations.

CCPA (Cycle of Closest Point of Approach) is given as 1.6nm and 601ft where controllers were seeking to achieve 5nm or 1000ft.

Extracts from CAP493 MATS Part 1

Appendix E Paragraph 3.1

“Readback of ATS Co-ordination Messages

Controllers must ensure they obtain a read-back of any operationally significant information contained in telephone and intercom co-ordination messages, including:

- Levels;
- Headings;
- Speed Restrictions;
- Airways or route instructions;
- Runway in use;
- SSR Codes;
- Pressure Settings;
- Frequencies;
- Release and contact points”

This is the only reference to mentioning level during co-ordination and relates more to read-back of levels rather than a requirement to specifically state the level during all co-ordinations.

It could be argued that paragraph 3.1 above is sufficient instruction to make it clear that levels must always be mentioned but in this incident the act of co-ordination centred around the levels that the two flights controlled by ScATCC (Mil) were to operate below and above. This was the executive co-ordination and those readbacks were all made by both the ScATCC (Mil) and TAY controllers. The implication was that the DHC-8 would stay at FL180 but since there was no mention of that level there was no need for a readback.

So while the military MAA MATM states that both controllers are to refer to level of their ac there is no such laid down criteria for civil controllers.

However, the ScATCC (Mil) report states that ‘Had FL180 been stated on the landline conversation, it may have been reinforced in the controller’s thoughts....’ This may be worthy of consideration in the civil world.

Conclusions

This investigation has concluded that a number of events that were factors in this incident. It has also raised a high number of situational factors (compared to causal or aggravating) that may or may not have contributed. A situational factor is defined as a factor that was present during the incident but its effects cannot be determined or proven to have contributed.

It is clear that the main causal factor (CF) was the ScATCC (Mil) TAC N controller’s decision to allow the climb of the JS41 (CF1) to FL210 (then FL215) and break the co-ordination agreement with TAY Sector for that aircraft to remain at FL170.

While the ScATCC (Mil) controller is uncertain as to why exactly she gave the climb, there is evidence from the ScATCC (Mil) report that the controller mis-perceived the call from the JS41 as being from another company ac on frequency (CF2).

Aggravating factors included the ScATCC (Mil) controller being under loaded (CF3). The level of concentration provided in her decision to climb the JS41 clearly did not set any “alarm bells” ringing when the request for a climb was made.

It could be argued that CF4 is Causal, Aggravating or Situational. However it has been listed as aggravating in that it made the situation worse. If control of both aircraft had been with the ScATCC (Mil) controller CF2 may have occurred anyway but she may have reacted to the error more quickly. It should be noted that there is an element of conjecture in the assessment of the severity of this causal factor but no doubt remains that it has a degree of significance.

There is also evidence from other incidents in Class G airspace that point clearly to co-ordination/misunderstandings/awareness etc issues that arise from different agencies working in the same piece of airspace.

The following six causal factors are all situational i.e. they are factors that were present in the event but their impact cannot be determined or proven.

Military

Procedures clearly state that during co-ordination the level of traffic must be verbalised. While civil procedures do not state that explicitly it is deemed to be 'Good Practice' and the level of the DHC-8 was never actually mentioned by the TAY or ScATCC (Mil) controllers (CF5). So although both controllers had full situational awareness (evidence is from the traffic information that both controllers gave to both aircraft and that the co-ordination was emphasised twice) there remains the lack of reinforcement to the ScATCC (Mil) controller of the DHC-8's level.

Airway P18 is described as CDR Category One (CDR 1) between ADN and NATEB, Mon-Fri 0530-0900, and from 1700 Fri or the day preceding a PH to 0900 Mon or the day following a PH Winter (Summer 1hr earlier). The Airway is not available for use during these periods when MoD requires access to the airspace. This limited availability (CF6) will obviously mean that the route (which is regularly used by civil passenger flights) is generally Class G airspace and will subsequently involve flights being operated by different agencies in that airspace.

It is possible that the ScATCC (Mil) controller was at least partially distracted when the track of direct OTR she had given to the JS41 crew was going to infringe upon D323 (CF7). It is not uncommon for a minor error such as this, whether it is corrected or not, to cause a controller to become unsettled and unfocused. The fact that this 'distraction' occurred immediately before the JS41 crew requested FL210 would seem to support that possibility.

The ScATCC (Mil) report states 'The controller stated that it was the first day back after the Christmas period therefore *lack of currency* (CF8) may have been an issue. Although this is the same for other controllers coming back from leave or extended absence, this may have been a contributory factor as to why a lapse in concentration had been suffered in this instance.'

Civil

The TAY trainee offered lateral avoiding action after the DHC-8 crew had reported a TCAS RA (CF9). While this factor had no impact on the incident it does require to be noted.

It should also be noted that the JS41 crew did not clearly state to the ScATCC (Mil) controller that they were receiving a TCAS RA (CF10). This lack of correct or clear information to the ScATCC (Mil) controller resulted in her also providing avoiding action when none should have been given.

Both controllers mitigated the event to some degree by passing TI to both crews well in advance (CF11 & CF12) and therefore providing them with good situational awareness. However, this raises the question of why the JS41 crew requested a climb to FL210 when they were aware of the company traffic. Did they check on TCAS?

Prestwick Centre Recommendations

It has been noted from previous incidents that there are signs of a trend where controllers (on civil side and in this case the military side) have made significant safety errors where there should have been enough cognitive and skills capacity to avoid such mistakes. The trend, albeit statistically minor, has often involved being under loaded and demonstrating a lack of concentration leading to surprisingly uncharacteristic but significant errors.

Prestwick Centre conducted a highly successful 'Watch out for Gorillas' campaign in 2007/08, where controllers were alerted to looking out for the obvious that we sometimes do not see.

It is recommended that Unit Management, in conjunction with Scottish MILITARY, conduct a campaign highlighting and emphasising to both civil and military controllers at Prestwick, the vulnerability of the human to not seeing the obvious and then putting this lesson into an ATC context. This recommendation will be satisfied when all PC controlling staff (and Ops Room support staff if considered necessary) have been exposed to this campaign and that Unit Management are satisfied the message has been successfully delivered.

This Recommendation was accepted by General Manager Prestwick Centre.

While not having any impact on this incident the avoiding action given by the TAY trainee controller requires to be addressed. MATS Part 1 states:

'When a pilot reports a TCAS RA, controllers shall not attempt to modify the aircraft's flight path'.

Although the TAY trainee controller appears to have instinctively reacted to observing S TCA following her discussion with the new planner and hearing the DHC-8 "TCAS RA" the fact remains that an avoiding action was given when controllers should have been 'hands off'. The military controller also gave avoiding action but the TCAS RA call from the JS41 crew was either not given or was unclear.

It is recommended that Unit Management ensure that all controllers are reminded of the MATS Part 1, Section 1, Chapter 9, and Paragraph 5.2 through Safety Co-ordination Team actions such as TRUCE, ART or Watch Briefings.

This Recommendation was accepted by General Manager Prestwick Centre.

ATSI endorsed the NATS Ltd joint civil/military report. It was noted that two recommendations were accepted by the civil ATS provider, and importantly, the final recommendation, which will remind Scottish Area civil controllers of their roles and responsibilities when a TCAS RA is reported, is scheduled to be completed by 31 July 2012. [ATSI Note: the CAA's AATSD En Route Inspectorate has sight of these reports through the internal MOR distribution process and they are therefore available for follow-up at the regulatory oversight level).

As a further step, ATSI shall be highlighting the report to the Editor MATS Part 1/Chair ATC Procedures Working Group.

BM SAFETY MANAGEMENT reports that both ac were operating IFR in VMC: the JS41 in receipt of a DS from ScATCC (Mil) TAC N and the DHC-8 in receipt of a DS from SAC TAY Sector.

Taskload and complexity for TAC N were low, with the incident ac and an un-related Saab 2000 on the frequency flying about 11nm astern of the JS41 throughout the Airprox. Significantly, the incident occurred approximately 10min after TAC N took over the control position at the start of her shift, her first shift back after the Christmas 2011 break. Whilst TAC N was rostered for a number of shifts

over the Christmas period, they completed little controlling due to low traffic levels. Moreover, their shift times in the 2-months prior to the incident were as follows:

Date	Activity
31 Oct – 4 Nov	Mon – Thur, mentoring on simulator, Fri PM Supervisor
7 – 11 Nov	Annual leave
14 – 18 Nov	PM Supervisor
21 Nov – 9 Dec	Detached – non controlling
12 – 16 Dec	PM Supervisor
19 Dec – 3 Jan	Christmas Leave, night shift 24 & 25 Dec, low traffic levels, minimal controlling

RAF ATM Force Order 300.125.3b states that:

'In order to maintain currency, controllers are to, as a minimum, achieve on console an operating currency of 8 hours per month in each discipline for which an endorsement is held. When a controller fails to meet this minimum requirement over 3 consecutive months, they will be required to undergo a standards check comprising a practical examination and a working knowledge check. Notwithstanding the 8-hour requirement, any controller/assistant who does not consider themselves to be current in a particular discipline should inform the supervisor/ATCO IC who is to arrange remedial action.'

The incident sequence commenced at 0904:06 as TAC N liaised on the landline with TAY Sector over the transfer of control of the JS41 and the unrelated Saab 2000 from TAY Sector to TAC N. Although the landline call continued until 0906:13, from the perspective of the investigation the critical element was the co-ordination that was agreed and re-iterated between 0905:49 and 0906:05. TAC N confirmed with TAY Sector that they would, *“not be below flight level 1-9-0 with the [un-related Saab 2000 C/S] when he comes to me against your [DHC-8 C/S].”* TAY then re-iterated, *“not below flight level 1-9-0 and not above flight level 1-7-0 with the [JS 41 C/S]”* to which TAC N replied, *“affirm.”* At this point, the DHC-8 was 46.7nm S of the JS41, with the ac maintaining FL180 and FL170 respectively.

At 0908:07 the JS41 crew made initial contact with TAC N and at 0908:58, was passed TI on the DHC-8 as, *“traffic 12 o'clock, 1-5 miles [radar replay confirms 18.6nm] opposite direction co-ordinated above.”*

At 0909:23 TAC N authorised the JS41 crew to route under their own-navigation to OTR; however, the controller realised at 0909:51 that this route would take the JS41 through EG D323 which was active and amended the JS41's route via UMBEL.

At 0910:05, with the DHC-8 8.5nm SE of the JS41, the latter's crew requested a climb to FL210 that was approved and then amended at 0910:14 to accommodate the correct quadrantal level. At this latter point 7.3nm lateral separation existed.

At 0910:34 with 4.2nm lateral separation between the 2 ac, the JS41's SSR Mode C indicates a climb to FL171. At 0910:38, with 3.6nm separation, TAC N transmitted to the JS41 *“apologies, stop climb immediately for coordination”*; however, the JS41 crew's reply was initially garbled and then advised TAC N to standby. During this, at 0910:44, STCA activated high-severity Red. TAC N immediately instructed the JS41 crew, *“..avoiding action, turn right heading 2-7-0 degrees”* which was readback by the JS41 crew. At this point, the JS41 was passing FL174, 2.5nm NW of the DHC-8.

The CPA occurred at 0910:58 as the JS41 passed 1.1nm W of the DHC-8, with the JS41 descending through FL173 and the DHC-8 climbing through FL184, both in accordance with their respective TCAS RAs. [Minimum vertical separation of 400ft is shown for one sweep at 0910:49, with horizontal separation of 1.9nm.]

Although the unit investigation concluded that the improper format of the coordination that occurred between TAC N and TAY Sector may have caused TAC N's cognitive error in issuing the climb instructions, BM SM contends that this is not likely. TAC N demonstrated their understanding of the agreement in both their report narrative and their use of language in the TI passed to the JS41 at 0908:58, describing the DHC-8 as "coordinated above." Moreover, subsequent to completing her report, the controller has commented that she may have been distracted by the unrelated Saab 2000 from the same company, thinking that it was the aircraft requiring the climb. However, the flow of the conversation when the climb instruction was issued makes this unlikely, given that the JS41 linked their request to climb to FL210 to the conversation begun by TAC N in amending the JS41's routing.

For TAC N to have issued effectively 2 separate climb instructions (FL210 at 0910:05 and FL215 at 0910:14) without having perceived the conflict posed by the DHC-8 when it was 7.9nm and 7.3nm away respectively, suggests that either TAC N was not looking at their surveillance display when she issued the instruction or, more likely, had mentally discounted the DHC-8 as a conflict as it was coordinated. This is suggestive of low levels of situational awareness, alertness and/or cognitive arousal, which it is reasonable to argue, were caused by the individual's shift pattern history over the preceding weeks.

TAC N's climb instruction to the JS41 placed the flight in conflict with the DHC-8, breaking the coordination agreement with Tay Sector.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both aircraft, transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved together with a joint unit report that included TCAS analysis and comment from the appropriate ATC authorities.

The DHC-8 crew was evidently aware of the JS41 from the TI issued by TAY and had spotted it on their TCAS display. Moreover, they had also seen the JS41 below them before it commenced its climb so they had good SA even before the TA was enunciated. The TCAS analysis indicates the DHC-8 crew complied with the TCAS RA promptly and it was clear to Members that the crew's part in this Airprox was limited to following the instructions issued to them. Whilst the trainee on TAY had incorrectly issued an avoiding action turn instruction after the DHC-8 crew announced their RA, Members agreed that it had no effect on the outcome.

Evidently, this Airprox stemmed from the instruction issued by TAC N to the JS41 crew to climb to FL210/FL215, following their request for a higher cruising level. Whilst the JS41 crew had been informed of the DHC-8 15nm ahead that was "...co-ordinated above.." when they first called TAC N, they had not been informed of its level. A Member postulated that if TAC N had told the JS41 crew that the DHC-8 was only 1000ft above them at FL180, they might not have asked for the en-route climb at that point; however, once the crew made the request, it remained TAC N's responsibility to prevent any conflict with the co-ordinated traffic so the JS41 crew was also just following TAC N's instructions. Although the Unit report highlights that specific levels were not mentioned, the DHC-8's Mode C was plainly displayed to the controller and if TAC N had been looking at the radar when she instructed the JS41 crew to climb the potential for conflict would have been readily apparent. A civil area Member questioned the efficacy of two ATC units providing a transit middle airspace radar service in the same vicinity. However, the Board recognised this was commonplace throughout UK airspace and the NATS Advisor added that there was no evidence to suggest that if the same unit had been working both flights the Airprox would not have occurred.

The BM SM Advisor reaffirmed that there was no doubt that TAC N was aware of the DHC-8's level beforehand, but it was the controller's inappropriate reaction to the JS41 crew's request, approving a climb through the DHC-8's level in breach of the agreement with TAY, that had resulted in this conflict. The Advisor believed that this was a momentary error by the TAC N controller, who had quickly realised her mistake. A military controller Member opined that TAC N's work rate had not been able to match the demands of the traffic situation, which, in his view, was indicative of a lack of

currency; Members discussed this issue and the difficulties confronting more experienced controllers who are understandably employed more frequently in supervisory roles. Nevertheless, the rules seemed plain enough so the issue of controller currency was a matter for the individual and the unit concerned. After a wide ranging debate, Members agreed unanimously that the Cause of this Airprox was that TAC N climbed the JS41 into conflict with the DHC-8.

TAC N had plainly been distracted in correcting the JS41's projected track clear of D323 and altering the JS41 crew's requested level to the appropriate quadrantal cruising level rather than focusing on the potential for conflict, despite the co-ordination beforehand. Nevertheless, only 24sec elapsed between the instruction to climb to FL215 and TAC N issuing the *"..stop climb immediately.."* instruction, when it was evident she had realised her mistake. The Board noted that shortly after the STCA 'red' warning the controller incorrectly issued an avoiding action turn while the JS41 crew was reacting to a TCAS RA; however, Members recognised that the controller would not have been aware of the TCAS event because the relevant RT call was garbled. The TCAS analysis confirms that the JS41 crew complied with the RA promptly. Moreover, with both aircraft on a steady course they were set to pass abeam with 1.1nm horizontal separation even before any avoiding action turns could begin to take effect. Vertical separation had also been restored by that point with 1100ft evident on Mode C. The Board concluded, therefore, that the foregoing coupled with the sound appreciation and swift response of all concerned had effectively removed any Risk of a collision in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: TAC N climbed the JS41 into conflict with the DHC-8.

Degree of Risk: C.

AIRPROX REPORT No 2012002

Date/Time: 8 Jan 2012 1403Z (Sunday)

Position: 5143N 00009E (RW20 North Weald - elev 321ft)

Airspace: LFIR (Class: G)

Reporting Ac Reported Ac

Type: C150 Model a/c

Operator: Civ Pte Civ Pte

Alt/FL: 50ft↑ NR
aal agl

Weather: VMC CLBC VMC NR

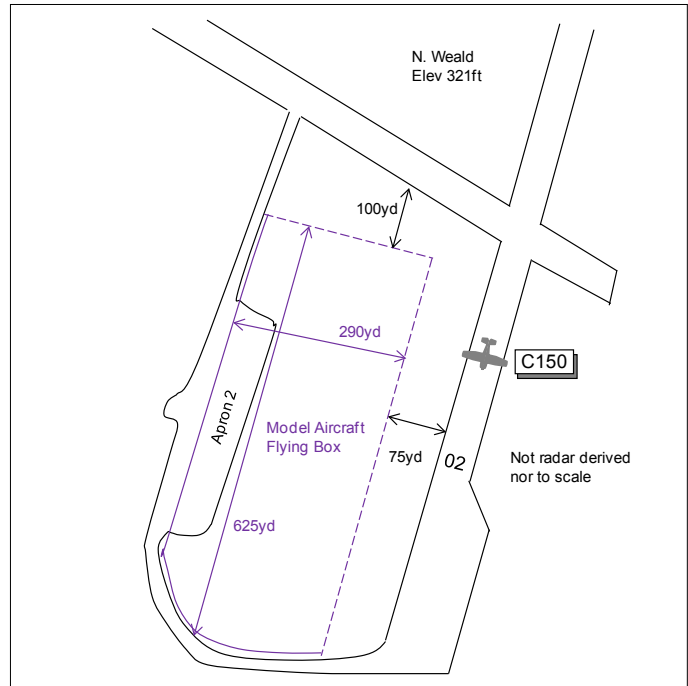
Visibility: >10km NR

Reported Separation:

4m V/30m H Not seen

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C150 PILOT reports on departure from N Weald RW20 and in receipt of an A/G service from N Weald Radio on 123.525MHz, squawking 7010 with Mode C. The visibility was >10km flying clear below cloud in VMC and the ac was coloured white/red; lighting was not reported. Heading 200° at 70kt climbing straight ahead through 50ft aal he saw a model ac moving fast towards his flightpath in his 1-2 o'clock range 50m at roughly the same height. The model then turned sharply to port 180° and flew away from the RW. Although he didn't have time to react he believed that it was about 30m at its closest point. He did not declare an Airprox at the time and he assessed the risk of collision as none.

The model involved was a low-wing single-engine type with about 4-5ft wingspan. He opined that model ac should not be flying so close to an active RW, believing that had the operator lost control then he may not be here today. A colleague of his also commented on how close model ac were being flown to an active RW when there is a lot more space available that would not cause a problem. A published Flight Guide shows the area for model ac [apron W of RW02 threshold] though there is nothing which shows the limits that they should stay within or that model ac will be flying when ac are arriving or departing. He felt that model flying should not carry on at its present location when the RW is active.

UKAB Note (1): The AIDU Minor Aerodromes and Microlight Sites publication also shows that model ac fly from an apron to the W of RW02 threshold. Local Hazards include model flying on the A/D during daylight hours.

THE MODEL A/C OPERATOR reports flying an 88in wingspan model YAK54 between 1400 and 1515hr but did not recall at any point being in conflict with a C150. Throughout his flights he had adhered to the 'model flying box' at N Weald; the 'box' is limited airspace that is strictly policed by both his own club members and the ground control at the airfield. He was not made aware that rules on this or any other matter had been breached. To offer a safe system of operations, the Model Flying Club (MFC), airfield ATC and Operations use a ground to ground radio system that is manned at all times during their flying sessions. An aerial photo of N Weald with the Flying Box superimposed was provided as well as the flight pattern flown.

THE MODEL FLYING CLUB COMMITTEE reports the model aircraft operator was believed to be identified correctly from the timing and description of the model given by the C150 pilot. What the committee believes has happened is a mis-sighting due to perspective. The model in question has a wingspan of 2.23m (>7ft) and what the C150 pilot saw was not a 4ft wingspan model at 50yd converging to approximately 30yd but the larger 7ft wingspan model further away converging but within the RW02/20 airspace box allocated to model flying. The C150 pilot may have been a visitor and not familiar with model flying on Apron 2. Local pilots are aware of their presence and are invariably told by 'ATC' when they are active whilst aircraft are taking-off or are on short final on RW20/02. If full size aircraft need to enter the airspace box in an emergency, model flyers are advised by ATC and stand down. The flying members are situated on Apron 2 in the centre to the West side, adjacent to but not on the perimeter track. All models are flown looking East, irrespective of wind direction. The maximum height allowed is 400ft QFE. They also maintain a full-time member who monitors the height and location of models within the boundaries and approaching full size aircraft, at or below 400ft, who may not have been advised by ATC that models are active. On this occasion the spotter did not see any conflict with a C150. The committee could not understand why the C150 pilot did not radio ATC at the time of the alleged Airprox and left the reporting until the end of his flight. Had he done so, ATC would have contacted the model flyers immediately on the ground radio and it would have been possible to get a more accurate fix on the model alleged to have been involved. They received no advice whatsoever nor were they advised that one of their models had encroached outside the 'box'. Following a discussion with the Aerodrome Manager it was found that the flying box (625yd N-S and 290yd E-W, E boundary 75 yd from West edge of RW02/20) agreed with ATC Operations in June 2010 and incorporated in the MFC Licence and Lease had not been included into the Aerodrome Operation Manual (AOM). The AOM will be updated later in 2012.

THE BMFA reports the club operate under the terms of a well defined set of practices and protocols which have been agreed with the aerodrome management. A significant aspect of this arrangement is the requirement for model flyers to be in contact with Tower at all times through a handheld radio and in addition to this a 'spotter' is required at all flying sessions. In the majority of cases where model flying takes place on a full size active aerodrome it is only outside the notified hours of operation. However there are a few where the 2 activities co-exist with no problems whatsoever, North Weald is a good example of this. Modern radio equipment has become spectacularly reliable so the days of interference generated 'shootdowns' are in reality a thing of the past. In addition to this all radio controlled model aircraft are legally required to be fitted with a failsafe that upon loss or corruption of the signal brings the throttle to closed or idle. Also, as with the club based at North Weald, clubs that operate in close proximity to full size aviation activity generally set a minimum standard of pilot certification along with the implementation of additional measures such as the requirement for a 'spotter' at all flying sessions. Acting as second pair of eyes, the 'spotter' would obtain the most accurate view of the flying area 'infringements' from a location in line with the edge of the box however by the nature of the role the 'spotter' needs to be located with the pilot in order that communication takes place throughout the flight. At the distances involved it would be apparent from the pilot's box (by the spotter) when an aircraft was flying on close proximity to the edge of the defined flying area. This of course relies on a degree of competency and experience on the part of both the spotter and the pilot, hence the certification requirements specified in the club rules.

UKAB Note (1): The North Weald Aerodrome Manager provided a copy of the AOM which included detailed procedures to be followed by the MFC and 2 graphics; the first depicting 3 areas set aside on the aerodrome for model flying and the second showing prohibited areas i.e. 'no-fly' zones to models. However, neither of these graphics correlated with the graphic provided by the MFC Committee. The Aerodrome Manager met with the MFC Committee and agreed the 'Flying Box' portrayed in the graphic provided by the MFC was correct and that he will ensure that the information available to pilots contained within relevant flight guides and the AOM regarding model flying will be amended accordingly.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac and reports from the appropriate operating authorities.

It was clear that the C150 pilot was surprised by the proximity of the model ac while on departure. Without accurate information as to the dimensions and position of the 'flying box', the C150 pilot was unaware that model ac could be flying to within 75yd of the RW edge during normal operations. The model was seen an estimated 50m away and to have turned sharply away at a distance of 30m. Members agreed with the suggestion in the Model Flying Club Committee's report that the model ac's large size - a 7ft wingspan and not 4-5ft - may have created the impression that it was closer than it appeared and the actual separation distances would have been greater than those estimated. A Member questioned whether flying a model towards an active RW with an ac climbing out was best practice. The Flt Ops Advisor confirmed that from his perspective nothing illegal had occurred with the model ac flying in accordance with BMFA procedures; however, he agreed that any manoeuvre towards an active RW could give rise for concern from pilots arriving or departing. Members believed that this incident 'boiled down' to a perception issue, with the C150 pilot unaware of the model flying box, concerned with the model ac's proximity and perceiving a conflict. From the information available, the Board believed that in the end this had been a benign event where normal procedures, safety standards and parameters were not breached.

Given that normal ac and model flying operations routinely occur concurrently but there had been lack of information available to the C150 pilot, Members agreed that the North Weald Aerodrome Operator should update the AOM and ensure the relevant Flight Guides reflect this update.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Pilot perceived conflict.

Degree of Risk: E.

Recommendation: The North Weald Aerodrome Operator is recommended to update the Aerodrome Operating Manual and ensure the relevant Flight Guides reflect the update.

AIRPROX REPORT No 2012004

Date/Time: 9 Jan 2012 1451Z

Position: 5149N 00118W
(O/H Oxford - elev 270ft)

Airspace: Oxford AIAA (Class: G)

Reporting Ac Reported Ac

Type: PA34 SR22

Operator: Civ Trg Civ Trg

Alt/FL: 5000ft↓ 4000ft
NK QNH (1029hPa)

Weather: IMC CLBL IMC CLBL

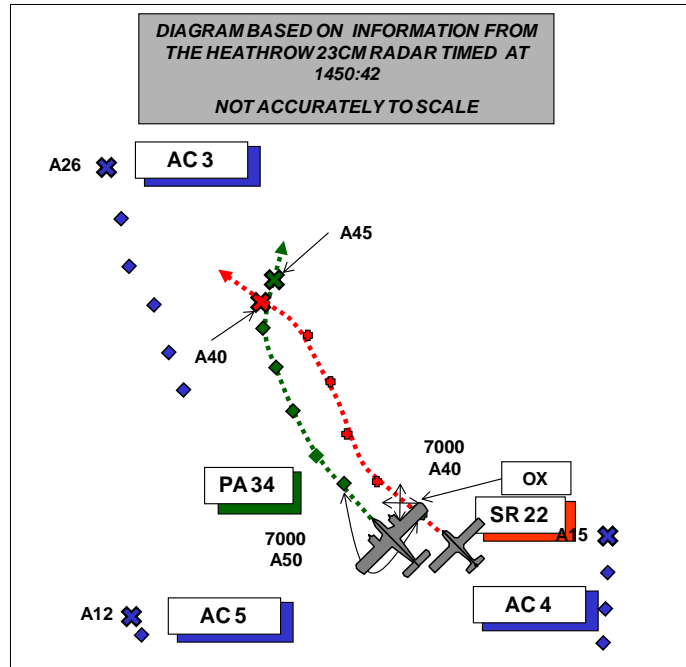
Visibility: NR >10km

Reported Separation:

500ft V/0.5nm H 200ft V/50m H

Recorded Separation:

500ft V/0.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA34 PILOT reports flying an IFR training flight in a blue and white ac with all external lights switched on in receipt of a PS from Oxford while squawking 7000 with Modes C and S but TCAS was not fitted. They were cleared to the 'OX367' [NDB] at FL060. Traffic called on the frequency and requested to route through from Benson direction the overhead at 4000ft. They were given descent to 3500ft which they initiated, heading 339° at 120kts and descending at 1000fpm. During the descent Oxford APP called the transiting ac and told them of their [the PA34's] intentions. The transit ac, a Cirrus type, called visual with them but still flew below them as both ac entered cloud. He stopped the descent until he lost sight of the Cirrus.

He reported the incident on Oxford APP and assessed the risk as being medium.

THE SR22 PILOT reports flying a white ac with all external lights switched on an IFR training flight; at the time they were in receipt of a BS from Oxford and were squawking 7000 with Modes C and S but TCAS was not fitted. They had turned overhead OX onto a heading of 340° at 130kts en-route to Sleaf, climbing from 3500ft to 6000ft, when they were notified of an ac ahead joining the hold at OX and they sighted the ac above them briefly 0.5nm away, as there were gaps in the cloud; it was, travelling in approximately the same direction but in a R turn. As they were unable to judge whether the ac was manoeuvring in, or joining the hold, or whether they were overtaking it or not, they stopped the climb. Very shortly afterwards the ac reappeared still above them and to the right in a right turn. Once they were well clear of it they continued their climb.

He assessed the risk as being Medium.

UKAB Note (1): The recording of the Heathrow 23cm radar shows the incident clearly as depicted above.

ATSI reports that the Airprox occurred at 1450:35, in Class G airspace, 1.5nm NW of Oxford Airport between a PA34 and a Cirrus SR22.

The PA34 was operating an IFR training flight inbound to Oxford Airport from Gloucester Airport and in receipt of a PS from Oxford APP. The SR22 was on training flight operating IFR from Denham to Sleaford and in receipt of a BS, also from Oxford APP.

The Oxford controller was providing an Approach Control Service together with a trainee, without the aid of surveillance equipment. The traffic levels were reported as medium with overall workload as medium-high. The trainee was an experienced controller, new to the unit and undergoing unit training prior to a unit endorsement examination.

ATSI had access to RTF and area radar recordings together with written reports from the Oxford controller and both pilots. The controller's recollection of the precise sequence of events was unclear.

[ATSI Note (1): The controller's initial written report incorrectly included details of the SR22's earlier flight from Sleaford to Denham. The correct flight progress strip (FPS) was not available.]

The RAF Brize Norton and Oxford METARs were:

METAR E GVN 091450Z 26007K T 9999 FE W014 B KN022 11/ 08 Q 1029 WHT TEMPO
SCT012 GRN=
EGTK (Met-observation) 091450Z 25010KT 9999 BKN021 11/08 Q1028 (QFE 1018)

The PA34, approaching from the West, contacted Oxford APP at 1444:38, reporting at FL060; the controller cleared it to the OX (NDB) at FL060 and instructed the pilot to report entering the hold. Information Papa was current with a QNH of 1028. This was correctly acknowledged by the PA34 pilot.

At 1445:43, the SR22 contacted Oxford APP reporting, "...en-route from Denham to Sleaford routing via your overhead we're at four thousand feet one zero two eight this time just cleared the Benson MATZ at ten miles to run to your overhead request a Basic Service and your approval for your overhead (SR22) C/S"; the controller replied, "(SR22) C/S Basic Service report overhead".

At 1447:02, the PA34 pilot reported entering the hold at FL060. [ATSI Note (2): The controller's flight progress strip showed the PA34 entering the hold at 1450]. The controller replied, "(PA34) C/S descend to alt three thousand five hundred feet the QNH is one zero two eight report leaving Flight Level six zero," which was acknowledged by the PA34 pilot.

At 1449:01, the PA34 pilot reported leaving FL060 and the controller instructed the pilot to report reaching 3500ft.

At 1449:40, the SR22 pilot reported, "...turning in the overhead northwest bound." The controller instructed the SR22 pilot, "...report when you wish to leave the frequency".

At 1449:50, the SR22 pilot requested climb to FL060 and the Oxford controller responded, "(SR22) C/S roger just be advised there is traffic a PA thirty four just left flight level six zero descending to alt three thousand five hundred feet inbound to the Oscar Xray hold"; the SR22 pilot replied, "Roger we are visual with that traffic (SR22) C/S we're in his six o'clock low". The radar recording shows both aircraft tracking NW, the SR22 overhead Oxford indicating 4000ft, with the PA34 indicating alt 4900ft and in the SR22 aircraft's 12 o'clock at a range of 0.4nm.

At 1450:07 the controller passed TI to the PA34, "(PA34) C/S just passing through the Oxford overhead is a Cirrus SR twenty two four thousand feet climbing flight level six zero", the PA34 pilot acknowledged, "(PA34) C/S" and the controller asked, "(PA34) C/S have you entered the Oscar Xray hold", the PA34 pilot replied, "Standby (PA34) C/S".

At 1450:32, radar recording shows the PA34 commencing a right turn indicating alt 4500ft with the SR22 crossing from right to left indicating 4000ft; both aircraft maintain their respective levels and their tracks cross at 1450:35.

At 1450:54, the PA34 pilot transmitted, “(PA34) C/S er AIRPROX time one four five zero”. This was acknowledged by the controller and the pilot added that he would discuss when on the ground. The PA34 subsequently reported on RTF, “...as we were descending in the hold he just flew right underneath us we both disappeared into cloud together...”

The PA34 pilot's report indicated that he was aware of traffic on frequency asking to route via the overhead at 4000ft from the Benson direction and reported sighting the SR22 ac and stopping the descent prior to both ac entering cloud.

The SR22 pilot's report indicated flying IFR and confirmed sighting the PA34 ahead and above. The SR22 pilot stopped the climb.

The controller felt sure that TI had been passed much earlier than was the case. She indicated that the combination of medium/heavy workload together with an increased confidence in the experienced trainee, may have contributed to the passing of late TI and the incorrect time shown on the FPS. She was content that once TI had been passed, the SR22 had sighted the PA34 ahead and above.

The controller had indicated a presumption that the SR22 had been VFR, which was reflected in his report. With hindsight the controller expressed being uncomfortable knowing that the SR22 had been IFR and IMC, when a more appropriate PS would have been available to the pilot.

The controller was asked about the discrepancy regarding the PA34 ac's 'hold entry time' shown on the FPS as '50' when it should have been '47' and the confusion this had caused. She reasoned that this time had not initially been annotated, but later at '50', remembered that the ac had reported taking up the hold. At the same time the pilot was asked to confirm that he had entered the hold. The controller was not sure if this had been a factor in the late passing of TI.

The PA34 ac was IFR and in receipt of a PS from Oxford APP; the controller was therefore required to pass TI to the pilot if a confliction was considered to exist. Due to a combination of increased workload and controller training, such TI was passed later than would have been expected, but nevertheless resulted in both pilot's acquiring a visual sighting and taking appropriate action. Had TI been passed earlier, it was considered likely that this would have aided the PA34 pilot's situational awareness and may have allowed the pilot to take earlier deconfliction action. CAP774, UK Flight Information Services, Chapter 5, Page 2, Paragraph 5, states:

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

The SR22 pilot operating IFR became IMC whilst in receipt of a B S. It may have been more appropriate for the pilot to have requested a PS, enabling the controller to provide the deconfliction minima between IFR flights in IMC. The controller passed a warning to the SR22 pilot as it passed overhead the airfield and resulted in the pilot acquiring a visual sighting of the PA34. CAP774, UK Flight Information Services, Chapter 2, Page 1, Paragraph 1, 3 and 5, state:

'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.'

'Service is available under IFR or VFR and in any meteorological conditions.'

Pilots should be aware that Basic Service might not be appropriate for flights in IMC when other services are available.

Pilots should not expect any form of TI from a controller/FISO, as there is no such obligation placed on the controller/FISO 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/FISO may provide TI in general terms to assist with the pilot's situational awareness. This will not normally be updated by the controller/FISO 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 TI on specific ac, and a pilot who considers that he requires such a regular flow of specific TI shall request a Traffic Service. However, if a controller/FISO considers that a definite risk of collision exists, a warning may be issued to the pilot.'

CAP774, UK Flight Information Services, Chapter 1, Page 1, Paragraph 2, states:

'Within Class F and G airspace, regardless of the service being provided, pilots are ultimately responsible for collision avoidance and terrain clearance, and they should consider service provision to be constrained by the unpredictable nature of this environment. The Class F and G airspace environment is typified by the following:

- It is not mandatory for a pilot to be in receipt of an ATS; this generates an unknown traffic environment;
- Controller/FISO workload cannot be predicted;
- Pilots may make sudden manoeuvres, even when in receipt of an ATS'.

The Airprox occurred in the vicinity of the Oxford OX-NDB hold between two ac operating IFR. The PA34 was in receipt of a PS and the SR22 was in receipt of a BS. The controller passed late TI, which nevertheless resulted in the two pilots acquiring a visual sighting of each other, enabling them to take appropriate action to stop their respective descent and climb.

A number of factors were considered to have been contributory factors:

- i. The late passing of TI to the PA34.
- ii. The controller training and increased workload was considered to have been a contributory factor in the late passing of TI and uncertainty about the time the PA34 entered the hold.
- iii. The SR22 was operating IFR/IMC and in receipt of a BS when it may have been more the appropriate for the pilot to have requested a PS.

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

The Board noted that this incident took place in Class G airspace where, regardless of whether they are operating under VFR or IFR and whether or not they are in a published instrument procedure, pilots are required to see and avoid other ac. That being the case, Members strongly advised pilots to make use of a radar based ATC service, preferably a DS, if they are flying in IMC. If no radar-based service is used, in IMC pilots are generally unable to fulfil their 'see and avoid' responsibility. Members observed that the PA34 pilot operating under a PS in the Oxford instrument pattern was concerned that the SR22 did not avoid him. While it could be argued that good airmanship would have been for the SR22 to either have (preferably) requested a DS or TS from the local LARS unit, Brize Norton, or if for any reason this was not available, a PS from Oxford thus allowing the respective controllers to provide a degree of co-ordination or separation. The CAA ATC Advisor, however, pointed out the CAP774 provision that:

‘Controllers may, subject to workload, initiate agreements (as defined in Service Principles) with pilots of aircraft under a Basic Service to restrict their flight profile in order to co-ordinate them with aircraft in receipt of a Procedural Service. However, controllers shall limit the occasions on which they make such agreements to those where it is clear that a conflict exists, and only when controller workload permits.’

Although the SR22 pilot reported that he was flying under IFR, Members questioned whether that was actually the case since he was not climbing to a correct quadrantal flight level and did not declare that he was IFR; in any event the Oxford Controller would not have known that he was IFR unless the (SR22) pilot told her, which apparently he did not [not on the transcript] despite having the opportunity to do so; the Controller assumed therefore, that he was VFR and she was not required to deconflict the ac. Had the SR22 been IFR the controller (most likely) would not have agreed a BS and requested the pilot to accept a PS and deconflicted the ac procedurally.

A pilot Member observed that the SR22 was on an instructional flight; in his opinion the sequence showed a poor appreciation of the situation and provided a poor example to the student.

Both pilots however stopped their respective descent/climbs as they entered cloud thus ensuring that there was significant vertical separation between the ac.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class G airspace between IFR traffic.

Degree of Risk: C.

AIRPROX REPORT No 2012006

Date/Time: 14 Jan 2012 1151Z (Saturday)

Position: 5410N 00110W
(3nm SE Sutton Bank)

Airspace: Lon FIR (Class: G)

Reporting Ac Reporting Ac

Type: Robin DR400 Piper Supercub

Operator: Civ Pte Civ Trg

Alt/FL: NK 1300ft
QFE (995hPa) QFE

Weather: VMC Haze VMC CLBC

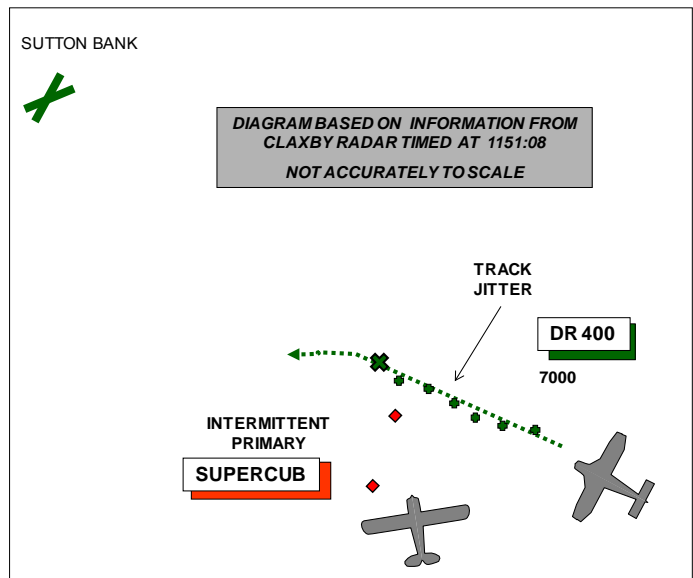
Visibility: 30km 10km

Reported Separation:

NK 15ft V/0ft H

Recorded Separation:

NR



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ROBIN DR400 PILOT reports flying a white, blue and orange ac with strobes switched on, on a private flight under VFR inbound to Sutton Bank; he was squawking 7000 but Modes C and S were not fitted. He had contacted Sutton Bank by telephone to ensure that he was clear to 'fly in' as he is very familiar with the site and procedures as he is a current gliding instructor, tug pilot and competition glider pilot and partakes in a gliding competition at Sutton Bank every August. He was informed [on the telephone] that the RW in use was 24 for the aerotow/glider only operations and informed them that he would land on RW20 which the tugs and gliders would also use; he gave them an ETA of 1130-1200 and said he would call on their operating frequency of 129.975.

He left Pocklington at 1135 and climbed to 2000ft at 100kt on Pockington QFE. When passing Castle Howard he changed to Sutton Bank, calculated their QFE and climbed to 1500ft (QFE) and changed course to a W'ly heading to remain clear of Sutton Bank operations by about 3nm to the S to position to the W of the airfield for a RH cct to RW20; this enabled him to observe the operation and also to merge safely with any tug/glider traffic in cct.

At about 7nm he made a call to Sutton Bank on 129.975 to inform them that he was approaching from the SE and would join RH for RW20 but there was no response from ground or from any other ac. A short while later he increased his speed to 120kt to descend to cct height, intending to join at about 1000ft. During this time he believes that both he and his passenger were maintaining a good lookout and the visibility was good in the direction of flight and to the N (down sun) although it was misty to the S into sun with an inversion at about 600ft. He made a second call when he was 3nm S of the airfield heading 270°, again stating his intentions but he heard only a slightly garbled reply from the PA18 Supercub indicating that they had had a 'near miss'.

Neither he nor his passenger saw the PA18 and it was only after discussion with the checking instructor/examiner in the PA18 that he realised the proximity of the two ac [reported by the other pilot as 10-15ft] and that the Robin had passed directly overhead the PA18 on a converging course.

Although he did not see the other ac below him as it was obscured by the fuselage and wing, he assessed the risk as being high.

THE PIPER SUPERCUB PILOT reports that he was conducting a VFR, bi-annual instruction with a gliding club tug pilot from Sutton Bank in a red and grey ac and was listening on 129.975; SSR was not fitted but FLARM was. They had just completed a practice forced-landing exercise, had climbed to 1300ft (Sutton Bank QFE) and had been cruising straight and level, heading 340° at 70kt for about 50-60sec when a Robin DR400 was seen through the roof Perspex passing from R to L about 10-15ft directly above them from their 3-4 o'clock. The Robin subsequently was seen to be heading about 280° and eventually landed at Sutton Bank on RW20. He reported the incident on the frequency in use and assessed the risk as being high; he thought that the ac had been hidden by the Supercub's high wing.

THE SUPERCUB CLUB CFI commented that the Supercub was fitted with FLARM; had the Robin (a tug from another club) been similarly fitted, the Airprox would probably not have occurred.

UKAB NOTE (1): The Great Dun Fell Radar was under long-term maintenance but the Claxby Radar recording provided some useful information. The DR400, squawking 7000 with no Mode C showed throughout the incident tracking about 280°. Although the Supercub did not show, a primary only contact appeared twice in the vicinity of the Airprox; it was not possible, however, to determine its track or the CPA. No altitude information was available. From the information available, it was deduced that the CPA was at about 1151.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, radar recordings and a comment from the Gliding Club CFI.

A pilot Member familiar with both ac informed the Board that unlike the DR400 where the visibility from the cockpit is very good, it is limited from the Supercub (except directly upwards and from the front seat directly ahead).

The DR400 pilot had, in the Board's view, taken all reasonable measures to ensure notification of his flight and his safe arrival at Sutton Bank; however, arrivals at busy hilltop gliding sites in light ac is not easy or straightforward and requires great care. Members reasoned from the available information that the Supercub had recovered, climbing away from the PFL from the low ground to the S of Sutton Bank and would not have been visible to the DR400 pilot below the ac. Although the DR400 would have been above the Supercub, it had most likely been obscured to its crew by the wing. Another Member opined that during their recovery, both pilots had probably been concentrating their lookout in the vicinity of Sutton Bank looking for gliders and tugs and positioning to join the cct.

A gliding pilot Member pointed out that although FLARM is not recommended by the CAA for GA use or universally fitted, he agreed with the CFI that in this case it would probably have enabled the pilots to see the opposing ac in time to avoid them.

Both ac were operating legitimately in Class G airspace where 'see and avoid' is the principal method of collision avoidance. That neither pilot saw the opposing ac was most likely due to the geometry of the encounter and the poor visibility from the PA18.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the DR400 pilot and effectively a non-sighting by the PA18 pilot.

Degree of Risk: A.

AIRPROX REPORT No 2012008

Date/Time: 17 Jan 2012 1027Z

Position: 5155N 00510W (2nm
NW of Brawdy disused
A/D)

Airspace: FIR/UKDLFS LFA7 (Class: G)

Reporting Ac Reported Ac

Type: AS355 MC-130

Operator: Civ Comm HQ USAFE-UK

Alt/FL: 500ft ~600ft agl
RAD ALT NK

Weather: VMC In Drizzle VMC NR

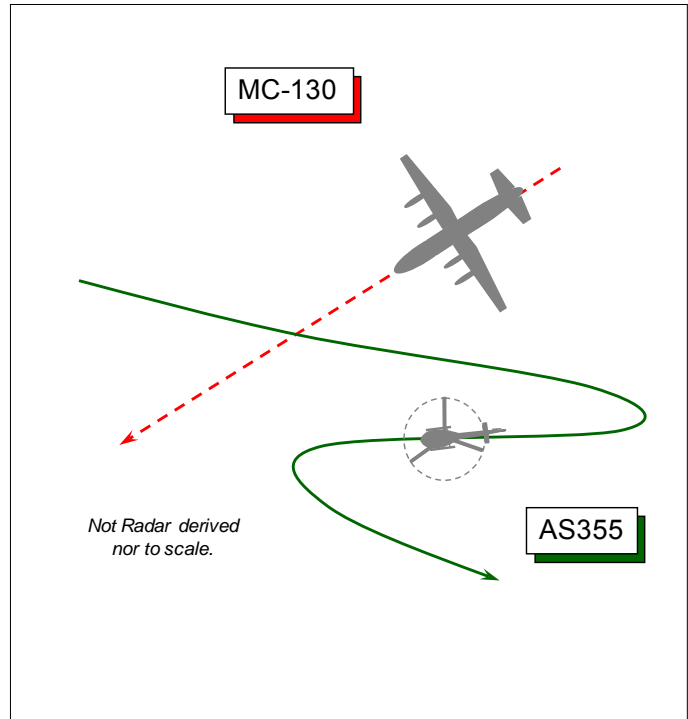
Visibility: 8-10km NR

Reported Separation:

Nil V/400m H 500m H

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AEROSPATIALE AS355F1 SQUIRREL II HELICOPTER PILOT reports that after departure from Pembrey he was conducting a pipeline inspection task under VFR and was in receipt of a BS from Haverfordwest on 122.200MHz. Whilst approaching a position about 2nm NW of Brawdy disused aerodrome, flying in VMC some 300ft clear below cloud in drizzle, heading 260° at 110kt in a level cruise at 500ft RAD ALT, a C130 was suddenly seen in his 3 o'clock about 400m away overtaking his helicopter to starboard at the same height about 100kt faster. He maintained his track as the C130 flew past with minimum horizontal separation of about 400m. The Risk was assessed as 'medium'.

His helicopter is coloured dark red and the HISLs were on. PCAS is fitted and a squawk of A0036 was selected with Mode C on. Mode S is not fitted.

THE LOCKHEED MC-130 PILOT provided a narrative, reporting that he was operating VFR in VMC conducting tactical low-level training in LFA 7. During the period of the Airprox he was conducting a Self-Contained Approach (SCA) at a 500ft Set Clearance Plane (SCP) to a planned low-approach at Brawdy disused A/D whilst monitoring the Haverfordwest TOWER frequency of 122.200MHz. At 6-mile final, in conjunction with SCA slow-down, he observed helicopter traffic visually and on the ac's ETCAS at a range of 4 miles. The helicopter, subsequently identified visually as an Aerospatiale variant matching the description of the reporting pilot's ac, had initially been observed on a diverging course to the SE. At 4-mile final, he observed the AS355 executing an approximate course reversal, resulting in a near-parallel ground track with a 1mile off-set. Visual avoidance was precluded at that point by solid fog/cloud at 1000ft agl, a lower cloudbase to the N (away from the AS355) and his ac's reduced manoeuvrability in the approach/gear/flap configuration. Electing to continue the SCA, he visually avoided the AS355 by overtaking at an estimated 40-90kt overtake. At 2-mile final, the AS355 was in his MC-130's 8 o'clock position and was observed reversing course again toward the SE. At the closest point the AS355 passed 500m away to port. The remainder of the approach, missed approach, and departure to the N was uneventful and the AS355 was observed on ETCAS throughout the occurrence.

UKAB Note (1): An A/G Service is provisioned at Haverfordwest - callsign Haverfordwest RADIO – when the A/D is open. The RT is not recorded.

UKAB Note (2): The Airprox occurred outwith recorded radar coverage.

UKAB Note (3): Notification of pipeline helicopter activity within LFA 7S was promulgated within the morning notification message issued by the LFBC under Y series NOTAM – Y0110/12, transmitted at 161617Z JAN.

UKAB Note (4): The disused A/D at Brawdy is now a Barracks operated by the Army, within which is situated a HLS.

USAFE-UK comments that further discussions with the Aircraft Commander(AC) established that he first saw the AS355 crossing his track, which he thought was about 240°, from right to left on a generally south easterly heading and passing clear. The subsequent course reversal by the AS355 indicated that its pilot had not seen the MC-130 prior to rolling out on his stated heading of 260°. However, the point at which the AS355 saw the MC-130 is not clear because its track roughly paralleled that of the MC-130 for some 2nm before turning away to the south east. The MC-130 AC was aware of the relevant PINS NOTAM.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The USAFE-UK Advisor explained that the MC-130 crew was aware of the possibility of encountering a pipeline inspection helicopter from the PINS NOTAM. Nevertheless, Members were briefed that such warnings were spread across a very large tract of the UK DLFS that morning and the unspecific nature of the information was of debatable benefit. Nevertheless, the MC-130 carries a large flight deck crew and the Advisor stated that after the pilot acquired it visually and on his sophisticated ETCAS (Enhanced TCAS) display the crew monitored the helicopter closely. It seemed that at one point during their self-contained (internal aids) approach, the MC-130 crew was restricted in their ability to manoeuvre away from the AS355 by the poor weather to the N and might also have lost visual contact on the helicopter, albeit that they maintained VMC throughout. One Member was concerned that the MC-130 pilot seemed to have carried on their approach regardless and if they had to turn away to the N might have flown into cloud. However, the MC-130 crew always retained the ability to climb-out of the LFS if they encountered IMC and the Advisor stressed that the MC-130 crew retained contact on the AS355 throughout the encounter on their ETCAS and were monitoring the position of the helicopter constantly.

Unfortunately, the occurrence was below recorded radar coverage so the geometry could not be clarified, but from the additional information obtained by the USAFE-UK Advisor, the MC-130 pilot recalled that the AS355 had been manoeuvring before he passed abeam the helicopter and its pilot spotted the MC-130 overtaking about 400m to starboard. It was not evident why the AS355's PCAS had not detected the presence of the MC-130 beforehand – unless the MC-130 was not squawking which seemed unlikely; however, the AS355 is shown squawking the appropriate conspicuity squawk with Mode C sometime earlier whereas the MC-130 is not shown at all. Nevertheless, a helicopter pilot Member suggested that the AS355 pilot might have been startled by the sudden appearance of such a large ac unannounced, but he should be reassured that his helicopter had been seen beforehand.

It was stressed to the Board that the diagram was merely a graphic representation from the best recollection of the MC-130 pilot, who believed there was a course reversal by the AS355 prior to it rolling out on 260° and it was after this point that the MC-130 overtook the helicopter 500m away. It was unclear if the AS355 pilot could potentially have seen the MC-130 any earlier before he turned but he would certainly have been unable to do so when the MC-130 was approaching from astern. The perceptions of the minimum separation from both pilots were not widely dissimilar at 400-500m and it was clear that the MC-130 crew had good SA on the AS355 during the occurrence. Taking all

these factors into account the Board concluded that this Airprox had stemmed from a sighting of VFR traffic operating legitimately in Class G airspace. Moreover at these distances, in the Board's view, normal safety standards and parameters had been maintained in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting Report.

Degree of Risk: E.

AIRPROX REPORT No 2012010

Date/Time: 1 Feb 2012 1628Z

Position: 5417N 00128W (2.5nm ESE
Leeming - elev 132ft)

Airspace: Vale of York AIAA (Class: G)

Reporting Ac Reported Ac

Type: Hawk T Mk1 BE200

Operator: HQ Air (Ops) Civ Comm

Alt/FL: 3500ft 4000ft↓
QFE (1034hPa) QNH (1038hPa)

Weather: VMC CLBC VMC CLBC

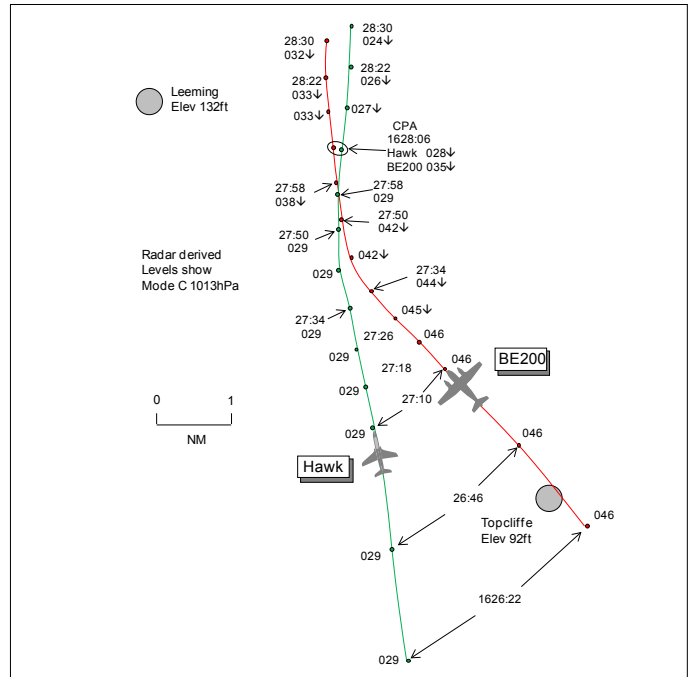
Visibility: 40km 8km

Reported Separation:

200ft V Not seen

Recorded Separation:

700ft V/0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK T MK1 PILOT reports inbound to Leeming and in receipt of a TS from Leeming DIR on 231.45MHz squawking an assigned code with Modes S and C. The visibility was 40km flying 500ft below cloud in VMC and the ac was coloured black with HISLs switched on. On recovery for a radar to ILS approach they were cleared for descent to 3500ft QFE 1034hPa heading 010°. On levelling-off about 10nm W of Linton-on-Ouse at 230kt they were given TI on a Calibrator ac 1600ft above descending in their 2 o'clock range 4nm. A thin solid cloud layer with base 4000ft prevented them visually acquiring the other ac. Passing Topcliffe they were given a traffic update and on this occasion a gap in the cloud allowed them to obtain a 'tally' on traffic, a low-wing twin-engine type, in their 2 o'clock about 2nm tracking N about 1000ft above and only slightly slower than themselves. It became visually apparent that the ac was descending and their converging tracks would take their ac underneath the Calibrator by a few hundred feet. Just as they passed directly beneath the Calibrator at about 200ft MSD (visually assessed) the Calibrator turned R onto 010° and continued descent on top of them. He immediately turned NE and pushed down (bunted) to 3200ft, below their cleared level but with the ground in sight, to avoid the other ac's descent. Further descent clearance was then given to 1600ft and the ILS was flown without further incident whilst maintaining 'tally' on the Calibrator as it turned NW and descended to about 2000ft to transit to the N of Leeming. He assessed the risk as medium.

THE BE200 PILOT reports inbound to Durham Tees Valley VFR and in receipt of a TS from Leeming Zone, he thought [actually during transfer from Linton-on-Ouse to Leeming], on VHF, squawking 0024 with Modes S and C; TCAS 1 was fitted. The visibility was 8km flying clear below cloud in VMC and the ac was coloured blue/white with nav, strobe and anti-collision lights all switched on. They were performing a calibration task for Topcliffe and were routing into the Topcliffe O/H at around 4000ft when the radar assessors informed them that they were 'task complete' and cleared to RTB. The FO informed Zone that the task was complete and they would RTB, and they took up a direct track to DTV. At this point he initiated a descent at 200kt as they were fairly close to DTV and needed to lose height. They were also approaching a thin layer of cloud which they wanted to descend below to remain in sight of the surface to facilitate a visual recovery into DTV. About this time Zone passed TI on a Hawk ac inbound to Leeming but this traffic was not sighted at any time by them, he thought. As they had not been handed-over to DTV he initiated a L turn onto approximately 330° to remain clear of the DTV CTR and, owing to the traffic call from Zone, he levelled-off at

around 3000ft to remain clear. They were handed to DTV and completed a visual approach to land. He was not aware of any Airprox occurring and there was no warning of traffic on the TCAS system.

THE LEEMING DIRECTOR reports operating as the LEO conducting an examination of DIR. A Leeming Hawk was handed over from ACC approximately 25nm S of Leeming for an ILS to RW16 under a TS. The Hawk was given descent initially to 3500ft QFE and TI was passed to Linton-on-Ouse (LOO). During the descent TI was passed to the Hawk pilot on an ac wearing a Calibrator squawk (indicating below) and the Hawk subsequently levelled-off at a height below the Calibrator ac and at this stage the 2 ac were still laterally separated. The Hawk pilot requested to amend his approach to a PSPC and was subsequently turned from his initial NW'ly heading onto a more N'ly track for a LH pattern (terrain and avoidance areas to the W of Leeming prevent an effective PSPC from being conducted RH). T I on t he C alibrator ac , now on a slowly converging heading, was provided on several occasions. Whilst the Calibrator was indicating level with vertical separation of 1600ft based on Mode C, the Hawk pilot eventually gained visual contact. At a position 4nm SE of Leeming the Hawk pilot reported the Calibrator ac descending from a position directly above. The Hawk flight was then given descent to 1600ft (pattern height) and the pilot reported the Calibrator was now separated by 200ft vertically, then 100ft. At the time that the Hawk was given descent to 1600ft, Mode C indicated no less than 500ft vertical separation. The Calibrator flight was shortly thereafter in receipt of a service from Topcliffe Approach (collocated in the Leeming ACR) allowing separation to be maintained for the remainder of the Hawk's approach.

THE LEEMING ZONE CONTROLLER reports covering the Topcliffe Approach position, a standard operating practice during periods of low intensity. At 1628 DTV passed a pre-note on transit traffic routing S from DTV and during the landline conversation a Calibrator flight free-called on the Topcliffe Approach frequency requesting a TS en-route to DTV and reporting in the descent to 3000ft on 1038hPa (believed to be the DTV QNH). The Calibrator pilot gave no position information during his initial call and the ac was believed to be E abeam Leeming. The Calibrator flight was instructed to squawk ident and, after a short delay, was placed under a TS as requested. The Calibrator was subsequently pre-noted to DTV during the continuing and, at times, convoluted ongoing landline conversation. Leeming Supervisor requested the level that the Calibrator was descending to and its pilot, when asked, reported that he was now descending to 2000ft on 1038hPa. By now the Calibrator was 4nm NE Leeming and in proximity to an ac working Leeming DIR, squawking 0411. The Calibrator pilot was given TI on the Hawk which was conducting a P SPC to Leeming and currently maintaining 1600ft on 1034hPa (Leeming QFE). A dditional T I w as g iven on t he H awk which was now 2nm SW tracking W and indicating 700ft below. Shortly after this the Calibrator pilot reported visual contact with the Hawk. The Calibrator pilot was then instructed to maintain his current heading in order to remain clear of the Leeming radar pattern and to continue with DTV.

BM SAFETY MANAGEMENT reports that this Airprox occurred between a Hawk operating IFR in receipt of a TS from Leeming (LEE) DIR being vectoring for an ILS approach and a BE200 operating VFR. The BE200 had been in receipt of a TS from Linton (LIN) Zone up until 1627:40, 33sec prior to the CPA. Both crews reported VMC, with the Hawk pilot reporting a thin, solid layer of cloud with a base at 4000ft. The respective crew's assessment of in-flight visibility differed, with the Hawk reporting unlimited visibility and the BE200 reporting 8km.

All heights/altitudes quoted are based upon SSR Mode C from the radar replay unless otherwise stated. Initial comparison of the radar replay and LEE tape transcript proved that a 42sec discrepancy existed between the 2 time-bases. Comparison of the radar replay and LIN tape transcript proved that a 15sec discrepancy existed between the 2 time-bases; transcript times were subsequently amended to correlate with the radar replay.

Analysis of the radar replay and tape transcript demonstrated that the BE200 crew free-called LEE Zone 3sec after the CPA. The BE200 had previously been in receipt of an A TS from LIN Zone, whilst conducting a flight check in the vicinity of Linton, on surveillance radar located at RAF Topcliffe, operated by 90 SU. However, due to the length of time taken to establish that the BE200 had been working LIN Zone and that the controller concerned was unavailable due to PDT, no report from LIN Zone was completed in time to inform this investigation.

LEE DIR was manned by a trainee under examination and the Unit's LEO and reported low workload and task complexity with only the reporting Hawk on frequency. LEE Zone reported their task load and complexity as low and, at the point of the CPA, were not working any traffic. Based on analysis of LIN Zone's tape transcript, their workload appeared to be moderate.

The incident sequence commenced at 1621:05 when the Hawk flight called LEE DIR on handover from LATCC(Mil), descending through FL148 for FL100, 9.2nm S SW of the BE200 which was indicating FL046. The Hawk flight was placed under a T S which was, "*reduced...due to limited surveillance performance.*"

[UKAB Note (1): Following RT exchanges it was established the Hawk pilot was requesting radar positioning to an ILS RW16 and DIR issued a turn onto 330° (L 10°) and a descent to 3500ft LEE QFE 1034hPa, which was all correctly read back.]

At 1622:03, LEE DIR contacted LIN Zone on landline to pass TI to them on the Hawk, due to its proximity to LIN and Church Fenton, stating the Hawk was inbound to Leeming for the ILS RW16 descending to 3500ft QFE.

Following an instruction to turn L onto heading 320°, at 1622:52, LEE DIR provided the Hawk pilot with TI on the BE200, stating "*(Hawk c/s) traffic right, two o'clock, five miles (radar replay shows 6.9nm), similar heading, four hundred feet below (radar replay shows 800ft above) Calibrator*", which was acknowledged.

At 1623:02, the 'live mic' facility captured a conversation between LIN Zone and LIN Supervisor. This involved the Zone controller moving to the APP position and band-boxing these two positions. From 1623:29, Zone had assumed responsibility for this band-boxed control position.

At 1623:08, the Hawk pilot, having levelled at 3500ft QFE and indicating FL029, requested LEE DIR to update him on the range of the BE200; LEE DIR replied, "*(Hawk c/s) that previously reported traffic is now right, three o'clock, six miles, similar heading, slow moving, indicating one thousand feet above (radar replay shows 1700ft above).*" During the incident sequence, the BE200 maintained between 200 and 225kt GS, broadly similar to the Hawk.

After being given TI on traffic in the LIN visual cct, at 1624:31 the Hawk pilot requested a, "*short pattern if able*" which was approved by LEE DIR and a vector onto 360° was given. At this point, the BE200 was 7.3nm NE of the Hawk maintaining FL046.

Between 1625:02 and approximately 1625:42, LIN Zone was involved in receiving a handover on an un-related LARS transit. Between these times, separation between the Hawk and BE200 closed from 6.5nm to 4.8nm, with both ac m maintaining their indicated levels of FL029 and FL046 respectively.

After being given TI on traffic deemed to be in the Dishforth visual cct, at 1625:24 LEE DIR provided an accurate update of TI to the Hawk pilot stating, "*...that first called traffic the Calibrator right two o'clock, now five miles, crossing right to left, one thousand seven hundred feet above*", which was acknowledged by the pilot. Shortly afterwards at 1625:39, the Hawk pilot asked whether the Calibrator (BE200) was, "*...maintaining his height?*" There was no initial response from LEE DIR and at 1625:45 the Hawk asked again whether the Calibrator (BE200) was, "*maintaining his present level?*" LEE DIR replied, "*...affirm, maintaining flight level four-six on radar*" which was acknowledged.

Between 1626:05 and approximately 1626:41, LIN Zone was involved in landline liaison initially with LIN TWR then LIN Ground about un-related traffic. Between these times, separation between the Hawk and BE200 closed from 3.9nm to 2.6nm, with both ac m maintaining their indicated levels of FL029 and FL046 respectively.

At 1626:22, LEE DIR provided a further, accurate update to the TI on the BE200 to the Hawk pilot stating, "...last reported Calibrator right, two o'clock, three miles, crossing right to left, one thousand six hundred feet above." The Hawk pilot replied, "...he's above the cloud layer, so unfortunately I can't [inaudible] I can't see him", which was acknowledged by LEE DIR.

Between 1626:44 and 1627:15, LIN Zone was involved with identifying and applying a BS to an unrelated rotary-wing undertaking a LARS transit to Dishforth. At the completion of this exchange of RT, 1.2nm lateral separation existed between the Hawk and BE200, with both ac maintaining their indicated levels of FL029 and FL046 respectively.

At 1627:10 LEE DIR provided a further update to the TI on the BE200 to the Hawk pilot stating, "...last reported track Calibrator now right, two o'clock at one and a half miles, crossing right to left, one thousand seven hundred feet above." The Hawk pilot replied that they were, "now visual (Hawk c/s)" later reporting that they gained visual through "a gap in the cloud" and remained visual throughout the remainder of the incident sequence.

At 1627:23, with 0.9nm lateral separation existing, LIN Zone asked the BE200 crew, "...whether I need to hand you back over to Topcliffe, are you err likely to be coming back out down towards Linton?" Initially, the BE200 crew asked LIN Zone to, "standby." Concurrently, at 1627:23, LEE DIR became involved in landline liaison with Durham Tees Valley radar, passing them TI on the Hawk, with the landline being transferred to LEE Zone at 1627:47 to receive a pre-note. At 1627:26, the BE200 commenced a descent and then, at 1627:38, with 0.3nm lateral and 1500ft indicated vertical separation, the crew stated that, "...it looks like we're complete now and request descent and V-F-R back in err Teesside." LIN Zone acknowledged the BE200 crew's transmission and suggested that they, "err free call err Leeming err correction, Topcliffe Approach, one-two-five-decimal-zero before going en-route." At this point, 0.2nm lateral and 1300ft indicated vertical separation existed. The BE200 crew acknowledged this instruction, going en-route at 1627:55.

At 1627:47 LEE DIR instructed the Hawk pilot to, "...turn right heading zero-one-zero degrees" which was acknowledged. At this point, the BE200 was 0.1nm NE of the Hawk, indicating descent through FL042 and had, simultaneously, also turned onto a track of 010°, as reported by the Hawk pilot. At 1627:50, 0.1nm lateral and 1300ft vertical separation existed between the 2 ac. At 1627:56, the Hawk pilot asked LEE DIR, "...is that the Calibrator directly above us?" and LEE DIR replied, "...affirm, directly above you." At this point, the BE200 was 0.1nm NNW of the Hawk indicating descent through FL038, vertical separation 900ft.

[UKAB Note (2): The CPA occurs at 1628:06, the Hawk pilot having commenced descent and turned onto a NNE'y track to deconflict from the BE200, as reported; the Hawk shown passing FL028 with the BE200 0.1nm to its W passing through FL035, 700ft above. The next sweep shows vertical separation as 600ft but lateral separation has increased to 0.2nm.]

The BE200 crew did not visually acquire the Hawk [until it was on L base leg and passing 2nm to its NE 700ft below] and reported that they had no indications on TCAS of the Hawk's presence. No TI was passed by LIN Zone to the BE200 flight at any point during the incident sequence. LEE DIR did not update the TI to the Hawk to state that the BE200 had commenced a descent.

[UKAB Note (3): At 1628:20 the Hawk pilot transmitted, "(Hawk c/s) approximately two hundred feet above (inaudible)" to which LEE DIR replied "...apologies say again". The Hawk pilot response was, at 1628:27, "Er now abeam the er Calibrator and about half a mile and he's 100ft above us". LEE DIR then instructed the Hawk pilot to descend to height 1600ft which was correctly read back.]

The BE200 flight free-called LEE Zone at 1628:16 stating that they were, "...descending altitude three thousand feet, one-zero-three-eight, requesting a traffic service and visual approach back into Durham Tees Valley."

In terms of the initial TI by LEE DIR at 1622:52, given the discrepancy between the transcript and radar replay and the fact that the Hawk was descending at this point, some difference between the

controller's reported height and that presented on the radar replay should be expected. Whilst a difference of 1200ft might suggest a perception/calculation error on the part of the controller, the LEO has confirmed that the initial TI was accurate. However, the LEO has stated that the controller may have made a perception/calculation error in terms of the update given to that TI at 1623:09. That said, given the presence of the cloud layer, this error did not affect the timeliness of the sighting of the BE200 by the Hawk pilot. Furthermore, the 3 further updates on the TI were accurate, enabling the Hawk pilot to continue to develop his mental picture and to visually acquire the BE200 at 1627:16 through the gap in the cloud. The Hawk pilot subsequently maintained visual contact with the BE200 and discharged his responsibility to avoid it, once he perceived that the BE200 was descending and had become a threat. Although a hindsight bias argument could be created to suggest that LEE DIR could have updated the TI to state that the BE200 was descending, this would not have affected the outcome of the Airprox as the Hawk pilot was visual with the BE200 from 1627:16. Moreover, beyond the Duty of Care laid down in CAP 774, there is no clear regulation or policy to determine a controller's responsibilities in these instances.

In terms of the ATS provided by LIN Zone, notwithstanding the pilot's responsibilities to "discharge his collision avoidance responsibility without assistance from the controller" there was a clear requirement for them to have passed TI to the BE200; it has not been possible to conclusively determine a cause for the lack of TI.

Given the respective tracks and vertical profiles of the Hawk and BE200, it might have been reasonable to expect that the TCAS equipment on the BE200 had given some indication of the Hawk's presence. The fact that it did not suggests either a malfunction or an incorrect mode selection on the part of the BE200 crew.

As an observation, given that this was neither a causal nor contributory factor, whilst the inclusion in TI of descriptions of relative speed should be encouraged as they assist the pilot in developing their mental picture, controllers must ensure that they are accurate. LEE DIR's inaccurate description of the BE200 as "*slow moving*" at 1623:08 could have painted an erroneous picture for the Hawk pilot, suggesting that he would rapidly overtake the BE200 down its port-side.

The BE200 and Hawk were on conflicting flight profiles within Class G airspace and the LEE ATM related safety barrier operated effectively, enabling the Hawk pilot to discharge his responsibility to "see and avoid."

HQ AIR (OPS) comments that it would perhaps have been prudent for the BE200 crew to take a DS from LIN, before commencing his descent. It is also surprising that no coordination took place between LIN and LEE ATC (other than the call at 1622:03) given the proximity of the 2 ac. However, ultimately the Hawk pilot was responsible for collision avoidance, and once he called 'visual' (or 'tally' in this case) he should have been aware that under CAP774 (ATSOCAS procedures) he was then required to take action as required to prevent the conflict with the BE200. If he had wanted ATC to provide vectors to ensure separation with the BE200 he should have asked for a DS. HQ Air has recently re-publicised the need for military aircrew to be familiar with the content of CAP774 and reiterated the responsibilities of aircrew with respect to collision avoidance. This will hopefully reduce the likelihood of reoccurrence of events of this sort.

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.

Military controller Members thought that LIN Zone had not given the BE200 crew a good service. When it became apparent to Zone that the BE200 had completed its task and was requesting descent, Zone had free-called the flight to Topcliffe APP without either a handover or, more importantly, TI being passed on the converging Hawk below. In the absence of TI, the BE200 crew

was unaware of the Hawk and descended into conflict with it, causing the Airprox. Members questioned the BE200 crew's flight rules (reported as VFR) and the appropriateness of the TS during their descent through a cloud layer, placing the flight in IMC. A DS would have been better in the circumstances to ensure that deconfliction minima were applied until the flight was able to become VMC. As it was, for whatever reason, the Hawk's presence was not detected on the BE200's ACAS and so the crew was descending effectively without any SA on the potential conflict. Fortunately LEE DIR had been watching the BE200 converge and had passed TI on several occasions to the Hawk pilot which built his SA on its passage. Military pilots Members wondered if the Hawk pilot, whilst being vectored under a TS, was expecting ATC to separate his ac from other traffic. Under the TS the pilot is responsible for maintaining his own separation from other traffic although ATC should not knowingly vector the ac into conflict with other traffic. During this encounter, the tactical vectoring given by LEE DIR steered the ac towards the radar cct pattern but vertical separation pertained up until the BE200 commenced its descent when NW of Topcliffe. Eventually as the BE200 descended through the cloud layer the Hawk pilot saw it directly above and took his own separation on it by turning and descending, which the Board concluded had removed any risk of collision.

The HQ Air Ops Members informed the Board that on the 14th Feb a Safety Bulletin was issued to military aircrew re-iterating the services available under ATSOCAS.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: In the absence of TI from Linton Zone, the BE200 crew descended into conflict with the Hawk.

Degree of Risk: C.

AIRPROX REPORT No 2012011

Date/Time: 1 Feb 2012 1134Z

Position: 5318N 00144W (O/H Camphill
G/S - elev 1350ft)

Airspace: LFIR (Class: G)
Reporting Ac Reported Ac

Type: ASK13 A109

Operator: Civ Club Civ Pte

Alt/FL: 100ft↑ 500ft
QFE agl

Weather: VMC CLBC VMC NR

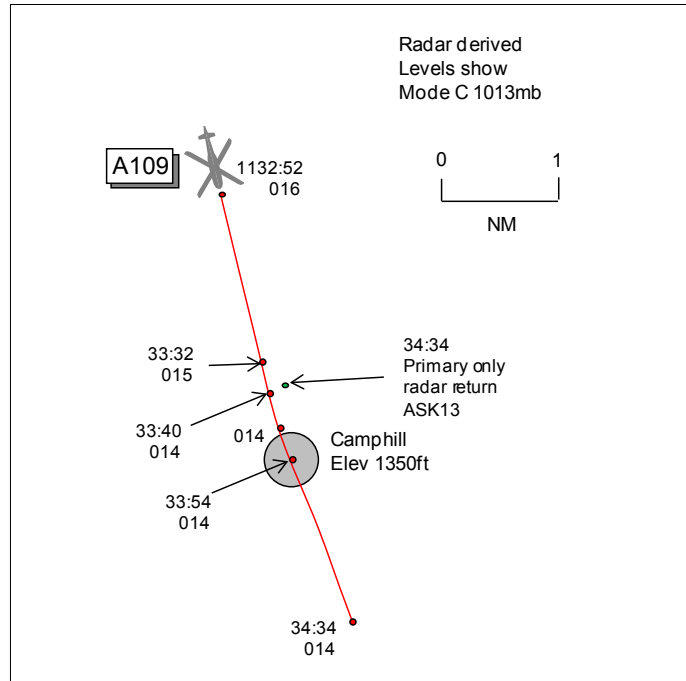
Visibility: >50km 10km

Reported Separation:

400ft V Not seen

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ASK13 PILOT reports flying a dual training sortie from Camphill and in communication with Camphill Radio on 129.975MHz; no transponder was fitted. The visibility was >50km below 4-5/8 cloud base of 1500ft with a moderate/fresh E'ly wind and the ac was coloured white/orange. He was the Duty Instructor seated in the front seat and about to take-off to the N to carry out some instructor training when they heard and saw a helicopter ahead. The red coloured helicopter was fairly large with a single main rotor with a flat underside and retractable undercarriage. It flew S along the W facing slope at the W edge of the airfield at an estimated height of 500ft. As it passed the windsock the helicopter turned 15°L and flew directly O/H the winch launch point. At the time, they had just commenced a launch heading 360°, which they chose to continue since the helicopter was passing 400ft O/H just as they left the ground climbing through 100ft QFE at 55kt. They did have the option of releasing the cable and abandoning the launch if they were going to climb into the path of the helicopter. They felt some turbulence from the wake during the launch but nothing excessive. He assessed the risk as low. If they had launched 30sec to 1min earlier then the helicopter would almost certainly have flown into the winch cable (about 4mm diameter and thus invisible to passing ac) with catastrophic consequences.

THE A109 PILOT reports en-route to Shoreham from a private site near S kipton and was not in communication with any ATSU, he thought, [see ATSI report] squawking with Modes S and C. The visibility was 10km in VMC and the helicopter was coloured burgundy with nav lights switched on. Cruising at 500ft at 140kt, he was heading S flying into sun on a route he flew regularly. He did not see the glider reported to him by RAC Mil and considered that he may have unintentionally flown close to Camphill glider site. He noted how difficult gliders are to see and opined that there are so many sites around and they are poorly marked on the UK 1:500000 maps. In future he intended highlighting all glider sites on his regular routes. He normally flies high or low past glider sites and avoids the cloud base level where gliders can often be found.

ATSI reports the Airprox occurred at 1133:45, O/H Camphill Gliding Site, within Class G airspace, between a Schleicher ASK13 glider and an Augusta A109 helicopter.

The ASK13 flight was commencing a winch-cable launch from Camphill Gliding Site and in communication with Camphill Radio (A/G), but not in receipt of an Air Traffic Control (ATC) Service.

The A109 flight was operating VFR, on a flight from Skipton (private site) to Shoreham and, having just called East Midlands Radar, was in the process of being identified, prior to the agreement of a BS.

Camphill Gliding Site is marked clearly on UK Topographical Air Charts and is listed in the UK AIP ENR 5 -5-1-1 (5 May 11) as a Glider Launching Site, centred on 531818N 0014353W, by winch/ground Tow with a vertical limit of 2000ft agl (elevation 1350ft), operating from sunrise to sunset.

CAA ATSI had access to RT from East Midlands Radar and area radar recordings together with written reports from both pilots. The weather provided is for Birmingham and East Midlands Airport.

METAR EGBB 011120Z 04011KT CAVOK 01/M03 Q1035=
METAR EGNX 011120Z 05013KT 9999 FEW020 02/M03 Q1036=

At 1132:50 the A109 pilot contacted East Midlands Radar, reporting 30 nm NW of East Midlands, squawking 7000, at 2000ft on QNH 1036. The radar recording shows the A109, squawking 7000, 2.3nm NNW of Camphill, tracking 170° towards the O/H and indicating FL016 (2220ft QNH 1036hPa, 1hPa = 27ft). At 1133:20 the A109 pilot is asked to squawk 4555 and, at 1133:40, the radar recording shows the A109 transponder code change to 4555 with the helicopter 0.6nm NNW Camphill, indicating FL014 (2020ft QNH 1036hPa). Sixteen seconds later the A109 passes O/H Camphill, now tracking 160° and still showing FL014 (2020ft QNH) approximately 650ft aal.

At 1134:34, the radar recording shows the A109, 1.5nm SSE of Camphill and also shows a primary contact appear 0.6nm N of Camphill. This is believed to be the ASK13 glider departing after the winch-launch.

At 1136.40, the controller identified the A109 25nm NW of East Midlands and a BS was agreed. The A109 pilot was asked to report approaching Derby. The East Midlands controller was not aware of the Airprox and no RT reports were received from the A109 pilot regarding gliding activity.

The A109 pilot contacted East Midlands Radar as it approached Camphill Gliding site. It was only after the Airprox had occurred that the controller was able to identify the A109 and agree a BS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were clear that this incident could have been averted through thorough pre-flight planning by the A109 pilot. Route planning using the 1:500000 topographical chart should reveal any airspace hazard that may affect transit through an area, including glider sites. Camphill is marked clearly on the 1:250000 and 1:500000 charts with the site elevation and maximum altitude to which gliders can be encountered on the winch cable. It was unclear whether the A109 pilot was using an on-board navigation system/moving map in flight, the database of which may not show glider launching sites. Pilot Members opined that in transiting at low level, the A109 pilot was not giving himself much time to visually identify ground features, there being high ground to the NW of Camphill with the site situated on the edge of a W facing escarpment and valley. It is the responsibility of pilots to take due regard of airspace hazards and to ensure that any avoidance is taken by a suitable margin. In this case, the A109 pilot flew O/H the promulgated and active Camphill glider launching site below the maximum height of the winch cable and into conflict with the ASK13 which he did not see, causing the Airprox. Because of the helicopter's speed, the GA/gliding Member thought that it would have been difficult for the launch party to have detected the approaching A109 in time before the winch launch sequence had commenced. Fortunately the ASK13 pilot had heard and seen the approaching A109 and had quickly assessed that the launch could continue as there was the option

to abort if circumstances changed. As it was, the A109 passed an estimated 400ft above the ASK13 as it climbed through 100ft just after take-off. Members agreed with the ASK13 pilot that there was the potential for a more serious incident if the helicopter had arrived O/H slightly later with the possibility of encountering the glider towards the top of its launch attached to the winch cable. However, in this case, although the ASK13 passed unsighted to the A109 pilot, the early sighting of the helicopter and subsequent actions taken by the glider pilot were enough to persuade the Board that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The A 109 pilot flew O/H a promulgated and active glider launching site below the maximum height of the winch cable and into conflict with the ASK13, which he did not see.

Degree of Risk: C.

AIRPROX REPORT No 2012013

Date/Time: 14 Feb 2012 1517Z

Position: 5226N 00032W (11nm SSW Wittering)

Airspace: LFIR (Class: G)

Reporting Ac Reported Ac

Type: Tutor C152

Operator: HQ Air (Trg) Civ Club

Alt/FL: 2000ft 2000ft
RPS (1018hPa) QNH (1024hPa)

Weather: VMC CLBC VMC CLOC

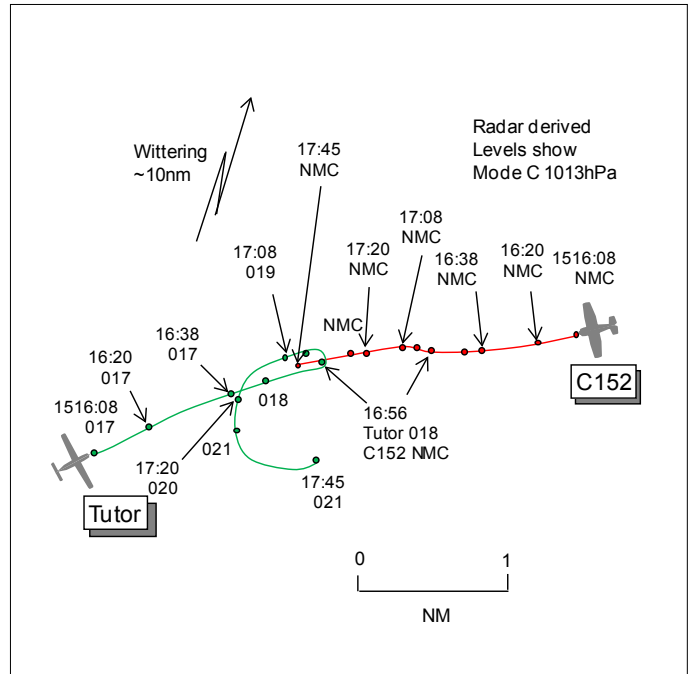
Visibility: 15km >10km

Reported Separation:

Nil V/1.5nm H 2-300ft V
/>1000m H

Recorded Separation:

0.7nm H 1516:56
0.6nm H 1517:45



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TUTOR PILOT reports flying a dual local navex training sortie from Cranwell, VFR and in receipt of a reduced TS from Cottesmore on 130.2MHz, squawking with Modes S and C. The visibility was 8-15km flying 2000ft below cloud in VMC and the ac was coloured white with strobe, landing and nav lights all switched on. Heading 055° out of sun at 120kt level at 2000ft RPS 1018hPa, TI was given at range 4nm and again at 2nm before a single-engine Cessna was seen visually in his 1 o'clock at range 1.5nm heading towards him at the same level. An emergency L break turn onto S was taken as avoiding action until he became visual with the Cessna again and the previous heading was resumed. No solid TAS data was available throughout the incident. He assessed the risk as medium.

THE C152 PILOT reports flying a dual local navex training sortie from Peterborough Conington, VFR and in communication with Conington Radio on 129.725MHz, squawking 7000 with NMC. The visibility was >10km flying clear of cloud in haze in VMC and the ac was coloured white/red/blue; ac lighting was not reported. About 2nm S of Oundle heading 281° (tracking 259°) flying into sun towards Harrington disused aerodrome at 2000ft QNH 1024hPa and 90kt (G/S 68kt W/V 340/35) he spotted a Grob Tutor about 1500m or more away in his 11 o'clock high (approximately 500ft above) wings-level heading away from his ac. A few seconds later the Tutor commenced what appeared to be a 60° banked turn to port away from his ac whilst appearing to lose height until rolling wings-level heading about 090°. It then tracked in the opposite direction with a distance no closer than 1000m, passing down his port side about 200-300ft above. The Tutor made no attempt to turn away from his ac at any point, he thought, and he did not feel it necessary to take avoiding action. Once the Tutor was in his 7 o'clock and >1000m away it turned to track NE'ly and at that point he returned his attention to his student's progress with the navex. He assessed the risk as none. In his experience, having instructed for over 10yr and >3500hr total time, he did not believe this to have been an Airprox. If, at any stage during the flight, he felt that he was approaching an Airprox he would have taken action to avoid the other traffic. This was not the case during this flight and at all stages he felt he was remaining clear of all other traffic.

BM SAFETY MANAGEMENT reports that this Airprox occurred between a Tutor T1 operating VFR in receipt of a TS from Cottesmore Zone and a C152, operating VFR speaking to Conington Radio.

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

The Tutor was operating on a navigation exercise, routing via Kettering and Peterborough before RTB at Cranwell and contacted Zone at 1457:56 following a radar handover from Cranwell ATC. The Tutor's TS was reduced by Zone as Cottesmore were providing an ATS SSR-only; this was neither causal nor contributory to this Airprox.

Zone, manned by an experienced trainee and mentor, described their workload as medium with 7 ac on freq, with low task complexity.

At 1515:06, Zone passed TI to the Tutor flight on the C152 as, *"...traffic twelve o'clock, five miles, opposite direction, no height information"* which was not acknowledged and was thus re-iterated at 1515:18 as, *"...traffic twelve o'clock, four miles, opposite direction, no height information."* The updated TI was acknowledged by the Tutor pilot with c/s. The C152 was not fitted with a Mode C capable transponder and the lack of height information could be considered to have been an aggravating factor in this Airprox.

At 1516:35, Zone provided a further accurate update to the TI for the Tutor flight stating, *"...previously reported traffic slightly right of your twelve o'clock, two miles, opposite direction, no height information"*, which was acknowledged by the Tutor pilot.

At 1516:56, with the C152 0.7nm E of the Tutor in its one o'clock, the Tutor commenced an initially tight L turn onto W, which then continued steadying onto a NE'ly track to pass 0.6nm S of the C152 at 1517:44, having climbed approximately 300ft. This latter time reflects the CPA.

Both pilots report flying at 2000ft, with the Tutor operating on the Barnsley RPS of 1018hPa and the C152 on 1024hPa, equating to 180ft vertical separation. It is likely that these were the reported operating altitudes and thus the vertical separation prior to the avoiding action taken by the Tutor.

Based upon the C152 pilot's report, it appears that their first sighting of the Tutor was as it steadied briefly on W, after that ac had commenced its avoiding action turn at 1517:04, and immediately prior to its continued turn to port to steady NE'ly. It is probable that the C152 pilot's visual acquisition of the Tutor was hampered by them flying into sun and the haze and it is likely that the turn by the Tutor changed the C152's perspective, enabling them to sight it.

Although the Tutor pilot's report mentions that they became visual with the C152 with around 1.5nm lateral separation, the instructor has subsequently amended this to around 0.5nm. Moreover, they have confirmed that they executed the "emergency left break" having become visual with the C152, continuing the L turn until they regained visual contact with it as they passed to the S.

In this instance, Zone provided a good level of accurate TI for the Tutor, which enabled the pilot to take decisive action to avoid the conflict.

HQ AIR (TRG) comments that the TI provided was timely and was updated sufficiently to enable the Tutor pilot to gain visual contact. The information could have been used at an earlier stage to attempt to break the collision in a more controlled manner through a small heading change. Based on the radar picture, the sighting appears to have occurred at around 1nm, which is reasonable considering the geometry of the event. Whilst the avoiding action taken was effective in controlling the closure, it put the conflictor into a position where it could not be seen. A turn through 90° or less would have allowed sight of the conflict to be maintained, permitting subsequent avoiding action to be made if required. Whilst the actual risk of collision was nil in this case, the potential risk was high up to the point where the sighting occurred and the avoiding action was taken.

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.

The HQ AIR Ops Member informed the Board that pilots are taught emergency break turns during flying training; however, the SOP is to turn through 90° and then roll wings-level to re-assess the threat ac. The Tutor pilot was given a good level of TI by Cottesmore Zone and , although the potential for conflict should have been apparent owing to the relative bearing remaining constant, the pilot continued on track. A small heading change early on was all that was needed to deconflict the flightpaths. It was at about 1nm range that the Tutor pilot saw the C152 and took avoiding action by executing a 180° turn away, resulting 0.7nm separation at the CPA. It was as it rolled out onto a W'ly heading that the C152 instructor first saw the Tutor, and then watched it turn across his track to pass clear on his LHS. Members agreed that these sightings, although apparently late, had occurred in reasonable time given the head-on geometry (small target aspect) compounded by the C152 flying into sun. From the C152 pilot's viewpoint, unaware the Tutor had already turned through 180°, nothing untoward had happened and the subsequent manoeuvring by the Tutor pilot was a non-event. Looking at the geometry from the recorded radar, Members agreed that the ac's tracks were always in potential conflict and this had led to the Airprox. However, with the Tutor pilot's sighting and robust action taken, which resulted in adequate separation, and the C150 pilot's sighting, the Board concluded that any risk of collision had been removed and that normal procedures, safety standards and parameters had pertained during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace resolved by the Tutor crew.

Degree of Risk: E.

AIRPROX REPORT No 2012014

Date/Time: 16 Feb 2012 1129Z

Position: 5102N 00140W
(8nm SSE Boscombe
Down)

Airspace: Lon FIR (Class: G)

Reporting Ac Reported Ac

Type: Gazelle TB9

Operator: HQ Air (Ops) Civ Pte

Alt/FL: 2000ft 2200ft
QFE (1015hPa) QNH

Weather: VMC CLBC VMC CAVOK

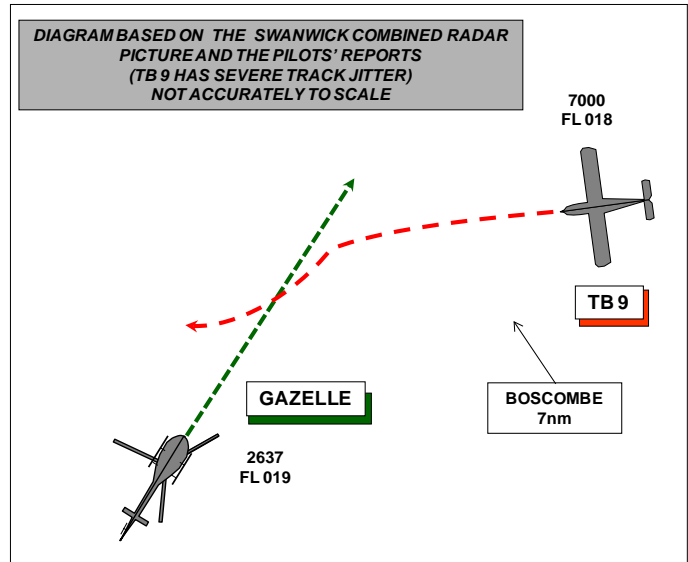
Visibility: 25km 20nm

Reported Separation:

100ft V/200m H 50ft V/150m H

Recorded Separation:

~100ft V />0.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GAZELLE PILOT reports flying a camouflage grey/green ac squawking 2637 with Mode C in receipt of a TS from Boscombe APP; TCAS was not fitted. On completion of the medium level navigation phase of a continuation training sortie the pilot requested radar vectors for a PAR recovery. While being vectored at 2000ft QFE, heading 050° (out of sun) and at 100kt, ATC reported traffic to the E. The crew reported looking and nothing was seen by either aircrew. ATC subsequently re-reported the traffic and the ac captain renewed his attempts to see the ac; on leaning forward to see around the canopy frame he saw a blue and white single-engine light ac in their 2 o'clock position slightly below and in a gentle turn to pass down their R side. The captain and the supernumerary crewmember in the left seat estimated the other ac to be about 100ft below and 2-300m away at its closest point. At no stage did the crew feel the ac presented sufficient risk to take avoiding action but felt that the other ac might have been engaged in avoiding action [on them] when sighted and so they declared an Airprox to ATC, assessing the risk as being medium.

A VFR recovery was subsequently initiated and an in-flight Airprox report made in accordance with SECTION 1 SPECIAL NOTES 2 of the ERB.

THE TB9 PILOT reports that he was flying a red, white and blue ac on a private VFR flight from Popham to Compton Abbas on a route taking them slightly N of Lockerley, then straight to Compton Abbas and were listening out with them. They were heading 260° at 105kt at about 2200ft in good conditions, with scattered cumulus well above their height, when a camouflage green Gazelle helicopter was first seen about 300m away in their 11 o'clock, slightly above and crossing from L to R. They took avoiding action by banking sharply to the L but the other ac did not seem to react and passed them on their starboard about 150m away. TCAS was not fitted and his GPS does not log data except flight times, so the timings are approximate.

He assessed the risk as being high.

THE BOSCOMBE APP CONTROLLER reported that he was fully briefed on the current airspace and flying situation when he took control of the position. On Boscombe Stud 4 he had rotary traffic arriving for an instrument approach to RW23 from the S. The ac was under a TS and as such had been passed TI on a contact to the E by the off-going controller. The contact was still relevant and closer so he called the traffic again but the Mode C was not displayed. The conflicting traffic continued to converge so he called it again, this time it was inside half a mile with the Mode C then indicating that it was at the same level. Moments later the rotary called visual on the traffic and informed him that he was filing an Airprox so he acknowledged, noted the details and passed them onto the duty ATC Supervisor.

BM SAFETY MANAGEMENT reports that this Airprox occurred between a Gazelle operating VFR in receipt of a TS from Boscombe APP while being vectored for a PAR and a TB9 operating VFR; both ac reported being in VMC.

All heights/alts quoted are based upon SSR Mode C data unless otherwise stated. The radar replay of the TB9s flight path exhibited significant track jitter which affected the assessment of the final stages of the incident sequence; consequently, the respective crew's description of events and assessments of minimum separation have been used to assess the Airprox.

APP described their workload as medium to low at the time of the Airprox, having recently taken control of the position. The incident sequence commenced at 1127:28, prior to a changeover of controllers, with APP passing TI on the TB9 to the Gazelle, stating, "*traffic right, two o'clock, five miles, crossing right left, similar height*"; this was acknowledged by the pilot. While the TI was broadly accurate, the TB9 was not crossing the Gazelle's path at 90° but was on a converging track. The Gazelle maintained a heading of 050° and indicated height of 1900ft throughout the incident sequence.

CAP413 Chapter 5 1.6.1 states that:

'Whenever practicable, information regarding traffic on a possible conflicting path should [include the] relative bearing of the conflicting traffic in terms of the 12 hour clock with the optional prefix 'left or right' as appropriate; distance from the conflicting traffic; direction of flight of the conflicting traffic; relative speed of the conflicting traffic or the type of aircraft and level if this is known...Relative movement and level should be described by using one of the following terms as applicable: closing, converging, parallel, same direction, opposite direction diverging, overtaking, crossing left to right, crossing right to left.'

At 1128:14, APP passed TI to unrelated traffic. At this point, the TB9 was 2.9nm NE of the Gazelle on a converging track from right to left, indicating co altitude with the Gazelle at 1900ft. At 1128:45, having completed the handover of control position, APP updated the TI to the Gazelle as, "*previously called traffic northeast, one mile, manoeuvring, low level*"; however, the Gazelle's callsign at the start of the transmission was garbled, with only the numeric element being audible. Moreover, the numeric element sounded muffled and was spoken rapidly and the TI was not acknowledged by the Gazelle pilot. The TB9 was 1.3nm NE of the Gazelle and on the radar replay, continued to indicate co altitude with the Gazelle at 1900ft. APP reported that at this point, the TB9's SSR Mode C was not showing on their surveillance display.

At 1128:56, APP provided a further (partial) update to the TI on the TB9 stating, "*that previously called traffic now indicating one hundred feet below, descending*"; the pilot replied at 1129:04 that they were, "*err visual with that traffic and err would like to now pass behind us and err will forward an Airprox, standby*". Subsequently, the Gazelle pilot reported that the TB9 was obscured behind the canopy frame and that it was first sighted by the Captain in the, "*two o'clock position, slightly below and in a gentle turn to pass down the right side*" as he leant forward. Based upon the radar replay, the Gazelle's transmission at 1129:04 is approximately the point of the CPA, with assessments of minimum separation being between 150-200m laterally and 50-100ft vertically.

CAP774 requires controllers to update TI if the conflicting ac continues to constitute a definite hazard. It is implicit within the requirement to update TI that the update shall be passed in such time as to enable the pilot to assimilate the information in order to discharge their responsibility to 'see and avoid'. Moreover, CAP774 states that "when passing TI, relative bearings are routinely passed in terms of the 12 hour clock; however, if the ac under service is established in a turn, the relative position of the conflicting traffic should be passed in relation to cardinal points."

Notwithstanding the crew's responsibility to 'see and avoid' and the effect of the canopy frame on their lookout, the ATM aspects of this Airprox warrant further analysis. While the cause of the Airprox was a late sighting by both crews, BM SM contends that the late sighting by the Gazelle's crew was contributed to by the timeliness and accuracy of the TI given by APP.

Based upon the Gazelle crew's report of sighting the TB9 immediately after receiving an update to the TI, it is reasonable to argue that they are referring to the update at 1128:56. Moreover, given the lack of acknowledgement of the TI at 1128:45 and the fact that it is not mentioned within their report, it is reasonable to suggest that the Gazelle crew either did not hear the TI or were unable to determine that the TI was for them. Based upon the initial garbling of the transmission at 1128:45, the latter hypothesis is more likely. However, whilst the TI passed at 1127:28 was sufficiently detailed, it and the updated TI at 1128:14 and 1128:56 did not adequately describe the track of the TB9 relative to the Gazelle, nor were the updated TI calls in the correct format. Moreover, while APP reported that the update provided at 1128:45 was made without the benefit of SSR Mode C data, they described the TB9 as being at, "low level"; it has not been possible to resolve this discrepancy. Notwithstanding that the Gazelle crew may not have realised that the TI at 1128:14 applied to them, the inaccuracies of the three TI broadcasts could have contributed to the late sighting of the TB9 by the Gazelle crew.

In terms of the timeliness of the TI, the update to the TI at 1128:45 occurred 19sec/1.3nm prior to the CPA, with the final update occurring about 8sec/0.5nm before. Notwithstanding the relatively low closure speed of the ac involved, updating TI at such close range gives little time for crews to assimilate the TI, visually acquire the conflicting ac and either avoid it, or seek deconfliction advice if they remain unsighted. It is reasonable to argue that the handover of control position between 1128:14 and 1128:45 may have affected the timeliness of the provision of updated TI.

BM SM has highlighted to RAF SATCOs that caution should be exercised when handing over control positions when aircraft are proximate.

HQ AIR (OPS) comments that the crew of the Gazelle received TI that did not specifically indicate the potential for conflict and which did not appear to have given them an appropriate level of concern. Greater adherence to the CAP413 extract above would go some way to addressing this issue, and may have prompted the crew to have taken their own avoiding action. In addition, there is scope for confusion as to responsibilities when being vectored by ATC, who are required not to vector ac into known conflicts; the interpretation of 'vectoring' is crucial and has been a factor in other Airprox events, where crews not under 'own navigation' have seemed to expect vectors that would not put them into conflict. Despite this confusion, the responsibility for collision avoidance remains with the ac commander when under ATSOAS, but more assistance from ATC would have been provided had a DS been requested.

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.

Members were informed by the HQ Air BM SM Advisor that, although the Gazelle was placed on a heading by the Boscombe Controller, this was issued before the start of the RT transcript and well before any confliction would have been evident to him.

TI was passed to the Gazelle pilot as required when under a TS and updated, but the initial description was not wholly accurate and could have led the pilot into not assimilating that the traffic (in his 2 o'clock) was heading directly towards a point where the ac would be in conflict.

The TB9 pilot was not in receipt of any traffic warnings or information as he was listening out with Compton Abbas with about 15nm to run to the airfield. One Member thought a call to Boscombe as the ac passed to the S of them might have established that they had traffic in the area [the radar recording showed another ac with a Boscombe squawk in the area].

Notwithstanding these factors, both ac were operating legitimately in Class G airspace where 'see and avoid' pertains; both pilots saw the opposing ac at about 300m and the Board agreed that this was later than optimum. Both pilots did, however, see the opposing ac and the TB9 took effective avoidance, resulting in the Gazelle pilot deciding that none was required; this ensured that there was no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by the pilots of both ac.

Degree of Risk: C.

of passing below and laterally displaced to the right of the instrument traffic. At 1303:39 the TCAS, which was selected to TA, gave a 'Traffic,Traffic' alert to indicate that there was potentially conflicting traffic at 2nm. Without adjustment to the flight profile while heading 310° at 350kt, the front and rear seat occupants both confirmed that they were visual with the helicopter. TCAS indicated the traffic to be 500ft above, confirming their agreed visual assessment. At 1303:57 the rear seat handling pilot confirmed his intention to 'stay below him', both pilots confirming again that they were 'visual'.

At 1304:08 the trainee QFI called 'initials' and he was informed again by the ADC that there was instrument traffic at 4nm, to which he replied that he was 'visual'. The trainee QFI's visual assessment of a 500ft separation was approximately correct and the TCAS showed 400ft vertical separation as the Hawk transited below the helicopter.

During the de-brief it was stated that whilst vertical separation alone is safe, more lateral separation would have been preferable to ensure there was no misunderstanding of the Hawk's intentions or flightpath from ATC or by the helicopter crew.

They assessed the risk as low.

This report of events is taken from the Hawk TMk2 mission replay facility, which allows precise and complete review of the entire sortie, displaying HUD imagery, audio (from both cockpits and externally) as well as GPS position, TCAS and all front and rear cockpit multi function displays. The sortie record has been retained and is available for review.

THE VALLEY TALKDOWN CONTROLLER reports that he was the Talkdown controller for the PAR of a Sea King. Around 4 miles he saw an ac return appear on both azimuth and glidepath, in the Sea King's 9 o'clock turning towards the centreline. The speed of the return, heading and height, was sufficient for him to assess there was a risk of collision and he therefore initiated an avoiding action instruction to climb with TI. Following the climb the Sea King captain reported visual with the ac passing directly underneath and that he was to file an Airprox report. Once the confliction had been resolved he continued the talkdown without further issue.

THE VALLEY ATC SUPERVISOR reports that his comments were written after analysis of the tape transcripts of the ADC and PAR frequencies and from speaking to the controllers involved.

The Sea King pilot reported that an Airprox occurred with a Hawk TMk2 while a Hawk TMk1 formation was also joining the cct.

[UKAB Note (1): Points covered in the BM SM report have been edited for brevity.]

At 1303:59 PAR issued an avoiding action climb to the Sea King due to an ac believed to be on a collision course; this would appear to have been the Hawk TMk2 re-joining through initials. The Airprox appears to occur between 1303:59 (the avoiding action) and 1304:06 (Sea King pilot stating that the ac had under-flown him). The avoiding action instruction is, "*climb to height 1000ft*"; at this range from touchdown on PAR (4nm ish) the ac would have been at around 1200ft on a 3° glidepath, so it would not be possible to achieve this avoiding action; however, the instruction to climb was very clear and this error did not contribute to the Airprox. The Sea King pilot does not address this issue in his report, stating that an avoiding action climb was given and he infers that he was underflown immediately after the climb was given.

The actions of the PAR controller, height error accepted, are consistent with the normal actions expected when a controller assesses a collision risk on PAR. PAR lateral coverage is limited at 4nm from touchdown and any fast-jet ac positioning from the visual cct to initials will appear very late and very fast on the PAR screen. Given that the controller must assess rate of closure, heading, and height, it is not surprising that the avoiding action was a last-minute measure. But again, the avoiding action offered is not a contributory factor. It is assessed that ATC carried out the correct actions and ensured that all ac were made aware of the locations and intentions of all other ac; this is supported by the tape transcripts.

This Airprox appears to have been caused when the Hawk TMk2 underflew the Sea King which was conducting a PAR. The Hawk had been informed about rotary instrument traffic both directly by the ADC and again by hearing the information being passed to the Hawk formation on the same frequency. It is the responsibility of ac joining through initials to avoid PAR traffic by a safe margin; ATC assist in this process by passing TI on instrument traffic - this was done in this case.

BM SAFETY MANAGEMENT reports that this Airprox occurred between a Sea King operating IFR conducting a PAR GCA in receipt of a TS from Valley Talkdown (TD) and a Hawk TMk2 operating VFR in the visual cct area at Valley.

Given the range of RAF Valley from NATS radar heads and the height at which the Airprox occurred, no radar replay was available to inform the investigation.

The ADC reported his workload was medium, with low task difficulty. TD reported their workload as medium to low, with average task complexity. The incident sequence commenced at 1300:52, with Valley operating to RW31 RH, as the ADC made the '8-mile' broadcast on the TWR freq. At this point, the Hawk TMk2 was ahead of the Sea King conducting a straight-in PFL, monitored on SRE.

At 1301:44 the Hawk called TWR to join, stating that they were, "*turning left downwind to initials.*" The ADC instructed the Hawk to, "*join runway three-one right hand, Q-F-E one-zero-two-nine, circuit clear, there is rotary instrument traffic (the Sea King) at seven miles.*" The Hawk replied that they were, "*looking for that traffic.*" The Initial Point for RW31 RH is 4nm from the aerodrome on the extended centreline.

At 1301:58, the ADC broadcast on the radar clearance line to TD, "*one out over the bay to initials*" referring to the incident Hawk routing to initials. Immediately, TD re-broadcast on the radar clearance line and on freq to the Sea King, "*one wide downwind to initials*". Following Airprox 2011123 at RAF Valley, the FOB was amended so that turns out from the visual cct for initials were to be conducted on the deadside; therefore, the Hawk would not have flown, "*wide downwind to initials*" as stated by TD but, "*out over the bay*" as stated by the ADC.

At 1302:14, TD informed the Sea King of an unrelated pair of Hawks [TMk1s] joining for a visual recovery "*passing down your left hand side, visual with yourself.*" At 1302:45 this unrelated formation called TWR, were given clearance to join and informed of the, "*one joining (the reported Hawk), rotary instrument traffic at five and a half miles.*" The unrelated formation reported visual with both the reported Hawk (TMk2) and the Sea King. Simultaneously, TD passed TI to the Sea King on the unrelated formation as, "*traffic left nine o'clock, two miles, indicating slightly below.*"

At 1303:48 the unrelated formation reported initials and the ADC re-stated the position of the Sea King and passed the surface wind. At 1303:59, 5sec after the Sea King passed through 4.5nm from touchdown, TD issued avoiding action to the Sea King, instructing them to, "*climb to height one thousand feet immediately, traffic was six o'clock, one mile.*" The Sea King replied, "*it's okay, visual, he went underneath us*". Simultaneously, the Hawk had called initials on the TWR freq and was advised that there was, "*one deadside, instrument traffic four miles, wind three-two-zero twelve knots.*" This was acknowledged by the Hawk, reporting that they were, "*visual with that traffic.*" The Hawk crew has subsequently reported that they were visual throughout the incident sequence and under-flew the Sea King, assessing that the 500ft vertical separation was sufficient. With hindsight, during the de-brief, the Hawk crew acknowledged that "whilst vertical separation alone is safe, more lateral separation would have been preferable to ensure that there was no misunderstanding of their intentions".

The MMATM Chapter 29 Para 23 states:

"Provided that the aircraft return and Data Block can be clearly seen, lower range scales can be selected as soon as the aircraft reaches the relevant range from touchdown (i.e. ...at 5 nm, the 5 nm range can be selected). If the PAR controller observes another radar contact, whose

position and/or track is likely to affect the PAR close to the point where the range would normally be reduced, then the range change **should** be delayed until the controller is satisfied that he can monitor the situation on the lower range setting.”

Aircrew human factors appear to have been the causal factor in this Airprox event; however, some of the ATM aspects do warrant further analysis. In terms of the ADC's actions, BM SM contends that, the TI given to the Hawk on its initial join and TI given on the freq to the unrelated Hawk formation, sufficient information was provided to the Hawk on the Sea King. Further specific TI would have been nugatory and would arguably not have changed the Hawk's flight profile and thus the incident outcome.

In terms of TD's broadcast to the Sea King referring to the Hawk routeing to initials, it is possible that this created an incorrect mental image of the situation for the Sea King crew. However, given that they were flying a GCA and that TD could not have affected the Hawk's flight profile, this would not have affected the outcome of the occurrence and, therefore, is neither causal nor contributory.

In terms of TD's actions, and as SATCO Valley has pointed out, given the 5nm range scale at which they were operating the PAR, TD was faced with having to make a rapid assessment of the rate of closure, heading and height of the 2 ac. It is to TD's credit that the assessment of the requirement for avoiding action and the principle of issuing a climb for avoiding action was sound; however, given that the Sea King was approaching 1200ft QFE at the time, the instruction could have been interpreted as either a descent to 1000ft QFE, or an immediate climb. In the event, the Sea King crew did not have time to action TD's instruction and the instruction was not a factor in this incident. However, this incident is a reminder to all PAR controllers to maintain situational awareness of where their ac are in 3 dimensions and to consider what their actions might be at any stage in a GCA when faced with similar circumstances.

BM SM will highlight the findings of this investigation to all military ATCOs.

HQ AIR (TRG) comments that the Hawk crew flew sufficiently close to the Sea King to cause them and the controller concern. Whilst it was not noted in their report, the Hawk crew complied with the requirement to route through initials (left of centreline) but observed the Sea King further to their left. Their options were then to err closer to the centreline and the liveside or to route further to the left. The first option would reduce separation from cct traffic and both options would have resulted in the Hawk crossing the PAR controller's display. The offset of the PAR approach might also be considered to be contributory. In the event, the Hawk crew were visual with the Sea King throughout and there was no risk of collision. The fact that they were visual was not communicated in a timely enough fashion to the PAR controller and the Sea King crew to allay their eventual concern. However, the situation was made more likely by the potential conflict in approach directions between the PAR and the visual initial point. Whilst there is also no generally accepted principle regarding visual joiners avoiding instrument traffic by deconflicting laterally to the deadside, doing so at an early stage in this case would have prevented the underflight and the resultant concern.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

There was some discussion regarding the alignment of the RW31 PAR and the position of the IP. It was established that the PAR is not offset [formally], although a pilot with local knowledge opined that traffic that indicates on the C/L to the PAR controller is often slightly left of the C/L. Further, the RAF Valley FOB promulgates the IP for RW 31 as being at a point 3.8nm (from touchdown) on the C/L (Bearing 130.24°T). Further it states:

'a. **Instrument Traffic.** Instrument traffic has priority over traffic joining visually. Aircrew are to ensure that all instrument traffic is afforded safe separation either by visually acquiring it or by procedurally avoiding its reported height and/or position. Aircrew are to be aware of how the Tacan final approaches converge with and cross the visual recovery lanes. PAR and SRA traffic are to be anticipated to be positioned closer to the runway centreline.'

Members noted that the Hawk crew had been visual with the Sea King throughout and had avoided it in compliance with the instruction above. Members agreed however that the PAR Controller, on seeing an unknown return approaching the Sea King took the correct action by instructing it to climb, albeit with an instruction that was not totally clear. Had the Hawk crew avoided the Sea King by a reasonable lateral margin as well as vertically, or the talkdown controller been informed by the ADC that the Hawk was visual with the Sea King, he would probably have not been concerned. Members agreed that it is good practice to overtake on the right and not to under-fly other ac, although in this case proximity to Mona may have precluded this.

No radar information was available but Members accepted that the separation provided by the Hawk crew from their Mission Recording System to be accurate.

Members agreed unanimously that the Hawk crew had complied with the RAF Valley FOB but might have anticipated that they would cause the PAR Controller concern.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: By flying underneath the Sea King on a PAR approach, the Hawk crew caused its crew and the Talkdown Controller concern.

Degree of Risk: E.

AIRPROX REPORT No 2012016

Date/Time: 16 Feb 2012 1825Z (Night)

Position: 5114N 00149W (2km S of Crossing Bravo [2nm WSW of Netheravon])

Airspace: SPTA D125 (Class: -)

Reporting Ac Reported Ac

Type: Merlin HC3a pr Puma

Operator: HQ JHC HQ JHC

Alt/FL: 300ft
agl ↓300ft
QFE (1011hPa)

Weather: VMC CLBC VMC NR

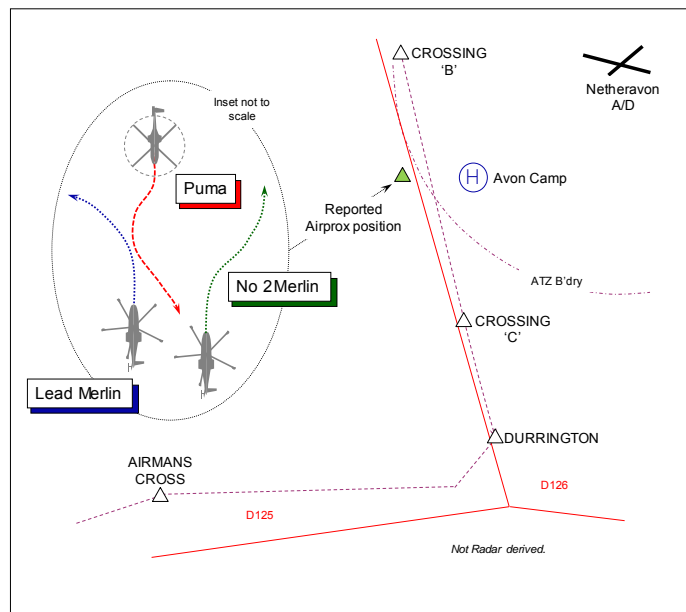
Visibility: 25km 25km

Reported Separation:

Nil V/<200m H <200m H

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MERLIN HC3a HELICOPTER PILOT reports he was flying as the No2 of a formation of two Merlin helicopters tasked in support of Exercise PASHTUN JAGUAR, within the Salisbury Plain Training Area (SPTA). The formation was tasked to pick-up troops from Shrewton Folly and fly them to the drop-off point at Avon Camp. The formation followed the standard routings and heights toward Avon Camp: Airman's Cross-Durrington-Crossing Charlie. They were flying under VFR, using NVGs escorted by a Lynx helicopter flying above the formation at 2000ft Portland RPS (1024hPa). A squawk of A7002 [Danger Areas General] was selected with Modes C and S on; TCAS is not fitted.

Under a P S, he thought, the formation was 'listening-out' on a UHF frequency with OVERLORD - a tactical ground station who provided updates on other aviation activity in SPTA - who informed them that a Puma was departing Netheravon A/D via Crossing Bravo and heading S. The crew were 'eyes out' as an approach was made to Avon Camp HLS from 500ft agl. Although the formation were technically flying at night [the end of civil twilight was at 1755], the prevailing red sky under a distant cloud layer, coupled with the cultural lighting from the surrounding towns and villages made it difficult to identify the Puma at distance. During the approach to the HLS the lead Merlin pilot elected to overshoot from about 200ft agl and initiated a turn to the L to set up for the HLS again. At this point, flying straight and level northbound at 80kt, the No2 Merlin crew saw the Puma for the first time about 1km away, taking avoiding action. The Puma crew were seen to break R initially to clear the lead Merlin's overshoot direction, but was then forced to break L at 300ft agl as the lead Merlin pilot turned L to set-up for a further approach. At this point he as the PF in Merlin No2, broke R and climbed to deconflict from the Puma. The Puma was then seen by Merlin No2 PIC passing 200m down the LH side of his helicopter, at the same height, flying in the opposite direction with a 'very high' Risk of collision. No Airprox report was filed on the RT.

He noted that poor light levels, the cultural lighting and the red sky were factors, together with 'poor deconfiction' provided by OVERLORD.

After landing, during the debrief between all crews involved, it emerged that the Puma crew did not see the No2 Merlin at any stage.

The Merlin has a green colour-scheme; navigation lights and a red strobe were displayed.

UKAB Note (1): In a subsequent telephone conversation with the reporting No2 Merlin Pilot, he confirmed that the geometry of the Airprox was broadly that shown in the diagram. The Merlin pair were approaching the HLS in echelon starboard at a spacing of 5-6 rotor spans [5x70ft span = 350ft min]. The lead Merlin crew did not see the Puma at all prior to the encounter and only saw it clearing to the S when setting up for the second approach. The Lynx was clear to the N and above the formation when the Airprox occurred and its presence was not a factor.

THE PUMA HC1 HELICOPTER PILOT reports he was conducting a night currency sortie from Netheravon A/D within SPTA using NVGs and incorporating low-level operations to a number of HLSs before returning to Netheravon. His helicopter has a green colour-scheme; navigation lights and a red strobe were displayed together with IR formation lights on bright and flashing. He was in receipt of a PS, he thought, from SALISBURY OPS [only a communication service is provided from an A/G Station] on 276.00MHz. A squawk of A7002 was selected with Modes C and S on; TCAS is not fitted.

After departure from Netheravon A/D, descending from 500 ft to 300 ft agl following the standard routings S from Crossing Bravo VRP at 120kt, SALISBURY OPS reported on the RT that a formation C/S comprising 2 Merlins and 1 Lynx were operating in the Durrington VRP area. At this point the 3 crew members in the Puma were 'eyes out' looking for the reported ac. The crew found it particularly difficult to spot any ac due to the time of the day - just after dusk - and the backdrop of Durrington town that was 'backing down' the NVG, so spotting any 'strobing' ac was extremely difficult. Approaching a point 2km S of Crossing Bravo, one of the Merlin helicopters was spotted less than 1km away and the Puma PIC elected to roll R in order to move to the R of the standard route, in an attempt to follow the Right-Hand Traffic Rule. At this point the Merlin's course was unclear; however, the direction and height of the Merlin helicopter then became apparent and it was seen that the Merlin was flying a reciprocal to the Puma's southerly course at the same height prompting the PNF to call 'break right' to the PF. While breaking R, the PF was visual with the Merlin and saw that it had started to turn to port toward the Puma. The PF then elected to climb and roll L in order to avoid the Merlin, which appeared to pass below the Puma less than 200m away. The crew lost sight of the Merlin and elected to maintain a straight and level course until the crewman spotted the Merlin again in their 5 o'clock. The Puma crew only spotted one Merlin helicopter.

After a debrief on the ground with the Merlin crews, it was ascertained that the Puma crew had only been visual with the lead Merlin helicopter. The No2 Merlin, whose crew had also taken avoiding action against his Puma, was not seen.

UKAB Note (2): Sunset was at 1716UTC; the Airprox occurred within the period defined as night within the UK LFHB.

UKAB Note (3): The 1750Z Boscombe Down METAR: 29010KT 9999 BKN038 08/03 Q1027 BLU=

THE AIR SUPPORT OPERATIONS CENTRE (ASOC) OPERATOR provided a helpful comment.

The UK ASOC role during Exercise PASHTUN JAGUAR.

OVERLORD is the C/S of the Command and Control agency based in Afghanistan which provides tactical information and routing. The UK ASOC does not fulfil this particular task in theatre but its personnel, who are from many branches (his own being Battlespace Management), have routine interaction with those that do and have supported exercises in this role when those with direct experience of OVERLORD are unable to attend. The UK ASOC does not offer an ATS, but merely shares traffic information in addition to that provided by SALISBURY OPS. Its primary contribution to the Exercise is to provide tactical information, such as on 'hot' airspace (live or simulated) for the integration of Joint Fire. Co-location with SALISBURY OPS is essential for building situational awareness.

UK ASOC personnel and those in SALISBURY OPS only became aware of the Airprox some 24hr after the event. The aircrews' submissions have provided a degree of retrospective insight, and he

recalls there being a time when both SALISBURY OPS and OVERLORD had separate ac on different frequencies. The Merlin flight was inbound toward Netheravon and checking their routing with OVERLORD whilst the Puma was outbound talking to SALISBURY OPS, presumably after leaving Netheravon's frequency (C/S ODIN). There was no deviation from the standard routing procedures passed to the ac; information would have been passed on any known traffic in order to widen general awareness of other activity. He has no recollection of any Airprox being mentioned at the time. As is the norm with these exercises, the flights would NOT have been placed under any 'service' by OVERLORD at any stage and were operating under VFR at all times.

UKAB Note (4): The Airprox occurred outwith recorded radar coverage.

UKAB Note (5): The UK Military Low-Flying Handbook at LFA1 2-1-1 para 8 SPTA specifies that:

- a. **'Salisbury Plain Air Ground Service.** Salisbury Plain Air Ground service [SALISBURY OPS] exists principally for the co-ordination of air-operations close to SPTA. **It does not provide any form of air traffic service** which, if required, must be sought from local air traffic control agencies....'

HQ JHC comments that this was a very serious event which nearly resulted in a mid-air collision. It remains an operational imperative to train at night and in this event whilst all lighting SOPs were being followed, this Airprox occurred through a combination of factors:

Both the Merlin pair and the Puma crew were passed a warning from the respective agencies (Puma by SALOPs and the Merlins by OVERLORD). This tactical service does not assume responsibility for collision avoidance and it is still the pilot's responsibility to see and avoid other traffic. This was a significant factor with the use of two separate frequencies for traffic (primary is for range deconfliction including ground units and live ordnance).

The time of day with the effectiveness of the Night Vision Goggles being reduced by the high levels of ambient light.

This Airprox occurred during a particularly intense period of aerial activity as part of a recurring exercise to prepare crews and troops for deployment to Theatre and HQ JHC recommends that for future exercises the additional deconfliction measures are implemented;

Unidirectional use of the SPTA helicopter routes during the exercise.

Aircraft conducting non-exercise training or currency flights are to depart the SPTA by the most expeditious route and not to use the areas within SPTA for that flight (for example, departing to the north directly from Netheravon).

JHC has asked OC Tactical Operations (Air Traffic Management) of 1 Air Control Centre to produce a Memorandum of Understanding on the use of a single frequency during the exercise for purpose of OVERLORD and SALOPs. Following the incident, for the remainder of the exercise, OVERLORD and SALOPs operated on the same frequency (the published SALOPs frequency) to permit direct communication between ac in potential confliction.

HQ JHC, though Tactical Operations (Air Traffic Management) of 1 Air Control Centre, are intending to deploy a mobile Watchman Radar to Netheravon for the next Exercise pending resolution on a number of operational and environmental issues. In addition it is clear that the fitting of TCAS, which is being actively pursued by this HQ, would have significantly helped to prevent this incident.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of two of the ac involved, a report from the ASOC Operator and comments from the appropriate operating authority.

The HQ AAC helicopter pilot Member opined that the Lynx, as part of the mixed formation, was not a factor in this Airprox but might have been able to prevent it. In his view, the Exercise scenario called for the Lynx to provide 'top cover' for the two Merlins as they made their approach to the HLS at Avon Camp. In view of the warning from OVERLORD that the Puma was southbound along the route from Crossing Bravo, the Lynx crew ahead of the Merlins should have spotted the approaching Puma and warned the Lead Merlin pilot. The No2 Merlin pilot's report confirmed that they were aware of the Puma beforehand and were looking for it, but neither Merlin crew spotted the Puma as they made their approach to the HLS. A Member suggested it might have been wiser to have delayed the approach to the HLS until the Puma was spotted and had passed clear to the S, as the Merlin pilot had highlighted the difficulties of operating on NVG close to high levels of background 'cultural' lighting especially with the remaining red sky. The helicopter pilot Member concurred that this would have caused significant difficulty for the Merlin crews in sighting another ac in the LH forward quadrant as they flew N, which is about where the Puma was. Furthermore, the Member opined that the Puma crew, also operating on NVG, did not have quite the same difficulty, but the background lighting of Durrington – to the S of the Airprox location – would have affected the efficiency of the Puma crew's NVG. The Board discussed the issue of operating on NVG at length; the helicopter pilot Member confirmed that NVG give aircrew much better SA about the topography of the ground, but spotting ac lights against a background of cultural lighting remains a problem. However, lifting-up the NVG to revert to normal vision will allow crews to spot other ac lights. There was nothing fundamentally wrong with using NVG and other Members familiar with their use agreed it was a matter of technique.

It was explained that SPTA is a very busy exercise area but SALOPs are not able to effect deconfliction of individual flights within the area and it was clear that there was some confusion within the minds of the helicopter pilots involved about the exact role of OVERLORD and SALOPs. Whilst tactical ATC teams do set up for these pre-deployment exercises – apparently there was one operating at Netheravon – they had no input here. However, the Board noted and welcomed the measures proposed by HQ JHC for future Exercises to reduce the risks of airborne conflicts: uni-directional routes; operating on a single frequency; excluding non-exercise participants from SPTA and deploying a mobile Watchman Radar would all be beneficial.

The helicopter crews were operating quite legitimately under VFR at night with conventional lighting displayed. Both crews had been forewarned of each other's presence but they were operating in the same vicinity on different frequencies. Unfortunately, as the Airprox occurred at low-level none of the recorded radars available to the Board had captured the event. Nevertheless, the pilots involved all broadly share the same view of what had occurred. The Puma crew saw a single Merlin – the lead helicopter – whilst it was making its approach to the HLS and turned R to remain to the R of the route in an attempt to deconflict themselves from the single helicopter they had seen. The Board agreed that the Puma crew had probably seen the lead Merlin as soon as they might reasonably have been expected to do so. As the Merlin's direction of flight became clear the Puma crew hardened their turn to the R but their attempt to maintain separation was thwarted by the lead Merlin crew who, whilst unsighted on the Puma, elected to overshoot and turned to the L to set up for another approach to Avon Camp. The Board concluded that the non-sighting of the Puma by the lead Merlin crew was part of the Cause. As the lead Merlin turned L towards them, the Puma crew was forced to reverse their R turn by climbing and rolling L into an avoiding action turn to pass the lead Merlin on its starboard side, unaware that the No2 Merlin was also to the starboard of the leader. This caused the No2 Merlin crew, who had gained visual contact with the Puma as it made its initial starboard turn, to break R as the Puma passed between the Merlin pair with 200m horizontal separation, the No2 Merlin pilot reports. Members agreed that this was the second part of the Cause; while avoiding the lead Merlin, the Puma crew flew into conflict with the No2 Merlin, which they did not see.

Turning to the inherent Risk, the Puma crew's robust action had enabled them to fly clear of the lead Merlin by an estimated 200m, which Members agreed had removed the actual Risk of collision with that ac. However, they then flew into close proximity with another helicopter that they were unaware of. Fortunately, by that stage the No2 Merlin crew had gained visual contact with the Puma and were able to take effective avoiding action, also achieving 200m separation. Although this also ameliorated the Risk, the Board concluded that with two crews unsighted on another helicopter at close quarters, the safety of the ac involved had certainly been compromised in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: 1. A non-sighting of the Puma by the lead Merlin crew.
 2. While avoiding the lead Merlin, the Puma crew flew into conflict with the No2 Merlin, which they did not see.

Degree of Risk: B.

AIRPROX REPORT No 2012017

Date/Time: 16 Feb 2012 1115Z

Position: 5334N 00331W (3nm NE
Douglas Platform - elev
146ft)

Airspace: Liverpool Bay HTZ (*Class: G*)

Reporting Ac Reported Ac

Type: AS365 P68

Operator: CAT Civ Comm

Alt/FL: 1000ft↓ 1350ft
QNH (1027hPa) QNH (1027hPa)

Weather: VMC CLBC VMC CLBC

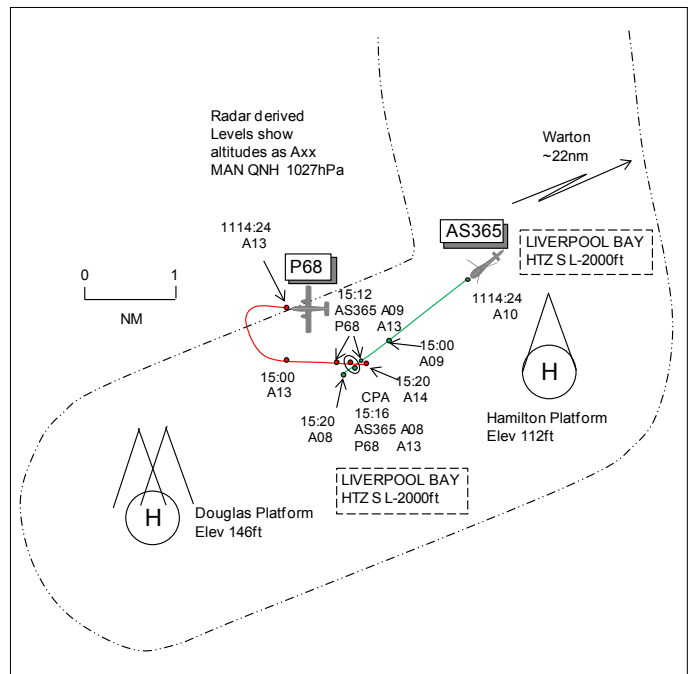
Visibility: >10km 10km

Reported Separation:

300ft V/Nil H 800ft V/400m H

Recorded Separation:

500ft V/0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AS365 PILOT reports en-route from Blackpool to Douglas Platform, VFR and in receipt of a BS from Warton Radar on 129.525MHz, squawking 0467 with Modes S and C; TCAS 1 was fitted. The visibility was >10km flying 3000ft below cloud in VMC and the helicopter was coloured red/grey with nav, anti-collision and strobe lights all switched on. With approximately 15nm to run to the right heading 239° at 135kt and 1000ft QNH 1027hPa they noticed an action AC in the vicinity of Douglas Platform. This ac was manoeuvring between their level and 300ft above as they approached. They asked Warton if they were working the ac but were told that it was working Liverpool and that Warton would contact Liverpool for further information. They saw the ac at about 10nm range and as they approached Douglas with about 5nm to run the ac turned towards them on an intercepting track. At this point a TCAS TA was generated and they started their descent to the Platform and watched as the high-wing twin-engine ac overflew them about 300ft directly above. He assessed the risk as medium/high. Warton subsequently requested the ac to move onto their frequency and it became clear that the other ac's pilot was unaware of the HPZ (Helicopter Traffic Zone).

THE P68 PILOT reports flying a local sortie from Hawarden, VFR and in receipt of a BS from Liverpool on 119.85MHz, then Warton on 129.525MHz, squawking 0260 with Modes S and C. The visibility was 10km flying 2500ft below cloud in VMC and the ac was coloured white/blue with wing and tail strobes switched on. He was giving Liverpool 'Operations Normal' calls every 30min and the incident occurred when he was on Line 8 of his aerial survey heading 090° at 140kt level at 1350ft QNH 1027hPa. About 2-3nm N of Douglas Platform he saw an AS365 about 2nm away on a converging/crossing track about 500ft below and watched it pass underneath by 800ft, descending, heading in the opposite direction about 400m away; he did not consider the helicopter to have been a threat. Liverpool ATC asked him to call Warton and the controller said that he should not be operating in that area so he broke-off the survey line and moved from the area.

THE P68 DEPUTY CHIEF PILOT comments that the company has had a root and branch investigation into the circumstances surrounding this Airprox which was viewed as a serious incident. A new extensive low-flying brief, including SMS, covering all aspects of the company's operations has been written and is being reviewed by the CAA. The P68 pilot has been involved fully in the

investigation and is committed to ensuring that a repeat of his mistake will not recur. It came to light that the pilot had been using the Southern Area 1:500000 map so had he been using the correct chart this incident in all probability would not have happened. While on the day he was complying with ATC instructions he was obviously speaking to the wrong ATSU. The pilot is fully aware of the implications of using the wrong chart but by way of mitigation he stated that the changeover from the Northern to Southern chart was very close to where the ac was operating. The HTZ was in the top RH corner of the survey square. On reflection it is clear that the correct chart was the Northern Area 1:500000 and although the pilot did have both charts in the ac on the day he used the incorrect one. Since this incident the company have amended their survey brief so that any ACN/NOTAM generation is considered, the flights will contact Warton midweek and Blackpool at weekends by telephone before commencing the survey and have 2-way radio contact with them during the flight.

THE WARTON LARS/APPROACH CONTROLLER reports working the AS365 as it transited from Blackpool to the Liverpool Bay Rigs. The helicopter was flying at 1000ft QNH 1026 under a BS and as it was about 5nm E of the HTZ the controller was aware of a 0260 radar contact travelling W'bound and did not consider this contact to be traffic to the AS365. The controller then dealt with other traffic to the SE of Warton and another flight near DCS. On the next scan of the Liverpool HTZ the controller saw a 0260 contact approximately 3nm from, and 400ft above, the AS365 and passed TI to its crew. The crew mentioned they had seen it on their TCAS and expressed surprise that the ac was in the HTZ. The controller contacted Liverpool Approach who informed LARS that the ac was under a BS so Liverpool Approach were asked to free-call the ac to the Rigs frequency of 122.375MHz in order to obtain permission to fly within the HTZ. A colleague then took over the position and the off-going controller made further enquiries, establishing the other ac, a P68, was on a survey flight. The P68 pilot called LARS stating that he was unable to make contact with the rigs frequency before he was told to vacate the HTZ.

ATSI reports that the Airprox occurred at 1115:16, in Class G airspace, 26nm SW of Warton and within the boundary of the designated Helicopter Traffic Zone (HTZ) of the Liverpool Bay Gas Field. The AS365 was operating on a VFR flight from Blackpool Airport to the Douglas Platform situated in the Liverpool Bay Gas Field and in receipt of a BS from Warton Approach. The P68 was operating VFR off the N Wales coast to conduct an Aerial Survey at an altitude of 1300ft and was in receipt of a BS from Liverpool Radar.

The UK AIP Page ENR1-6-7-9 (30 Jun 11) describes off-shore operations in the Liverpool Bay area as follows:

- '3 Morecambe Bay and Liverpool Bay Gas Fields - Helicopter Support Flights.
- 3.1 Permanent platforms positioned on the Morecambe Bay and Liverpool Bay Gas Fields are shown at ENR 6-1-15-7.
- 3.2 Helicopter Traffic Zone (HTZ)
 - 3.2.1 A Helicopter Traffic Zone (HTZ), established as notification of helicopters engaged in platform approaches, departures and extensive uncoordinated inter-platform transit flying, is established around the Morecambe Bay and Liverpool Bay Gas Fields. An HTZ consists of the airspace from sea level to 2000ft amsl contained within the tangential lines, not exceeding 5nm in length, joining the neighbouring circumferences of circles 1.5nm radius around each individual platform helideck.
- 3.3 Airspace Structure – Morecambe Bay.....
- 3.4 Airspace Structure – Liverpool Bay
 - 3.4.1 The helicopter support land base is Blackpool Airport. Low level flights, normal operating height 1000ft amsl on the Blackpool QNH, operate daily between Blackpool Airport and the helidecks. Transit height to/from the Lennox platform is 500ft amsl. Flights between helidecks are normally conducted between 500ft and 1000ft.
 - 3.4.2 The route structure is:
 - (a) Blackpool to Gate G (534449N 0030441W) to Hamilton (533357N 0032716W);
 - (b) Blackpool to Gate G to Lennox (533719N 0031037W).Note: Routes are bi-directional.

3.4.3 Helicopter traffic information is available from Warton Approach during the Warton ATC published hours of operation. Outside these hours, information is available from Blackpool Approach.

3.4.4 Gas release and burn-off operations may take place at any time without prior notification from off-shore gas installations.'

(Rigs operated by BHP Petroleum and RTF Traffic and LOG 122.375MHz).

In the RT transcript reference is made to Helicopter Protected Zone (HPZ). These were renamed Helicopter Traffic Zones (HTZ) on 8 April 2010. CAA ATSI had access to the following: RT recording from Liverpool and Warton ATC. NATS Area radar recording, Warton ATSU radar recording, written report from both pilots, Warton controller written report.

Warton and Liverpool METARs:-

METAR EGNO 161050Z 27014KT 9999 BKN044 08/06 Q1026=

METAR EGGP 161050Z 28011KT 9999 SCT046 08/06 Q1027=

At 1055:30, the P68 flight contacted Liverpool Approach and reported on task conducting an aerial survey in the Rhyll/Prestatyn area, off the N Wales coast at an altitude of 1300ft for a period of 3hr. The Liverpool controller agreed a BS, allocated a squawk 0260 and passed the Liverpool QNH 1027. The P68 pilot advised that he would give an 'Ops' call every 30min and reported commencing the survey.

At 1104:20, the AS365 flight, on departure from Blackpool, contacted Warton Approach, reporting in the climb to 1000ft. The Warton controller agreed a BS and passed the Warton QNH 1026.

At 1113:16, Warton radar recording shows the P68 N of the Douglas Platform, on the boundary of the HTZ, tracking W and indicating an altitude of 1200ft. The AS365 is shown entering the HTZ to the NE of the Hamilton Platform, indicating an altitude of 900ft. The distance between the 2 ac is 5nm.

At 1113:42, the Liverpool controller warned the P68 pilot to look out for traffic approaching from the NNE, squawking the rig conspicuity code (0467) and indicating 1000ft unverified. The P68 pilot reported looking out for the traffic.

At 1113:47, the Warton controller warned the AS365 pilot about traffic, 12 o'clock at a range of 3nm at 1300ft manoeuvring over the rigs showing a squawk allocated by Liverpool. The AS365 pilot advised Warton that the other aircraft [P68] was in a Protected Helicopter Area [AIP refers to Helicopter Traffic Zone]. The radar recording shows the 2 ac on reciprocal tracks at a range of 2.5nm, with the P68, indicating an altitude of 1300ft and the AS365, indicating an altitude of 900ft. The P68 is then observed to commence a L turn and track W.

At 1114:25, after a discussion with Liverpool, the Warton controller advised the AS365 pilot that the P68 was conducting an Aerial Survey. In response the pilot reported that the P68 was turning back towards them and said it would be helpful if the ac was on the company frequency [Rig RTF 122.375MHz]. The radar recording shows the P68, 2.1nm W of the AS365, turning onto an E'ly track. The 2 ac then track towards each other on converging headings.

[UKAB Note (1): By 1115:12, the radar recording shows the AS365 at altitude 900ft in the P68's 12 o'clock range 0.3nm, the P68 at altitude 1300ft. The next sweep at 1115:16 is the CPA, the tracks of the 2 ac having crossed, the P68 indicating an altitude of 1300ft with the AS365 indicating an altitude of 800ft in its 0130 position range 0.1nm. The next radar sweep shows the P68 now at 1400ft and the AS365 at 800ft as the 2 ac begin to diverge.]

At 1115:50, the AS365 pilot requested the registration of the P68 from the Warton controller and reported that the P68 had flown directly towards the helicopter at about 300-400ft above. The Warton controller informed the pilot that the P68 was shortly to come onto the Warton frequency.

The radar recording shows the AS365 helicopter landing at the Douglas Platform at 1117:33 and the P68 tracking E/W indicating an altitude of 1300ft.

At 1120:40, the Liverpool controller (at the request of Warton) requested that the P68 pilot contact the Liverpool Bay Rig frequency 122.375MHz. Shortly afterwards at 1122:40 the P68 pilot reported back on frequency reporting 'no response' from the Rig frequency. The AS365 pilot subsequently reported that the P68 flight had called on the Rig frequency but using the 'Warton' c/s. At 1125:40 the Liverpool controller instructed the P68 pilot to squawk 7000 and contact Warton Radar.

At 1126:35, the P68 flight contacted Warton and the pilot was asked whether he had been authorised to operate in the Rigs protected zone. The P68 pilot responded 'negative'. The controller agreed a BS allocating a squawk 3642. As part of the survey the P68 pilot indicated a requirement for tracks backwards and forwards until clear of the area and asked for permission to continue. The Warton controller responded that this couldn't be approved without prior authorisation and should really have been arranged before getting airborne. The P68 pilot advised that he would continue the survey work nearer to the shore and commented that he didn't have 'that helicopter area' on his chart. The P68 pilot then reported changing back to the Liverpool frequency.

When the AS365 helicopter reported airborne from the rigs returning to Blackpool the controller advised the pilot that the P68 did not have the HPZ on his chart and had been advised he wasn't allowed in. This was acknowledged by the AS365 pilot.

As a result of this incident, the Warton ATSU issued a bulletin to remind controllers of the status of the HTZs as described in the UK AIP. Warton also indicated that it is common practice for Warton controllers to remind pilots operating sorties off-shore that they should remain clear of the Liverpool HTZs. Warton considered it likely that over a period of time, this may have pre-disposed controllers into believing that pilots required permission to enter the area, when this was not the case.

It was not clear if the P68 pilot was aware of the off-shore operations, the Rig RTF frequency or the helicopter information available from Warton Approach specified in the UK AIP. The HTZ is not restricted or protected airspace and there seems to have been a misunderstanding by the controller regarding the status of the HTZ (referred to as HPZ). This resulted in the controller refusing permission for the P68 to continue in the area of the Gas Rigs.

Both flights were in receipt of a BS from 2 separate units. As indicated in the AIP, it would have been more appropriate for the P68 pilot to have contacted Warton to receive a service and additional information on helicopter activity in the area. The P68 pilot advised the Liverpool controller about survey work "just off the N Wales coast in the vicinity of Rhyl and Prestatyn". It may not have been obvious to the Liverpool controller that the P68 was going to operate in the vicinity of the Rigs. Both controllers gave a warning to their respective ac. CAP774, UK Flight Information Services, Chapter 2, Page 1, Paragraph 1, and 5, state:

'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.

Pilots should not expect any form of traffic information from a controller/FISO, as there is no such obligation placed on the controller/FISO 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/FISO may provide traffic information in general terms to assist with the pilot's situational awareness. This will not normally be updated by the controller/FISO 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/ FISO considers that a definite risk of collision exists, a warning may be issued to the pilot.'

After the Airprox, when it became apparent that the P68 was likely to be in conflict, a number of factors led to further misunderstanding.

- a) The P68 was asked to contact the Rig RTF frequency 122.375MHz but appears to have used the 'Warton' callsign on that frequency. Receiving no response the P68 pilot returned to the Liverpool frequency.
- b) The Warton controller seems to have been unclear regarding the status of the HTZ, referring to the HPZ and the requirement for prior authorisation.

CAP774, Chapter 1, Page1, Paragraph 2, states:

'Within Class F and G airspace, regardless of the service being provided, pilots are ultimately responsible for collision avoidance and terrain clearance, and they should consider service provision to be constrained by the unpredictable nature of this environment.'

The Airprox occurred when the AS365 and P68 flights, whilst in receipt of a BS, came into close proximity when operating in Class G airspace within the Liverpool Bay Gas Field HTZ. There was no requirement for the controllers to monitor the flights but each passed a warning to their respective ac.

A number of factors were considered to be contributory:-

- a) The 2 flights were operating in the same area but operating on separate frequencies.
- b) The P68 pilot appears not to have been familiar with the guidance promulgated in the UK AIP regarding off-shore operations in the vicinity of the Liverpool Bay Gas Field.
- c) The P68 pilot reported operating off the N Wales coast in the vicinity of Rhyl and Prestatyn. It was not obvious to the Liverpool controller that the P68 intended to operate in the vicinity of the Liverpool Bay Gas field.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear to Members that there were some misunderstandings within both cockpits of the subject ac and in Warton ATC. The AS365 pilot was apparently expecting more protection within the HTZ than was available; a HTZ is not an ATZ nor is it exclusive to helicopter traffic. The HTZ is Class G airspace where the presence of helicopters is highlighted for other users but with no ATC service available; the frequency is manned by ground personnel and is licensed for administrative and logistic purposes associated with safe offshore operations. The procedures followed by helicopter operators whilst flying within the HTZ were established by local agreement, there being no procedures promulgated for traffic transiting a HTZ. Similarly, the P68 pilot was unaware of the HTZ, owing to poor pre-flight planning, and was using the wrong chart during the survey flight. However, there was no reason for the P68 to be excluded from the Class G HTZ; the pilot did not need to contact any ATSU during the survey portion of the flight. That said, had the P68 pilot noted the HTZ's existence from the Northern Area chart, he would have been cross-referred to the AIP entry which mentions the availability of TI from either Warton or Blackpool ATSUs. The Board agreed it would be good airmanship to contact the relevant ATSU for TI whenever flying in a HTZ. Warton ATC erroneously believed that permission/authorisation was required for transiting traffic to enter the HTZ and that the P68 flight, without 'clearance' to be there, must vacate the HTZ. Given the Class G status of the airspace, both pilots were responsible for maintaining their own separation from other ac through see and avoid. In the end both flights, although under a BS from 2 different ATSUs, received a traffic warning on each other. This warning enhanced the P68 pilot's SA and enabled him to visually acquire the approaching helicopter about 2nm away and, he estimated, 500ft below; content that no action was necessary; he watched it pass well below by 800ft. Meanwhile the AS365

pilot already had a 'heads-up' on the P68 from his ACAS but was concerned that there was 'unknown' traffic within the HTZ. The AS365 pilot saw the P68 manoeuvring at about 10nm range and when the P68 turned onto an E'ly track a TCAS TA was generated. The AS365 pilot elected to descend to increase separation estimating the ac crossed with 300ft separation. The radar recording shows the converging ac initially separated by 300ft; they cross 0.1nm apart and separated by 500ft vertically. Members agreed that the visual sightings by both crews had ensured that any risk of collision had been effectively removed and, as there was no requirement on the P68 pilot to participate in procedure or contact an ATSU, the Board concluded that this had been a sighting report in a HTZ where normal procedures, safety standards and parameters pertained.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report in a HTZ.

Degree of Risk: E.

AIRPROX REPORT No 2012027

Date/Time: 1 Mar 2012 1357Z

Position: 5545N 00230W (6nm
NW Charter Hall – [13nm
SW of SAB])

Airspace: UKDLFS (Class: G)

Reporting Ac Reported Ac

Type: Hawk T1 Tornado GR4

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

Alt/FL: 750ft 300ft
agl agl

Weather: VMC NR VMC CLBC

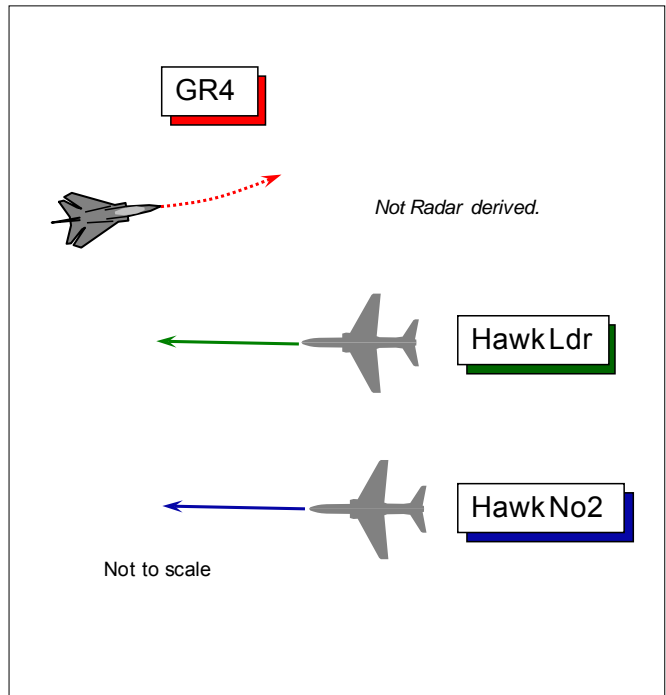
Visibility: 15km 15km

Reported Separation:

500ft V/200m H 500ft V/800ft H

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BAe HAWK T1 PILOT reports he was leading a pair of Hawk ac operating autonomously within LFA16 on a 2v 1 low-level evasion sortie for a Weapons System Operator (WSO) student. Heading W at 420kt approaching a position 6nm NW of Charter Hall light ac strip, during evasion he 'kicked' to put the fighter in his 6 o'clock to action a bomb-in-face (BIF) tactic. To simulate this he wing waggled and climbed to a height of about 750ft. As he resumed straight and level flight his wingman called 'tally' on a GR4 ahead on his nose. He acquired the GR4 visually himself at a range of about ¼nm, which then passed down his RH side 200m away and about 500ft lower than his ac. No avoiding action was taken as he assessed the GR4's flight path would keep the ac clear of each other and the Risk was 'low'. He stated that, as the Airprox occurred in the middle of a 'bounce', his lookout was focussed on the ac executing the bounce.

His ac has a black colour scheme; the HISLs and landing lights were on. A squawk of A7001 was selected with Modes C and S on; TCAS is not fitted.

THE TORNADO GR4 PILOT reports he was operating as a single GR4 in the LFS as his wingman was delayed on the ground. He was monitoring the LFS common frequency and was squawking with Mode C. TCAS is not fitted.

Flying at low-level at a height of about 300ft and approaching the location of the Airprox heading 080° at 420kt, he became 'tally' with a single Hawk in his 12:30 position at a range of about 3-4km. The Hawk was assessed as flying at a height of 1000ft, with L to R movement in the canopy. To avoid the black Hawk he manoeuvred 10° left and maintained level flight at 300ft keeping tally on the ac. At this point he and his navigator started to scan for a potential wingman. Assessing the horizontal displacement at the closest point to be in his 3 o'clock at about 800-1000ft, it did not appear that the Hawk pilot had seen his GR4. Just before the lead Hawk passed abeam, displaced some 800-1000ft horizontally to starboard and 500ft above his GR4 at the closest point, the No2 Hawk was seen in battle formation to port of the lead Hawk. At no stage did he feel that there was a risk of a collision and stated the Risk was 'low'.

His ac has a grey colour-scheme but the HISLs were on.

HQ AIR (OPS) comments that the Airprox occurred within Class G airspace at low level. The Hawk No2 ac acquired the GR4 (as would be expected from the formation SOP-defined lookout sectors) and called the 'tally' to the lead Hawk pilot. The lead Hawk pilot used this information to gain visual on the GR4, albeit at fairly short range. The benefits of flying in tactical formation and combining lookout sectors for an improved chance of detection are clearly illustrated. The GR4 pilot had previously gained tally on the lead Hawk and as a sight line rate existed, which demonstrated that the GR4 and Lead Hawk were not on a collision course, he sensibly did not manoeuvre hard to increase separation on the Lead Hawk until he had thoroughly scanned the surrounding airspace (for the expected wingman).

UKAB Note (1): The Airprox occurred outwith recorded radar coverage.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was apparent to the Members that the GR4 pilot saw a single Hawk first, in his 12:30 position at a range of about 3-4km and evidently the lead Hawk ac. Although he recognised that there would be some lateral displacement when the Lead Hawk was first spotted, Members noted the GR4 pilot wisely manoeuvred gently left to ensure a wider berth as he maintained level flight at 300ft agl whilst keeping a watch on the lead Hawk and scanning for a No2, which was subsequently spotted before the ac passed abeam.

It appeared that the No2 Hawk crew spotted the GR4 slightly later but promptly warned the Lead Hawk pilot about it, who saw the GR4 from a range of ¼nm. The Board noted that although he was able to do so, the lead Hawk pilot saw no need to take avoiding action as he assessed the GR4's flight path relative to his own would keep the ac clear of each other. The GR4 subsequently passed some 200m clear to starboard from his perspective, broadly in agreement with the GR4 pilot's estimate of about 240m. Taking all these factors into account, the Board concluded that this Airprox had stemmed from a conflict in the UKDLFS that had been resolved by the GR4 pilot.

Although the lead Hawk pilot had initiated his climb to 750ft agl as part of his evasion exercise, fortuitously, this had the added affect of increasing the vertical separation at a critical juncture and he wisely maintained this height as the GR4 passed abeam some 450-500ft below him. Despite the high closing speed of 840kt, the lead Hawk and GR4 pilots were visual with each other's ac in reasonable time. This coupled with the reported separation, led the Board to conclude, unanimously, that any Risk of a collision had been effectively eradicated.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the UKDLFS resolved by the GR4 pilot.

Degree of Risk: C.

AIRPROX REPORT No 2012033

Date/Time: 14 Mar 2012 1351Z

Position: 5521N 00132W (Amble
Light - elev 41ft)

Airspace: UKDLFS/Sco FIR (Class: G)

<u>Reporting Ac</u>	<u>Reported Ac</u>
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<u>Type:</u> Tornado GR4	Untraced
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<u>Operator:</u> HQ Air (Ops)	NK
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<u>Alt/FL:</u> 700ft ↓	NK
RPS (1019hPa)	NK

<u>Weather:</u> VMC CLBC	NK
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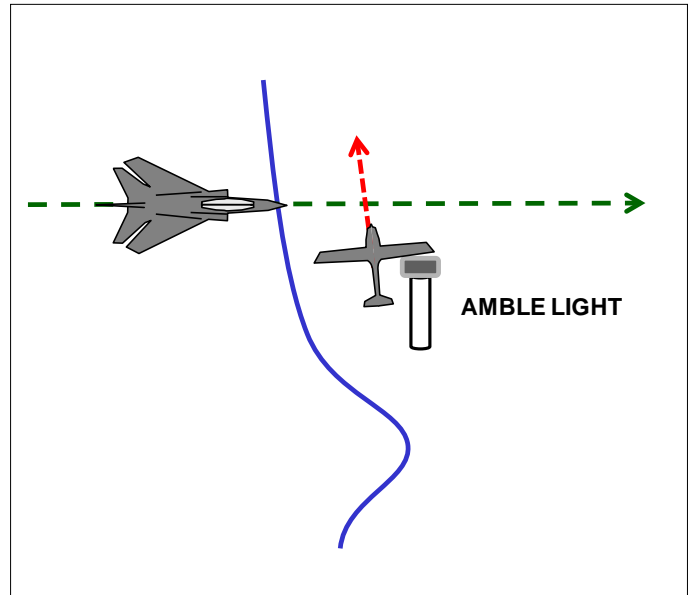
<u>Visibility:</u> 8km	NK
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Reported Separation:

50ft V/300ft H	NK
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Recorded Separation:

NK



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO PILOT reports that he was leading a formation of 3 ac on a tactical low level training sortie, squawking 7001 with Modes C and S but TCAS was not fitted. Following a climb to 'coast out', heading 090° at 420kt, they were in a shallow descent through 700ft Rad Alt when a light ac was seen about 50ft above them and 300ft to their R and crossing for the R to L. The ac, which was not seen prior to that point, appeared to be heading 350°, paralleling the coast just out to sea. The ac had a single propeller, mid-blue over-cockpit wings and a white fuselage and it was not seen to manoeuvre. Due to the lateness of their sighting they were unable to manoeuvre before their flightpaths crossed.

The pilot observed that they were busy rejoining with his wingman and his view in the direction of approach of the light ac was obstructed by the canopy arch.

He reported the incident to Newcastle APR on the RT and assessed the risk as being medium.

UKAB Note (1): Despite extensive radar and procedural tracing action the other ac could not be identified.

UKAB Note (2): The Great Dun Fell radar was not available due to refurbishment and the incident did not show on any other recorded radars.

UKAB Note (3): The position given by the Tornado was taken from the Mission recording system, and is 1nm off the coast.

HQ AIR (OPS) comments that this report highlights the conflicting requirements of an OCU instructor. On the one hand he is required to monitor the actions of his student during a formation rejoin, yet on the other he is still required to perform lookout for the formation. He must divide his priorities carefully to ensure he does not focus on one task to the exclusion of the other.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the Tornado pilot and operating authorities. The Prestwick and Swanwick recordings did not show the event but it did show on the Newcastle Radar which was not (on this occasion) available to the Board due to technical difficulties. However, the assistance of Newcastle ATC and the Eshott Airfield operators in attempting to trace the light ac, albeit unsuccessfully, was appreciated.

An Advisor with knowledge of the local area informed Members that it is not unusual for light ac and microlights to fly up or down the coast in that area as it is very picturesque. Although the Board was not certain of light ac flight details, it appears that both ac were operating legitimately in Class G airspace of the FIR/UKDLFS where 'see and avoid' pertains.

The pair of Tornados was rejoining just after coast-out and the lead crew reported that they were busy rejoining with their No2 and would have been searching for him. In addition, although the crew might have seen the light ac sky-lined prior to pulling up to cross the coast, once they had climbed to above its level it would have been difficult to see against the dark background of the sea. The issue of the Tornado canopy-arch blind spot is a well known problem which pilots should be aware of and move their head or upper body to see round it (this is also an issue in many other ac types including GA and helicopters).

Bearing in mind the proximity of the two ac, Members were surprised that the light ac pilot did not see or hear (apparently) the Tornado and also file a report.

Although there was some separation extant, it was minimal and the Board agreed that in this instance there was a risk that the ac would have collided.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively a non-sighting by the Tornado crews and a presumed non-sighting by the light ac pilot.

Degree of Risk: A.

AIRPROX REPORT No 2012039

Date/Time: 16 Mar 2012 1144Z

Position: 5332N 00234W (3½nm
NE of Haydock Park
VRP)

Airspace: London FIR (Class: G)

Reporting Ac Reported Ac

Type: Squirrel HT3 DH Tiger Moth

Operator: HQ Air (Trg) Civ Club

Alt/FL: 1000ft ↑↓1100-1800ft
QNH (1015hPa) QNH

Weather: VMC CLBC VMC CLBC

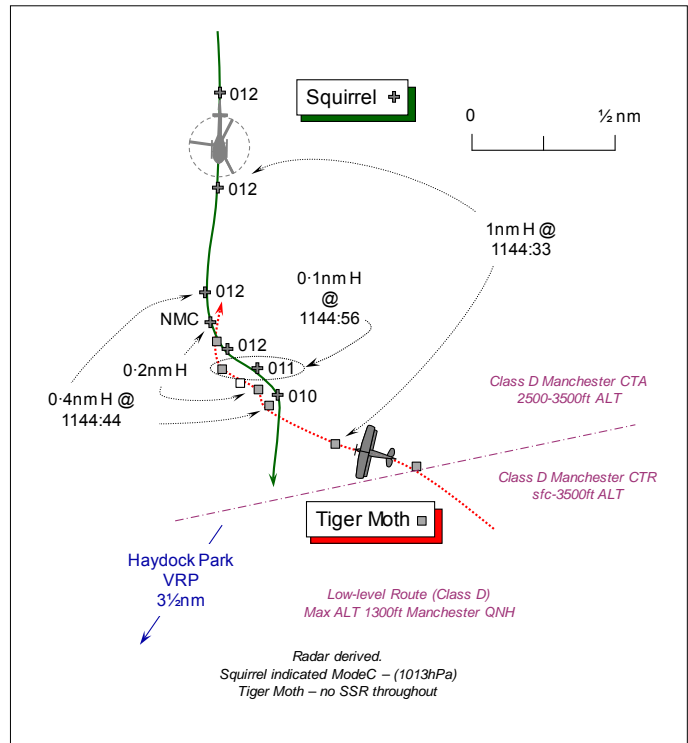
Visibility: 20km >10km

Reported Separation:

50ft V/Nil H Not seen

Recorded Separation:

<200yd H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SQUIRREL HT3 HELICOPTER PILOT reports he was flying a VFR NA VEX returning to Shawbury via the Low-Level Route through the Manchester CTR. He was listening out on the promulgated frequency of 118.575MHz; the Manchester ATIS conspicuity code of A 7366 was selected with Modes C and S.

Shortly after entering the Low-Level Route in the vicinity of Haydock Park, he thought, [actually just to the N of the boundary] level at 1000ft Manchester QNH (1015hPa), heading 185° at 110kt, a biplane was seen at short range in his 11 o'clock about 150ft away and 50ft above his helicopter, crossing from left to right. Initially the conflicting biplane - with silver wings and a dark green fuselage - had been obscured behind the standby compass on the central cockpit strut; it did not appear to be showing any lights. To avoid the biplane [a DH82 Tiger Moth] he immediately initiated a 60° AOB descending L turn; at this point the Tiger Moth pilot also commenced what seemed to be an avoiding action turn to the R exacerbating the situation still further. Consequently, he increased his ROD to about 2000-3000ft/min in order to avoid the Tiger Moth, whose pilot then reversed the turn to the L thereby passing about 200-300ft overhead his helicopter. The Tiger Moth continued on a NW'ly course, so when clear he climbed back to his transit altitude and regained his track to exit the low-level route to the S via Oulton Park VRP. He assessed the Risk as 'medium'.

His helicopter has a black fuselage with yellow upperworks; all the white HISLs were on together with the landing light.

THE de HAVILLAND DH82A TIGER MOTH PILOT reports he was instructing a student, who was the PF, after departing Liverpool bound for Manchester (Barton). His Tiger Moth has white wings with a green fuselage and he was in receipt of a BS from Barton INFORMATION on 120.25MHz; SSR is not fitted. Whilst conducting general handling (GH), VFR, at the reported Airprox location he was operating between 1100 - 1800ft QNH beneath overcast cloud at 75kt. The Squirrel helicopter flown by the reporting pilot was not seen and he was informed of the Airprox in a telephone call from the RAC at Swanwick.

ATSI reports that the Airprox occurred at 1144:56 UTC, in Class G airspace, 3.3nm NE of Haydock Park VRP and just to the N of the Manchester Low-Level Route, which lies within the Manchester CTR.

The Squirrel HT3 helicopter was operating VFR on a training exercise from Shawbury, squawking A7366 to transit N-S through the Manchester Low-Level Route. The Squirrel was maintaining a listening watch on the Manchester APPROACH frequency in accordance with the UK AIP Page AD 2-EGCC-1-15 (8 Mar 12), paragraph 7, which states that:

‘within the Low -Level Route helicopters or aeroplanes may fly without individual ATC clearance...’; and paragraph 8, which states that: ‘pilots flying within 5nm of the Manchester CTR and maintaining a listening watch on the Manchester APPROACH frequency may select code 7366’ (does not imply the receipt of an air traffic control service).

Manchester ATC confirmed that neither the Squirrel nor the Tiger Moth pilot had contacted Manchester APPROACH.

The Manchester 1120Z METAR: 20012KT 9999 BKN020 11/06 Q1015 NOSIG=

At 1144:15, radar recording shows the Squirrel, squawking A7366 indicating 1200ft Mode C (1013hPa) flying southbound towards the Manchester Low-level route. The Tiger Moth is shown as a primary contact only [no SSR fitted] manoeuvring in the Squirrel helicopter’s 11 o’clock at a range of 1.7nm. The Tiger Moth is observed to track broadly NW.

At 1144:50, the two ac are shown as primary contacts only, on reciprocal tracks at a range of 0.3nm. The Squirrel pilot’s written report indicated that the Tiger Moth was sighted in his 11 o’clock at a range of 150ft and 50ft above. At 1144:56, radar recording shows the Squirrel, indicating an altitude of 1100ft in a L turn, with the Tiger Moth in close proximity [<200yd. The Squirrel’s Mode C then indicates further descent to 1000ft (1013hPa) in general conformity with the pilot’s reported avoiding action descent before the helicopter turns S to regain track through the Low-Level Route.]

CAP774, Chapter 1, Page1, Paragraph 2, states:

‘Within Class F and G airspace, regardless of the service being provided, pilots are ultimately responsible for collision avoidance and terrain clearance, and they should consider service provision to be constrained by the unpredictable nature of this environment.’

The Airprox occurred when the Squirrel helicopter and Tiger Moth came into close proximity within Class G airspace. Pilots operating in Class G airspace are ultimately responsible for collision avoidance.

HQ AIR (TRG) comments that based on the Tiger Moth pilot’s report, the ‘avoiding action’ seen by the Squirrel pilot was unrelated manoeuvring by the Tiger Moth. The range of the Squirrel pilot’s initial sighting appears from the radar picture to have been about 0.5nm rather than the reported 150ft. The decision to manoeuvre in altitude was sensible, particularly in light of the apparent compensating turns. The incident highlights the known issue with cockpit obstructions in any ac and reemphasises the need to move the head when looking out and/or altering flight path to expose conflicting ac on a collision course that may be hidden behind such obstructions.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was apparent to the Board that ATC played no part in this Airprox; the Squirrel was operating autonomously, whilst approaching the Class D CTR to transit through the low-level route, where there is special provision for pilots to transit this 4nm wide route under VFR without an individual ATC clearance. The Tiger Moth pilot reports he was intending to land at Barton, having departed from Liverpool, so it seemed that he had not just cleared the route; however, the ac did fly further to the N after the Airprox had occurred. Whilst the Tiger Moth crew was plainly also entitled to be operating in this vicinity, Board Members were surprised that the instructor had chosen the natural choke point of the northern entry point to the route to conduct GH instruction. This seemed unwise and this Airprox was a good example of what can happen when pilots are closely focussed on their individual tasks – perhaps to the detriment of all-around lookout.

As it was, both ac were just outside the northern boundary of the CTR in Class G airspace with both pilots equally responsible to ‘see and avoid’ other ac in the vicinity. In this situation, however, the Tiger Moth crew had the helicopter to their R and in accordance with the Rules of the Air were required to ‘give way’ to the Squirrel. The GA Member stressed the poor lookout from the front seat of the Tiger Moth – the rear seat is better – and the difficulties of communicating in an open cockpit, but it is evident that neither the instructor in the Tiger Moth nor the student PF saw the helicopter at all - possibly as a result of the inherent limitations caused by the biplane’s configuration. Given these limitations, and the proximity to the low-level corridor, the GA Member opined that more attention should have been given by the Tiger Moth pilot to clearing their air ahead. The HQ AAC Member emphasised that lookout from the Squirrel helicopter is not particularly good either, and he reinforced the importance of pilots continually moving their heads, coupled with moving the ac, to clear airframe blind spots regularly. Nonetheless, the Command considered that the Squirrel crew might have seen the Tiger Moth a little earlier than the pilot had estimated; this was based on the helicopter’s manoeuvre as evinced by the radar recording just as the range between the two ac returns decreased from 0.4 - 0.2nm. The Board was briefed that the weak primary contact of the Tiger Moth did exhibit some ‘track jitter’ on the recording and the radar data was incomplete with a number of returns missing – which was not surprising from the fabric covered aeroplane - the open white square on the diagram representing a predicted position for the Tiger Moth just before the two ac passed very close indeed, but certainly less than 200yd apart. Although the Squirrel pilot perceived the Tiger Moth’s manoeuvres to be avoiding action, the Tiger Moth pilots were completely unaware of the Squirrel. The Board concluded, therefore, that this Airprox was the result of a non-sighting by the Tiger Moth pilots and a late sighting by the Squirrel crew.

While there was no reason to doubt the Squirrel pilot’s estimate of 50ft vertical separation, the lack of any Mode C from the Tiger Moth did not enable the vertical separation to be confirmed independently. Fortunately, the Squirrel pilot’s robust avoiding action turn and descent proved wholly effective and he was able to remain clear of the other ac despite the Tiger Moth student’s manoeuvres. Nevertheless, the Board concluded unanimously that at these close quarters, with only one crew aware of what was happening, the safety of the ac involved had been compromised in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the Tiger Moth pilots and a late sighting by the Squirrel crew.

Degree of Risk: B.