

ASSESSMENT SUMMARY SHEET FOR UKAB MEETING ON 21 APRIL 2010

Total: 17

Risk A: 1

Risk B: 1

Risk C: 15

Risk D: 0

<u>No</u>	<u>Reporting</u>	<u>Reported</u>	<u>Airspace</u>	<u>Cause</u>	<u>Risk</u>
2009-109	ASW28-19E (CIV)	PA28 (CIV)	G	Apparent non-sighting by the PA28 pilot and effectively a non-sighting by the ASW28 pilot.	A
2009-111	CP1310 Super Emeraude (CIV)	C152 (CIV)	G	Effectively a non-sighting by the C152 pilot and a late sighting by the Emeraude pilot.	B
2009-120	BE200 (MIL)	Tornado GR4 (MIL)	G	Sighting Report (TCAS)	C
2009-126	Hawk T Mk1 (MIL)	Hawk T Mk1 (MIL)	G	Conflict in the LFS resolved by the crew of Hawk (B). Contributory Factor: A breakdown in a recently introduced deconfliction procedure.	C
2009-127	Sea King Mk3 (MIL)	Hawk T Mk1 (MIL)	G	Having not been informed that the RIFA was active, the Hawk crew flew into conflict with the Sea King. Recommendation: RAF Valley procedures for the notification of RIFA status should be reviewed.	C
2009-130	Bell 206 (CIV)	Vans RV8 (CIV)	G	The ADC did not provide Traffic Information to either pilot in the ATZ. Recommendation: That the Aerodrome Operator should review the Shoreham Aerodrome AIP entry regarding helicopter operations.	C

2009-132	RA390 Premier 1 (CIV)	Untraced Paraglider (N/K)	G	A conflict in Class G airspace resolved by the Premier 1 pilot.	C
2009-133	Slingsby T59D (CIV)	Cessna C303 (CIV)	G	A non sighting by the C303 pilot and late avoiding action by the T59 pilot.	C
2009-134	Gulfstream 5 (CIV)	Europa (CIV)	G	Sighting Report.	C
2009-136	B737-700 (CAT)	R44 (CIV)	D	Sighting Report (TCAS).	C
2009-138	Do328 (CAT)	Harrier (MIL)	A	The Harrier formation leader descended below his cleared Flight Level.	C
2009-141	Paraglider (CIV)	Sea King Mk4 (N/K)	G	The Sea King crew flew close enough to the paraglider to cause its pilot concern.	C
2009-142	Apache (MIL)	Enstrom 480B (CIV)	G	The Enstrom pilot flew close enough to the Apache to cause its crew concern.	C
2009-143	DHC-8 (CAT)	C152 (CIV)	D	The Dash 8 crew was cleared to fly a visual approach without a height restriction, which resulted in a conflict with the C152.	C
2009-145	Cessna 152 (CIV)	Bell 430 (CIV)	G	The Bell 430 pilot flew sufficiently close to the C152 to cause its pilot concern.	C
2009-146	A320 (CAT)	B737-500 (CAT)	A	The Air North mentor did not comply with the Heathrow MATS Part 2 procedures.	C

2009-151	Lockheed Tristar (MIL)	B767 (CAT)	D/G	<p>The ADC passed an ambiguous clearance to the B767 crew, which resulted in a conflict with the Tristar.</p> <p>Contributory Factor: The B767 pilot's first call reporting their cleared level was not assimilated by APP.</p> <p>Recommendation: The MoD should request a review of the instructions in CAP413 about the passing of climb-out restrictions.</p>	C
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AIRPROX REPORT No 2009-109

Date/Time: 5 Sep 1300 (Saturday)

Position: 5214N 00009W (4nm
NNW of Gransden Lodge
GS)

Airspace: London FIR (Class: G)

Reporting Ac Reported Ac

Type: ASW28-18E PA28

Operator: Civ Pte Civ Pte

Alt/FL: 3550ft 2500ft
QNH QNH

Weather: VMC VMC

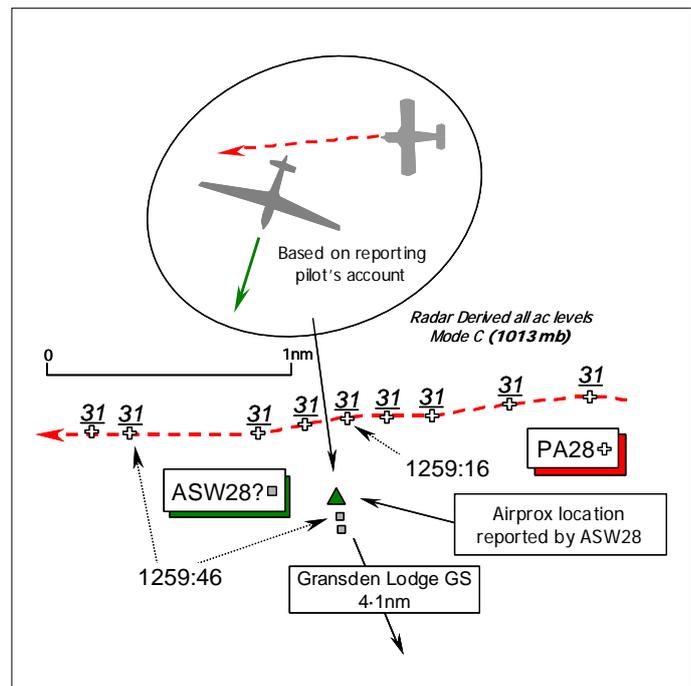
Visibility: >20nm 20nm+

Reported Separation:

20ft V/Nil H 100m V/300m H

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SCHLIECHER ASW28-18E GLIDER PILOT reports departing from Gransden Lodge glider launching site whilst operating on the gliding common frequency of 130.4MHz. At the co-ordinates given [52°14'31"N 000°09'22"W] - about 342°(M) Gransden Lodge 4.1nm - heading 195° at 40kt some 700ft below cloud in a level cruise at 3550ft amsl, a powered aeroplane was heard, so lookout was intensified whilst trying to locate it. A single engine aeroplane was spotted as it passed some 20ft below the glider - flying in from 8 o'clock before clearing away at 2 o'clock - with a 'high' risk of collision. The blue and white aeroplane appeared to be flying straight and level or possibly climbing; no avoiding action was taken.

THE PIPER PA28 PILOT reports he was in transit between Tibenham and Gloucestershire in his blue and white aeroplane. He thought he was in receipt of a FIS [Basic Service] from either Lakenheath or London INFORMATION; SSR was selected on with Mode C. Mode S is not fitted.

In a level cruise flying at an altitude of about 2500ft, he thought, heading 260° on a bearing of 100° from the GST NDB, at 108kt he became aware of a glider passing from port to starboard [sic] about 500m ahead and about 50m [sic] above his ac. He initiated a descending L turn to avoid the glider, which passed astern about 100m above him and about 300m away. As he turned he saw a second glider following the first that he passed in front of with greater separation. He recalled that he had been monitoring a military tanker ac on his port side around the time the Airprox occurred. The Risk was assessed as 'none'.

UKAB Note (1): The UK AIP at ENR 5-5-1-2 promulgates Gransden Lodge Glider Launching Site situated at 52° 10' 41"N 000° 06' 53"W as active from Sunrise to Sunset (HJ). Gliders may be encountered up to 3000ft above the site elevation of 254ft amsl launched by Winch or Aerotow Tug ac.

UKAB Note (2): An analysis of the Debden, Stansted and Heathrow radar recordings was inconclusive as the Airprox is not shown. The PA28 is evident as both a primary and secondary contact on the Debden recording, squawking A1177 – London AC Swanwick – whilst maintaining a westerly course. The PA28 is shown in a level cruise at 3100ft unverified Mode C (1013mb) – about 3370ft QNH (1022mb) and broadly 180ft below the ASW28 pilot's reported altitude of 3550ft amsl. At

1259:16, the PA28 approaches a point 0.33nm N abeam the location reported by the ASW28 pilot, albeit 46sec before the reported Airprox time. The PA28 turns slightly L as reported, however, no descent is apparent from its Mode C. No other contacts that could be associated with the ASW28 glider are evident until 1259:46, when a primary contact is shown marginally to the S of the reported location. One further primary contact is shown on the next sweep that might be the subject ASW28 glider, before the contact fades. It is not possible to resolve the apparent anomaly of the reported geometry of this encounter: the PA28 pilot reported sighting a glider crossing ahead from port to starboard, whereas the ASW28 pilot reports heading 195° as the reported aeroplane passed underneath from 8 o'clock to 2 o'clock.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was unfortunate that the anomalies within this report could not be readily resolved. Whilst the PA28 was heading 260°, the glider, reportedly heading 195°, should have been passing from R to L of it. However, the PA28 pilot reported that the glider he saw had passed from L to R about 500m ahead and about 50m above his ac. That the PA28 was the aeroplane involved seemed to be in no doubt; the colour matched and the radar recording had shown the ac passing marginally to the N of the reported location of the Airprox in a level cruise on the heading reported. Whilst Members were cognisant of the tolerances applicable to Mode C indications – generally +/-200ft to be verified correct - the PA28 was shown at an equivalent altitude of about 3370ft QNH (1022mb) - some 180ft [-55m] - below the ASW28 pilot's reported altitude of 3550ft amsl. This tied in with the separation reported by the PA28 pilot but not his reported transit altitude of 2500ft. On balance it seemed that the PA28 pilot might well have reported a different occurrence at another location to that reported by the ASW28 pilot. The PA28 would certainly not have been on a bearing of 100° from the GST at the actual Airprox location. Furthermore, his comment about seeing a military tanker off his port side suggested he was describing an incident elsewhere, possibly nearer to Brize Norton, as there was no military tanker shown on the radar recording anywhere to port of his track as he passed the Airprox location. Some Members considered that it was difficult to come to meaningful conclusions when faced with such conflicting details, not least the glider pilot's estimation of 20ft vertical separation was markedly different to that of the PA28 pilot. A CAT pilot Member, who was also a glider pilot, opined that, in general, glider pilots are accurate judges of narrow separation as they are used to being in close proximity to other ac, such as during an aerotow. Conversely, a CAT pilot Member considered that the PA28 pilot would have been bound to see the glider if it had passed only 20ft away. However, the GA pilot Member opined that white gliders against background cloud are not easy to spot, and the Board was certainly well aware from previous reports of the difficulties of acquiring gliders visually.

Irrespective of the conflicting details reported, it was plain that this Airprox in the see and avoid environment of Class G airspace was fundamentally a lookout issue. Therefore, the Board concluded that part of the Cause was that the PA28 pilot had probably not seen the ASW28 glider flown by the reporting pilot – an apparent non-sighting on the PA28 pilot's part. Furthermore, the PA28 had approached the ASW28 from behind the port wing and had not been seen by the glider pilot in time for him to take any effective avoiding action. The Board also concluded, therefore, that an effective non-sighting by the ASW28 pilot was the other part of the Cause.

The Board was divided over the issue of the inherent Risk. Some Members suggested that whilst it seemed that neither pilot had seen the other's ac in sufficient time to take avoiding action, the evidence of the radar recording was sufficient to show that vertical separation was in the order of 180ft. This led them to conclude that safety was not assured. Other Members were not convinced; they considered the glider pilot's estimate of 20ft vertical separation had not been contradicted by the radar data because of the tolerances applicable to Mode C. Because of these conflicting opinions, it was concluded by a majority vote that there was an actual Risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Apparent non-sighting by the PA28 pilot and effectively a non-sighting by the ASW28 pilot.

Degree of Risk: A.

AIRPROX REPORT No 2009-111

Date/Time: 25 Sep 1325

Position: 5026N 00431W (18nm E
Newquay)

Airspace: FIR (Class: G)

Reporting Ac Reporting Ac

Type: CP1310 C152
Super Emeraude

Operator: Civ Pte Civ Club

Alt/FL: 1900ft 1700ft
(RPS 1025mb) (QNH 1029mb)

Weather: VMC CLBC VMC CLBC

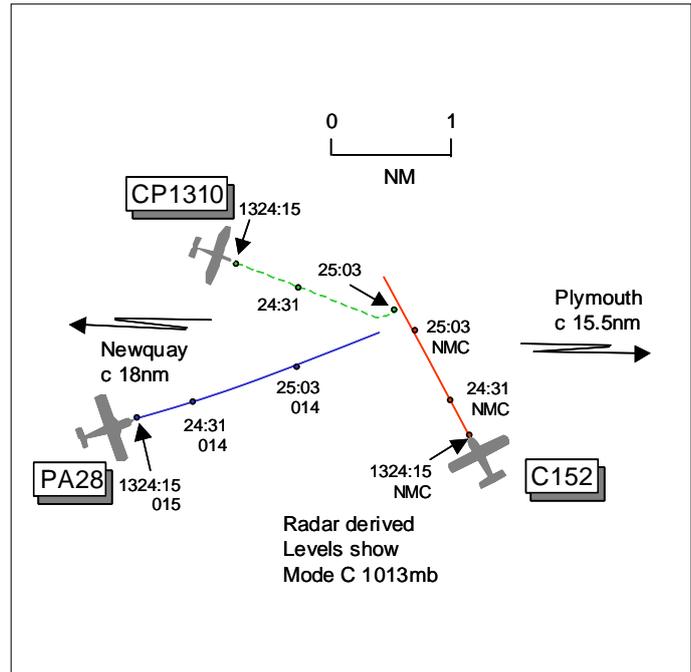
Visibility: >10km 10km

Reported Separation:

Nil V/<50m 80ft V

Recorded Separation:

NR



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CP1310 SUPER EMERAUDE PILOT reports en route to Compton Abbas VFR and in receipt of a BS from Newquay on 133.4MHz; no transponder was fitted. The visibility was >10km flying 100ft below cloud in VMC and the ac was coloured yellow/white; no lighting was fitted. Heading 090° at 90kt and 1900ft RPS 1025mb he was alerted by ATC to PA28 traffic in his 4 o'clock position, which he acquired visually on a converging course and overtaking his ac fairly rapidly at a similar level, or slightly higher. The PA28 kept disappearing behind clouds so it was difficult to track and it was taking up a lot of his attention as he decided whether or not to alter his flightpath to deconflict. As he watched this ac, ATC called possible pop-up traffic, a Cessna, in his vicinity. He looked forward and the front RHS of the windscreen was filled with Cessna, about 100m away at the same level, crossing obliquely (towards) from R to L. He instinctively rolled hard L (almost inverted - 150° AOB) and pulled to establish a rapid descent and turn away, estimating separation of <50m as he lost sight of it during the manoeuvre. Shortly after this he reported the Airprox to Newquay. He assessed the risk as very high. Having undertaken his initial flying training in the RAF he was disappointed that he had not spotted the Cessna earlier, having concentrated on the PA28 which had led to a breakdown in his scan for other traffic. He commended the Newquay APR, for had the controller not called the Cessna (not required under a BS) he would not have looked forward and believed he would have collided with it.

THE C152 PILOT reports a student first solo Navex away from the Bodmin cct VFR routing to Fowey, Looe, Boscastle and Wadebridge at 1700ft QNH 1029mb and in receipt of a BS from Newquay Approach on 133.4MHz squawking 1743. The visibility was 10km flying 100ft below cloud in VMC and the ac was coloured white/blue with anti-collision light switched on. The frequency was quite busy with frequent calls from numerous flights. The Airprox occurring on the Looe to Boscastle leg about 5nm N of Looe. Heading 340° at 90kt he was concentrating on flying straight and level when he saw a flash of something in his 10 o'clock at the same height. He glanced to see an Emeraude ac about 80-100ft away invert and dive underneath his ac by about 80ft, watching it then through the RH door window in his 4 o'clock as it dived towards the ground, turned and pulled out level. There was then a call on the radio from a pilot stating he was going to file an Airprox. Shortly

after this Newquay requested his height, which was 1700ft, and was told that there were 2 other ac in the vicinity at 2000ft. He assessed the risk as high. Later he spoke to the Radar controller by telephone and was told that his ac could not be seen on radar at the time and it was 25nm from the radar head. He also spoke to the other pilot post flight who told him that he had been looking over his shoulder for a known converging ac and on looking ahead he had seen his C152 and taken avoiding action. This experience had taught him that when there is a low cloudbase, light ac will generally fly just under it, hence the possibility of an encounter. Also, this likelihood is increased by a pilot's visibility being affected by bright sunlight under certain conditions. The lesson seems to be for everyone to keep a good lookout at all times, all around, and not to fixate on any known ac that may be converging and listening out on the radio and understanding what is around. He believed that in the open FIR it would be a good idea to make regular calls advising position, height and heading to let other traffic know your flightpath. Owing to terrain, there are significant areas where radar coverage is affected, so that ac will not be displayed below certain heights. Lastly, the overall vision from the C152 cockpit is obscured by 2 x 6" wide portions of ac structure either side of and just ahead of the pilot's field of view.

THE NEWQUAY APR reports working a busy session of mainly VFR BS traffic including both subject ac. The Emeraude was heading towards Plymouth whilst the C152 was a student pilot on an E Cornwall Navex. The C152 disappeared from radar about 15nm SE of Newquay and the Emeraude was not identified but a primary radar return was present in the expected position and track. Another light ac was suspected to be close to the Emeraude and TI was passed to both pilots who reported visual. Immediately afterwards the SSR label of the C152 popped-up in front of the Emeraude, 12 o'clock range 1nm. TI was passed to the Emeraude pilot who did not respond so TI was repeated, following which the pilot reported an Airprox after avoiding the C152. Later, the C152 pilot confirmed that he had seen the Emeraude fly below his ac.

The Newquay METAR shows EGHQ 251320Z 29011KT 9999 SCT034 14/11 Q1028=

UKAB Note (1): Met Office archive data shows the Plymouth METAR as 1320Z EGHD 251320 32004KT 270V020 9999 BKN032 16/11 Q1029=

ATSI reports that the incident took place about 18nm E of Newquay Airport in Class G airspace. At 1310:48, the C152 flight established communications with Newquay Radar. The student pilot reported he was, *"...on a nav exercise from Bodmin to Bodmin via Fowey Looe Boscastle Wadebridge not above two thousand feet request Basic Service please (C152 c/s)"*. The Newquay Radar controller instructed the flight to squawk 1743 and confirmed the provision of a BS, which was read back. When the squawk was selected, the Burrington radar recording shows the ac about 2.5nm S of Bodmin aerodrome, with NMC being displayed. It was already on the first leg, S to Fowey after which it would route E to Looe and then turn NNW to Boscastle, SW to Wadebridge and thence to Bodmin.

The Emeraude departed from RW30 at Newquay, at 1311, on a VFR flight to Plymouth, which is broadly an E'ly track. One minute later, the pilot reported on the Radar frequency and requested a BS, not above 2000ft. Newquay Radar confirmed the BS, issued the Newquay QNH 1028mb and provided *"if required"* the Wessex RPS 1025mb. The pilot read back the Wessex RPS value. No squawk was issued, as the ac was not transponder equipped.

Details of a BS appear in MATS Part 1, Section 1 and is defined as *'...an ATS provided for the purposes 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.'* Also, *'A controller may identify an aircraft to facilitate co-ordination or to assist in the provision of generic navigational assistance, but is not required to inform the pilot that identification has taken place'* and *'Pilot's should not expect any form of traffic information from a controller, as there is no such obligation placed on the controller under a Basic Service outside an Aerodrome Traffic Zone (ATZ), and the pilot remains responsible for collision avoidance at all times. However, on initial contact the controller may provide traffic information in*

general terms to assist with the pilot's situational awareness. This will not normally be updated by the controller unless the situation has changed markedly, or the pilot requests an update. A controller with access to surveillance derived information shall avoid the routine provision of traffic information on specific aircraft, and a pilot who considers that he requires such a regular flow of traffic information shall request a Traffic Service. However, if a controller considers that a definite risk of collision exists, a warning may be issued to the pilot.'

At 1313, Newquay Radar advised the Emeraude flight that it was not showing on radar and passed generic TI on an ac in the area. This exercise was repeated at 1315 in respect of other traffic, the Emeraude again advised it was not seen on radar. At 1315:50, a level report was requested of the Emeraude, the pilot reporting "...nineteen hundred on the Wessex". Nothing relevant took place until 1324:17, when Radar provided TI to a PA28, (not involved in the incident) which was E'bound towards Plymouth, under a BS from Newquay. It followed an enquiry from its pilot about Plymouth LARS "c/s I believe Plymouth Mil are actually closed currently believed to be you have traffic north er east north range of one mile eastbound that's an Emeraude possibly one thousand nine hundred feet". Once this was acknowledged, the Emeraude was addressed (1324:30) "(c/s) traffic possibly you have traffic to the south one mile similar track P A twenty eight level unknown", the pilot replying "Visual (c/s) just passing this time". TI so specific can introduce a level of blurring between individual Services under ATSOAS. This is cautioned against in the FIS guidance published in MATS Part 1, Section 1 Chapter 11, Page 3, Paragraph 2.8 Standard Application of Service. 'Fundamental to the provision of the UK FIS outside controlled airspace is the standard application of the services to prevent the boundaries between the services becoming confused. Agreement to provide a service and acknowledgement of that level of service by a controller and pilot respectively, establishes an accord whereby both parties will abide with the definitions of that service as stated herein. Once an accord has been reached the controller shall apply that service as defined. If a pilot subsequently requires elements of a different service, a new accord shall be negotiated. Where there is a need for local procedures to be promulgated that are at variance to these procedures, these will be subject to CAA approval. By incorporating elements of another service to that agreed, there is a danger that pilots will come to routinely expect those elements as a part of that service. This could lead to pilots requesting an inappropriate service for the flight profile or flight conditions in the future. Therefore, pilots should not expect, nor ask, controllers to provide any element of another service; likewise, controllers should not offer nor provide elements of any other services.'

About 20sec later, at 1325:02, further TI was passed to the Emeraude pilot. This time, in respect of the subject C152, which the Radar controller later reported had just reappeared. He transmitted to the Emeraude, "(c/s) caution one er Cessna one five two possibly in your vicinity"; there was no response and Radar transmitted again, "(Emeraude c/s) Newquay one Cessna one five two just popped up in your vicinity to the east", to which the pilot responded, "Yeah Emeraude c/s's just taking avoiding action". The C152 was then given TI, "(c/s) caution two aircraft in your vicinity heading eastbound er altitude approximately two thousand feet". This was acknowledged and then the Emeraude pilot reported he would like to file an Airprox "on that" at time two five. Notwithstanding the guidance, above, about ensuring clarity between Services, the final action taken by Radar, would appear to fall within the guidance where a warning may be issued where it is considered a definite risk of collision exists (see BS: TI).

The Burrington radar recording shows that when the Emeraude flight was given TI on the PA28 (1324:30) it had adopted a SE'ly track with the C152 in its 12:30 position range 1-6nm. Thereafter the Emeraude's primary return becomes intermittent and the track irregular. However, by the time Radar issued the first, and unanswered, transmission of TI to the Emeraude flight on the C152, the former appears to have adopted a NE'ly track. The transmission started at 1325:02 and the radar picture at 1325:03 shows the C152 converging with the Emeraude from 3 o'clock at 0.3nm. By the next sweep, 8sec later, the primary return of the Emeraude has disappeared. It does not reappear until almost 2min later.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Looking at the controller aspects of this incident first, Members considered the amount of TI passed by the Newquay APR to the ac under his control under a BS. As highlighted in the ATSI report, Members were acutely aware of the possible blurring of services which could lead to pilots under a BS working a radar equipped ATSU believing that they may be getting a 'better' service than they actually are. However, the Board agreed that, because their ac were on converging/conflicting flight paths, the TI given to the Emeraude and PA28 pilots had been timely and appropriate. Moreover the TI then passed to the Emeraude pilot on the pop-up C152 immediately ahead, where an actual risk of collision existed, was considered 'best practice' and should be commended. An ATCO Member commented that the traffic levels usually regulate the amount of information exchanged on any frequency; i.e. a busy ATCO would not have the capacity to give BS flights TI owing to his attention being taken up with other flights some of which may have a higher priority (TS or DS). Owing to the location of this incident, where ATSUs are spread widely, it was likely that most of the traffic would be working the same unit on the same frequency so pilots should be able to obtain good SA from the RT exchanges. In other areas with more available ATSUs this mental 'air picture' can be diminished because traffic can be under an ATS from different units in the same piece of airspace. A lesson identified from this incident is that irrespective of the type of service being received under ATSOCAS, in Class G airspace pilots should maintain a good lookout scan for conflicting traffic at all times. Turning to the piloting aspects, the scenario had evolved because the pilots had chosen to fly just below the prevailing cloudbase. Subject to local terrain constraints, a pilot Member opined that best practice would be to select a cruising altitude several hundred feet below cloud thereby allowing pilots a better chance at detecting other ac and giving more options of avoiding them. The Emeraude pilot had allowed himself to become focussed on the PA28 converging from his R to the detriment of his lookout scan. This had led to his late sighting of the C152 crossing from R to L which was a part cause of the Airprox. The student C152 pilot had an equal responsibility to 'see and avoid' other traffic but only saw the Emeraude as a 'flash' before it passed, too late for him to take any avoiding action which Members agreed had been effectively a non-sighting and the second part of the cause.

Considering the risk, the Emeraude pilot's prompt and robust action was thought to have been just enough to remove the actual collision risk but the ac passed in such close proximity, with the C152 unsighted during the manoeuvre, that the Board concluded that safety has been compromised during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively a non-sighting by the C152 pilot and a late sighting by the Emeraude pilot.

Degree of Risk: B.

AIRPROX REPORT No 2009-120

Date/Time: 28 Sep 1017

Position: 5352N 00107W (19nm E
Leeds/Bradford)

Airspace: AIAA (Class: G)

Reporting Ac Reported Ac

Type: BE200 Tornado GR4

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

Alt/FL: FL90 FL90

Weather: VMC CLAC VMC CLNC

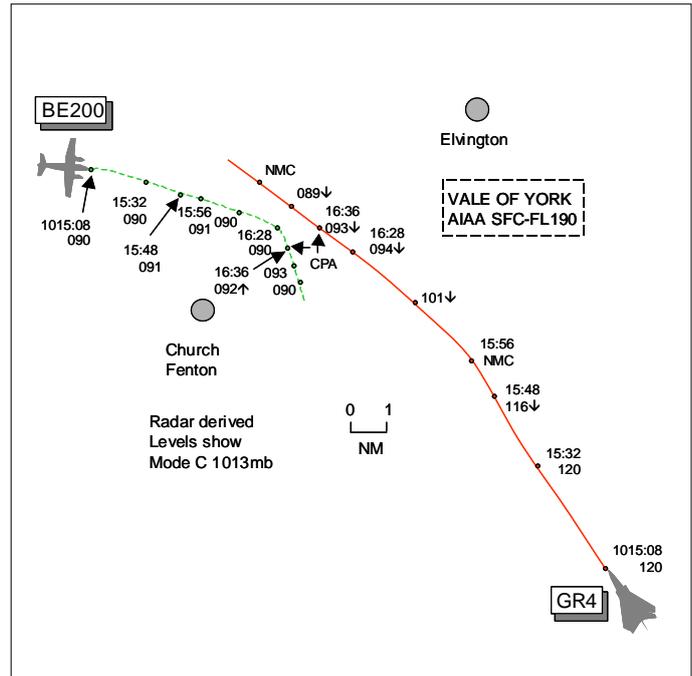
Visibility: >40km 40km

Reported Separation:

NR No problem

Recorded Separation:

100ft V/1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BE200 PILOT reports heading 100° at 200kt and FL90 after a practice diversion to Leeds/Bradford airport, squawking 7000 with Modes S and C. They were in VMC, 5000ft above cloud with >40km visibility on quiet frequency Stud 7 to facilitate a 'hot debrief' prior to contacting Linton Zone for a TS for their recovery to Cranwell. A TCAS TA was issued on traffic on the nose at about 4nm above their ac and this was followed shortly afterwards by RA commands of "climb, climb now", "monitor v/s", "descend", "increase RoD" and "clear of traffic". These commands were given in quick succession and lasted for total duration of 8-10sec. He took control of the ac, disengaged the A/P and attempted to comply with the multiple RA commands – max performance climb, momentary descent and level-off. Owing to the short duration and changing nature of the TCAS commands it was impossible to comply with them all completely. Despite a prolonged visual search by both pilots for the conflicting traffic (initiated immediately on receipt of the TA alert) the other ac remained unsighted to either crewmember. As they were not visual with the other ac at any point and unaware whether they were sighted to the other pilot, it was not possible to visually assess the risk of collision. However, owing to the frequency and urgency of the TCAS RA commands against unsighted traffic, he assessed the risk of collision as medium. The Airprox was declared to Linton Zone immediately after the occurrence.

THE TORNADO GR4 PILOT reports descending to low-level under a TS from Linton Zone, squawking an assigned code with Mode C. The visibility was 40km in VMC with no cloud. When close to the Linton O/H heading 330° at 400kt he was advised of traffic on his L which he could see, having been levelled at FL90, he thought, until visual. The traffic was not close enough to be even considered a problem. Once visual he continued his descent to low-level as the Wx in the area was VMC and he was in sight of the surface. He remained with Linton until established at low-level, just W of the MATZ, in the area of Knaresborough.

DAATM reports that the GR4 was conducting a medium level descent to low-level under a TS with Linton Zone (Zone) on frequency 235.2 MHz, squawking 4534 with Mode C. The descent was stopped at 9500 ft QFE 1022mb due to unknown traffic indicating FL090. The unknown traffic was a BE200 squawking 7000 with Mode C. The BE200 subsequently reported the Airprox on the LARS VHF frequency 118.55MHz.

The GR4 was handed to Linton Zone by LATCC (Mil) for a low-level let down in the Harrogate lakes area to the W of Linton-on-Ouse at 1015:09, 'Linton Zone Good Morning GR4 c/s on handover'. Zone replied, 'GR4 c/s Linton Zone Good Morning identified FL120 Traffic Service report ready for descent'. The GR4 pilot replied, 'FL120 Traffic Service ready for descent c/s'. Zone acknowledged and instructed the GR4 pilot to set the Linton QFE 1022mb, which was acknowledged correctly by the pilot. At 1015:28 Zone passed TI, 'GR4 c/s traffic left 11 o'clock one zero miles crossing left to right indicating FL090 descending (there is a brief pause) descend to height 9500ft report approaching, report Victor Mike Charlie below'. The pilot replied '9500ft wilco GR4 c/s'. At 1015:43 the GR4 is given a positioning turn, 'GR4 c/s for continuous descent and to remain clear of the Linton radar overhead turn left heading 300 degrees'. The GR4 pilot acknowledged the heading change before Zone updated the TI at 1015:58, 'GR4 c/s previously reported traffic is left 11 o'clock 5 miles crossing left to right now indicating FL090'. The TI was also acknowledged prior to the GR4 pilot reporting visual with the traffic at 1016:27, 'GR4 c/s visual with that traffic now we'd like further descent please'. Zone replied at 1016:30 'GR4 c/s roger descend to height 3000ft report Victor Mike Charlie below' which was read back at 1016:36 as, '3000ft wilco GR4 c/s'.

[UKAB Note (1): The radar replay using the Claxby radar head captures the incident. When initial TI on the BE200 was passed to the GR4 pilot (1015:28) the radar range shows 12.9nm and this has reduced to 7nm when the second TI was given (1015:58). The GR4 pilot reported visual at a range of 2.1nm. The CPA occurs at 1016:36 as the ac pass port to port, the BE200 having executed a 30° R turn tracking 165° and climbing through FL092, passing 1nm SW of the GR4 which is descending through FL093.]

The Linton Zone controller provided accurate and timely TI and also built in some height separation between the GR4 and the unknown BE200, albeit only 230ft. Although not obliged to build in height separation under a TS the controller recognised the possible confliction and acted accordingly within the remit of CAP776.

HQ AIR (TRG) comments that this incident occurred in the Vale of York AIAA, Class G airspace. Having received TI the Tornado GR4 pilot became visual with the BE200 before the CPA and did not consider that avoiding action was required. The crew of the BE200 had received a TCAS TA and were aware that an ac (the GR4) was on the nose but at no time through out the incident did they become visual. Consequently, when the TCAS TA became rapidly changing RA commands, that they could not physically comply with, against an ac they could not see, the crew were quite concerned. Had the BE200 crew been in receipt of an ATS as they flew in the AIAA their SA may have been more complete.

HQ AIR (OPS) comments that this report was caused by the BE200 crews inadequate lookout and the pilot choosing to operate on a quiet frequency with no TS. The BE200 was correctly called to the GR4 who had it in sight and gave it due consideration and separation. If the BE200 had been in receipt of a TS or had maintained a better lookout this incident would have been avoided.

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.

A military pilot Member informed the Board that the BE200 crew had elected to fly within the Vale of York AIAA without obtaining an ATSOCAS from an ATSU contrary to the recommendation in the Mil AIP [ENR 5-2-8]. Members thought that without the benefit of an ATS, the crew's SA was diminished and believed that their lookout responsibilities were probably degraded whilst carrying out a 'hot-debrief', a task which could have been completed after landing. Although the Board recognised the value of a 'hot-debrief', they considered that this value was outweighed by the risk associated with flying through the AIAA without ATSOCAS. In discussing the L turn instruction from Linton Zone to the GR4, the Mil ATC Advisor stated that the action taken by Linton Zone, turning the GR4 onto a

radar heading to remain clear of the radar O/H and traffic in the Linton cct was SOP. However, the stop-off level issued was more than was required under a TS. Having asked the GR4 pilot to set QFE for his descent but then noticing the BE200 at FL90, Zone had endeavoured to provide some level of deconfliction by issuing descent to an intermediate level of 9500ft; it was unclear whether Zone had calculated that 9500ft QFE was just 230ft above the BE200 at FL90 as the controller may have arbitrarily picked 9500ft as, in the short time available, it 'appeared' to provide 500ft separation. Also, Members wondered whether the stop-off had exacerbated the situation, as had the GR4 been given a continuous descent it may have been already well below and clear of the BE200 as they became close laterally.

One pilot Member was keen to highlight 2 major aspects of this incident. First, the scenario of a non-TCAS equipped ac, the GR4, pointing towards the BE200, which is fitted with TCAS. The ACAS equipment is continuously calculating time to CPA and will issue alerts/warnings if safety margins/limits are breached. The GR4 was given a vector by Zone which pointed it towards the BE200, although the controller would have not been aware of the BE200's type and ACAS fit, the ac just appearing as a squawking radar return in potential confliction. Second, the BE200 crew was trying to comply with rapidly changing RA commands, their ac being a relatively low-performance type compared with the high performance GR4, whose pilot was taking visual separation. This situation can produce RA demands that are very difficult and potentially hazardous for the BE200 crew to attempt to follow. The lesson identified here was the need for controllers and pilots to assume that conflicting traffic is TCAS-equipped and give it a sufficiently wide berth to avoid triggering a TCAS RA if the ac is so equipped.

Both BE200 pilots were undoubtedly concerned as they were unable to visually acquire the GR4 after the TCAS TA was generated. Thereafter they were then busy trying to follow the rapidly changing TCAS RA demands triggered by the GR4, unaware of its pilot's visual acquisition and avoidance. Had the BE200 crew been in receipt of a radar service, as recommended, Members were sure that an early heads-up on the approaching GR4 with its intentions would have significantly increased their SA and reduced the surprise element of this brief encounter in Class G where 'see and avoid' pertained. For his part, the GR4 pilot was twice given good TI by Zone on the BE200 and he saw it shortly after receiving the second TI at over 2nm range. Content with the separation that pertained, the GR4 pilot requested further descent, which was approved, unaware of the BE200 crew's concerns and subsequent actions. These elements were enough to allow the Board to conclude that this incident was a sighting report (TCAS) and that no risk of collision had existed during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report (TCAS).

Degree of Risk: C.

AIRPROX REPORT No 2009-126

Date/Time: 18 Aug 1548

Position: 5254N 00351W (River Prysor Valley - 6nm SE Blaenau Ffestiniog)

Airspace: UKDLFS- LFA7 (Class: G)

Reporting Ac1 Reporting Ac2

Type: Hawk T Mk1 Hawk T Mk1

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

Alt/FL: 350ft 250ft
msd msd

Weather: VMC CLOC VMC CLOC

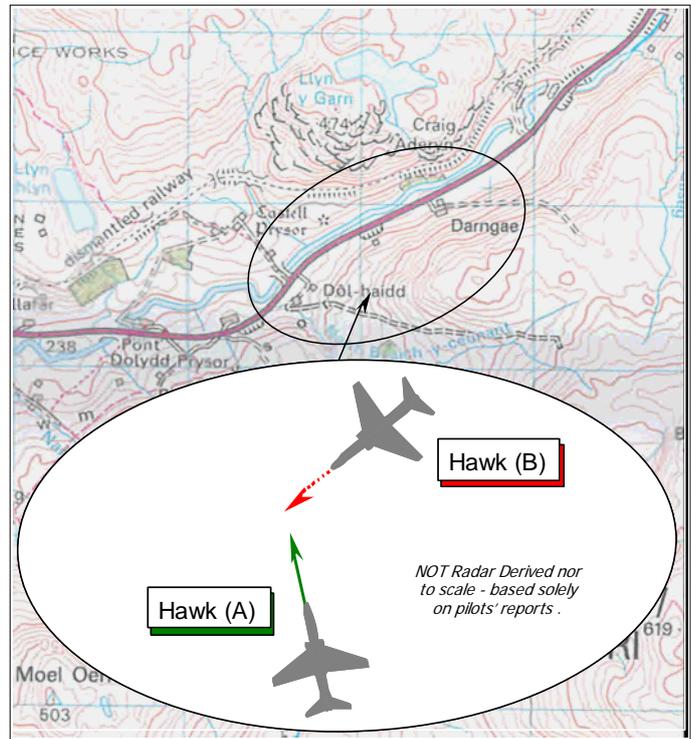
Visibility: Good Good

Reported Separation:

600ft H 250ft V

Recorded Separation:

Not recorded



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PILOT OF HAWK T Mk1 (A), a QFI, reports that he was flying an instructional sortie at low level towards the A5 pass for recovery to Valley at 420kt, but was not in receipt of an ATS. Operating on the UHF LFS frequency of 278.0MHz [whilst also monitoring 142.775 MHz, a Valley private frequency] they were flying in VMC under VFR with a good horizon and in good visibility. Heading 350° pitched 5° nose-down at 350ft msd, another Hawk was seen late in their R 1 o'clock about 900ft away crossing from R – L flying in a westerly direction and some 50ft below his ac. Minimum horizontal separation was about 600ft. Surprised to see another ac at that range, subsequently, he learned that the crew of the other Hawk was visual with his ac so, with hindsight, no danger was present and he assessed the Risk as 'low'. An Airprox report was subsequently filed with the Station Flight Safety Officer.

Neither Mode S, TCAS nor any other form of CWS is fitted. A squawk of A7001 was selected with Mode C. His ac has a black colour scheme; the HISLs and nose light were on.

THE PILOT OF HAWK T Mk1 (B), a QFI, reports that he was operating VFR in VMC, not in receipt of an ATS, but listening-out on 300.8MHz and 142.775 MHz [both Valley private frequencies] whilst in a low-level cruise at 250ft msd heading 230° at 420kt. The PNF spotted a Hawk [Hawk (A)] in their 10 o'clock position about 1nm away crossing over a valley ridge - the valley in which he was flying. This resulted in both his ac and Hawk (A) flying on crossing tracks approximately 90° apart. The pilot-in-command – the PNF - informed the PF of Hawk (A)'s presence and the conflict. To avoid a collision the PF reduced their height but maintained their heading to pass vertically clear beneath Hawk (A) by 250ft. He called the pilot-in-command of Hawk (A) after landing and a report was submitted through the Station Flight Safety Officer.

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

THE HAWK PILOTS' UNIT commented that this situation occurred because the internal Station de-confliction notification from each of these squadrons was not sent to the other. Therefore, neither crew was alerted to the routing of the other ac through the area beforehand. All Station aircrew

have been re-briefed on internal de-confliction routines to ensure de-confliction notification is communicated before each sortie and de-confliction documentation checked prior to warning-out.

UKAB Note (2): Further discussion with the pilot of Hawk (A) revealed that this internal de-confliction procedure had only recently been introduced when this Airprox occurred.

HQ AIR (TRG) comments that had the recently introduced deconfliction procedures been followed the planned tracks could have been amended reducing the chance of both ac being in the same valley at the same time. In addition, both crews could have made appropriate radio calls when in the vicinity of the valley to aid SA. The crew of Hawk (B) saw the other ac in sufficient time to fly an effective avoiding manoeuvre thus reducing the risk of an actual collision.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were grateful for the Station's frank comments about the breakdown in the deconfliction procedure that should have warned both crews about the routing of the other. It was explained that de-confliction information in the form of charts illustrating the planned route should have been exchanged between the two training squadrons before each sortie. These are then reviewed before crews walk to their ac, to detect any potential conflicts along their route. Furthermore, any unexpected delays between 'walking' and take off prompts a further check for potential encounters along the intended track by the Squadron Duty Officer, who is then able to alert the respective crews on the Squadron's private RT frequency or via a relay through ATC. It was recognised that this system could only expose the possibility of interaction with station-based ac whilst following their planned routes and clearly could not take account of unforeseen changes after departure, due to weather etc. Nevertheless, it did illustrate that the Station was endeavouring to minimise any potential for close encounters between Valley-based ac. It was unfortunate, therefore, that following recent changes to this procedure, a mistake had occurred, with the unfortunate result that the flight data for each of these flights was not exchanged between the two squadrons involved. The Board agreed that this omission had been a Contributory Factor to this Airprox, but were reassured to learn that rebriefing has taken place to reduce the potential for any recurrence of this nature.

Regardless of any Station internal de-confliction procedure, Members noted that in the 'see & avoid' environment of the military LFS, the pilots were responsible for detecting other ac in their vicinity and affording appropriate separation. Although the crew of Hawk (A) were unaware of the potential for meeting Hawk (B) and were surprised when they saw it late - about 900ft away in their R 1 o'clock and some 50ft below them, the PNF flying in Hawk (B) had spotted Hawk (A) in his L 10 o'clock position about 1nm away, as it crested the ridge into the valley in which he was flying. Pilot Members agreed that the prompt reaction by Hawk (B)'s crew, descending to pass beneath Hawk (A) by 250ft, had been sufficient to resolve the conflict. Members agreed unanimously, therefore, that the Cause of this Airprox was a conflict in the LFS resolved by the crew of Hawk (B).

In considering the risk, the overwhelming majority of Members believed that the crew of Hawk (B) had seen Hawk (A) in sufficient time to take prompt action to avoid it. By descending to pass 250ft beneath Hawk (A) as it crossed the Valley the crew of Hawk (B) had effectively removed any actual Risk. However, one experienced fast-jet pilot Member was not convinced; Hawk (B)'s descent toward the valley floor had limited (B)'s ability to manoeuvre. In his view, at these speeds and distances with only one crew visual with the other and able to effect avoiding action, safety had not been assured. If Hawk (A)'s crew had elected to descend as they crossed the Valley, it could have reduced the separation still further. However, the Board could only base their assessment of the Risk on what had actually occurred, not what might have happened if the circumstances had been slightly different. The majority of pilot Members believed that the crew of Hawk (B) had taken effective action in the time available, which convinced the Board that no risk of collision had existed in these circumstances.

The Board was briefed that the replacement Hawk T Mk2 training ac has a TCAS II system fitted. Members recognised the limitations of this equipment in the mountainous terrain, which will undoubtedly limit detection and warning times. Nevertheless, the Board was encouraged that the advent of this equipment could be of significant benefit to crews even in the low-level environment below 2000ft msd and might reduce the potential for Airprox of this nature.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the LFS resolved by the crew of Hawk (B).

Degree of Risk: C.

Contributory Factors: Breakdown in a recently introduced internal Valley de-confliction procedure.

AIRPROX REPORT No 2009-127

Date/Time: 14 Sep 1420
Position: 5322N 00420W (11nm NE Valley - elev 37ft)
Airspace: Valley MATZ (Class: G)
Reporting Ac Reported Ac
Type: Sea King MK3 Hawk TMK1
Operator: HQ AIR (Trg) HQ AIR (Trg)
Alt/FL: 2000ft 2000ft (QFE) (RPS 1025mb)
Weather: VMC CAVOK VMC CLBC
Visibility: 30km >10km

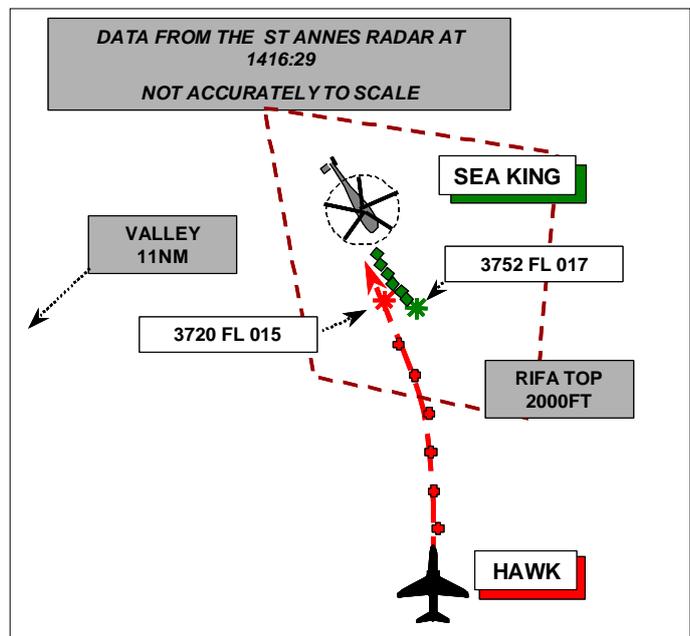
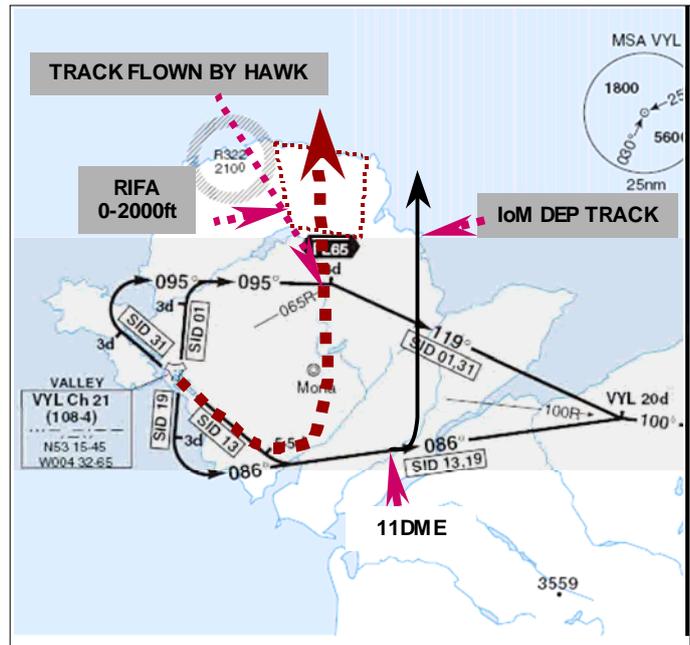
Reported Separation:
 Nil V/1m H 100ft V/1nm H

Recorded Separation:
 200ft V/0.3nm H

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SEA KING MK3 PILOT reports that he was instructing a student on an IF practice flight in a yellow ac with no TCAS fitted but with HISLs switched on, in receipt of a TS from Valley APP, operating in an area reserved [under Valley local procedures] for the use of Helicopters to practise Instrument Flying [the Rotary Instrument Flying Area (RIFA) see UKAB Note (3)]. Since the student in the right hand seat was under an IF visor to restrict vision outside of the cockpit, a TS was maintained throughout this part of the flight. During this part of the sortie, the instructor was giving manoeuvres to the student and Valley APP was passing TI. While heading 120° at 90kt, the instructor looked up to clear a turn and saw a black Hawk ac 1nm away on a reciprocal heading at a similar height entering the RIFA. He initiated a left turn to avoid it just as it did the same as apparently they had also seen them. Then a TI call was broadcast by APP, but by this time the Hawk was parallel laterally with their helicopter. They then recommenced their training as the Hawk left their area. He reported the incident to Valley APP and assessed the risk as being medium.

THE HAWK TMK1 PILOT reports flying in a black ac with nose light, HISLs and nav lights switched on, squawking as directed with Mode C, but with no TCAS fitted, and in contact with Valley Radar (RAD). They were flying under VFR and were cleared for an Isle of Man [VFR] departure from RW13 [see UKAB Note: (4)] climbing to 2000ft. When airborne they were given a TS and cleared 'own navigation' by RAD.



Shortly after they levelled at 2000ft QFE and 300kt and turned left onto 360°, reporting their heading and height to ATC. After transiting through the overhead of RLG Mona they set the RPS of 1025mb and continued to fly at 2000ft. While heading N they listened to the Ronaldsway ATIS on the VHF radio and they became aware that they had missed a call from Valley RAD when, on toggling off the VHF radio, they heard the end of a traffic report. At that point they saw a Sea King about 2nm ahead at about the same height. He [the instructor] took avoiding action to go behind the Sea King and made a “visual” call to Valley RAD once the conflict had been avoided. He assessed the risk as being Low.

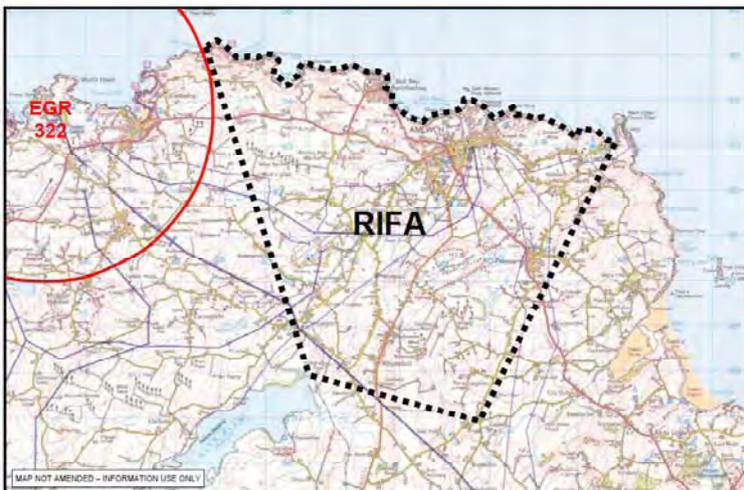
UKAB Note (1): The Secretariat contacted the Hawk Instructor for further information. He stated that he was flying a standard Isle of Man Departure, as cleared by RAD, at 2000ft QFE, which he called to ATC. He was not informed by ATC that the RIFA was active. He saw the Sea King at a distance of about 2nm but did not deem a hard turn away necessary and initiated a level 3G turn to the left, which took them behind the Sea King. They called the turn and that he was visual to ATC when he returned to UHF.

UKAB Note (2): The following is an extract from the RAF Valley Flying Order Book (FOB) as regards the RIFA:

ROTARY INSTRUMENT FLYING AREA

1. **General.** A Rotary Instrument Flying Area (RIFA) may be activated in the area depicted up to 2000ft Valley QFE (1500ft when Rwy 19 is in use). Helicopters intending to operate in the RIFA require a serviceable transponder and are to inform Valley Approach when outbound to the area. Valley Approach is to notify Mona ATC (if appropriate) and any ac that are likely to fly close to the RIFA of its status. Valley-based fixed-wing ac are to avoid an active RIFA laterally or overfly it at a minimum of 2500ft Valley QFE (2000ft QFE when Rwy 19 is in use). Visiting or transit ac will be routed clear of the RIFA whenever it is active. A greater upper limit for the RIFA may be available with the agreement of the ATC Supervisor.

2. **203 Sqn IF Operations.** The RIFA may prove inadequate for the trg needs of 203 Sqn. Under these circumstances the 203 Sqn QHI is to negotiate a suitable operating area with the ATC Duty Supervisor.



UKAB Note (3): The transcripts show that the Hawk crew was not informed by ATC that the RIFA was active, as required by the FOB procedure above.

UKAB Note (4): The following is an extract from the RAF Valley Flying Order Book as regards Ronaldsway departures:

1. **Ronaldsway (Isle of Man).**

a. **Routeing.** Initially follow the SID East

(1) N/A

(2) Rwy 13 or Rwy 19 – VFR. Climb to at least 2000ft. At 11 DME turn left onto North and intercept the VYL 020 radial.

(3) N/A

A diagram of the SID E superimposed with the Ronaldsway VFR departure, the RIFA and the Hawk track is above.

UKAB Note (5): The Holyhead RPS was 1025mb.

DAATM reports that the Hawk was departing RAF Valley RW13 on a SID East for a PD to Ronaldsway while the Sea King was conducting an IF training sortie in the RIFA on the Anglesey North Coast. The RAF Valley Flying Order Book states that, when active, the RIFA is up to 2000ft Valley QFE unless higher is approved. The weather was good and both ac were operating under VFR. A trainee controller supervised by a screen was manning Valley Radar [RAD]; he was controlling 2 military and 2 civil ac on different frequencies and the workload was medium.

The Hawk took off at 1413:12 calling RAD *'Valley Deps C/S now passing 2, level 2000 feet and looking for own navigation Traffic Service'*, RAD identified it, provided a TS and approved own navigation although the word *'own'* was clipped from *'own navigation'* on the tape transcript; the pilot then read back the type of service and *'own navigation'*. At 1413:53 the Hawk pilot advised RAD that he was turning L onto N for the PD and RAD acknowledged. During the exchange with the Hawk pilot the trainee controller initiated the handover of an unrelated ac to London Mil. After *'own navigation'* was approved for the Hawk, the screen noticed that the ac was flying directly towards the RLG Mona which was not active, so he was content to allow it to continue on track; a discussion then took place between the screen and the trainee regarding the drawbacks of allowing pilots to assume own navigation.

The screen controller then noticed that the Hawk was heading towards the RIFA, which was occupied by the Sea King so he decided to allow the trainee to call the Sea King to the Hawk however, another ac called on VHF and the trainee decided that the priority was to answer the calling ac rather than pass TI to the Hawk. The screen controller then took control of the frequencies and transmitted to the Hawk at 1415:30, *'C/S traffic 12 o'clock 4 miles crossing left to right same height RIFA traffic'*, and the pilot immediately replied *'that's copied'* and the screen then asked him if he was visual with the traffic. Upon receiving no reply, the screen controller requested the Hawk pilot to climb to 3000ft at 1416:00 to ensure separation and 2sec later the pilot reported visual.

Although TI was passed to the Hawk pilot regarding the Sea King iaw the rules for a TS at CAP774, there was the opportunity to pass it earlier.

Follow-up information was requested from RAF Valley regarding the role of the APP in this incident and a transcript of that position was requested. The controller was a first tourist working 3 speaking units and he described the workload as medium. It was acknowledged that the TI provided by both the RAD and APP controllers was late [the TI to the Sea King was transmitted at 1416:09; the Hawk rolled out on N remaining level at FL016/7 tracking directly towards the Sea King (indicating FL 021 descending), at 1414:27]. The Unit has addressed this by publicising the incident amongst all the controlling staffs and has conducted a training workshop that concentrated on TI and its importance in providing aircrew with good SA.

The unit investigation cited inexperience of the trainee and hesitation by the screen controller to take control of the situation as possible contributory factors in the incident. Also 'Understanding of RIFA operations' has been introduced as a specific objective in the Valley Radar training package.

HQ AIR (TRG) comments that had the extant procedures in the FOB been followed this incident would have been avoided. It is disappointing that the standard of TS provided fell below what would normally be expected. It is understandable that inexperienced trainees have to learn, but screen controllers need to be proactive and act swiftly when undesirable situations start to develop. The lack of notification to the Hawk crew that the RIFA was active and lack of TI to both crews were the major contributing factors to this Airprox. Fortunately, both crews were operating under VFR and maintaining a good lookout, which enabled them to see each other thereby allowing effective avoiding actions to be flown much reducing the risk of an actual collision.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members agreed that this incident occurred because the Hawk crew were not passed the status of the RIFA by RAF Valley ATC iaw the FOB procedure. The Board observed that the FOB requires the APP controller to pass details of the RIFA but outbound traffic does not routinely contact APP, so they would never be in a position to notify pilots of the RIFA status; however, it is understood anecdotally that this information is usually passed by APP to RAD who in turn pass it to departing traffic. Since on this occasion no information was passed to the Hawk crew, they incorrectly assumed that the area was not active and that they could transit through it. On becoming aware of the potential confliction after the Hawk turned left, the RAD Screen controller passed TI to the Hawk crew (at 4nm) that, despite them only partially hearing it due to their listening to the Ronaldsway ATIS on another frequency, enabled them to see the helicopter shortly thereafter at a distance they estimated as 2nm, and avoid it. Specialist military pilot Members agreed, however, that the Hawk crew should have afforded the Sea King greater separation, perhaps by climbing as well as avoiding it laterally; this, they thought, might have avoided the incident and alleviated the Sea King captain's concern. The Board noted that the TI passed by APP to the Sea King had been transmitted after the captain had already seen the Hawk about 1nm away, taken control from the HP and initiated a turn away from it, i.e. too late to have been effective.

Notwithstanding local procedures and that both ac were in receipt of a radar service, they were both operating VFR in Class G airspace where 'see and avoid' pertains. Although perhaps later than they would have liked, both crews did see each other and took effective avoiding action to achieve a minimum horizontal separation of over 500m; that being the case, Members agreed that there had been no risk of collision.

The Board was concerned that the procedures in the Valley FOB were apparently not sufficiently robust to ensure that all departing pilots were aware of the RIFA status and agreed that a review was required.

PART C: ASSESSMENT OF CAUSE AND RISK

<u>Cause:</u>	Having not been informed that the RIFA was active, the Hawk crew flew into conflict with the Sea King.
<u>Degree of Risk:</u>	C.
<u>Recommendation:</u>	RAF Valley procedures for the notification of the RIFA status should be reviewed.

AIRPROX REPORT No 2009-130

Date/Time: 8 Oct 1416

Position: 5050N 00019W
(Shoreham A/D cct elev:
7ft)

Airspace: Shoreham ATZ (Class: G)

Reporting Ac Reported Ac

Type: Bell 206 Vans RV8

Operator: Civ Pte Civ Pte

Alt/FL: 300ft NR
amsl (N/K)

Weather: VMC CAVOK VMC

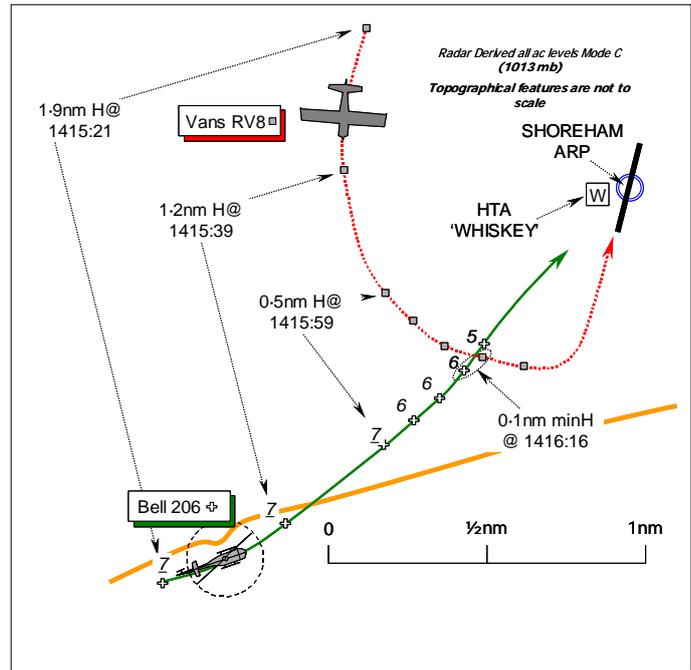
Visibility: >10km 10km+

Reported Separation:

50ft V/100m H NR

Recorded Separation:

0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BELL 206 (B206) JET RANGER HELICOPTER PILOT reports approaching Shoreham under VFR whilst in communication with Shoreham ATC on 123.15MHz [APPROACH & TOWER were combined]; fixed wing ac were circuiting to RW02 [in a LHC]. On final approach into Helicopter [Training] Area [HTA] 'WHISKEY', at 300ft amsl as instructed by Shoreham ATC heading 040° at 60kt, a Vans RV8 aeroplane [the registration was given] was first seen at 11 o'clock as it flew 100m directly in front from L – R at 350ft amsl - some 50ft above the helicopter.

The pilot of the Vans RV8 was not following the published fixed wing procedure for RW02 and effectively chose to cut right through the helicopter area rather than conducting a proper base leg and final approach to RW02. The Risk was assessed as 'high' and the minimum horizontal separation estimated at 100m.

A squawk of A7000 was selected with Mode C. The helicopter has a blue and silver colour-scheme and the HISLs were on.

THE VANS RV8 PILOT reports returning from Kemble and had been cleared to join downwind for RW02 by Shoreham TOWER. On making the standard 'downwind' call he was advised that he was Number 1 to land and to report 'final'. He was not notified by ATC of any restriction in terms of height or turning points nor was he aware of any helicopter operations at that point. Flying at the standard fixed-wing cct height of 1100ft he elected to make a cct that kept him within gliding distance of the aerodrome at all times. This is a relatively common practice at Shoreham when the cct is clear and is done in the interests of airmanship and safety in the event of an engine problem. To this end his base leg for RW02, heading 110° at 80kt, was relatively close to the aerodrome but S of the railway line, the descent was not a full glide approach.

He was aware, as was his passenger - a pilot of some considerable experience - of the helicopter on their right hand side as they made their descent on base leg but he cannot recall at what height this was. He first saw the B206 helicopter about 200-300m away and although the helicopter's presence was unexpected he did not need to take any avoiding action but monitored its track as it passed below and behind them. The Risk was assessed as 'low' but no minimum separation was quoted.

A squawk of A7000 was selected but Mode C was switched off. His ac has a yellow and green colour-scheme and the HISLS were on.

THE SHOREHAM COMBINED APPROACH AND AERODROME CONTROLLER (ADC) provided a brief report with a sketch map of the occurrence stating that the Vans RV8 made a non-standard approach, which conflicted with the B206. The RV8 pilot was instructed to join downwind at 1600ft and the B206 pilot instructed to join for HTA 'Whiskey' not above 600ft in the ATZ. When the RV8 pilot reported downwind he was instructed to descend and report 'final' as No1. The B206 pilot then reported that the RV8 had passed in front of his helicopter.

The Shoreham 1350 METAR was given as S/W: 010° 10kt; CAVOK; 16/05; QNH: 1018mb.

UKAB Note (1): The sketch map included with the ADC's report shows the RV8's track turning onto a very tight base-leg to the N of the railway line which passes broadly WSW - ENE immediately to the S of the aerodrome. The sketch suggests the flight path of the RV8 was much tighter than the ADC expected. However, the radar recording shows that the base leg of the RV8 was flown at a distance of about 0.62nm from the Shoreham ARP which would suggest that the final turn was made S of the railway line and thus wider than that reported by the ADC.

ATSI reports that the B206 pilot contacted Shoreham APP for joining clearance at 1409. The Approach and Aerodrome Control functions were combined at the time. The pilot reported, "*current position approaching Littlehampton 1 Thousand feet on 1-0-1-8 and request Basic Service and joining instructions*". The helicopter pilot was placed under a BS and cleared to, "*..join for Helicopter Area WHISKEY remain to the west of runway 0-2 the surface wind is 0-4-0 11 knots*". The pilot read back the ATS and instructions correctly. Helicopter area 'Whiskey' is situated 500ft to the W of RW02/20, approximately abeam the midpoint of the runway.

The Vans RV8 pilot established communication with the combined Shoreham APP/ADC just after the B206 pilot had read back his clearance. The pilot of the RV8 reported at 1500ft for rejoining and was cleared to, "*..join downwind left-hand 0-2 confirm you're inbound from Kemble*". This was confirmed and the pilot read back the joining clearance, "*..downwind to 0-2..*". At 1414:28, the RV8 pilot reported "*..just positioning downwind 0-2*" and was informed by the ADC "*number 1 report final*". No mention was made about the joining B206. The RV8, subsequently, reported short final and was cleared to land.

The pilot of the B206 made a comment about the RV8, which he believed had, "*..just crossed in front of us very low level*". The controller commented, "*Yes he turned final too low*" [whereupon the B206 pilot was cleared to land at point WHISKEY]. Over 1min later, the B206 pilot added, "*..we need to file..it was a near confliction there we were only at 3 hundred feet when that aircraft went..almost straight in front of us*". [The controller then mentioned to the VANS pilot "*..safer for you not to descend below 6 hundred feet when your turning finals*".] The pilot of the RV8 stated, "*I was trying to keep it close to the airfield actually I was number 1*". The controller responded, "*Yeah 1 for the tarmac there's still helicopters flying around*". The RV8 pilot later reported that he became aware of the unreported presence of the helicopter, as he descended on base leg.

The UK AIP at AD 2-EGKA-1-7 (Helicopter operations), states the areas in which extensive helicopter training takes place. These include:

'West of Runway 02/20 'W'; Pilots should note that 'W' is frequently below the fixed-wing 'deadside', so helicopters will normally be restricted to 600ft within the ATZ (i.e. 500ft below fixed-wing circuits).' [Fixed-wing cct heights are 1100ft aal for all runways.]

Neither of these pilots was informed about the details of the other ac by the controller. If the Vans pilot had been informed about the inbound helicopter, even only to the extent that Area 'W' was in use, it would have possibly allowed the pilot to sight the B206 earlier and thereby take appropriate action to avoid it. However, it is generally expected by ATC that fixed-wing ac, in the left-hand cct for

RW02, will remain clear of the helicopter area at 'W'. Consequently, traffic information (TI) is not regularly issued to these flights.

UKAB Note (2): The UK AIP at AD2-EGKA-1-5 promulgates the Shoreham ATZ as a circle radius 2nm centred on the longest notified runway 02/20, extending from the surface to 2000ft above the aerodrome elevation of 7ft amsl.

At para 6e of EGKA AD2.20 – Use of Runways – it is stated:

'Unless otherwise instructed aircraft joining the circuit will overfly the aerodrome maintaining 2000ft aal, until instructed to descend to circuit height on the inactive (dead) side of the runway in use and join the circuit by crossing the upwind end. Pilots should note that there would frequently be helicopters operating on the 'deadside' up to 600 ft.'

UKAB Note (3): The Pease Pottage radar recording shows the Bell 206 following the mean line of the coast as it approaches Shoreham aerodrome from the W indicating 700ft Mode C (1013mb) – about 850ft QNH (1018mb). The Vans RV8 is shown on a downwind heading with Shoreham aerodrome starting to draw abeam at 1415:21, just moments before the pilot reported positioning downwind for RW02; the B206 is at 12 o'clock 1.9nm away. Thereafter the RV8 enters a wide L turn with NMC indicated (reported switched off) whilst the B206 maintains level and also turns slightly L towards HTA 'Whiskey'. As horizontal separation reduces from 0.5nm, the B206 indicates a slight descent to 600ft, which is maintained to the CPA, timed at 1416:16, just as the RV8 crosses ahead of the helicopter on a base-leg for RW02 – in between sweeps – and is shown in the B206's 1 o'clock - 0.1nm away. The RV8 clears to starboard of the B206 and turns onto final as the B206 descends further towards HTA 'Whiskey'.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The ATSI report revealed that the B206 helicopter pilot had been cleared by the combined APP/ADC to *"..join for Helicopter Area WHISKEY.."*, just before the Vans pilot had called to join on the same frequency. Whether the Vans pilot would have been able to assimilate from the helicopter pilot's earlier transmission what the B206 was doing at this juncture was unclear to the Members. However, when the Vans pilot was cleared by the APP/ADC to, *"..join downwind left-hand 0-2.."* the B206 pilot should have been able to hear this transmission, but the B206 pilot reported not being aware of the other ac until the conflict occurred.

The B206 pilot had contended that the Vans pilot was not following the published fixed wing procedure for RW02. The Board noted that the Shoreham entry in the UK AIP stipulated that 'unless otherwise instructed' fixed-wing pilots will join overhead the aerodrome, descend to circuit height on the deadside of RW02 and join the circuit upwind. However, given the 'variable ccts' also stipulated, it was clear that the ADC was empowered, and had elected to provide, at his discretion, a more expeditious downwind join for the Vans pilot instead. A military helicopter pilot Member advised that he would have expected to join for point 'Whiskey' by approaching at 90° to the fixed-wing cct direction usually from the Deadside, but as the B206 was joining from the W this was impractical and would have necessitated crossing the RW. The radar recording reflected that the B206 pilot had followed the coast eastbound into the ATZ to a point 1½ nm SW of the aerodrome and then turned towards 'Whiskey', which seemed sensible to the Board. The B206 pilot's chosen flight path was then to approach broadly into wind at 600ft ALT onto final, thereby crossing underneath the base-leg to RW02. Despite the warning in the Shoreham AIP entry that *"Whiskey' is frequently below the fixed-wing 'deadside'"*, Members recognised that on this occasion, with RW02 LHD in use, the B206 was always on the Liveside of the fixed-wing cct. Therefore, despite the restriction of 600ft within the ATZ which afforded a 500ft separation below fixed-wing ccts, clearing two ac to positions in close

proximity on the aerodrome - as the RW and the HTA are here – at the same juncture will potentially result in conflicting flight paths unless further action is taken. The Board agreed that it was essential, therefore, that each pilot knew about the other. An experienced CAT pilot Member noted that the Vans had flown into close quarters with the helicopter before the B206 pilot was aware of it, and from the individual pilots' accounts and the RT transcript provided with the ATSI report it was apparent that the Shoreham ADC had not passed any TI to either flight. In the provision of the aerodrome control service within the ATZ, the Board agreed with the ATSI view that both pilots should have been told about the presence and intentions of the other. The ATSI Advisor explained that the comment in his report that traffic information is not regularly issued to cct traffic about helicopters at 'Whiskey', concerned helicopters operating tight ccts inside the fixed-wing cct. However, the ATSI Advisor stressed that with the helicopter approaching the aerodrome TI should have been passed to both flights. The GA pilot Member did not perceive that the Vans pilot had done anything wrong and other pilot Members agreed. Whilst he might have flown a tighter cct than the norm, which kept him within gliding distance of the aerodrome, there was no reason why he should not do so as he had not been apprised of any other traffic in the ATZ that might conflict. Moreover, when he had reported positioning downwind he had been advised by the ADC that he was "*number 1 report final*", and could reasonably anticipate that no other ac were in his way. Without TI both pilots' situational awareness had been impaired and the Board concluded that the Cause of the Airprox was that the ADC did not provide TI to either pilot in the ATZ.

Turning to the Risk, the Vans pilot saw the helicopter, which was cross-cockpit off the starboard side, about 200-300m away as he made his descent on base-leg. Although he did not estimate the minimum separation, he stressed that he had not needed to take any avoiding action, but monitored the B206 as it passed below and behind his aeroplane. From the other cockpit, the B206 pilot first saw the Vans at 11 o'clock as it flew 100m directly in front from L – R some 50ft above; similarly, no avoiding action was taken. Whereas the radar recording showed the minimum recorded horizontal separation was 0.1nm - ~185m - after the Vans had crossed ahead of the helicopter. Unfortunately, it was not possible to determine the vertical separation at this point because the Vans' Mode C was switched off. The Board perceived this to be unwise and recommended that Mode C should always be selected 'on', whether speaking to an ATSU or not, to assist radar equipped ATSUs and to ensure that TCAS equipped ac are provided with the altitude data necessary to prevent collisions. An experienced CAT pilot Member suggested that at the recorded separation and short sighting distances quoted here, coupled with the descent of the Vans onto Final, safety had not been assured. However, this was a solitary view. The majority of the Members agreed that even at these close quarters no avoiding action had proved necessary by either pilot; the B206 was in level flight just before descending on final and the Vans pilot was always in a position to climb further and increase the vertical clearance above the helicopter if need be. The Board agreed, therefore, that no risk of a collision had existed in these circumstances.

With the direction of ccts variable, at the discretion of the ADC, Members questioned the advice contained in the AIP at AD 2-EGKA-1-7 relating to helicopter operations. Specifically that: HTA 'Whiskey' is frequently below the fixed-wing 'deadside'. The Board considered it more important to stress to fixed wing pilots that helicopters would frequently be encountered within or below the fixed-wing 'liveside'. Consequently, the Board agreed a Safety Recommendation: that the Aerodrome Operator should review the Shoreham Aerodrome AIP entry regarding helicopter operations.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The ADC did not provide traffic information to either pilot in the ATZ.

Degree of Risk: C.

Safety Recommendation: That the Aerodrome Operator should review the Shoreham Aerodrome AIP entry regarding helicopter operations.

AIRPROX REPORT No 2009-132

Date/Time: 13 Oct 1419

Position: 5112N 00038W (3nm SW Guildford)

Airspace: LFIR (Class: G)

Reporting Ac Reported Ac

Type: RA390 Premier 1 Untraced Paraglider

Operator: Civ Trg N/K

Alt/FL: 2400ft NK
(QNH 1030mb) (N/K)

Weather: VMC CLBC NK

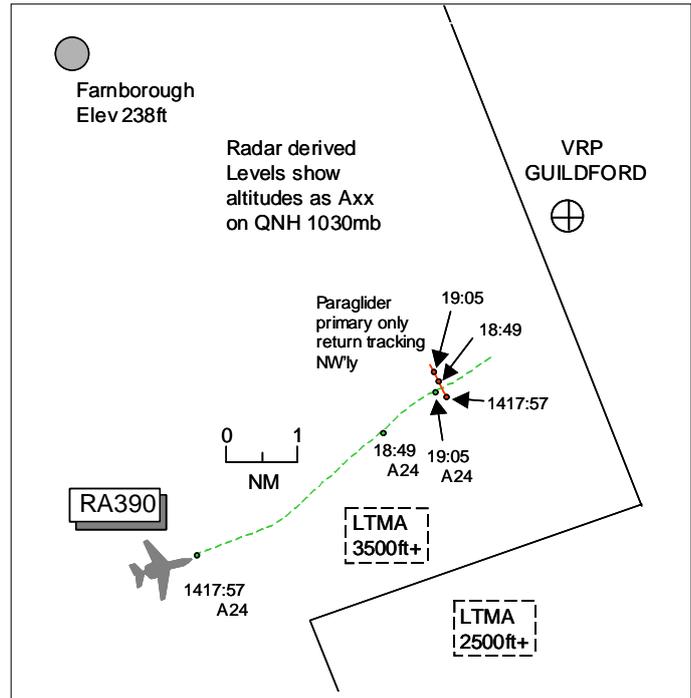
Visibility: >10km

Reported Separation:

Nil V/0.5nm H NR

Recorded Separation:

0.3nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE RA390 PREMIER 1 PILOT reports inbound to Farnborough IFR and in receipt of a TS from Farnborough on 134.35MHz, squawking 7557 with Modes S and C; TCAS was fitted. The visibility was >10km clear below cloud in VMC and the ac was coloured white/maroon/brown/beige with anti-collision, nav, strobe and recognition lights all switched on. This was a training flight with an examiner PNF in the LH seat and PF in the RHS carrying out an Operator's Proficiency Check; both pilots were Capt on type. No abnormal procedures or drills were being conducted at the time and the ac was heading 050° at 220kt positioning downwind LH for the RW24 ILS. Previously they had been given TI for an ac on their RHS, which was sighted. About 1nm S of Guildford they obtained late visual contact with a powered paraglider about 1nm ahead in their 11 to 12 o'clock position at the same height. At this range the traffic appeared stationary but the orientation and movement were difficult to judge. Immediate avoiding action was taken by disengaging the AP and carrying out a steep turn to starboard, the paraglider passing 0.5nm to their L. At this time Farnborough Approach did not have radar contact on the paraglider and were in the process of issuing a L turn instruction. ATC were advised of their avoiding action and once the threat had passed they resumed vectoring for the ILS; they also advised them of their intention to file a report. After landing ATC advised that the paraglider had only presented intermittent primary returns after the incident. He assessed the risk as high.

RAC MIL reports tracing action did not reveal the identity of the paramotor. The BHPA were contacted as the Farnborough Unit report mentioned paramotor operations from a site to the ESE of Farnborough. BHPA were not aware of this site and could not provide any new information.

THE FARNBOROUGH APPROACH CONTROLLER reports that his position was bandboxed with LARS W and he was vectoring the Premier 1 onto heading 050° at 2400ft for an ILS RW24. About 2nm S of Guildford he told the flight to turn L onto 360° as the pilot had requested a short pattern cct. The pilot reported that he could not accept the heading owing to a paraglider close to them at the same level. As the controller had not observed anything in the area before and at the time, he told the flight to continue own navigation as they could see the paraglider in close contact and to report when able to accept vectors. It was at this time a faint primary contact was seen, not showing any movement, behind the Premier 1. The Premier 1 pilot reported clear of conflict and resuming heading

360°. The primary contact was very intermittent and was lost shortly afterwards when separation had increased to 1.5nm. Later the pilot stated he was filing an Airprox.

ATSI reports the incident took place about 7nm SE of Farnborough in Class G airspace, below the 3500ft base of the LTMA. The Premier 1 flight was inbound to Farnborough IFR and it established communications with Farnborough Approach at 1414:19, whilst in the descent to leave CAS. The pilot reported descending to 4000ft on QNH 1030mb on course to ODIMI, a track of broadly N. The APR agreed to provide the flight a TS on leaving CAS and stated it would be radar vectoring for an ILS approach to RW24. At the time, the APR was using the Farnborough local primary radar source with SSR data provided by the Heathrow 23cm radar.

A TS is defined in MATS Part 1, Section 1, Chapter 11, Page 5,
'A Traffic Service is a surveillance based ATS, where in addition to the provisions of a Basic Service, the controller provides specific surveillance derived traffic information to assist the pilot in avoiding other traffic. Controllers may provide headings and/or levels for the purposes of positioning and/or sequencing; however, the controller is not required to achieve deconfliction minima, and the avoidance of other traffic is ultimately the pilot's responsibility.'

The flight was issued further descent to 2400ft and during the next few minutes was vectored to the S of Farnborough, for LH downwind to RW24. At 1417:58, when the ac was about 7nm SSE of the Airport, it was placed on a heading of 050°. TI on known traffic followed. The pilot had earlier asked for a 'short pattern' for the ILS and, at 1418:49, to accommodate this, APR instructed the flight to turn L heading 360°. The pilot immediately responded *"Er negative we've just er...there's a paraglider at er our level and our position"*. The APR acknowledged the message and asked the pilot *"...are you happy to take your own navigation to avoid"*, to which the pilot said *"No we've just cleared through him now (c/s)"*. The APR advised that nothing was seen on the radar and, after establishing the pilot could accept vectors once again, repeated the heading instruction of 360°. This was read back and then the APR stated, *"(c/s) I do have an intermitting contact in that area now but it is intermittent"*, which the pilot acknowledged. The Premier 1 completed the remainder of the approach without further incident, but the pilot did state that he would be putting some paperwork in about the encounter.

A very slow moving primary only target, with an irregular track, is detected by the Heathrow 23cm primary radar recording. At the time the APR issued the L turn onto 360° before the pilot reported sighting the paraglider (1418:49), this primary target is in the Premier 1's 12 o'clock range 1nm. Three sweeps later 1419:05, the radar records the Premier 1 altering course to the R and passing 0.3nm to the S of the target, maintaining 2400ft Mode C. Once clear, the ac returned to the previously assigned heading, 050°. Thereafter, it completed an event free approach and landing.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the Premier 1 pilot, transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

Members could add little to this incident. The Farnborough APR was unaware of the paraglider's presence as he vectored the Premier 1 in the instrument approach pattern. As the airspace was Class G, there was an equal responsibility by both pilots to maintain their own separation from other ac through 'see and avoid'. Without the benefit of a report from the paraglider pilot it was unclear whether its pilot saw the Premier 1; however, the pilot had limited options available to avoid the rapidly approaching business jet. That said, the Premier 1 crew had visually acquired the paraglider in good time ahead on their projected track and taken prompt avoiding action by turning R to pass behind it. This element was enough to allow the Board to conclude that this had been a conflict resolved by the Premier 1 pilot where any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace resolved by the Premier 1 pilot.

Degree of Risk: C.

AIRPROX REPORT No 2009-133

Date/Time: 10 Oct 1352 (Saturday)

Position: 5112N 00125W (2nm E of Andover)

Airspace: London FIR (*Class: G*)

Reporting Ac *Reported Ac*

Type: Slingsby T59D Cessna C303

Operator: Civ Pte Civ Pte

Alt/FL: 3300ft amsl NK

Weather: VMC VMC

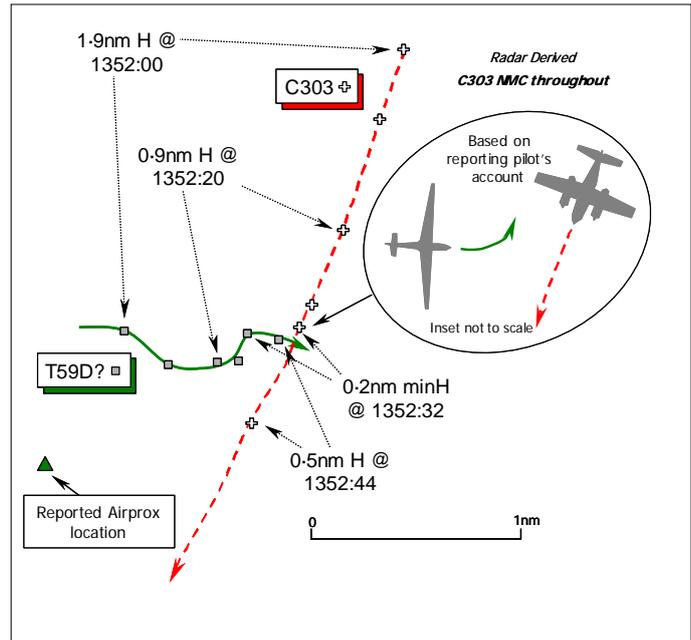
Visibility: 20km NR

Reported Separation:

200ft V/Nil H NK

Recorded Separation:

0.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SLINGSBY T59D GLIDER PILOT reports he was heading back towards Lasham, after turning overhead the western side of Andover. As he crossed over the town towards the junction of the A303/A3093 to the SE of Andover [51°12' N 001°27'W], heading generally E at 60kt, he saw a twin-engine white ac off to port about 5km away and below his glider flying broadly N to S at right angles to his course. His glider was in a gradual descent in sinking air through an altitude of 3300ft, but it soon became apparent that there was a high risk of a collision with the twin-engine ac - subsequently identified as the C303. He waggled his glider's wings to attract the attention of the other pilot, but the C303 did not alter course. Vertical separation was decreasing, which made him think the other aeroplane was climbing, so to avoid the twin he pulled sharply up to increase the vertical separation and turned to the L whilst also keeping the aeroplane in view. Minimum vertical separation was 200ft as the twin passed directly beneath his glider with a 'moderate to high' Risk. In retrospect, he should have changed course earlier but if he had altered to the L it would have resulted in a head on situation. Whereas, if he had turned R he would have lost sight of the aeroplane astern. He added, that if he had realised earlier that the vertical separation between his glider and the C303 was decreasing he would have turned L to fly behind the approaching aeroplane.

UKAB Note (1): The RAC conducted a trace for the reported ac, which was identified from the recorded radar data and a report obtained from its pilot just over 1 month after the Airprox occurred. However, further investigation revealed that this was not the ac involved, the error resulting from an incorrect plot on the radar display of the position where the Airprox occurred. Subsequently, the reported ac was identified as a C303 Crusader. The C303 pilot immediately provided a report, apologising for the lack of detail; understandably, some considerable time after the event, he could recall little of this flight apart from what he could extract from his logbook. Nevertheless the C303 pilot has most helpfully provided what information he can, together with some general comments.

THE CESSNA C303 CRUSADER PILOT reports that his logbook shows that he flew from Cambridge to Bournemouth in VMC along the entire route. His ac is white in colour and HISLs are fitted. Mode S is fitted but the ac is not equipped with TCAS.

On this route he would normally operate under VFR switching from Benson ATC after passing CPT - possibly to Boscombe Down - and then transfer to Bournemouth Approach after receiving their ATIS information, whilst ensuring that he was below the maximum required altitude for entry into CAS from

Stoney Cross VRP. His route would take him to the E of Andover as he usually flies a track direct CPT to Stoney Cross VRP [which takes the C303 through the reported co-ordinates and the Airprox location evinced from the radar recording]. He avoids flying W of Andover as that would take him towards Middle Wallop parachuting drop zone. As always, he keeps a good look out; the area NE of Bournemouth is very busy with military ac and, as controllers cannot be relied upon to provide a warning or avoidance under a BS, a good look out is essential. As the glider pilot was in a descent and had to steer sharply to the L, it indicates that the glider was to the R of his C303 when the glider pilot saw his ac. He did not see the glider.

He noted that gliders are notoriously difficult to spot; they are white in colour, often against a white sky or clouds, and are often invisible until they make a turn. Although he is aware of their limitations, the absence of transponders, lights or strobes on aircraft that are so difficult to see makes gliders a serious hazard for other aviators. He is not anti-glider, but stressed that gliders do not paint a good picture on radar for ATC and suggested that if they were to have tin foil the length of their fuselage, or at least the floor lined with it, they would give a better radar return.

He asked that his best wishes be conveyed to the glider pilot if it actually was his C303 that was involved; congratulating the glider pilot on his avoiding action skills, he was sorry he had caused him a fright.

UKAB Note (2): Analysis of the Heathrow Radar recording shows the C303 squawking A7000 – but identified from the ac's individual Mode S identity (AID) – approaching the location of the Airprox at 1352:00 on a SW'ly track towards Bournemouth at a radar-derived ground speed of about 155kt. No Mode C is indicated by the C303 at all throughout the period that it passes the plotted location of the Airprox reported by the Slingsby glider pilot, thus the vertical geometry cannot be confirmed independently. An intermittent primary contact is shown flying in an easterly direction, which is probably the glider flown by the reporting pilot but its identity cannot be confirmed. As the two tracks converge on a position 2nm E of Andover – broadly 1nm NE of the reported Airprox location - the contact presumed to be the Slingsby glider turns sharply NE as the C303 closes from a range of 0.9nm. The two ac pass starboard-starboard at a range of about 0.2nm at 1352:32, the C303 maintaining a SW'ly course. The T59 then alters R onto an easterly course as the horizontal separation increases.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The delay in contacting the pilot of the C303 as a result of the tracing error was regrettable. However, it was clear that he had conscientiously endeavoured to provide what information he could about this particular flight. That the C303 was the ac reported by the Slingsby T59 glider pilot was no longer in any doubt as the radar recording had shown the C303 flying through the exact location with the ac's Mode S AID evident; this was the only other ac shown in the vicinity. Controller Members were aware that gliders can be more difficult to identify on radar recordings and clearly the T59 was not fitted with any SSR. However, given the reported location and time, coupled with the evident close similarities to the manoeuvre flown, the Board accepted that the radar recording had captured the occurrence reported by the glider pilot and that the other contact shown was his T59. This was the only other data available to the Board because ATSU's only keep RT recordings for 30 days. Therefore, even if the C303 pilot had been under an ATS from Boscombe Down the recording would have been over-written by later data and the controller would have been unlikely to recall such an event due to the intervening period.

The GA pilot Member advised the Board that he was familiar with the C303 as it was a type that he flew himself. He emphasised the difficulties of lookout from this type of ac and it was plain to the Board that the C303 pilot had not seen the T59 glider. For if he had, notwithstanding his obligation to avoid it under the Rules of the Air, good airmanship would have probably led him to give it a wider berth.

A CAT pilot Member, who is also an experienced glider pilot, pointed out that in sinking air the T59 glider pilot would have been eager to keep to as direct a course as was possible for the return to Lasham. At the altitude he reported – 3300ft amsl – if he was not able to find additional lift it might have been difficult for him to achieve his destination, and the prospect of a remote field landing might have been looming large in his mind. However, it was evident to the Members that he had detected the C303 some 5km away - as it approached from the NNE. Members noted that the T59 glider pilot had stressed that if he had realised earlier that the vertical separation between his glider and the C303 was decreasing he might have turned L at an earlier stage. He believed that the twin might have been ascending, causing the vertical separation to reduce below that he had originally estimated. Unfortunately, despite being equipped with Mode C it was clear that this Mode within the C303's transponder was either not functioning or the pilot had not selected Mode C 'on'. Thus it was not possible to compare the glider pilot's reported altitude at the time with a Mode C indication from the C303 and assess the vertical separation that actually existed as the aeroplane passed by 0.2nm to starboard. Notwithstanding his right of way under the Rules of the Air, the glider pilot suspected that the C303 pilot had not seen his glider and wisely turned L to avoid the approaching twin-engine aeroplane. It was plain from his own report that, in retrospect, he should have taken action at an earlier stage and the Members agreed with his frank conclusion. The Board decided that this Airprox had resulted from a non-sighting by the C303 pilot and late avoiding action by the T59 pilot.

Turning to the inherent Risk, the glider pilot had spotted the C303 at a range of over 3nm and maintained a watchful eye on it as it approached, subsequently taking robust action to increase the separation by pulling up sharply and turning L whilst keeping the aeroplane in view. This resulted in horizontal separation of 0.2nm the radar recording reflected. Although the vertical separation that existed could not be determined independently, the Members had no reason to doubt the veracity of the gliders pilot's estimate of the resulting separation of 200ft, after he had climbed his glider. The Members agreed unanimously that due to his actions, no risk of a collision had existed in these circumstances.

The C303 pilot's report had included several valid comments illustrating the difficulties of sighting gliders, many of which are contained in previous Airprox reports. The difficulties of detecting gliders built of composite materials on primary radar are also well known and a reliable light-weight transponder with sufficient battery power for extended flights is still not in general use. However, that is all for nought unless a radar service is obtained so that ATC can provide traffic information on any ac observed to be in conflict. That necessitates pilots asking for a TS at a minimum since the C303 pilot is quite right to state that, in general, no routine traffic information will be forthcoming under a BS. Notwithstanding this advice, the Board recommends that Mode C should always be selected 'on', whether speaking to an ATSU or operating autonomously; this is to assist radar equipped ATSUs and to ensure that TCAS equipped ac are provided with the altitude data necessary to prevent collisions.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the C303 pilot and late avoiding action by the T59 pilot.

Degree of Risk: C.

approach, he decided to not initiate any avoiding action but to continue at his current alt and heading, assuming the other ac would pass behind and below him. As it passed behind he could not maintain visual contact so he could not determine the separation or if it had taken avoiding action.

He did not consider at any time that there was any risk of collision.

On landing at Duxford on RW06 about 10min later he was asked to call the TWR and was informed that an ac inbound to Cambridge had reported an Airprox.

With hindsight, he believes that he could have contacted Cambridge, which would have given him more TI but, given the short distance to Duxford and not being familiar with the airfield, he might have been a little too keen to get joining instructions. He also commented that under the Rules of the Air the other ac, being on his starboard side, had the right of way but he considered that a left turn would have quickly put him out of visual contact and he might not have had sufficient lateral separation from the extended centreline required to complete a right turn safely.

UKAB Note (1): The recording of the Debden Radar shows the incident clearly. At 1206 the G5 can be seen flying the instrument approach as published and is 6nm SW of the airfield indicating level at an Alt of 1500ft (QNH 1030mb). The Europa, squawking 7000, passes through the G5's 12 o'clock from left to right, 0.9nm ahead, tracking 140°, 100ft above it in a very shallow descent. Just after the CPA the G5 commences its final descent at 5nm, and the Europa continued its very slow descent. The Europa remains outside the Cambridge ATZ at all times but crosses the RW05 CL at 3.7nm from the airfield at an Alt of 1800ft (the sweep before it crosses) descending.

ATSI reports that at 1155 the G5, inbound on an IFR flight, established communication with Cambridge APP. At the time, Cambridge was not able to provide surveillance services consequently, the ac was provided with a PS. The MATS Part 1, Section 1, Chapter 11, Page 3, states:

'Controllers at approved ATC Units that do not have surveillance equipment available will routinely apply a Procedural Service to aircraft carrying out IFR holding, approach and/or departure procedures'.

The pilot reported descending to 4000ft, inbound to the CAM NDB and ATC responded by clearing him to descend to 3000ft on the QNH of 1030mb and warning him to expect an NDB approach to RW05. At 1158 the pilot reported entering the hold at 3000ft. The flight was then cleared "*next time over the Beacon report Beacon outbound for the procedural NDB to maintain Three Thousand feet initially*". When the pilot called outbound at 1202 he was cleared to descend on the procedure and instructed to report base turn complete. He made this report about 3min later and the controller responded at 1205:30, based on information on the ATM, "*you may have traffic crossing your final approach from left to right southbound not seen from the Tower no h- indication of the height at the moment just looking at the moment*"; the pilot replied "*Yeah we've got him three hundred feet above we've got him on TCAS er (break) continues on that track we're gonna probably have to break off the approach actually*".

A radar analysis was carried out, which corroborated the events described at UKAB Note (1).

The Europa pilot contacted Duxford FIS at 1202, reporting inbound from Sandtoft, currently 12nm N and requesting joining clearance. The pilot was informed the RW in use was 06 with a right-hand circuit and the QFE was 1026mb; the information was read back correctly. The pilot then reported at 1208, passing Sawston and approximately 90sec later downwind. Thereafter at 1211, the pilot called on final approach to 06 and subsequently landed. No comments were made on the frequency about sighting the subject G5.

Neither Cambridge nor Duxford was aware of each other's traffic, however, Cambridge ATC was able to warn the G5 pilot of the presence of unknown traffic and he reported sighting it on TCAS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were concerned that this was another conflict between IFR traffic on an instrument approach and a routine GA VFR flight, with both ac flying in Class G airspace. They also perceived that there is a widely held misapprehension that operating under IFR that affords some degree of protection or even priority over VFR flights. However, it is important to stress that for both these ac flying in Class G airspace, whether VFR or IFR, in transit or during an instrument approach, their pilots had an equal and shared responsibility under the Rules of the Air to see and avoid each other. Many busy airfields have instrument approaches through Class G airspace. Some of these, as in this case, have equally busy GA airfields in close proximity leading to local 'hotspots' or 'choke points'. Airfields with published instrument approaches have these 'approach lanes' clearly depicted on VFR charts depicted by the 'feather' symbol; good practice, Members agreed, is to avoid the approach lanes or cross expeditiously at a height above or below the glidepath (300ft per mile out is a good guide for the glidepath) and call the ATC unit concerned.

The Board noted that the Europa pilot had considered and planned his flight well and his ac had a high standard of equipment. They also noted that, despite the advice above, due to its proximity to Cambridge, it is difficult to approach Duxford expeditiously from the NW without flying through the Cambridge RW05 approach. Further, Members considered the Europa pilot's decision to operate on the Duxford frequency as he prepared to join the circuit, reasonable; however, perhaps an early notification of his intention to cross the approach path at a specified time and distance out would have helped the Cambridge controller's SA. Notwithstanding this however, based on ATM information the Cambridge Controller was able to warn the Gulfstream pilot about the Europa, although the pilot's report would seem to indicate that he (the pilot) did not fully understand the procedures pertaining to the type of airspace in which he was operating in, nor assimilate correctly the position of the Europa relative to the airfield until he received a TCAS TA then visual contact.

For his part, the Europa pilot saw the Gulfstream throughout the crossing, maintained about 1nm separation and the pilots considered the risk to be none/low respectively; that being the case the Board agreed that this had been a sighting report.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT No 2009-136

Date/Time: 13 Oct 0725

Position: 5153N 00017W (3nm FIN
APP RW26 Luton - elev 526ft)

Airspace: Luton CTR (Class: D)

Reporting Ac Reported Ac

Type: B737-700 R44

Operator: CAT Civ Pte

Alt/FL: 1000ft↓ <1500ft
(agl) (QNH)

Weather: VMC CLBC VMC NR

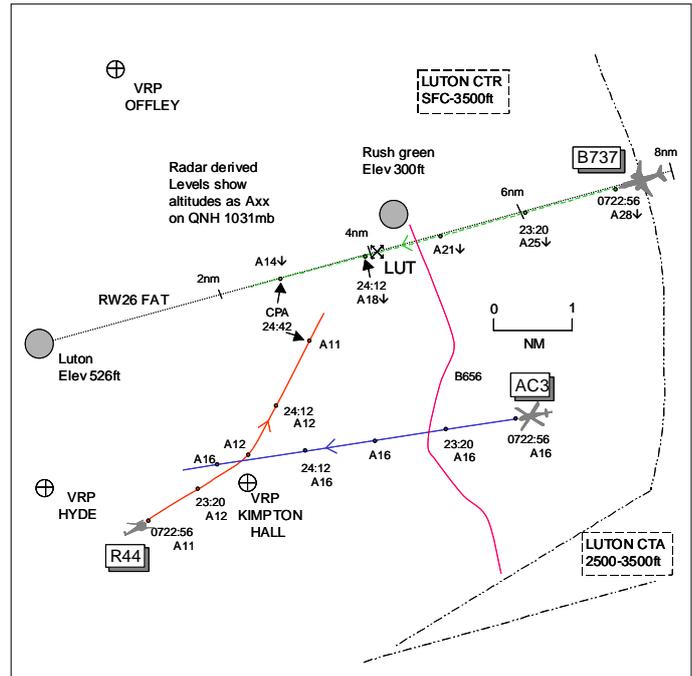
Visibility: 10km NR

Reported Separation:

300ft V/1nm H 1nm H

Recorded Separation:

300ft V/0.9nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports inbound to Luton IFR and in communication with Luton Approach and then Tower squawking with Modes S and C. Heading 258° at 135kt at 3nm final RW26 descending through 1000ft agl they received a TCAS TA which popped-up 300ft below and within 1nm to their L. They had been advised of this traffic but had reported visual with another ac 3nm S of Luton. Luton Radar was also handling other IFR traffic plus helicopter traffic N of the aerodrome. The ac in question [the R44] was on approach to Rush Green on a visual flightpath below the RW26 ILS GP. Although this was allowable it was not desirable and he opined that perhaps the procedures should be changed to prevent ac getting so close. He assessed the risk as high.

THE R44 PILOT reports flying VFR into Rush Green and in receipt of a RCS from Luton, squawking with Modes S and C. The Wx was VMC and the helicopter was coloured red/gold with anti-collision and strobe lights switched on. He was not aware of a situation that qualifies as an Airprox and he was surprised that one had been filed on this occasion. He regularly flew through the Luton Zone, usually tracking between BNN or Hemel in the S to either Letchworth (NE corner of CTR) or Rush Green. He was very familiar with the Zone and its VRPs. On this flight he was asked to route from Hemel to Kimpton Hall where he could expect further instructions, as there was a B737 on long final. He was visual with the B737 and he recalled the crew confirming with ATC that they had seen his helicopter on TCAS. The Zone transit was perfectly normal, both flights were talking to Luton and both were aware of each other's position at all times. Both flights had followed Luton's instructions; he was asked to route behind the landing B737, which he did, estimating the distance was not less than 1nm. He assessed the risk as none.

UKAB Note (1): Met Office archive data shows the Luton METAR as 0720Z 13/10/09 EGGW 130720Z 31004KT 260V350 CAVOK 08/06 Q1030=

ATSI reports that Air Traffic Services in and around London Luton airspace were being provided by a single controller on a combined Luton Intermediate and Director position at London Terminal Control, 'Luton Radar'. The Luton CTR is Class D airspace. In accordance with the requirements of Class D airspace, Luton Radar has responsibility for separating IFR flights against other IFR flights and for passing TI to IFR flights on VFR flights operating in the CTR/CTA. In order to fly VFR in the Luton CTR, VFR ac are required to obtain a clearance from ATC and comply with ATC instructions (UK AIP ENR 1-4-5, 12 Feb 09).

The R44 pilot called Luton Radar at 0718, having lifted-off from a private site near Bovingdon. The Luton Controller, previously notified of the R44's intentions, issued a clearance to enter the Luton CTR as "...you are clear to enter the Luton Control Zone now VFR not above altitude one thousand five hundred feet to your site at Rush Green". The clearance was read back correctly and upon entering the CTR the R44 was instructed to "route from your present position direct to Kimpton Hall then Rush Green"; this was also read back correctly.

Kimpton Hall is a VRP notified in the UK AIP as being within the Luton CTR (AD 2-EGGW-4-1, 22 Nov 07) [3-25nm SE Luton Airport]. Rush Green is located slightly N of the Luton RW26 C/L at approximately 4nm [0-25nm NNE LUT NDB]. An LoA exists, which states the procedure agreed for all pilots using Rush Green who wish to enter, or leave, the Luton CTR. The procedure for VFR traffic entering the Luton CTR is detailed in the London Terminal Control MATS Part 2 (page LTN-31, 2 Oct 09) and states 'Pilots inbound to Rush Green under VFR must establish RTF contact with GW [Luton] INT before entering controlled airspace. The flight must then be conducted in accordance with the clearance issued. VFR entry clearance will normally involve following the B656...'.

At 0718:20 the B737 flight contacted Luton Radar in the descent to altitude 5000ft on a heading of 270°. Shortly afterwards the B737 was instructed to turn L on to heading 180°, a base leg heading for RW26. Further descent to altitude 3000ft was issued before Luton Radar cleared the B737 on to a heading of 220° and to descend on the GP once LOC established. At 0722:00, whilst on base leg, the B737 was given TI on an A109 [AC3], "...traffic to the southwest of you range of three miles or t er tracking westbound just remaining three miles south of the centreline that traffic is an Agusta one oh nine VFR not above one thousand five hundred feet". The B737 pilot acknowledged the TI with, "...thanks for that copied"; however, there was no subsequent report of visual contact with this traffic. The A109 was in fact at a range of 5nm from the B737. The R44 at this time was in the vicinity of the HYDE VRP some 12nm away.

At 0723:20 the R44 was issued with two pieces of TI. Firstly, on the A109 and then, on the B737, to which the R44 pilot reported 'visual'. The A109 had previously received TI on the R44. However, the B737 had not, at this stage, received reciprocal TI on the R44, now 5-5nm away in the B737's 11 o'clock position.

Shortly after receiving TI the R44 turned at Kimpton Hall and proceeded to track towards Rush Green, i.e. towards the RW26 approach path. This placed the R44 between the B737 and the A109.

At 0724:10 the Luton Radar controller informed the B737 "...that er Robinson forty-four is just to the south of you range of one mile routeing to Rush Green". At this point the R44 is at altitude 1200ft in the B737's 10 o'clock range 2-2 miles and converging from the L, 600ft below. The B737 pilot replied, "traffic in sight". The Luton Controller then transferred the B737 to Tower. As the B737 continued on the ILS, at 0724:42 the R44 came within 0-9nm and 300ft of the B737 in its 9 o'clock and then passed behind and below the B737.

There was no comment on the Luton frequency by the B737 pilot with regard to the proximity of the R44.

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, and reports from the appropriate ATC authorities.

It was clear that the R44 pilot was complying with the ATC route instruction and that the pilot was passed TI on the B737 in good time and saw it immediately. However, the reciprocal TI to the B737 crew was given late, the RT transcript revealing that the Luton Radar controller had apparently thought that he passed TI earlier when he transmitted "...that er Robinson forty-four is..." when this had been the first time that TI, on the R44, had been passed. Although the range given was 1nm, the

actual separation was 2.2nm with the helicopter 600ft lower than the airliner. A commercial pilot Member commented that informing the IFR B737 crew that the R44 was routeing to Rush Green would be hard to assimilate, as the IFR flight would not be aware of the location of Rush Green unless the crew were locally based. When the B737 crew reported 'visual' it was unfortunate that they had sighted the A109, which was tracking SW'ly, S of, and parallel to, the ILS, not the R44. Following the pop-up TCAS TA contact, the B737 crew were concerned as they appear to have thought the 'intruder' was unknown traffic passing close by, unaware that it was the R44 whose pilot was taking visual separation on their ac. The Luton controller had fulfilled his responsibilities with respect to Class D airspace, although earlier, more specific TI to the B737 crew would have given them more time to assimilate the relative positions and flight paths of the A109 and the R44. In the end the Board concluded that the TCAS TA 'sighting' had caused the B737 crew concern but that the TI, visual sighting and flightpath chosen by the R44 was enough to remove any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

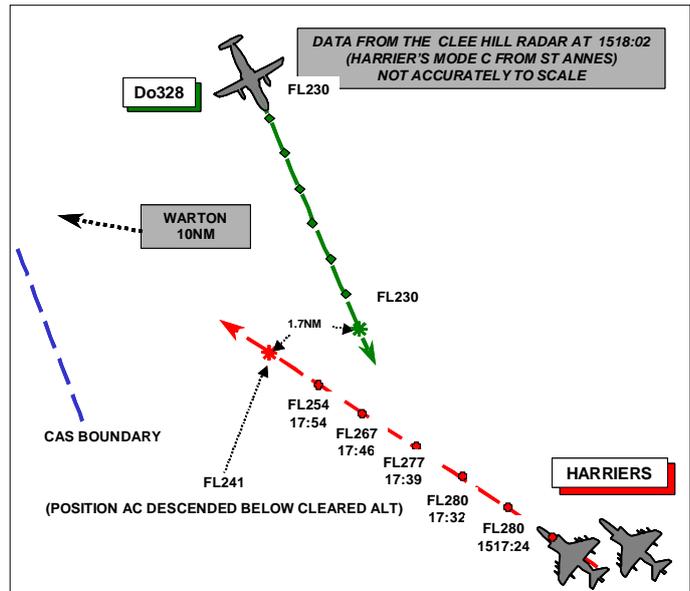
Cause: Sighting report (TCAS).

Degree of Risk: C.

AIRPROX REPORT No 2009-138

Date/Time: 22 Oct 1518
Position: 5345N 00235W (10nm E Warton)
Airspace: N615 (Class: A)
Reporter: Manchester ACC
1st Ac 2nd Ac
Type: Do328 Harrier
Operator: CAT HQ AIR (OPS)
Alt/FL: FL230 FL230
Weather: NR VMC
Visibility: NR 20km
Reported Separation:
NR N/K

Recorded Separation:
1100ftV/1.7nm H
(0ftV/2.9nmH at 1518:10 after the ac were diverging)



CONTROLLER REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MANCHESTER SECTOR 29 PLANNER reports that he was OJTI for a trainee planner. His trainee had co-ordinated a Cleared Flight Path (CFP) for a formation of 2 Harriers on track DENBY-FIWUD [on the coast 10nm NNW Warton] at FL280. LATCC (Mil) called back when the Harriers were abeam POL and were requesting descent. The Do328, tracking S at FL230, was at CALDA [8nm E Warton] so LATCC (Mil) was told descend the Harriers to FL240 only and further descent when [5nm] clear of the Do328. As the Harrier's radar return passed over the Do328 it was noted that no Mode C was being displayed [see UKAB Note (2)] and simultaneously the Do328 pilot transmitted. "Manchester are you aware two military ac have just descended through our level two miles away from us?" The Do328 pilot also informed them that no TCAS TA or RA was received.

When he contacted the LATCC (Mil) controller he [LATCC (Mil)] said, "they bust their level....". He understood that the LATCC (Mil) controller would report on the incident.

THE LATCC (Mil) NW TAC CONTROLLER reports that he was controlling 2 Harriers routing DENBY - FIWUD to go low level with Warton Radar. They had been given a CFP by MACC Sector 29 (S29) at FL280. About 15nm before Warton the Harrier leader requested a descent but was told to standby due to conflicting traffic at FL230 [the Do328]. NW TAC called S29 Planner and requested a decent to FL240 above the ac; S29 approved and gave clearance for further descent when 5nm clear of the traffic. NW TAC then cleared the Harrier formation to descend to FL240 and called the Do328 as coordinated traffic. After passing the Do328 the Harriers continued their descent below FL240 without being given a clearance or having the prescribed 5nm separation. MACC S29 called saying that the Do328 had seen the Harriers continue their descent and was concerned.

THE LATCC (Mil) SUPERVISOR reported that he contacted the S29 controller who informed him that the Do328 pilot was shaken but would not be filing an Airprox as he did nor receive a TCAS RA. He reviewed radar and RT recordings to ascertain the exact sequence of events and RT exchanges; this confirmed that the NW controller had given a correct descent instruction and had called the

coordinated traffic to the Harrier leader who readback the cleared level but he had subsequently descended below it.

THE Do328 PILOT did not consider the event an Airprox and declined to provide a report.

THE HARRIER PILOT reports that he was not contacted until 8 days after the event. (See UKAB Note (1) At the time of the Airprox he was leading a formation of 2 ac under radar control of LATCC (Mil) in the descent to low level under a high workload and squawking as directed but was not aware of an Airprox.

UKAB Note (1): It was initially understood that the Do328 captain would report the incident. However after several attempts no report was forthcoming so LATCC (Mil) was contacted. The LATCC (Mil) controller, however, asked that the incident be filed as an ATC Incident – Level Bust. During this period MACC moved to Prestwick and subsequently the S29 Controller was on leave. When contacted after on the day he returned to work he stated that he wished the incident to be considered an Airprox.

UKAB Note (2): The Harriers were under a Radar Control service in Class A airspace.

ATSI reports that at 1506 a Do328 en route from Edinburgh to London City reported to MACC S29 FL230 on track LAKEY. The S29 TAC Controller instructed the Do328 to continue via LAKEY, MAN then PEDIG. At 1508 the LATCC (Mil) NW controller called S29 Planner to request a CFP for a pair of Harriers and this was co-ordinated between both parties at FL280 routing DENBY – FIWUD.

At 1517:20 the LATCC (Mil) NW controller called S29 to request descent for the formation, but he saw the Do328 at FL230 so S29 Planner approved descent only to FL240. At that time the formation was in the Do328's 12 o'clock at a range of 8nm on a reciprocal track that crossed slightly from left to right.

As the formation commenced their descent SSR Mode C level reporting disappeared from the controller's situation display but on analysis of available radar data, it was determined that the St Annes radar maintained track of the formation's Mode C level reporting throughout the descent. (See UKAB Note (2) below).

UKAB Note (3): When the Harriers commence their descent (see ATSI report regarding RoD) their Mode C indications are not displayed on the Cleve Hill or Great Dun Fell radar recordings, the Mode C indicating - - -. The St Annes radar, however, tracked the Harrier's Mode C throughout. The SSR interrogators had sensed the Harrier's Mode C but when the radar system software compared the various returns, due to the large differences between succeeding values, it 'deemed' them to be anomalous and erroneous data [invalid showing - - -] and thus did not display this 'low confidence' information. NATS single source radar parameters are optimised for civil traffic and are set to different threshold values, which are radar head specific due to the different range and rotation rates of the different radar heads. There is no reason to doubt the accuracy of the St Annes source Mode C data. It would appear the threshold set at the St Annes radar allows for higher RoDs than either the Cleve Hill or the Great Dun Fell radars.

Between 1517:39 and 1518:17, the formation passed from the Do328's 12 o'clock to its 5 o'clock and at the closest lateral separation (1518:00) the formation was abeam the Do328 at a distance of 1.7nm. The formation's Mode C level (St Annes) was recorded as:

1517:39	FL277
1517:46	FL267
1517:54	FL254
1518:02	FL241
1518:10	FL229
1518:17	FL217

Over the time period above the average rate of descent is 9470 fpm. Throughout the encounter, the level of the Do328 remained FL231 and the pilot later informed the S29 TAC that no TCAS RA was received.

The UK Mil AIP states at ENR1-1-1 Para 2.1:

‘All aircraft in UK Controlled Airspace within the London and Scottish FIR/UIR, other than those in an emergency and certain conditions specified for military aircraft as detailed below, operating under normal circumstances, should not operate with a climb or descent rate exceeding 8000ft per minute’.

UKAB Note (3): There are several exemptions to the above but none applied to the Harriers in the circumstances surrounding this Airprox.

At 1518:30, the Do328 informed the S29 TAC that:

“two er military jets have just gone straight through our level within two miles of us ... they were I guess one thousand feet above us er till they passed our twelve o'clock and then they cleared our level”

After the encounter, at 1519, the SSR label of the formation changed to 3642: a code assigned to Warton.

The S29 Planner called LATCC (Mil) NW at 1520 with regard to the formation's level bust; NW TAC replied that he would be submitting a report.

In summary, the formation descended through its cleared level of FL240 imposed to provide separation from Do328. Given the speed at which the incident occurred and the absence of Mode C level reporting data on the S29 situation display, there was little that the controllers could have done to avert the encounter. The co-ordination was performed in accordance with procedure and there are no civil ATC implications as a consequence of this incident.

DAATM reports that the LATCC (Mil) NW TAC controller stated that their workload was ‘moderate’. About 10min before the incident at 1508 LATCC (Mil) NW TAC requested from MACC S29 Planner a cleared flight path (CFP) for the Harrier formation at FL280 routing DENBY to FIWUD. Coordination was agreed with MACC S29 Planner who added that the Harriers were coordinated through CAS once above FL260. At 1511:30 MACC S29 Planner called the NW TAC controller and asked that he turn the Harriers 10 degrees left; although no reason was given for this track change, NW TAC agreed. At 1513 the routeing restriction was lifted and the Harriers were cleared back on route. Approximately 2min before the incident, Harrier leader requested descent. The NW TAC controller correctly identified conflicting traffic indicating FL230 squawking mode 3A code callsign converted, so the Harriers were told to standby and NW TAC contacted MACC S29 Planner to coordinate them against the Do328. MACC S29 Planner agreed FL240 and about 30sec before the incident, descent was given to FL240 with the Do328 being called as coordinated traffic. Harrier leader acknowledged the TI and read back the descent instruction correctly.

The [Clee Hill] radar replay at 1517:38 shows the Harriers indicating FL278, 4.3nm SSE of the Do328; the next sweep shows them 2.8 nm SSE with NMC displayed. CPA is reached at 1517:54 with the ac showing a separation of 1.7 nm.

The Do328 pilot reported the incident at 1518:30 saying ‘er yep two er military jets have just gone straight through our level within two miles of us’ and further stated ‘yeah they were literally er two miles er to our righthand side they were I guess one thousand feet above us er till they passed our twelve o'clock and then they cleared our level’. The MACC S29 Planner advised the Do328 pilot that the Harriers had ‘bust their level’ and the pilot responded ‘er Manchester C/S as we were visual with

the jets coming in and we didn't get er a resolution advisory we won't be filling out paperwork'. The Harriers then continued their descent and the separation opened.

The LATCC (Mil) NW Tac applied services correctly and, having originally asked for a CFP, amended his cleared flight level (CFL) after negotiation with MACC S29 Planner. He correctly identified a possible conflict with the Do328, so he sought coordination and a timely course of action to resolve the conflict was agreed; a read back of the coordinated level was obtained from the Harrier pilot prior to descent. The lack of Mode C readout during the moments immediately preceding the incident reduced the controllers SA, but from a controlling aspect, this was not a contributing factor to this Airprox.

HQ AIR (OPS) comments that despite being in a high workload situation crews must comply with ATC instructions when in Class A airspace. Also of note is that the RoD used by the Harriers was in excess of the recommended 8000fpm laid down in the UK Mil AIP.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Harriers were under Radar Control in Class A CAS and were correctly cleared to descend to FL240; the formation leader apparently correctly acknowledged this clearance (reported by Supervisor but transcript not available). Although it had not caused a conflict of flight paths, because the ac had crossed and were on diverging tracks before passing FL240, the Harriers' unauthorised descent through FL240 had resulted in a breach of standard separation.

Despite several suggestions, due to the Harrier formation leader's brief report, Members were unable to determine why the Harrier formation had descended below its cleared level.

A Member familiar with several types of Military ac pointed out that complying with the 8000fpm RoD rule is not necessarily straightforward as 8000fpm is 'off scale' on some military VSI/HUDs. (The Harrier VSI displays up to 6000fpm). Another Member observed that, in his opinion, it was most unlikely that either the Harrier's RoD or that the Mode C data was not displayed to the controller due to radar software filtering, were factors in the level deviation. Further, he opined that the relatively high (9000fpm) RoD had not in this instance affected the Do328's TCAS since TCAS II is designed to provide collision avoidance protection for RoC/Ds up to 10 000fpm.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Harrier formation descended below its cleared flight level.

Degree of Risk: C.

AIRPROX REPORT No 2009-141

Date/Time: 28 Oct (Wed) 1157

Position: 5043N 00247W
(Bridport)

Airspace: Lon FIR (Class: G)

Reporting Ac Reported Ac

Type: Paraglider Sea King MK4

Operator: Civ Pte HQ JHC

Alt/FL: 290ft 200ft
(QNH 1013mb) (N/K)

Weather: VMC VMC

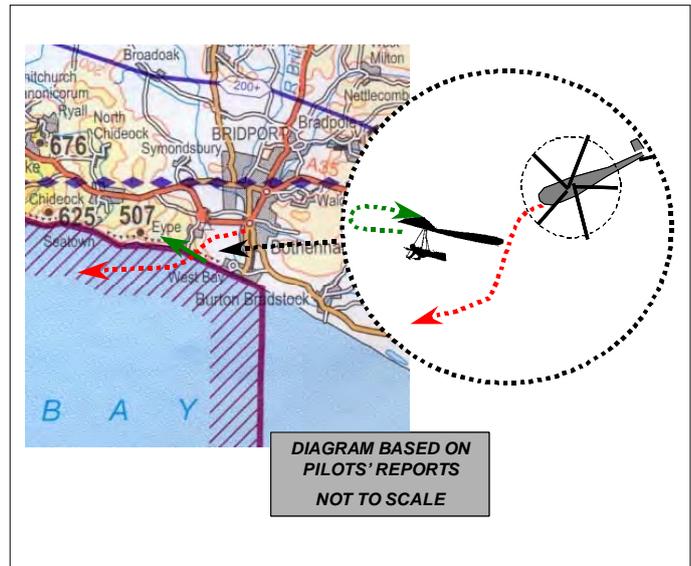
Visibility: 10nm >10km

Reported Separation:

0ft V/ 200m H 30ft V/300m H

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PARAGLIDER PILOT reports flying a multicoloured paraglider with no radio, SSR or TCAS fitted. He was cliff soaring following the cliff E of West Bay Town [on the coast S of Bridport], in level flight tracking 295° at 21kt when he saw a large helicopter approaching. The helicopter pilot appeared to have seen his paraglider as the ac changed course out to sea then took up a track parallel to his own, displaced by 200m, but continued flying at the same altitude as his paraglider. He changed heading by 30° to increase terrain clearance then reversed his track onto 115°. He considered that the military helicopter had flown too close to him and he suffered from the turbulence caused by its rotors, which was exacerbated by the helicopter flying upwind of him. As a result he became unable to control his paraglider and lost alt rapidly nearly impacting with the cliff edge. Eyewitnesses estimated that he dropped 60ft when his canopy collapsed, which clearly endangered his life. He assessed the risk of collision as high reporting the incident after landing.

THE SEA KING MK4 PILOT reports he was flying a green ac with strobes and nav lights switched on, squawking with Mode C and in receipt of a BS from Plymouth Mil W. They were flying a planned low level sortie to the Britannia Royal Naval College Dartmouth to test a new HLS routing via the South Coast from Burton Bradstock [just to the E of Bridport] to Dartmouth. The cloud base was 1200ft allowing them to climb occasionally to make Ops normal calls to Plymouth Mil and Exeter Radar with whom they were in contact. They were navigating using current maps and publications and selected the route to avoid all known restrictions.

On notification of the Airprox 3 weeks after the event, he contacted the crew and they confirmed his recollection of events. As they climbed to 200ft agl to cross a headland just to the SW of Bridport, while heading 260° at 90kt, they saw a paraglider 700m away on the top of the headland. He instructed P2, who was the handling pilot in the LHS, to turn left (out to sea) to give the glider room and ensure that it was not forced over the water. The aircrewman monitored the relative position of paraglider to ensure they were a safe distance away before they turned back on track and continued over the land. They did not come any closer than 300m to the glider, a distance he considered suitable considering the late sighting.

At the time they checked their maps to ensure that they had not flown through a promulgated location, then climbed to report the paraglider position to Plymouth Mil as there was another helicopter operating in the area (possibly a police ac but he cannot recall).

He flew his ac to avoid the paraglider, allow it more room over the land, and at no point did he consider that either his own ac or the paraglider were in any danger. Therefore he did not consider the incident to be an Airprox.

UKAB Note (1): The incident took place below the base of recorded radar cover.

UKAB Note (2): The METARs for the two stations nearest the incident location for 1150 were:

Yeovilton: EGDY 281150Z 30003KT 9999 SCT022 17/13 Q1018 WHT TEMPO FEW025 BLU

Bournemouth: EGGH 281150Z 24006KT 9999 FEW011 SCT026 17/14 Q1019

UKAB Note (3): The incident took place just on the boundary of DGD012, which was active at the time up to 3000ft. Plymouth Mill provides a DACS but they have no record of any contact with the Paraglider. It is understood anecdotally that it is common for paragliders to operate on the cliff-line in that area and this is accepted by the RN to be outwith the Danger Area.

HQ JHC comments that the Sea King pilot appears to have taken what he believed to be appropriate avoiding action when he saw the paraglider, yet the avoiding action appears to have been insufficient to prevent the paraglider entering turbulent air. The decision of the paraglider pilot to turn back towards the Sea King flight path may well have exacerbated the problem and it is unclear why he made the second turn onto 115°. The Sea King pilot was operating within the principle of 'See and Avoid' and in this instance it did not result in the removal of all risk to the paraglider (risk of collision reduced but the proximity of the helicopter affected the safety of the paraglider). It is recommended that this Airprox Report is given wide dissemination to helicopter pilots.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, a radar recording and a report from the Sea King operating authority.

In addressing the HQ JHC comment regarding the paraglider's turn onto 115° a Member familiar with paragliding suggested that this had simply been to remain in the area of lift. He also stated that, in his opinion, even a heavy helicopter co-altitude at a distance of 2-300m would not cause a paraglider canopy to collapse and that the reported collapse had probably been for another reason. A helicopter aircrew Member also pointed out that 'downwash' is exactly that, extending downwards from a helicopter rotor and in this case with a very light South-Westerly breeze would almost certainly not have reached the paraglider. He also stated, however, that a combination of flying close to, higher than and upwind of a paraglider is recognised as being poor practice.

Notwithstanding these factors Members agreed that, although a separation of 300m (reported by the Sea King crew) between two low-speed ac in Class G airspace could be considered adequate to prevent any risk of collision, it had caused the Paraglider pilot significant concern regarding his safety. The HQ JHC Member considered that affording the paraglider a wider berth would have prevented the incident.

Although HQ Navy recognises, and accepts, that paragliders operate along the coast bounding several offshore Danger Areas, Danger Areas are there for a reason and intense helicopter activity in them, as occurred on the day of this incident, is commonplace. Therefore paraglider pilots should expect to encounter rotary-wing traffic if they choose to operate along these sections of coastline.

PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT No 2009-142

Date/Time: 13 Oct 1433

Position: 5120N 00121W (3.5nm
SW Greenham Common)

Airspace: UKDLFS/LON FIR(Class: G)

Reporting Ac Reported Ac
Type: Apache Enstrom 480B

Operator: HQ JHC Civ Pte

Alt/FL: 1500ft 1500ft
(QNH 1027mb) (QNH)

Weather: VMC CAVOK VMC CAVOK

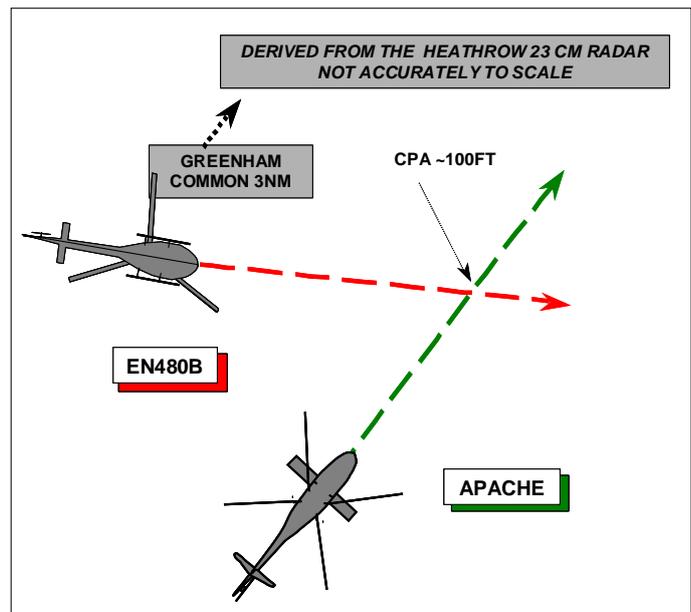
Visibility: >10km 20km

Reported Separation:

100ft V/0m H 200ft V/Nil

Recorded Separation:

100ft V/ <0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE APACHE PILOT reports flying a black ac with all lights switched on, squawking 7000 with Mode C, but with no TCAS fitted, in transit from Middle Wallop to Wattisham, in receipt of a BS from Wallop. When 3nm SW of Greenham Common, heading 040° at 110kt, the rear seat pilot saw a light blue Squirrel type helicopter, 300m away in their 7 o'clock at the same height on a converging heading. As the rear seat pilot called the ac, it took avoiding action by descending and passing 100ft below them before climbing back to the same level and turning right on to a SE'y heading.

He assessed the risk as being high and reported the incident on landing, due to poor radio communication.

THE EN480B PILOT reports flying a blue ac with strobes switched on squawking 7000 with Mode C, while trying to establish a BS with Farnborough, having just changed from Lyneham. He departed from a private helicopter site in Bath at 1415 and contacted Lyneham APP when airborne. Five minutes before the Apache helicopter crossed their path he tried to contact Farnborough Radar 134.35 but the controller was not accepting calls at the time as he was on the landline telephone trying to resolve a problem with another ac.

He continued on his route, heading 095° at 90kt, and saw an Apache helicopter 2nm away, coming from the S on a N'y heading, so he descended from about 1800ft (QNH) to around 1400-1500ft to avoid a collision; the Apache passed overhead a few hundred ft above them.

The weather was clear, they had the Apache in view all the time, they passed directly below it and he was certain that his ac had been visible to the Apache, so he assessed the risk as being none.

UKAB Note (1): ATSI contacted Farnborough who stated that the EN480B called them at 1429 and was advised to standby. This was due to the controller attempting to split the cross-coupled Approach and LARS West frequencies. Once this split was achieved at 1433, the ac was given a BS. The pilot did not mention an Airprox on the RT so the controller did not complete a report.

UKAB Note (2): An analysis of the Heathrow 23cm, 10cm and Clee Hill radars shows the event, both ac squawking 7000 with Mode C. The Apache approaches the CPA tracking 045° and the EN480B 095°, as both pilots reported (on a line of constant bearing). Initially the EN480B is at an alt of 1700ft

and the Apache 1600ft (Mode C – accuracy 200ft). When the ac were about ½ nm apart the EN480B descends by about 100ft (no Mode C on sweep of the CPA) to pass below the Apache before recovering to 1600ft. Both tracks suffer from jitter so individual returns have not been depicted on the diagram above.

UKAB Note (3): Under the Rules of the Air, Rule 9, the ac with the other on its right (the EN480B in this case) shall give way.

HQ JHC comments that it appears that the EN480B pilot was content to continue on a line of constant bearing for longer than the Apache pilot would have expected. Early avoiding action is always preferable as this indicates to the other ac that you have seen them.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that both ac had been operating in Class G airspace where they had an equal and shared responsibility to ‘see and avoid’ other ac. Under the Rules of the Air (Rule 9(3)) the EN480B, having the Apache on its right should have given way, which the pilot did preventing any collision risk, but not by a margin large enough to avoid the Apache crew from being concerned. An experienced GA Member observed that he considered it best practice to avoid both laterally and vertically as it provides the other pilot with a good indication that he has been seen and that positive avoiding action is being taken. Members agreed unanimously that although the EN480 pilot did avoid the Apache, as he was required to do, avoiding it by a larger and more distinct margin would most likely have alleviated the Apache crew’s concern.

While not directly a causal factor, the GA Member observed that the Apache had been operating at an alt where many GA ac fly; although the Apache crew were operating entirely legitimately, choosing a lower altitude could avoid many conflicts such as this.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The EN480B pilot flew close enough to the Apache to cause its crew concern.

Degree of Risk: C.

AIRPROX REPORT No 2009-143

Date/Time: 7 Nov 1117 (Saturday)

Position: 5322N 00255W (3.25nm NW
Liverpool - elev 80ft)

Airspace: CTR (Class: D)

Reporting Ac Reported Ac

Type: DHC-8 C152

Operator: CAT Civ Trg

Alt/FL: ↓1600ft NR
(QNH 992mb) (QNH)

Weather: VMC CLBC VMC NR

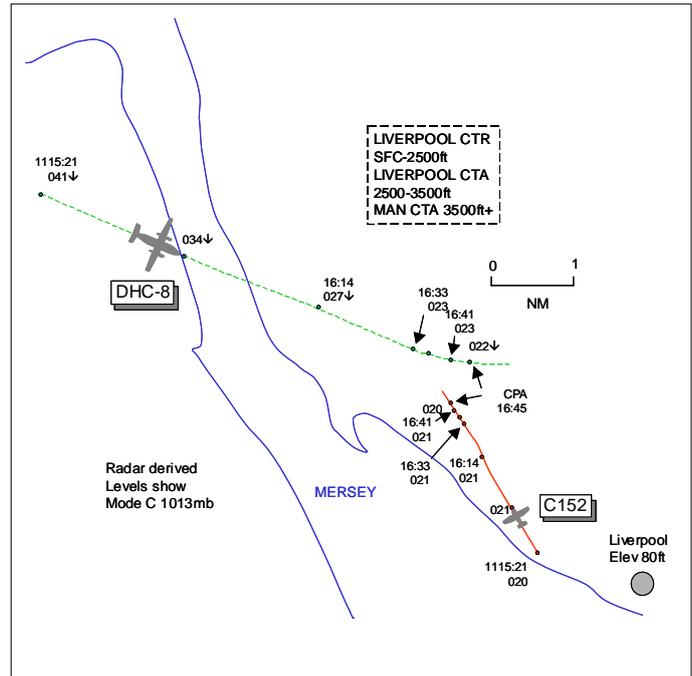
Visibility: 10km NR

Reported Separation:

200ft V/NR H NR

Recorded Separation:

200ft V/O-6nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DHC-8 PILOT reports inbound to Liverpool, IFR and in receipt of a RCS from Liverpool Radar on 119.85MHz, squawking 3770 with Modes S and C. The visibility was 10km flying 1000ft below cloud in VMC so they requested a visual approach, which was approved for RW27. They proceeded towards the downwind leg at 210kt and commenced descent to 1600ft but it was noted during the final 1000ft of descent that there was possible conflicting traffic showing on TCAS. The situation was monitored and the ac was manually levelled-off at 1800ft simultaneously as a TCAS TA was received. The FO became visual with a light ac range 2nm and they turned L away before it passed abeam 200ft below and then behind on their R. The approach was continued for a normal landing. When initially cleared for the visual approach ATC passed TI about a police ac operating in the area of Runcorn Bridge, approximately 4nm final RW27. Whilst considering this traffic their SA was reduced regarding the nearer traffic. He assessed the risk as low.

UKAB Note (1): Initially a PA28 was identified as the reported ac. However, the pilot's description of his sortie did not reflect the Airprox per se. Further tracing action was commenced and the subject C152 was identified; however, this was 3.5 months post incident. The C152 instructor thought that the Airprox might have occurred while he was positioning No 2 to a DHC-8 whilst rejoining the RW27 cct, and he completed a CA1094 Airprox Report Form. After consultation with the UKAB Secretariat, the C152 instructor could not recall being in proximity to a DHC-8 whilst departing Liverpool at the start of the sortie and so his report has not been included.

THE LIVERPOOL RADAR CONTROLLER reports the DHC-8 flight requested and was granted a visual approach for RW27 when 8nm NW of the airport. The DHC-8 came closer to the aerodrome than anticipated and when this was observed TI was passed on the C152 departing VFR to the NW and other traffic in the RH visual cct.

ATSI reports that the Airprox occurred approximately 3nm NW of Liverpool Airport, within Class D airspace of the Liverpool CTR.

At 1110:00, the DHC-8 flight, inbound on an IFR flight from the Isle of Man, established communication with Liverpool Approach, reporting descending to FL70 to TIPOD; the ac was 33nm NW of the airport at the time. The pilot was informed that he would be vectored to the ILS RW27, No 1, with no speed restriction. The flight was turned L heading 115° and descended to an altitude of

2500ft. Subsequently, at 1114:40, when it was 12nm NW of the airport, the DHC-8 was instructed to turn L heading 095°, to position RH downwind for RW27. The pilot commented, *“we’re visual if that helps”*. The controller replied, *“affirm you’re cleared for the visual approach traffic is a police Islander operating currently at the Runcorn Bridge not above Fifteen Hundred feet and they’ll be routing to Widnes shortly”*. The pilot acknowledged the information. The APR stated that he would usually limit ac on visual approaches initially to an altitude of 2500ft, to ensure 1000ft vertical separation from outbound VFR traffic. He could not explain why he had not passed the instruction on this occasion. However, his subsequent actions were based on the belief that the altitude restriction had been issued. The APR telephoned the ADC to inform him that the DHC-8 was making a visual approach. This was acknowledged by ADC, who reported it would be No 2, following cct traffic. The APR said he would keep the DHC-8 until it was visual with the Islander.

Meanwhile, at 1112:30, the C152 flight, in contact with Liverpool Tower, had been cleared for take-off, with a R turn out, from RW27. It was departing to the NW, not above 1500ft, on a local VFR flight. VFR flights are routinely cleared to leave the Liverpool CTR VFR, not above 1500ft, to squawk 0260, the Liverpool conspicuity code. No departure release is requested from Approach but fpps on these ac are provided to Approach Control and this position is then subsequently informed of its departure time. Approximately 2min after the ac had been cleared for take-off, the C152 was transferred to Liverpool Approach. On initial contact, the pilot of the C152 reported enroute to Seaforth, which is a VFR situated on the northern edge of the Liverpool CTR. The radar timed at 1115:21, as the C152 flight makes its initial call, shows it tracking NW, squawking 0260. The SSR Mode C of the C152 shows it at FL020, which is equivalent to an altitude of 1400ft on the Liverpool QNH 992mb. The DHC8 is 7.9nm NW of the C152, passing FL041 (3500ft QNH), with its Mode S return, which is not available to Liverpool controllers, showing it descending to an altitude of 1600ft. The C152 flight was requested to report leaving the Zone. The pilot asked to climb to 2000ft to which the controller replied, *“maintain fifteen hundred initially got inbound traffic”*. The controller still believed that the DHC8 was descending to 2500ft and the 2 ac would be separated by 1000ft. Consequently, he considered that it was not necessary to issue further TI at the time. He also believed that the DHC-8 would make a wider visual cct than it actually carried out.

At 1116:15, the APR, realising that the DHC-8 had descended below 2500ft, advised the pilot *“there is light aircraft in your right two o’clock range of two miles Fifteen Hundred feet and below and the circuit’s active as well”*. The traffic was the subject C152 at FL021 (1500ft QNH), which was now 2.7nm SE of the DHC-8 and passing FL027 (2100ft QNH) and descending to 1600ft. No further information was passed to the subject flights about each other. After TI about the Islander was updated, the DHC-8, at 1117:30, was instructed to contact the Tower frequency. By this time, the DHC-8 was N of the airport, well clear of the C152.

[UKAB Note (2): The radar recording at 1116 33 shows the DHC-8 levelling-off at FL023 (1700ft QNH) and crossing 1.1nm ahead of, and 200ft above, the C152. The next radar sweep shows the horizontal separation reducing to 1nm with the DHC-8 commencing a L turn followed, on the next sweep 4sec later, as separation just over 0.6nm and still 200ft. The CPA occurs at 1116:45, as the C152, now indicating FL020 (1400ft QNH) passes just less than 0.6nm SSW of the DHC-8, which is now descending through FL022 (1700ft QNH).]

The MATS Part 1, Section 1, Chapter 2, Page 1, states the minimum services to be provided by ATC in Class D airspace: *‘(a) Separate IFR flights from other IFR flights; (b) Pass traffic information to IFR flights on VFR flights and give traffic avoidance if requested; (c) Pass traffic information to VFR flights and other VFR flights’*. On this occasion, the C152 was advised that there was an inbound ac but with no further information and the DHC8 was informed about the C152, albeit when the distance between the ac had reduced to about 2.7nm. Up to that point, the controller believed that the 2 ac would be separated vertically, by 1000ft.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the DHC-8 crew, transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

Members noted that the APR had intended to build in vertical separation between the inbound IFR DHC-8 and the outbound VFR C152, which is more than the minimum service requirements for Class D airspace. The APR had cleared the DHC-8 flight for a visual approach but omitted to give a height restriction, not below 2500ft, owing to the outbound C152 flying as directed at 1500ft. This omission had resulted in a conflict between the subject ac that had caused the Airprox. In arriving at this conclusion, Members were cognisant of the requirements in Class D airspace for VFR traffic to avoid IFR traffic. However, in this case, and notwithstanding his requirement to look-out, the absence of specific TI and the instruction to maintain 1500ft to the C152 pilot persuaded Members that it was the unrestricted descent of the DHC-8 towards the C152 that was the cause.

Members agreed that the passing of TI on the Islander ac operating at Runcorn Bridge had not helped the DHC-8 crew's SA with respect to the closer C152. The C152 had been given generic TI on the DHC-8 as *"...got inbound traffic"* when the pilot requested climb to 2000ft but this was not updated when the DHC-8 descended through 2500ft and flew closer to the airport than the APR anticipated. The APR gave TI to the DHC-8 crew, albeit late; however, by that stage the crew already had the 'heads-up' from TCAS of the potential conflict with the C152 and arrested their descent at 1800ft simultaneously as a TA was generated. After visually acquiring the C152 2nm away and 200ft below, they made a L turn away from it. Although this had been a slightly untidy affair, the Board believed that the good SA, visual sighting and subsequent actions taken by the DHC-8 crew were enough to ensure any risk of collision had been quickly and effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The DHC-8 crew was cleared for a visual approach without a height restriction, which resulted in a conflict with the C152.

Degree of Risk: C.

AIRPROX REPORT No 2009-145

Date/Time: 21 Oct 1402

Position: 5143N 00057W (2nm
W Chinnor)

Airspace: Lon FIR (Class: G)

Reporting Ac Reported Ac

Type: Cessna 152 Bell 430

Operator: Civ Trg Civ Pte

Alt/FL: 2200ft 2000ft
(QNH) (RPS 996mb)

Weather: VMC CLBC VMC CAVOK

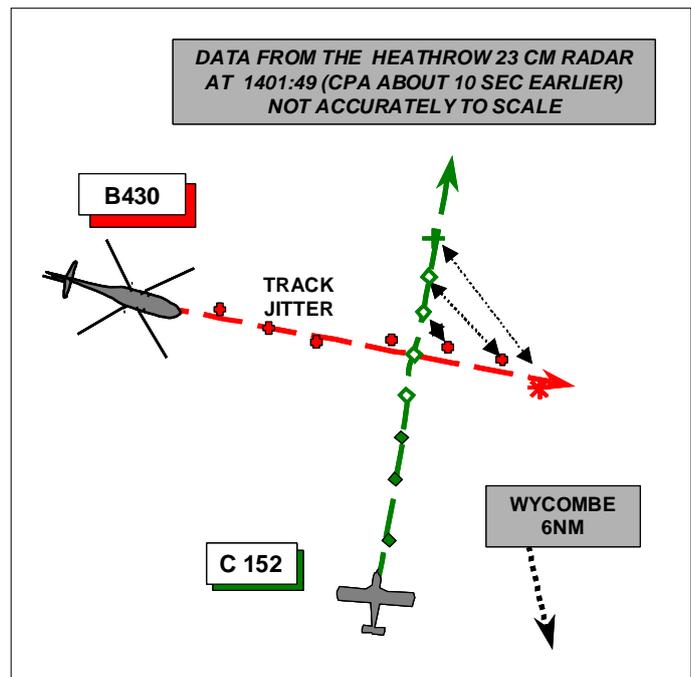
Visibility: 10km >10km

Reported Separation:

100ft V/Nil H 300ft V/500m H

Recorded Separation:

See UKAB Note (2).



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CESSNA 152 PILOT reports flying a local training flight under VFR in a white ac with red and blue stripes, squawking 7000 with Mode C [he thought] but with no TCAS fitted, and in receipt of a BS from Wycombe TWR. While heading 330° (he thought) at 90kt 6.5nm NW of Wycombe a helicopter, believed to be a white A109 [he thought] was seen to the their port side at the same alt and heading NE on a constant bearing with his ac. After a few sec it became apparent the helicopter had not seen his ac so he then decided to climb and maintain heading to avoid the other ac. The helicopter was seen passing behind by about 200ft and continuing on the same heading and at the same alt. He assessed the risk as being Medium, reporting the incident to Wycombe TWR.

UKAB Note (1): The C152 does not display any SSR throughout.

THE BELL 430 PILOT reports flying solo in a white helicopter with a blue stripe, squawking 7000 with Mode C and heading 092° at 120kt on a private flight from a private site to Stansted under VFR. While changing frequency from Benson to Farnborough, he was aware of a white single-engined monoplane in straight and level flight, 3km away in his 4 o'clock. He noted that the ac was continuing on track so he reduced airspeed by 10kts to allow it to cross ahead of him. When the ac was in his 1 o'clock it suddenly and aggressively assumed a high nose up attitude, which he assumed was due to the pilot's late sighting of his helicopter. After the ac crossed he increased speed and continued on his track towards BNN.

ATSI reports that a C152 was flying under VFR from Wycombe Air Park and at 1356 reported departing to the N on 995mb to TWR. Wycombe Air Park is situated in class G airspace and has no surveillance capability. At 1403 the pilot of the C152 reported an Airprox, stating: "(callsign).....two miles west of Chinnor at fifteen hundred local Augusta One Oh Nine passing same level er avoidance taken climbing above". The pilot added that the helicopter was white with blue stripes but he could not establish its registration. Some minutes later the controller asked the C152 about the track of the helicopter, the pilot replying: "Er it was opposite direction from the left same level from Benson heading north towards Luton Area". Wycombe were unaware of the helicopter and RT recordings show the helicopter did not call Wycombe TWR.

The B430 pilot's report states that he had recently changed from Benson (120.9Mhz) to Farnborough (125.250Mhz) and was in receipt of a BS. RAF Benson advise that the Bell 430 reported changing from their frequency to Farnborough at 1401. Farnborough advise that SSR codes are allocated whenever they provide a service but that no call was received from the B430 and consequently they have not provided a report.

The radar recordings show that the B430 changed from a Benson transponder code to a conspicuity code of 7000 at time 1358 and the 7000 code was retained until it changed to a Stansted code at time 1410.

There are no apparent ATC causal factors.

UKAB Note (2): An analysis of the Heathrow 10 and 23cm radars showed the incident although both ac tracks suffer from significant jitter. At 1358.36 the Bell 430 can be seen on a steady track of 095° indicating an alt of 2000ft and the C152 as a primary only contact tracking initially about 350°, before turning slightly to the right. Both ac approach each other with unchanged parameters on a line of constant bearing, with the C152 in the B430's 1 30 position until about 1401:30 when the C152's return disappears for several sweeps, reappearing after the CPA in the Bell 430's 0730 at about ½nm. Although the CPA cannot be determined, it would appear from projecting the C152's track that it passed through the B430's 12 o'clock at a distance of less than 0.2nm.

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 authorities.

Members were not able to resolve the anomalies in the geometry of the incident reported by the two pilots; however, they accepted radar recording showed the incident reported and, despite the track jitter, showed enough detail to make a reasonably accurate analysis. Also it appeared from the radar recording that, despite him reporting otherwise, the C152 pilot did not have his SSR switched on, or it was not serviceable.

Both ac were operating legitimately in Class G airspace and both had an equal and shared responsibility to see and avoid other ac in accordance with the Rules of the Air. The B430, having the C152 on its right should have given way to it. Although the B430 pilot reported that he did give way by reducing speed by 10kt, GA Members considered this to be inadequate. They also observed that best practice is to conduct avoidance laterally and/or vertically as it gives to opposing pilot a visible indication of the avoidance. Reducing or increasing speed significantly, although sometimes effective, can, as in this case, lead to the other pilot believing that his ac has not been seen or avoided by a sufficient margin.

In this incident, however, both pilots saw and avoided the opposing ac, albeit by a margin smaller than either pilot would have desired. That being the case, the Board agreed that there had been no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The B430 pilot flew close enough to the C152 to cause its pilot concern.

Degree of Risk: C.

AIRPROX REPORT No 2009-146

Date/Time: 19 Nov 1307

Position: 5128N 00034W (4nm W
Heathrow - elev 83ft)

Airspace: LTMA (Class: A)

Reporter: LTC SW DEPS

Type: A320 B737-500

Operator: CAT CAT

Alt/FL: 5000ft↑ (QNH) 3800ft↑ (QNH)

Weather: VMC NR VMC NR

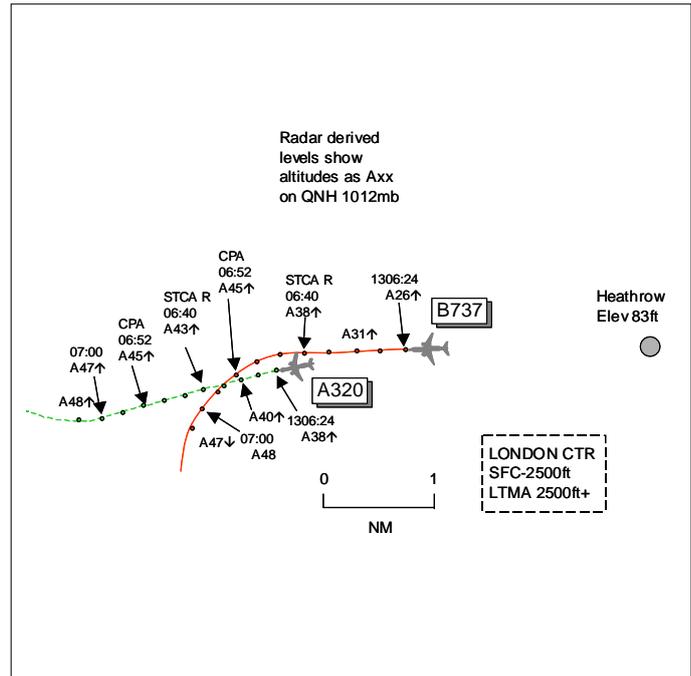
Visibility: NR NR

Reported Separation:

NR NR

Recorded Separation:

Nil V/0-8nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LTC SW DEPS/WILLO CONTROLLER reports that the A320 took off on a CPT departure whilst the next departure was the B737 on a DVR SID. He thought that the separation looked 'quite tight' and assumed the Tower would keep the flights and separate them visually in the vicinity of the aerodrome or stop the climb of the B737. Just as STCA activated with a high severity alert, the A320 was transferred to his frequency climbing to 6000ft. His first call was to give avoiding action onto heading 300°; he instructed a R turn because the DVR SID flown by the B737 would eventually turn away to the L. He also passed TI on the B737 behind. At this point he could not distinguish between the 2 ac datablocks above the radar returns and he saw the B737 at the same level as the A320 (4600ft altitude) and then climbing to 4800ft before descending in the turn on the DVR SID back to 4000ft. The lateral separation appeared to be about 0.5nm with the B737 having a faster GS, determined from the ac's trail dots. The A320 crew did not report any TCAS alerts and continued their departure. After issuing avoiding action there was nothing he could do, as the returns were so close he could not decipher and/or be sure of the datablock information.

THE HEATHROW AIR N DEPARTURES CONTROLLER reports mentoring a Phase 2 trainee working RW27R departures. The A320 had taken off on a CPT departure and was climbing well but with a relatively low forward speed. The B737 flight was cleared for take-off with the correct 1min separation. With the B737 airborne he checked to see what departure order had been selected by the trainee and made a note on the training report. The trainee transferred the A320 to LTC SW Deps and then they both noticed how much faster the B737 was. The trainee asked him if the B737 should be stopped at 4000ft, which he confirmed, and the trainee passed the instruction. The B737 crew reported that they were already passing 4000ft and would descend. They could see both ac at all times and could see that the A320 was in a R turn off the CPT SID track. They kept the B737 on their frequency until the acs' tracks diverged and then issued instructions to climb to 6000ft and transferred the flight when radar separation was assured. The radar returns on the ATM were within 1nm of each other and he saw the A320's Mode C reading 5400ft and the B737 reading 4400ft before it descended.

THE A320 PILOT reports departing Heathrow IFR on a CPT SID and in communication with London squawking an assigned code with Modes S and C. As they climbed through 5000ft, he thought, for

6000ft, ATC issued an avoiding action R turn onto heading 300°. The A/P was disconnected and the ac was turned R and the climb was continued. Later ATC informed them that this was due to the proximity of another ac that departed behind them, also from RW27R. The other ac was not seen and neither a TCAS TA or RA was received.

THE B737 PILOT reports departing Heathrow IFR when the controller instructed them to level off at 4000ft. At the time they were climbing through 3800ft with inflight MET conditions of VMC and they had been visual contact with traffic ahead at all times. They reduced power to idle to comply with the instruction but owing to their vertical speed the ac's climb was only stopped at about 4500ft; an immediate descent to 4000ft was performed. No Airprox report was filed because from their perception the proximity of the other ac was not critical; no TCAS warnings were triggered during the incident.

ATSI reports that the Heathrow 1250 Wx was: surface wind 220°/16kt visibility +10km and cloud few 3000ft.

The departure RW 27R was under the control of a mentor and trainee as Air N. The trainee was relatively inexperienced as a controller at Heathrow, although she had previously held a Certificate of Competence at another airport. The mentor had returned from a break ahead of his trainee and had taken over the position. His last action was to clear the A320 for take off, before handing over the frequency to the trainee.

The A320 flight was cleared to line up and wait at Alpha 3 at 1302, with another ac departing ahead from an intersection. The B737 flight was, subsequently, cleared to line up at Alpha 3 after the A320 had departed. At 1304:02, the A320 flight was instructed *"Two Seven Right clear for take off two two zero degrees one six gusting two eight knots"*. Fifty three seconds later, at 1304:55, the trainee cleared the B737 for take off RW27R.

The A320 was departing on a Compton (CPT) 3F SID: *'Straight ahead to intercept LON VOR R258 until LON D7, then turn right onto NDB WOD QDM 271°, cross LON D11 (CPT D17) above 3000, to NDB WOD (CPT D13) above 4000, cross CPT D8 at 6000 (5%) then to CPT VOR'*. The B737 was on a Dover (DVR) 5F SID: *'Straight ahead to LON D2, then turn left onto NDB EPM, 4000 or above (4.6%), then (but not before LON D10) DET VOR R273, cross DET D32 5000 or above, DET D29 at 6000, DET D5 at 6000 to DET VOR, then to DVR VOR'*.

The Heathrow MATS Part 2 states the departure separations required for IFR departures. The timed based separation required between the A320, on a CPT 3F and the B737 on a DVR 5F SID, is 1min. It is routine practice at Heathrow, when 1min separation is required, to clear the second ac for take off when the first aircraft is airborne. However, the appropriate separation is not always achieved by this method. On this occasion, the B737 rolled quickly and departed 43sec after the A320. In this event, the procedures stated in the Heathrow MATS Part 2 should have been followed: *'Transfer of Control of Departures. The departures controller may only transfer outbound aircraft to the appropriate TC frequency once: All aerodrome conflicts have been resolved, and The aircraft has been seen to commence its initial turn onto track. If the departure time separation applied does not achieve the expected airborne separation then the Air controller should intervene to establish positive track separation by the use of an early turn onto a heading. This action is to be recorded on the FDE and co-ordinated with the appropriate TC controller'*.

The A320 flight was instructed to contact the LTC SW DEPS Controller at 1306:25. At the time, the A320 was passing 3800ft, 1.2nm ahead of the B737, which was passing 2600ft. After the A320 had been transferred, the mentor looked at the ATM and observed that the B737 was catching up the A320. He realised that the A320 should not have been transferred. The trainee, also, was aware of the situation and instructed the B737 to *"...stop your climb four thousand feet maintain four thousand feet"*. It is unclear whether or not the trainee asked the mentor if she should take this action. The pilot replied *"...we're already passed four thousand and we're now descending"*. The mentor reported that he could see both ac clearly out of the window, observing that the B737 had commenced a L turn

behind the A320, which was turning R. After the tracks of the 2 ac were diverging, the B737 was cleared to climb to 6000ft, in accordance with the SID.

The CPA, 0.8nm, occurred at 1306:52. The Heathrow H10 radar display shows both ac passing 4500ft, climbing to 6000ft. The Mode S of the A320 indicates its heading as 251°, with GS 164kt and the B737 heading 251°, at GS 194kt. As the B737 turned to pass 0.9nm behind the A320 and 100ft above it (1407:00), it had reached 4800ft before commencing its descent back to 4000ft.

On first contact with LTC, the radar controller, realising the close proximity of the subject ac, issued avoiding action to the A320 “...avoiding action turn right heading of Three Zero Zero degrees traffic behind climbing to six thousand feet”. After the pilot read back the heading the instruction was changed “..traffic er is behind you now er conti- er actually fly heading of Two Eight Zero degrees and maintain six on reaching”.

Both pilots later confirmed on their respective TC frequencies that they had not received a TCAS RA during the incident.

THE NATS UNIT INVESTIGATION reports that the B737 had carried out a full power take-off owing to windy conditions experienced on arrival. The A320 followed the C/L of the CPT SID track. However, the B737 commenced a relatively late L turn taking the ac to the edge of the DVR SID lateral swathe; this would be commensurate with the higher speed of the ac. It became apparent that the A320 operator’s ac departing Heathrow adopt a climb profile, prescribed in ICAO Doc 8168, which alleviates noise close to the aerodrome. This results in a slower forward speed until the ac reaches 3000ft at which point it will accelerate to 250kt. Other airlines adopt a different profile, also described in ICAO Doc 8168, which results in an earlier acceleration to 250kt at 1000ft. The consequence of this is that similar ac types and weight may still have a different departure profile.

A Safety Notice 02/10, ‘Aircraft Departure Performance’ has been published in order to alert controllers to the potential difference in departure performance’.

TCAS Performance Assessment

Mode S Downlink – No TCAS II RA messages were downlinked via Mode S during the timeframe of this encounter. This indicates that no RAs were issued to either ac in this encounter.

InCAS Alert Statistics

Closest Point of Approach (CPA)

CPA Time	Horizontal Sep. (NM)	Vertical Sep. (ft)
13:06:52	0.824	22

Minimum Lateral Separation

Min. Latsep Time	Horizontal Sep. (NM)	Vertical Sep. (ft)
13:06:52	0.824	22

Minimum Vertical Separation

Min. Vertsep Time	Horizontal Sep. (NM)	Vertical Sep. (ft)
13:06:51	0.826	0

Assessment of TCAS Performance

The Interactive Collision Avoidance Simulation tool (InCAS) simulation using single source radar data from Heathrow 10cm radar indicates that no Traffic Alerts (TAs) or Resolution Advisories (RAs) were issued to either ac in this encounter. This aligns with the lack of downlinked RAs for this encounter.

TCAS II is intended to prevent airborne collisions via the display of proximate traffic to help aid visual acquisition of intruding ac and if necessary by providing the pilot with a vertical manoeuvre to resolve the conflict.

Primarily TCAS II uses the principle of ‘time to closest point of approach’ (CPA) to determine when to issue Traffic Alerts and Resolution Advisories. However if both ac have similar speeds and headings, as is the case in a ‘catch up’ scenario then the time to CPA calculation becomes ill conditioned and an alert may not be issued when required. In these situations, in addition to calculating the CPA, TCAS II also determines the separation between the ac. If the lateral separation is under this modification (known as DMOD) then an alert will be issued. For this encounter between the A320 and the B737 the sensitivity level of TCAS was set to ‘4’ as the encounter occurred between 2350 and 5000ft.

TCAS uses the alarm thresholds for sensitivity level 4 as shown in Table 1 below.

The table indicates that although the vertical separation between the ac was sufficient to generate a TA and RA; the lateral separation although small at ~0.8nm was still larger than the 0.48nm required to issue a TA or 0.35nm required to issue an RA for this encounter.

Own Altitude (feet)	SL	Tau (Seconds)		DMOD (nmi)		Altitude Threshold (feet)	
		TA	RA	TA	RA	TA	RA (ALIM)
< 1000	2	20	N/A	0.30	N/A	850	N/A
1000 - 2350	3	25	15	0.33	0.20	850	300
2350 - 5000	4	30	20	0.48	0.35	850	300
5000 - 10000	5	40	25	0.75	0.55	850	350
10000 - 20000	6	45	30	1.00	0.80	850	400
20000 - 42000	7	48	35	1.30	1.10	850	600
> 42000	7	48	35	1.30	1.10	1200	700

Table 1: Sensitivity Levels of TCAS II

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

When the 1min departure separation was not achieved between ac, the onus was on the Air N trainee and mentor to resolve the situation. Contrary to the MATS Part 2 procedures, the trainee transferred the A320 to LTC SW DEPS whilst the ac were in conflict and then ‘stopped-off’ the climb of the following B737. Members agreed that the mentor, who was responsible for his trainee’s actions, should have ensured compliance with the procedures and, in not doing so, had caused the Airprox.

The A320 crew was unaware that the B737 was closing up and followed the avoiding action R turn issued by LTC SW DEPS. The B737 crew were told by Air N to stop their climb at 4000ft, but as they were already passing that altitude with a high ROC, they reached 4800ft before commencing a descent. The geometry of this encounter was, surprisingly, outside the parameters to trigger a TCAS alert/warning, even though separation had reduced to 0.8nm. Owing to the good Wx the B737 crew had maintained visual contact with the preceding A320 throughout and had monitored its flightpath whilst complying with ATC stop-off instruction. This visual contact was enough to allow the Board to conclude that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Air N mentor did not comply with the Heathrow MATS Part 2 procedures.

Degree of Risk: C.

AIRPROX REPORT No 2009-151

Date/Time: 1 Dec 1426

Position: 5147N 00128W (5nm
ENE of Brize Norton
elev: 287ft)

Airspace: Brize CTR/AIAA (*Class: D/G*)

Type: Lockheed Tristar B767

Operator: HQ Air (Ops) CAT

Alt/FL: 3500ft 2800ft↑
QFE (1000mb) QNH (1010mb)

Weather: NR NR

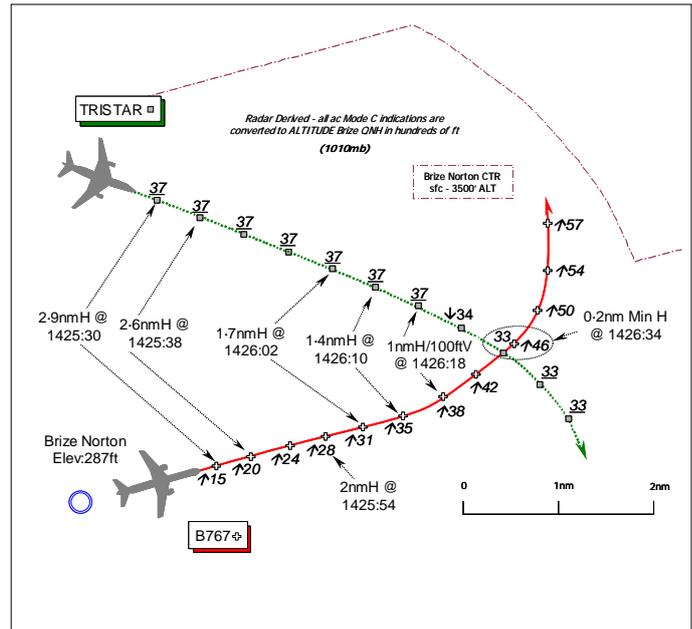
Visibility: 10km NR

Reported Separation:

200ft V/0.8nm H NR

Recorded Separation:

100ftV @ 1nmH/0.2nm MinH @1300ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

BOTH PILOTS FILED

THE LOCKHEED L-1011 TRISTAR PILOT reports he was the Pilot-in-Command (P-i-C) conducting a training sortie whilst in receipt of a TS from Brize Norton Director (DIR) on 133.75MHz. A squawk of A3740 was selected with Mode C; Mode S and TCAS are fitted.

Whilst commencing the right hand turn at the end of the outbound leg of the Brize Norton NDB [Locator/DME] hold for RW08, a B767 was first seen 1½nm on their starboard side slightly below his ac. The B767 continued to climb through the Tristar's level and then turned towards his ac. To avoid the B767 he rolled out of the turn onto a heading of 112° and commenced a descent at 800ft/min. At the same time TCAS enunciated a TA and ATC demanded an immediate avoiding action turn to the L. Since he deemed that the B767 was so close that any turn - either L or R - would endanger his ac, he continued the descent without initiating a turn. The B767 passed slightly ahead from R – L; he estimated the horizontal separation as 0.8nm when the B767 was some 200ft above the Tristar and assessed the Risk as 'very high'. DIR was immediately informed that an Airprox had occurred.

THE BOEING B767 PILOT reports departing under IFR from Brize Norton bound for Trenton Canada. The departure clearance was issued whilst taxiing out for RW08; however, the clearance was refused as it involved the use of QFE, which was not in accordance with company SOPs. A further clearance was then copied of: "cleared runway heading [RW08 QFU – 076°] 2800ft on QNH 1010mb to join CAS 5nm N of MALBY level Flight Level 80 squawk 3247 London CONTROL 134.75 Brize when instructed 127.250". Both pilots understood this meant climb straight ahead to 2800ft QNH (1010mb) but that their cleared level was FL80. In hindsight, he can see the potential for clarification to be sought, but at the time neither pilot felt there was any ambiguity. On departure passing approximately 1700ft QNH (1010mb), he thought, [actually at 2400ft QNH] the crew called Brize Approach (APP), reported their altitude passing and 'climbing Flight Level 80 runway heading'. This statement was not queried or challenged by ATC. Shortly afterwards he saw the Tristar on his L about 3nm away and 300ft above them – apparently operating on a different frequency. Simultaneously they received an instruction to turn left onto a radar heading of 260°. [UKAB Note (1): The B767 P-i-C may have confused the timing of this instruction with the outbound radar vectoring

instruction onto 280° issued by APP earlier at 1425:53.] He refused the instruction and maintained their current heading deciding that with their current rate of climb the potential conflict would be over in seconds. He was able to monitor the Tristar visually and with TCAS that confirmed the latter was flying level [at that point]. TCAS enunciated a momentary TA but they did not receive an RA. APP then stated they had been instructed to 'stop climb at 2800ft but this was not the case verbatim; if the words 'stop climb' or 'climb to altitude 2800ft' had been used in the departure clearance he can without doubt say that he would have interpreted the clearance correctly and selected 2800ft as his initial cleared altitude.

Stressing that he was not trying to apportion blame to the system, the controller or himself, in this instance if the airways joining instructions had been given separately to the local departure instructions, or more simply, if the controller had used the phrase 'stop climb 2800ft', or, 'after departure climb to altitude 2800ft', it would have prevented this incident. Furthermore, he could have been immediately corrected by ATC when he reported his cleared level after take-off to APP.

THE BRIZE NORTON AERODROME CONTROLLER (ADC), a Local Examining Officer (LEO), reports that this Airprox occurred during the examination of another controller for the award of his local ADC validation. [The LEO was responsible for the operating position with both Brize Ground (121.725) and Tower (123.725MHz) combined onto the ADC position.] The B767 was due to depart on RW08 for MALBY under IFR. The MALBY SID requires ac to be TACAN-equipped but the B767 was not fitted with TACAN. Therefore, to avoid passing a lengthy scripted clearance that might require clarification, the ADC candidate liaised with APP before passing the B767's clearance [words to the effect of]:

'After departure maintain runway track climbing 2800 feet QNH, for radar vectors to join CAS 5nm N MALBY level Flight Level 80, squawk....frequency for London control 134.750 when instructed. Frequency for Brize Approach 127.250.'

The pilot read back this clearance, but from the way it was read back neither the LEO nor the ADC candidate detected any misunderstanding of this clearance.

Although standard procedure is to pass all ac departing to MALBY a MALBY SID, the candidate was not corrected as it was considered that the departure clearance passed was not, in itself, unsafe, albeit that the point was always going to feature in the session debriefing. It was not suspected at the time that the way the clearance was passed by the candidate to the B767 crew could have been confusing, as the Unit convention when using a MALBY SID is to pass both the departure clearance and airways joining clearance at the same time. Although the candidate passed a different SID, he did so in a convention that was not unexpected.

There was a delay between the clearance being passed and the ac's departure due to checks and another inbound IFR ac. When the B767 was 'released' by APP, the controller gave the instruction, 'released 2800 QNH'. This was not passed to the B767 crew as both he and the candidate were content that 2800ft QNH (1010mb) was the extent of their clearance. The B767 then departed and was switched to Brize APP.

The LEO perceived that the inexperience of the ADC candidate was a contributory factor.

THE BRIZE NORTON DIRECTOR (DIR) reports he was Mentor to a trainee controller operating DIR, using the Brize Watchman ASR and Brize SSR that were fully serviceable and set to a 20nm displayed range. The Tristar was the only ac under control at the time of the Airprox; it was in the Brize hold at 3500ft QFE (1000mb) under a TS and he assessed his workload as 'low'. The trainee was in full control of the ac when APP co-ordinated the B767's departure from Brize Norton not above 2800ft QNH (1010mb). He overheard the Approach Controller [APP - who was also under training] instruct the ADC to maintain runway track 2800ft QNH for the departure of the B767 and then release it. His trainee then gave traffic information about the departing B767 to the Tristar crew. As the B767 got airborne the Tristar was turning S in the hold at 3500ft QFE (1000mb). He then noticed that the B767's Mode C was indicating 032 - 3200ft (1013mb) - [about 3110ft QNH (1010mb) when

the ac were 1.7nm apart] and shouted to the APP controller asking what his traffic was doing whilst simultaneously his trainee issued an avoiding action instruction to the Tristar crew to turn to the N. The Tristar crew did not take the turn and elected to descend below the B767 as the latter continued to climb; at this point the Tristar crew informed him that they would be filing an Airprox against the B767. He estimated minimum separation to have been 200ft vertically and 1nm horizontally.

THE BRIZE NORTON APPROACH CONTROLLER (APP) reports that he was Mentor to a trainee controller who was operating the APP position on 127.25MHz from 1413:00, also using the Brize Watchman but with SSR from the Clee Hill source that was fully serviceable. The B767 was awaiting release from RW08 for a MALBY departure but the crew were unable to fly the SID, so the intention was to climb the ac on departure on RW track to an altitude of 2800ft Brize QNH (1010mb) and then give radar vectors for MALBY. With the Tristar in the locator hold at a height of 3500ft Brize QFE (1000mb) under a TS, when the ADC called for a release on the B767 his trainee gave the instruction to maintain RW track, climb to 2800ft Brize QNH (1010mb). As the B767 became airborne his trainee was co-ordinating on landline a LARS track transiting close to the Brize overhead. Due to that landline conversation he did not hear clearly the initial airborne call from the B767 crew. As the co-ordination conversation was taking place the DIR Mentor noticed that the B767 was climbing above his cleared altitude. Avoiding action was issued to the B767 crew to descend and DIR issued an avoiding action turn to the Tristar crew. The B767 crew reported visual with the Tri-star. When he asked the B767 crew why they had climbed above an altitude of 2800ft QNH, the pilot said he understood that he had been cleared to climb to FL80 to join CAS at MALBY. He informed the B767 pilot that APP had not cleared him to climb above 2800ft and that the Tristar crew was filing an Airprox. Subsequently, the B767 continued en-route with LAC.

THE BRIZE ATC SUPERVISOR (SUP) also provided a comprehensive report broadly substantiating the foregoing controllers' accounts.

The Brize Weather was reported as: surface wind 140/04kt; visibility 20km nil weather; FEW 11000ft, SCT 16000ft; QFE 1000mb, QNH 1010mb.

HQ AIR COMMAND ATM SAFETY ANALYSIS (formerly DAATM) reports that the Tristar was in the BZN NDB hold for RW08 at 3500ft QFE (1000mb) prior to recovery to Brize Norton. [UKAB Note (2): Acting SATCO Brize Norton advises that the Tristar had been established in the hold in Class G airspace above the upper level of the CTR previously and remained under a TS. This is SOP at Brize Norton for all Instrument Traffic.]

The B767 was departing Brize Norton to join CAS at MALBY. When the Airprox occurred the controlling positions of APP, DIR and LARS [that was initially bandboxed with APP] all had trainees being screened by qualified Mentors and the Tower controller (ADC) was under examination. The Supervisor (SUP) was present in the Approach Control Room and he reported his division of attention to be 'extensive' due to the training taking place in all radar positions and the examination taking place in the VCR.

At 1408:49 the ADC called APP on the landline to notify APP that the B767 had started to taxi for a MALBY departure squawking A3247. The MALBY SID is based on the BZN TACAN but, as the B767 was not TACAN equipped, it could not fly the procedure as published. The ADC continued to explain, "he's got no TACAN so can you give him a SID B and then vectors or do you want me to read the spiel to him?" The ADC, in referring to 'the spiel', meant the text from the TAPs/Mil AIP which, when passed, would allow the B767 pilot to input the applicable reporting points of OSGOD and MALBY into their navigation system and thus fly the briefed profile. However, APP agreed to a SID B, squawking A3247 and to frequency 127.250 MHz. SID B is a climb on runway track to 2500ft QFE [2800ft QNH]. Shortly after this exchange APP dealt with numerous LARS and landline calls before APP/LARS was 'split' at 1413:00 and the LARS task handed to another controller. Meanwhile, at 1412:20 the ADC passed the B767's departure instructions and included the airways joining clearance, using QFE as the pressure datum. However, the B767 crew required to use QNH so the ADC re-negotiated with APP and an amended departure clearance was issued. This was transmitted by the ADC, together with the CAS joining clearance, to the B767 crew at 1413:32:

"[B767 C/S] after departure climb runway track 2800ft QNH 1010 to join controlled airspace 5 miles north of MALBY level FL80 squawking 3247 and frequency for London, when instructed, 134.750, after departure contact Brize APPROACH 127.250."

[UKAB Note (3): The B767 crew read back their clearance:

"[B767 C/S] is cleared runway heading 2800ft on the QNH 1010 to join controlled airspace 5 miles north of MALBY level FL80 squawking 3247 London frequency 13475 and Brize 12725."

The ADC acknowledged the read-back as correct, and then switched the B767 to the Tower frequency. The stop at 2800ft QNH (1010mb) for the B767 enabled 1000ft separation to be maintained beneath the Tristar in the NDB hold at 3500ft QFE (1000mb) – equating to 3800ft QNH - in accord with the co-ordination agreement established between APP and DIR. There is no mention on the tape transcript of a co-ordination agreement being established between APP & DIR to ensure 1000ft standard separation between the Tristar and the departing B767. However, Acting SATCO Brize Norton advises that APP and DIR are sat next to each other in the ACR. APP is the co-ordinating authority for the airspace and as such tactically co-ordinated the B767's departure 'off-mic' with DIR.]

The LEO examining the ADC reported that no misunderstanding by the pilot was detected from the way he read back the clearance issued. Furthermore, although the clearance passed was not standard for ac departing for MALBY, the candidate was not corrected as the LEO did not consider the departure clearance passed was unsafe.

[UKAB Note (4): Acting SATCO Brize Norton added that the MALBY SID is based on the BRIZE TACAN, although the TAP charts do provide a non-TACAN based routeing. The inclusion of the climb out restriction in the same message as the airways joining clearance was non-standard. The candidate, in an effort to simplify the passing of the clearances removed the effective safety barrier afforded by the release call to APP, where normally the climb out restriction would be passed separately.]

From 1415:09 the B767 held, initially at the pilot's request and then due to other traffic on a practice diversion, until 1421:00 when a line-up instruction for RW08 was issued. At 1423:48 the candidate ADC received a 'release' clearance from APP trainee as *"the [B767 C/S] is released 2800 feet QNH 1010"*; the ADC read back the release clearance to APP *"released 2800 feet 1010 roger Tower"*. Cognisant of the imminent departure of the B767, DIR passed traffic information to the Tristar crew in the NDB hold as *"[Tristar C/S] shortly to depart Brize 767 climbing to 1000ft below."* The Tristar crew responded that they were currently in the hold subsequent to which DIR asked them to report their final turn inbound and obtained the type of approach they required.

At 1424:15, the B767 crew was issued with their take-off clearance by the ADC: *"[B767 C/S] cleared take off surface wind 150 6 knots."* The take-off clearance issued to the B767 crew was not precisely what APP had given to the ADC within the 'release'. However, the ADC and LEO were content that the restriction of 2800ft QNH issued together with the airways joining clearance was extant.

After reading back their take-off clearance the B767 crew was immediately transferred, at 1424:21, to APP on 127.250MHz. At 1425:36, APP called LARS on the landline requesting co-ordination for the B767 against another ac under the control of LARS. As this request was being made the B767 crew called APP at 1425:37, *"Brize Approach good afternoon [B767 C/S] passing 2 thousand 4 hundred climbing Flight Level 8-0 climbing straight ahead."* The pilot noted in his report that the above statement was neither queried nor challenged by ATC. Whilst the B767 crew was passing their message, the LARS controller replied to an ac on the LARS frequency; the landline to APP was still open. The APP controller's report acknowledged that the B767 pilot's initial call was not heard clearly due to the distraction of the landline conversation. At 1425:46 APP acknowledged the B767 pilot's transmission by advising *"[B767 C/S] Brize APPROACH identified."* A few seconds later, under instruction from the Mentor, the APP trainee instructed the B767 crew to turn L onto 280°, which at 1425:48 the crew read-back. APP then continued to co-ordinate with LARS.

During the APP/LARS co-ordination negotiation, at 1426:11, DIR issued the Tristar crew an avoiding action turn against the B767, “[Tristar C/S] *avoiding action turn left heading 360.*” The DIR’s and SUP’s reports both state that the DIR Mentor shouted a verbal warning [apparently ‘off-mic’] to APP about the confliction. At 1426:14, the B767 crew reported to APP, “[B767 C/S] *we have a Tristar out to our left we’ve ahh...*”. The B767 pilot’s written report adds that it was about 3nm away and 300ft above. An exclamation by the trainee APP controller in response on an open microphone clearly indicates that he was surprised by the B767’s transmission. At 1426:17, the APP trainee instructed the B767 crew to “*..descend ahh 2 thousand 8 hundred feet*” whilst at precisely the same time the Tristar pilot informed DIR that he was “*..in the descent [C/S]*”. The Tristar pilot’s report states that an 800ft/min descent was initiated and although the B767 pilot reports that a turn onto 260° was issued by APP no such instruction was captured on the RT recording. The B767 pilot elected not to follow APP’s instruction to descend as he assessed that with the rate of climb of the B767, the confliction would be over in seconds.

The radar recording shows the B767’s departure from RW08 and the Tristar established in the NDB hold. Whilst the B767 maintains a steady climb throughout, at the CPA of 1nm/100ft indicated, the Tristar is seen to descend 300ft in one radar sweep after which the confliction is resolved.

At 1426:24 the Tristar crew reported that they were maintaining 3000ft [QFE] and at the same time the B767 crew reported to APP that they were “OK [C/S] *now in the turn*”. APP asked the B767 crew if they were “*..visual with that traffic*” to which the B767 crew replied at 1426:27, “*affirm [pause] and well clear.*” APP continued the co-ordination with LARS, agreeing to take 1000ft Mode C separation below the LARS track with the B767, whilst DIR and the Tristar crew discussed the situation. DIR advised the Tristar crew that the B767 had “*..bust his level he didn’t stop off*”, to which the Tristar pilot replied that he would be filing against the B767. DIR further advised that when it was noticed that the B767 was climbing above the expected altitude, the B767 was given avoiding action; the Tristar pilot re-iterated that a report would still be filed. At 1427:08, the APP Mentor - who had taken over direct control of the position - asked the B767 crew to “*confirm you were given a stop climb 2800ft QNH on departure?*”, to which the B767 crew replied “*Negative, FL80.*” APP then placed the B767 under a DS outside CAS and passed traffic information on the co-ordinated LARS traffic. After the B767 crew was given ‘own navigation’ to MALBY and a further climb, APP advised that the Tristar was filing an Airprox. APP added that, “*..the instructions should have been to stop climb 2800 feet on the Brize QNH when you were airborne you were given a left turn on to [heading] 2-8-0 at no point were you given an instruction to climb to Flight Level 8-0*”. The B767 crew then advised APP, “*...keep the tapes because that’s not our understanding of how it was, we understood maintain runway track ‘til 2 thousand 8 hundred feet and then it was the departure to join controlled airspace Flight Level 8-0. We understood the clearance to maintain track until passing 2800 feet.*” About 30 sec later the B767 pilot added, “*also on first contact with Brize Radar [APP] passing 1500 feet I reported passing I think 2300..sorry passing 1500 or thereabouts, [the B767 pilot called passing 2400ft] climbing Flight Level 8-0 was my first call...*”. APP acknowledged the B767 pilot’s comment and switched the flight to London Control.

The B767 pilot’s report acknowledged the potential for clarification was evident but at the time neither pilot felt that there was any ambiguity. The pilot went on to say ‘if the phrase stop climb had been used there would have been no ambiguity.’

The B767 crew was issued a departure clearance to 2800ft Brize QNH at the same time as they were given an airways joining clearance to [join level at] FL80. When cleared to take off, the [climbout] restriction of 2800ft QNH (1010mb) was not re-iterated to the B767 crew. Believing their clearance was only to maintain runway track until 2800ft QNH, the B767 continued their climb towards FL80 to join CAS. The crew of the B767 did not understand their clearance was a climbout restriction.

APP was distracted by an open landline with LARS and did not hear the B767 crew report “*...passing 2 thousand 4 hundred climbing Flight Level 8-0 climbing straight ahead.*” The B767 climbed through the level of the Tristar at a range of just over 1nm. Although ATC issued avoiding action instructions

to both crews, both ac captains decided their own course of action was the safest resolution of the confliction.

A thorough investigation was conducted by HQ AIR and DAATM Staff Officers. A recommendation to amend the TC (Dir), TC (RA) and TC (ADC) orders in the Brize Norton Controllers' Order Book, to cover the use of conditional clearances and the issue of a climb-out restriction, has been incorporated.

HQ AIR (OPS) comments that the inclusion of the climb out restriction in the same message as the airways joining clearance was misinterpreted by the B767 crew, an easy mistake to make. All controllers must be meticulous in passing unambiguous clearances, especially when dealing with foreign operators who may be unfamiliar with local procedures and UK terminology. The instructions passed could easily be interpreted as clearance to climb to FL80 with the restriction of straight ahead to 2800ft before turning towards the airways joining point. Action taken by HQ Air and DAATM to amend the procedures for issuing conditional clearances and the issue of a climb out restriction in the TC (Dir), TC (RA) and TC (ADC) orders in the Controllers Order Book should prevent reoccurrence. Consideration should be given to staffing an amendment to the relevant documents to ensure that the order amendments made to the Brize Norton Controllers Order Book are promulgated widely.

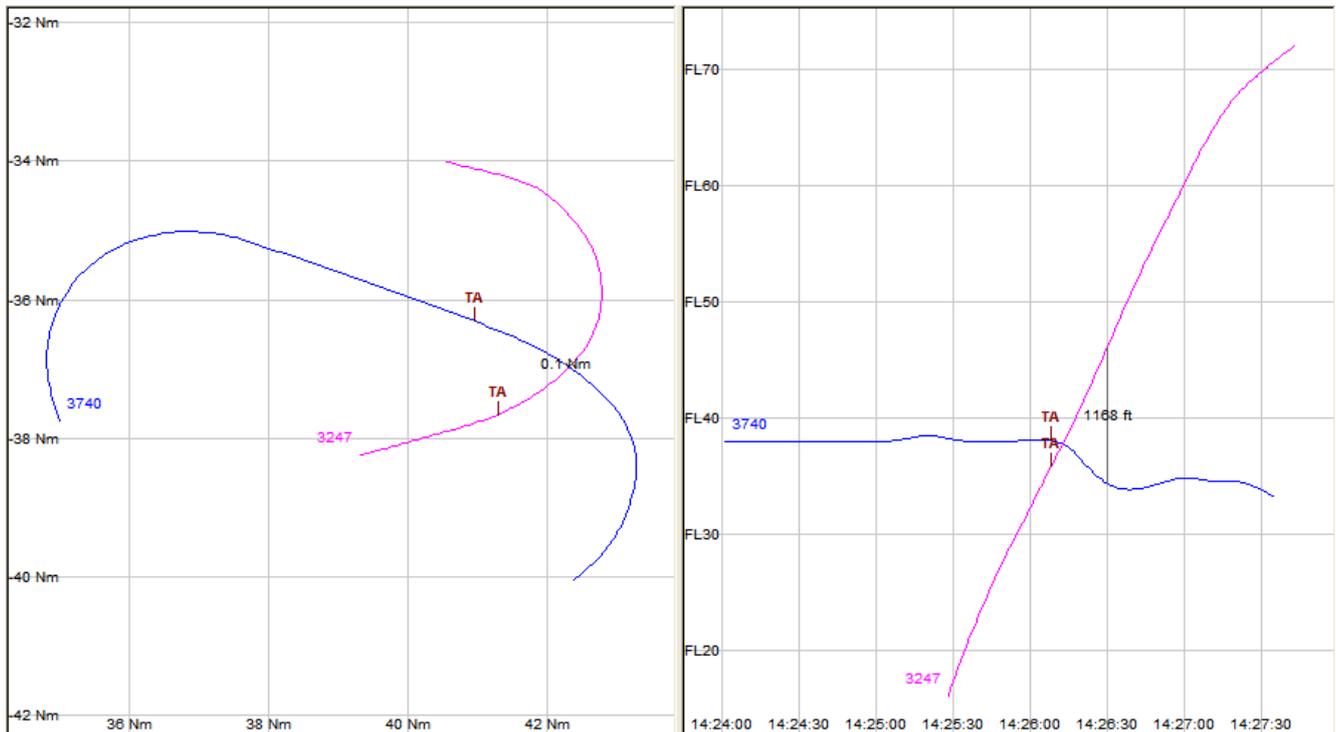
UKAB Note (5): Mode C indications displayed on the Clee Hill Radar recording are related to either the SAS or, within specific lateral parameters below 6000ft amsl, the London QNH (1011mb). For the purposes of illustrating this encounter, the Mode C indications have been uniformly converted to altitudes based on the Brize QNH of 1010mb.

The B767 is shown climbing into coverage through an altitude of 1500ft at 1425:30, squawking the assigned code of A3247, which is subsequently converted to the flight ID through the Code Callsign Distribution System. Meanwhile the Tristar is shown squawking A3740 maintaining 3700ft Brize QNH – above the upper limit of the CTR (3500ft amsl) in Class G airspace. Both ac converge as the B767 maintains a steady course on departure passing 2800ft QNH at 1425:54, with the Tristar 2nm away directly off the port beam 900ft above. At 1426:02 when the ac are shown 1.7nm apart, the B767's Mode S selected level is displayed as FL80, but this would not have been apparent to the controllers within the Brize ACR who are not provided with Mode S data. The B767 is shown in a L turn, in compliance with the radar vector onto 280° issued by APP, having climbed through the level of, and indicating 100ft above, the Tristar that has closed to a range of 1nm still off the port beam, with both ac now in Class G airspace above the CTR. A combination of the B767's RoC through 4200ft QNH and the Tristar crew's avoiding action descent through 3400ft QNH into the CTR results in 800ft of separation on the next radar sweep where the ac are shown ½nm apart. The B767 crosses the Tristar's nose from R – L, in between sweeps, and draws L into the Tristar's 10 o'clock 0.2nm at 1426:34 - the point of minimum recorded horizontal separation; the Tristar levels at 3300ft as the B767 climbs through 4600ft when separation of 1300ft is evident. The Tristar commences a R turn and the B767 continues to turn L and climb whilst the range opens and the latter clears to the N.

UKAB Note (6): NATS Ltd helpfully provided an analysis of the TCAS warnings received during the encounter using the InCAS simulation tool in conjunction with TCAS messages downlinked via Mode S, extracted and recorded by the ATM Safety Monitoring Tool (ASMT). The ASMT indicates that none of the 12 NATS Mode-S capable radars received any RA messages from either aircraft during this encounter.

The InCAS simulation based on interpolated single source radar data from the Clee Hill Radar only simulated the generation of TCAS TAs, which were received by both aircraft at 1426:08 at a range of 1.4nm. The ACAS diagnostics provided by the InCAS simulation indicates that although the 'Range Test' that would have enabled an RA was passed at 1426:14, the subsequent 'Altitude Test' showed the predicted vertical miss distance at the CPA of 881ft was greater than the threshold value of 600ft. In summary, the results of the simulation confirm and explain the TCAS warnings reported by both crews and that an RA would not be triggered in these circumstances.

INCAS SIMULATION



Encounter diagram based on Cleve Hill single source Radar data

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It seemed that 'Human Factors' had played a significant part in this Airprox. It was immediately apparent to the controller Members that every operating position, with the sole exception of the SUP, was manned either by a trainee screened by a Mentor or, in the case of the ADC, by a controller undergoing a validation check from an LEO. Usually, it is a matter for individual unit SUPs to balance the weight of the training task against the overarching requirements of safety. Whilst acknowledging the necessity to progress individual controllers training towards validation efficiently, controller Members considered it unwise to have every operating position manned in this way throughout the Tower. The potential for an error to go unchallenged was significant and this Airprox was a salutary example to Mentors/Supervisors of what can go wrong when their attention is momentarily diverted, potential pitfalls are not spotted, or action that they themselves would have accomplished if operating 'solo' is not taken promptly.

It was clear at the outset that neither the LEO nor the B767 crew recognised any ambiguity when the ADC passed the B767's departure instructions and CAS joining clearance in one seamless transmission. Both the LEO and candidate were content in their minds that 2800ft QNH (1010mb) was the extent of the B767 crew's clearance whereas the B767 crew believed the ADC's instruction allowed them to climb straight ahead to 2800ft QNH, then continue the climb to FL80 to join at MALBY. It was clear that the choice of phraseology used by the ADC to pass both the CAS joining clearance and the climb-out restriction in the one transmission was the crux of the issue. One CAT pilot Member thought it unusual to receive two levels in the same transmission, which would have prompted him to clarify what was required, whereas others were unsure. The Board was briefed that a 'straw poll' amongst transport crews at Brize suggested that some thought it ambiguous and they would have challenged the instructions issued by the ADC, whereas others would have followed the profile flown by the B767 crew. With the facts laid bare by the RT transcript and the MAA ATM Safety

Analysis report, all Members agreed with the B767 pilot's view that, without some specific instruction to stop the climb at 2800ft, the combined instructions/clearance given were open to mis-interpretation – as occurred here. The accounts provided by those involved in the incident suggest that clearances were routinely issued in this manner; however, Members and Advisors familiar with Brize commented this was not universal throughout the unit, or military ATC in general. Controller Members suggested that a CAS joining clearance is never issued together with a local climb-out restriction in this manner and the Board was briefed that accepted teaching on this topic at the Central ATC School (CATCS) is to pass them separately. All the controller Members assembled, without exception, would have transmitted these two instructions separately. First, the CAS joining clearance for MALBY, from London Control. Secondly, the local climb-out restriction from APP, which must be issued before the take-off clearance, to ensure separation between departing and holding traffic. Members said that if done in this manner, it would have reduced the potential for any ambiguity or mis-interpretation and made plain what was required. Members concurred that the phraseology used by the ADC was not clear. Therefore, the Board agreed unanimously that this Airprox had occurred because the ADC passed an ambiguous clearance to the B767 crew, which resulted in a conflict with the Tristar.

The Board noted that, as a result of this Airprox, revisions had been made to the Brize Norton Controllers' Order Book to cover the use of conditional clearances and the issue of climb-out restrictions. However, the HQ Air Command ATM Safety Analysis Advisor briefed that CAP413 – recently adopted by the MoD as the definitive document for ATS phraseology – does not give definitive guidance on this topic. The Members agreed unanimously that better guidance was required and therefore elected to make a Safety Recommendation: that the MoD requests a review of the CAP413 instructions about the passing of climb-out restrictions.

Neither the APP trainee nor his Mentor noticed the conflict immediately as they were distracted by the co-ordination with LARS on the landline. Both missed the significance of the B767 pilot's report to APP, "...*passing 2 thousand 4 hundred climbing Flight Level 8-0...*". The importance of listening to what pilots actually report as their cleared level within their initial 'check-in' over the RT was thus readily apparent. APP should have paid more attention to this transmission. If the Mentor had assimilated what was actually said, he could have intervened to restrict the B767's climb to 2800ft QNH and averted the conflict. The Board concluded that a Contributory Factor within this Airprox was that the B767 pilot's first call reporting their cleared level was not assimilated by APP.

The Board also noted that there was no evidence that APP had verified the B767's Mode C indication. A controller Member questioned whether the APP team were paying sufficiently close attention to their radar display as they did not notice the B767's Mode C indicating above 2800ft QNH. However, the ROC of the departing ac left little time to react: on the LATCC (Mil) recording the B767's Mode C indicated 2800ft at 1425:54 and thus it was not until the next sweep, 8sec later at 1426:02, that it would have been evident that the B767 was above the altitude APP was expecting the ac to level at. It seemed that the alert DIR Mentor spotted the true situation barely moments later as at 1426:11, DIR issued the avoiding action turn to the Tristar crew. The DIR's and SUP's reports both state that the DIR Mentor shouted a verbal warning 'off-mic' to APP about the conflict, which it seemed was when APP first realised what was happening. It is important to emphasise here, that the radar recording available to the Board, which included Mode S data, was not the same as that displayed to the controllers in the Brize ACR at the time. Although Brize is supplied with Clee Hill SSR data in addition to the local SSR source, controllers within the Brize ACR are not provided with Mode S data on their displays. If they were, the Downlinked Ac Parameters, which include the selected level (SEL), could be displayed to the controller. Here the B767's Mode S SEL of FL80 could have been another trigger that might have alerted the radar controllers that the B767 was not going to level at 2800ft as they anticipated. Regardless of the provision of Mode S, however, it was important to monitor departing traffic's Mode C closely and to be prepared for the unexpected.

Turning to the Risk, the Board noted that APP had co-ordinated with DIR to ensure that the Tristar maintained 3500ft QFE/3800ft QNH in the hold and had planned for the B767 to climb up to 2800ft QNH beneath it. This ensured that the required 1000ft standard separation would be preserved under the RCS provided by APP to the B767 crew – the type of service is not stated on the RT because it is deemed to be so and the only radar service that can be given to IFR flights in the Class

D CTR. From APP's perspective, nothing further was required until the B767 was clear of the Tristar horizontally and the B767's climb could be resumed to join CAS at MALBY. Meanwhile, DIR had promptly passed TI to the Tristar crew, who, primed about the departing airliner, were able to react swiftly when the B767 was first seen 1½nm on their starboard side, slightly below, about the same time as TCAS generated a TA. The Board supported the Tristar pilot's decision, based on his visual assessment of the geometry and dynamics of the situation, to ignore the DIR's avoiding action turn to the L, which would have put him belly-up to the B767, in favour of a descent that enabled him to remain in visual contact. The Board noted that the Tristar's descent, combined with the B767's rate of climb, avoided the parameters that would have triggered a TCAS RA and resulted in a separation of 100ft at 1nm range and 1300ft at 0.2nm range. For his part, the B767 pilot saw the Tristar some 300ft above his ac - he said from a range of 3nm. This did not quite gel with the radar recording, which showed the B767 600ft below the Tristar at a range of 1.7nm so it was feasible he first saw it somewhat closer. Nevertheless, Members recognised that the ROC achieved by the B767, clearly illustrated by the TCAS Encounter diagram and the radar recording, was taking the B767 rapidly through the B767's altitude. Fortunately, the B767 crew chose to ignore the avoiding action descent transmitted by APP; the radar update just before the B767 crossed through the Tristar's 12 o'clock shows 800ft of vertical separation and then 1300ft clear above it before the point of minimum horizontal separation of 0.2nm was reached. Clearly, this encounter might have ended differently had both crews not seen the other ac, and some Members expressed reservations that safety had not been assured as it was. However, on balance, the visual sighting by both crews and the Tristar's descent coupled with the B767's continued rapid climb convinced the Board that no risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

- Cause: The ADC passed an ambiguous clearance to the B767 crew, which resulted in a conflict with the Tristar.
- Degree of Risk: C.
- Contributory Factors: The B767 pilot's first call reporting their cleared level was not assimilated by APP.
- Safety Recommendation: That the MoD requests a review of the CAP413 instructions about the passing of climb-out restrictions.