



UK AIRPROX BOARD

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Analysis of Airprox in UK Airspace

**Report Number 25
July 2010 – December 2010**

Twenty-Fifth Report by the UK Airprox Board:

‘Analysis of Airprox in UK Airspace’

(July 2010 to December 2010)

produced jointly for

The Chairman
Civil Aviation Authority

and the

Chief of the Air Staff,
Royal Air Force

FOREWORD

The UK Airprox Board investigated 167 Airprox events that occurred in UK airspace during 2010. This Report contains the details of the 88 Airprox that occurred in the period Jul-Dec 2010; of these, 7 (8%) were assessed as Risk Category A (Risk of Collision) and 16 (18%) were assessed as Risk Category B (Safety not Assured). Caution is required in drawing conclusions from relatively small numbers of events. Looking at the entire year, Table 1 below shows that there was an increase in the number of Airprox reported during 2010 compared with the average over the previous 5 years but a reduction in the percentage that were assessed to be “risk-bearing” (Risk Categories A & B). One welcome statistic is that none of the Airprox assessed to be risk-bearing involved Commercial Air Transport (CAT).

	2005	2006	2007	2008	2009	2010	2005-2009 Average
Risk Cat A (Collision Risk)	19	15	9	13	11	12	13
Risk Cat B (Safety Not Assured)	51	40	39	38	36	33	41
Risk Cat C (No Collision Risk)	116	103	106	100	97	116	104
Risk Cat D (Insufficient Information)	2	1	0	4	3	6	2
Annual Totals:	188	159	154	155	147	167	161
Risk Bearing %	37%	35%	31%	33%	32%	27%	34%

Table 1.

Within the reports there are several themes that are common to previous years. By far the majority of Airprox occur in Class G (uncontrolled) airspace where late and non-sightings by pilots are the predominant causes. Poor airmanship contributed to a number of occurrences: pilots routing too close to gliding and microlight sites resulted in several Airprox, with the additional hazard of aircraft flying through the overhead of gliding sites below the promulgated maximum altitude of the launch cable. Perhaps unsurprisingly, Airprox occurrences frequently involve instructional sorties in which the level of Air Traffic Service (ATS) requested has been balanced against the need to minimise interference to the communication between pilot and instructor. We continue to see reports in which it appears that pilots do not understand the provisions and limitations of the ATS they are operating under, or do not appreciate that IFR and VFR traffic has equal and shared responsibilities to see and avoid each other in Class G airspace. Finally, we regularly see Airprox in and around ATZs caused by pilots joining the circuit without integrating safely with the traffic already established in the pattern.

The purpose of the Airprox Board is to improve Flight Safety by investigating Airprox occurrences, identifying the causes and risks, and promulgating the lessons identified. This Report (Number 25) is available in hard copy, CD and on our website at www.airproxboard.org.uk. Reports may be copied, reproduced etc by any person or organisation whose purpose is to improve Flight Safety. We also have a data base that we can exploit if persons or organisations wish to conduct research into Airprox events. We will welcome any comments you wish to make on the presentation of the reports, the material contained within, and any proposals for improvement. Please send an e-mail to admin@airproxboard.org.uk.

Ian Dugmore

Director UK Airprox Board

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INTRODUCTION

AIRPROX DEFINITION

An Airprox is a situation in which, in the opinion of a pilot or controller, the distance between aircraft as well as their relative positions and speed was such that the safety of the aircraft involved was or may have been compromised.

UK AIRPROX BOARD (UKAB) COMPOSITION

The UKAB is an independent organisation sponsored jointly by the CAA and the MOD to deal with all Airprox reported within UK airspace. There are eight civilian and six military voting Members on the Board, which is supported by specialist Advisers and chaired by the Director UKAB who reports directly to the Chairman CAA and Chief of the Air Staff, Royal Air Force. Board Members together form a team of experienced and hands-on practitioners in:

- Military and civilian Air Traffic Terminal Control, Area Control and Airfield Control.
- Commercial Air Transport (CAT).
- General Aviation (GA), powered and gliding.
- Military fixed wing and helicopter flying by the RN, Army and RAF.

UKAB's ROLE

The UKAB undertakes the following tasks in promoting improved safety standards in the air:

- Act as the start point for an investigation process into each incident, generally carried out by the Safety Regulation Group (SRG) of the CAA and/or Military HQs.
- Determine what happened plus analyses of the main causal factors.
- Assess the risk levels involved.
- Make Safety Recommendations where appropriate to reduce the risk of incident recurrence.
- Publish and distribute full reports so that lessons identified can be shared.

STATUS OF UKAB REPORTS

The sole objective of the UK Airprox Board is to assess reported Airprox in the interests of enhancing flight safety. It is not the purpose of the Board to apportion blame or liability. To encourage an open and honest reporting environment, names of companies and individuals are not published in UKAB reports.

RISK CATEGORIES

Risk level assessments are made on the basis of what actually took place and not on what might have occurred.

A	Risk of collision	An actual risk of collision existed
B	Safety not assured	The safety of the aircraft was compromised
C	No risk of collision	No risk of collision existed
D	Risk not determined	Insufficient information was available to determine the risk involved, or inconclusive or conflicting evidence precluded such determination

THE UKAB DATA SET

The UKAB Airprox database comprises a set of records, each of which related to a specific Airprox. As an investigation proceeds, from first report until the conclusion of the Board's deliberations, the UKAB Secretariat completes fields within the appropriate record. Analysis of the set of records is then possible to produce information such as is published in this Report.

THIS REPORT

The Report follows established practice by giving a broad overview on general trends and then examines in more detail some specific results for each of the three principal airspace user groups, Commercial Air Transport (CAT); General Aviation (GA) and Military.

Some events, reported as Airprox and therefore assigned a reference number by the Secretariat, are subsequently withdrawn and are thus not subject to full investigation and assessment by the Board. Only the reporter can withdraw an Airprox.

In this Report, numbers of 'Unknown' aircraft are added to 'Untraced' aircraft and weather balloons to produce the category, 'Other'.

Notes regarding the calculation of rates of occurrence:

- (1) CAT flying hour totals are supplied by the UK Civil Aviation Authority. Included are figures derived from Eurocontrol data on hours flown by commercial aircraft in transit through UK airspace as well as departures from and arrivals at UK destinations.
- (2) GA flying hours are supplied by the UK Civil Aviation Authority and are based on aircraft with less than 5,700Kg maximum take-off weight authorised. Gliders and microlights are included; gyroplanes, balloons and airships are excluded. General Aviation utilisation data is derived from the Aircraft Register and is formulated from the submissions provided by aircraft owners when Certificates of Airworthiness or Permits to Fly are renewed. Because Certificates of Airworthiness are normally renewed every three years, the hours flown by many aircraft will not yet have been reported. Utilisation figures for the last two-three years, as used in this publication, are therefore 'best estimates'. Each year, past utilisation figures are reviewed and amended as appropriate with this revised data being reflected into the calculation of GA Airprox rates.
- (3) Military flying hours are supplied by the Ministry of Defence and by US Air Forces Europe.

PUBLICATION OF REPORTS

A key UKAB objective is to communicate effectively the lessons identified from Airprox events. Bi-annual 'hardcopy' Reports continue to be the primary means of communication, supported by presentations at flight safety meetings, cd-roms and the Internet. The UKAB Internet website is updated at least every month: for example, details of the most recent set of Reports assessed by the Board are, when finalised, 'uploaded'.

The UKAB website address is www.airproxboard.org.uk

AIRPROX RESULTS FOR 2010

Number of Airprox

Figure 1 shows the monthly distribution of Airprox for 2010 compared with the average for the previous 5 years. Factors that impacted the distribution included the severe winter weather at the beginning and end of the year in addition to the effects of the Icelandic volcanic ash. However, Figure 2, showing the progressive total number of Airprox across the year compared with the previous 5-year average, reveals that spikes in the numbers of Airprox in other months more than offset the effects of the weather and the ash. There are no obvious common cases or themes to explain the spikes in March, May, September or October.

Figure1. 2010: MONTHLY DISTRIBUTION

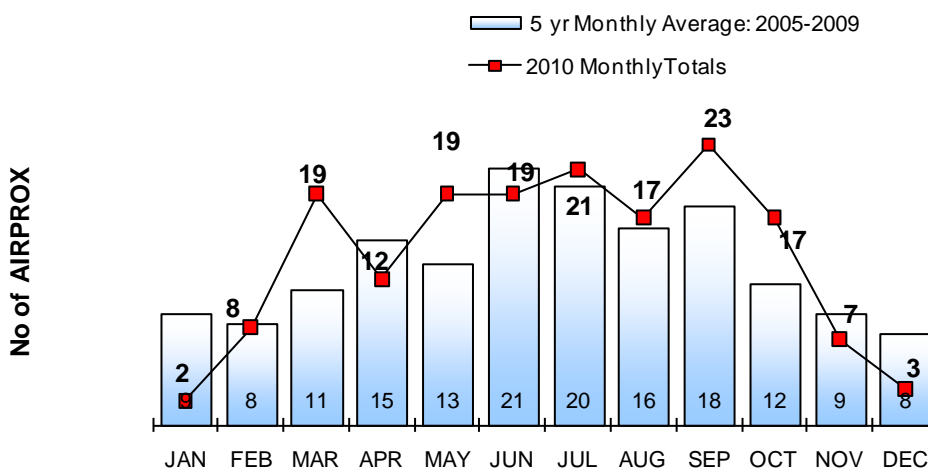
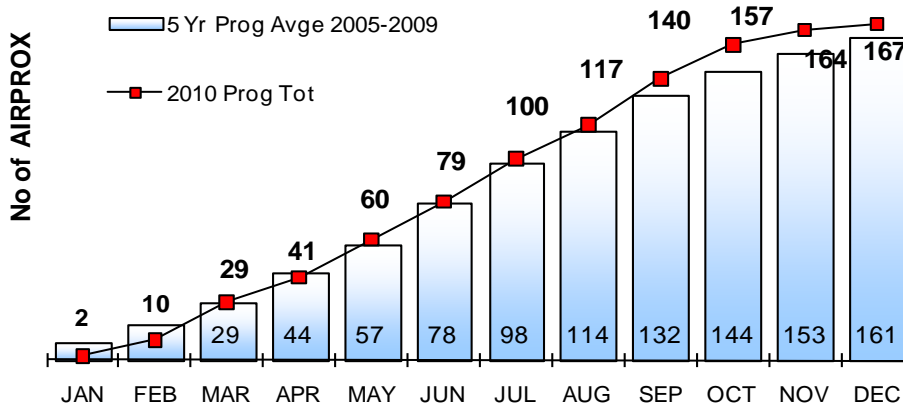


Figure 2. 2010: PROGRESSIVE TOTALS



In addition to Airprox recorded above, 9 were withdrawn before they had been assessed. This normally occurs when the reporting pilot or controller has reflected on what occurred and decided that the incident does not warrant a full investigation. This is entirely in line with Airprox Board preferences. We would far rather have pilots and controllers take the initial reporting action and subsequently decide not to proceed than, potentially, miss the opportunity to impound RT and radar tapes through a late decision to submit a report.

Trends by User Groups

Table 2 and Figure 3 show that a reduction in Civil - Civil Airprox has been offset mainly by an increase in Civil – Military encounters. There are no obvious explanations for these changes except possibly the reduced civilian activity levels in 2010 and a change in the reporting culture in the military; in 2009 military pilots were the reporting pilots in 16 out of 37 Civil - Military Airprox (43%) whereas in 2010 military pilots initiated the reports in 33 out of 54 Civil - Military Airprox (61%). The number of “Other” users is abnormally high in 2010. One was a parachutist who was under-flown by a helicopter and 8 were gliders whose pilots could not be traced.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Civil~Civil	97	109	87	109	99	95	93	93	74	63
Civil~Mil	73	77	67	69	74	46	38	38	36	54
Mil~Mil	20	31	23	22	8	12	12	17	30	34
Other	5	4	4	7	7	6	11	7	7	16
Totals:	195	221	181	207	188	159	154	155	147	167

Table 2. Trend by User Groups.

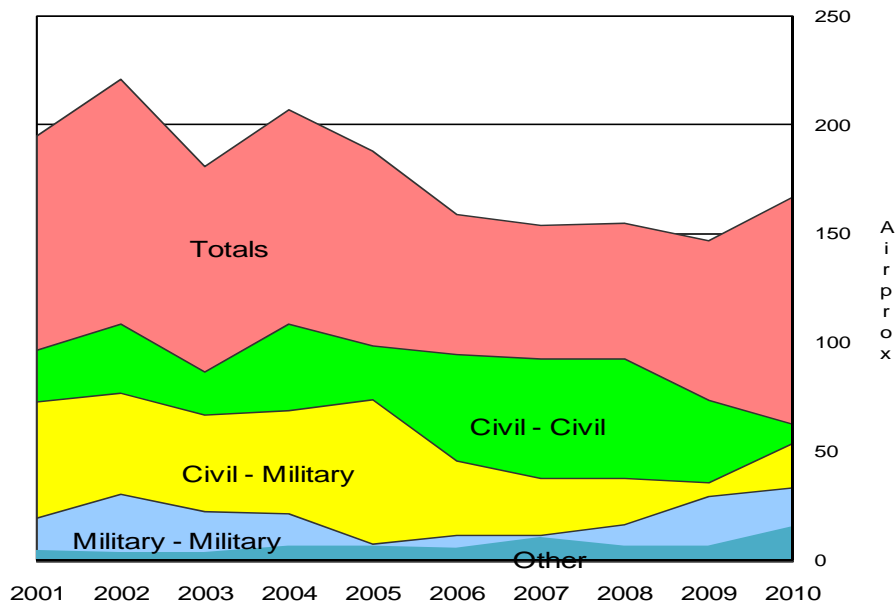


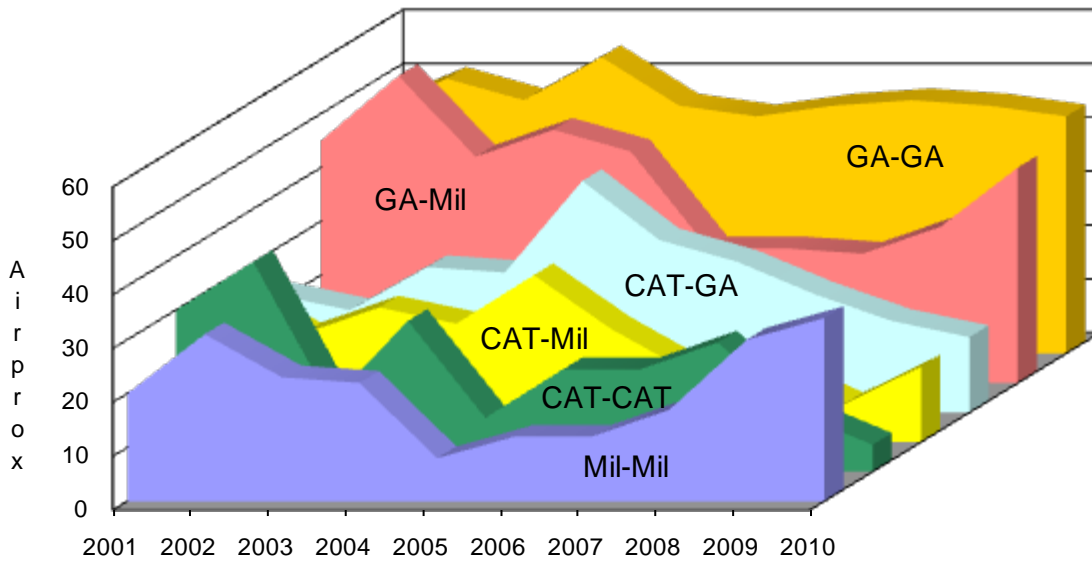
Figure 3. Trend by User Groups.

A further division of the civil group to separate CAT from GA is shown in Table 3 and Figure 4 below. The headline results here are the continued decline in CAT - CAT Airprox and an increase in GA – Military Airprox. If, as seems likely, the majority of the untraced glider pilots were civilian, the increase in GA – Military Airprox was higher still.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
GA~Mil	45	57	42	47	43	25	25	24	29	40
GA~GA	45	51	47	55	46	44	46	47	46	44
CAT~CAT	30	39	13	28	10	19	19	24	11	5
CAT~GA	22	19	27	26	43	32	28	22	17	14
CAT~Mil	28	20	25	22	31	21	13	14	7	14
Mil~Mil	20	31	23	22	8	12	12	17	30	34
Other	5	4	4	7	7	6	11	7	7	16
Total	195	221	181	207	188	159	154	155	147	167

Table 3. Trends by Flight Classification.

Figure 4. Airprox Trends by Flight Classification



Airspace

The breakdown of Airprox by airspace shows that, once again, the vast majority of Airprox occur in Class G airspace. See Figure 5 below.

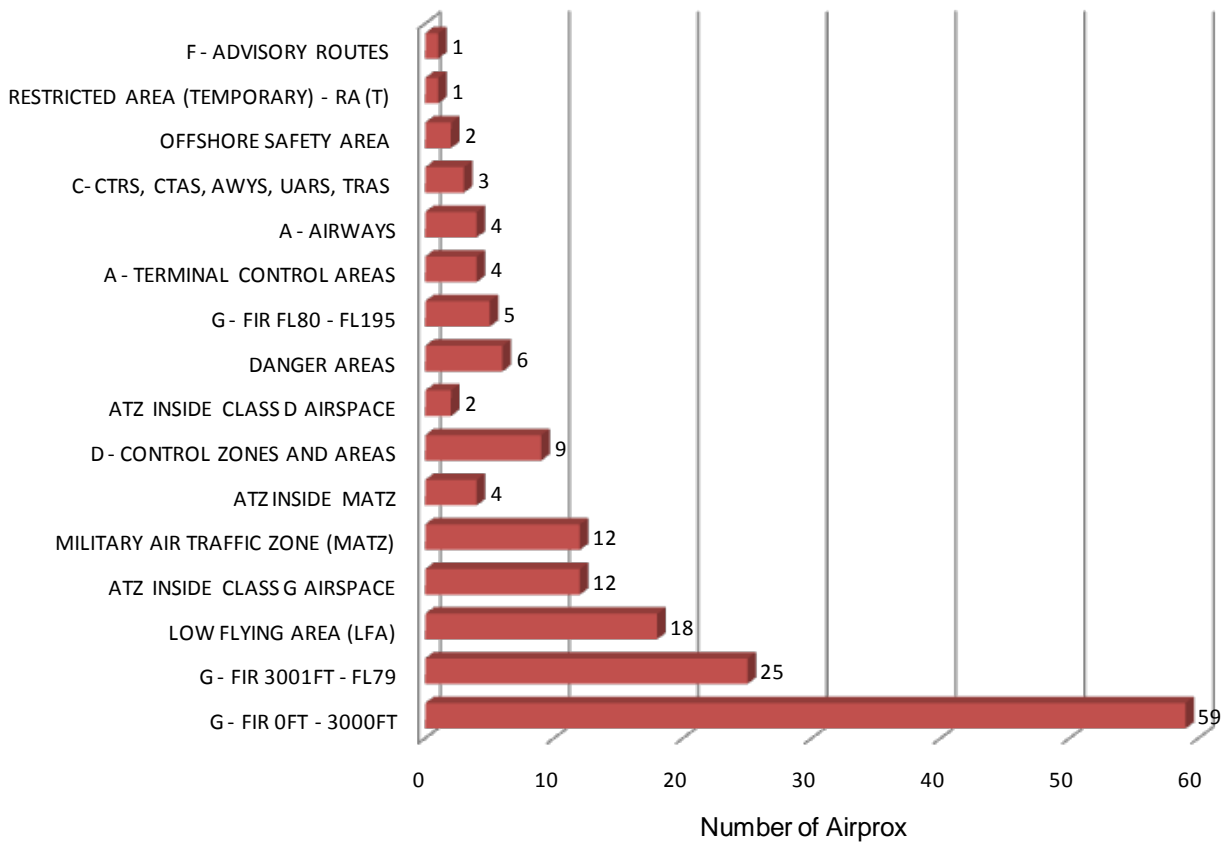


Figure 5. Airprox by Airspace.

In addition to the 10 Airprox resulting from uncleared penetrations of CAS or ATZs, we continue to see aircraft flying too close to glider and micro-light launching sites, frequently below the maximum promulgated height of the winch cable. Pilots joining the visual circuit but not following the established traffic pattern also feature regularly in Airprox reports.

COMMERCIAL AIR TRANSPORT (CAT) SECTION

CAT Risk

The number of Airprox involving at least one CAT aircraft was the same in 2010 as the previous year but the absence of any risk bearing Airprox is most welcome. The trend is shown in Table 4 and Figure 6.

CAT Risk	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CAT Risk A	0	1	0	1	1	0	0	0	0	0
CAT Risk B	14	7	12	7	7	6	5	2	1	0
CAT Risk C	65	70	54	67	78	68	60	58	33	33
CAT Risk D	4	4	0	4	1	0	0	1	1	2
CAT Total Airprox	83	82	66	79	87	74	65	61	35	35

Table 4. CAT Risk Data 2001 - 2010

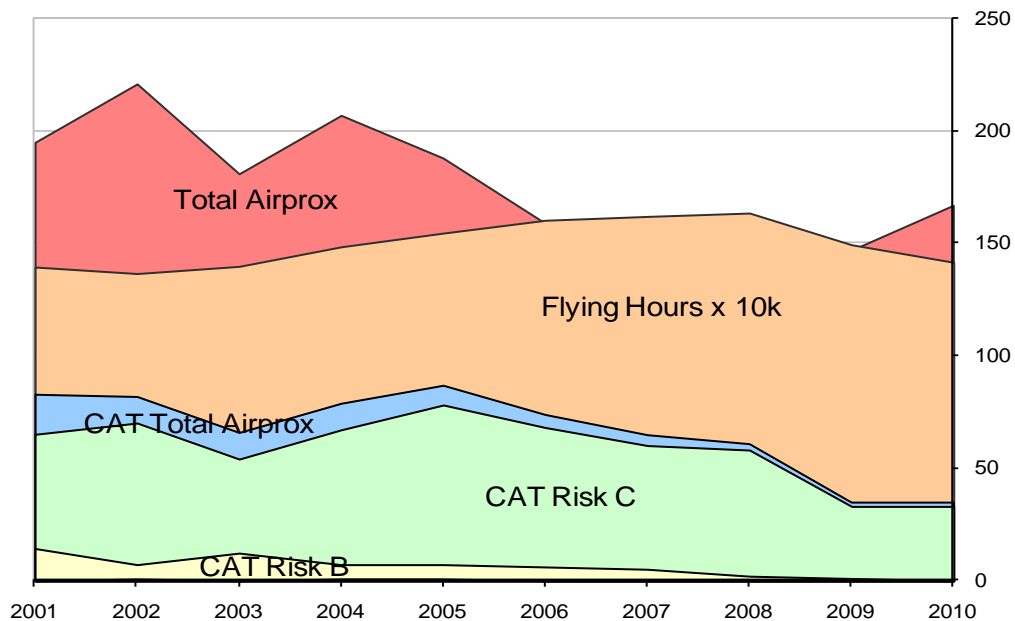


Figure 6. CAT Risk Distribution 2001 -2010 (Note Risk A & D too small to appear on chart- see Table 4)

CAT Rates

Turning to the rate of Airprox per flying hour for CAT, the reduction in annual flying hours means there is a small increase in the rate of Airprox involving at least one CAT aircraft. However, with no risk-bearing (Risk A & B) Airprox in 2010, the rate for the year is down to zero. Table 5 shows the trend in tabular form while Figure 7 shows the same figures graphically.

CAT Rates	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CAT Rate (A+B)	1.00	0.59	0.86	0.54	0.52	0.37	0.31	0.12	0.07	0.00
CAT Rate (A+B+C+D)	5.95	6.00	4.72	5.32	5.63	4.62	4.01	3.73	2.34	2.47
Hours x K	1,395	1,366	1,398	1,485	1,546	1,603	1,620	1,635	1,494	1,416

Table 5. CAT Airprox Rates per 100 000 Flying Hours

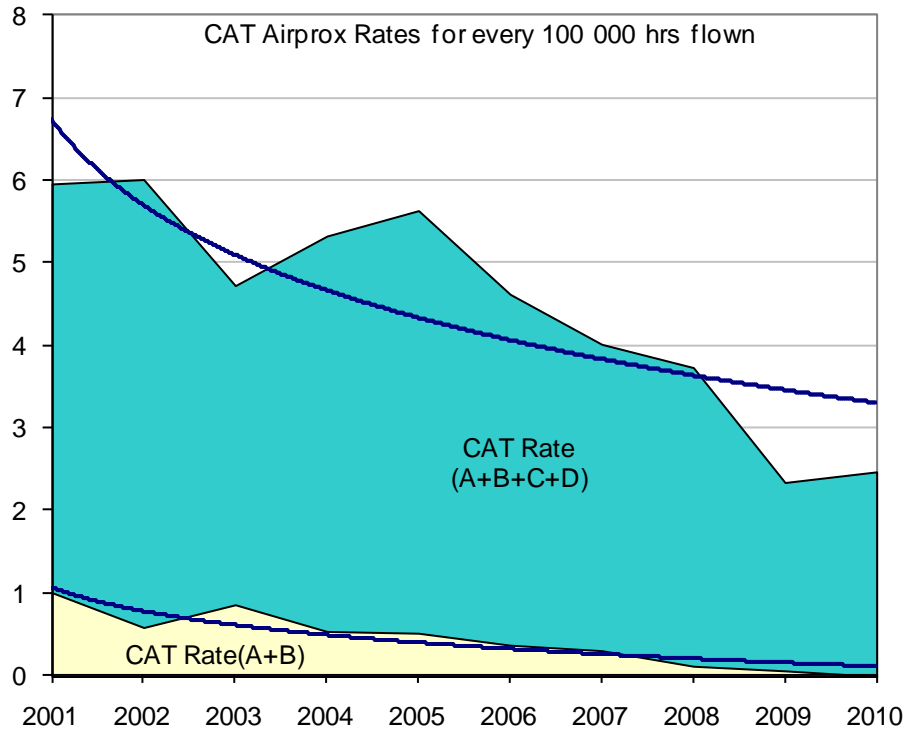


Figure 7. CAT Risk Rates 2001 – 2010

CAT Causal Factors

Ser.	Cause	Totals	Attributed to
1	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	6	PILOT
2	DID NOT SEPARATE/POOR JUDGEMENT	5	CONTROLLER
3	FIR CONFLICT	4	OTHER
4	CLIMBED/DESCENDED THROUGH ASSIGNED LEVEL	4	PILOT
5	SIGHTING/TCAS REPORT	3	OTHER
6	PENETRATION OF CAS/ATZ WITHOUT CLEARANCE	3	PILOT
7	CONTROLLED AIRSPACE CONFLICT IN VMC	3	OTHER
8	DID NOT TO ADHERE TO PROCEDURES/OPERATING INSTRUCTIONS	3	CONTROLLER
9	LACK OF CO-ORDINATION BETWEEN CONTROLLERS	3	CONTROLLER
10	CONFUSION OR POOR COORDINATION INCLUDING AT HANDOVER	2	CONTROLLER
11	DID NOT PASS OR LATE PASSING OF TRAFFIC INFO	2	CONTROLLER
12	INAPPROPRIATE ATC INSTRUCTIONS, USE OF INVALID FL	2	CONTROLLER
13	UNDETECTED READBACK ERROR	2	CONTROLLER
14	MISIDENTIFICATION	2	CONTROLLER
15	NOT OBEYING ORDERS/ FOLLOWING ADVICE/ FROM ATC	2	PILOT

Table 6. Most Common causal Factors in Airprox in 2010 having CAT aircraft involvement.

Each Airprox can have more than one cause and a total of 52 causes were assigned to the 35 Airprox involving CAT aircraft in 2010. The causes that were assigned more than once are shown in Table 6 above. With such small numbers it is not possible to detect trends with any confidence. However, the top 7 causes in 2010 were all within the top 10 causes in 2009. Of note in 2010, TCAS RA alerts were reported in 11 of the Airprox involving CAT; there were a further 299 occurrences involving CAT in UK airspace in which TCAS RA alerts were generated but not reported as Airprox.

GENERAL AVIATION (GA) SECTION

GA Risk

The 102 Airprox involving at least one GA aircraft constituted 61% of the total number of Airprox in 2010. This compares with a GA percentage of 65% the previous year. There was a slight reduction in the number of Risk-Bearing (RB) GA Airprox (ie Risk Categories A & B) maintaining a slow decline over the 10 year period as a whole. The details are provided in Table 7 and Figure 8, below.

GA Risk	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
GA Risk A	24	9	10	13	16	10	8	8	8	5
GA Risk B	27	58	38	42	41	36	30	31	20	25
GA Risk C	60	57	70	71	75	57	65	55	66	70
GA Risk D	1	3	0	4	1	0	0	4	1	2
GA Totals	112	127	118	130	133	103	103	98	95	102
All Airprox	195	221	181	207	188	159	154	155	147	167
%GA/All Airprox	57%	57%	65%	63%	71%	65%	67%	63%	65%	61%
%RB/GA Total	46%	53%	41%	42%	43%	45%	37%	40%	29%	29%

Table 7. GA Risk Data 2001 – 2010.

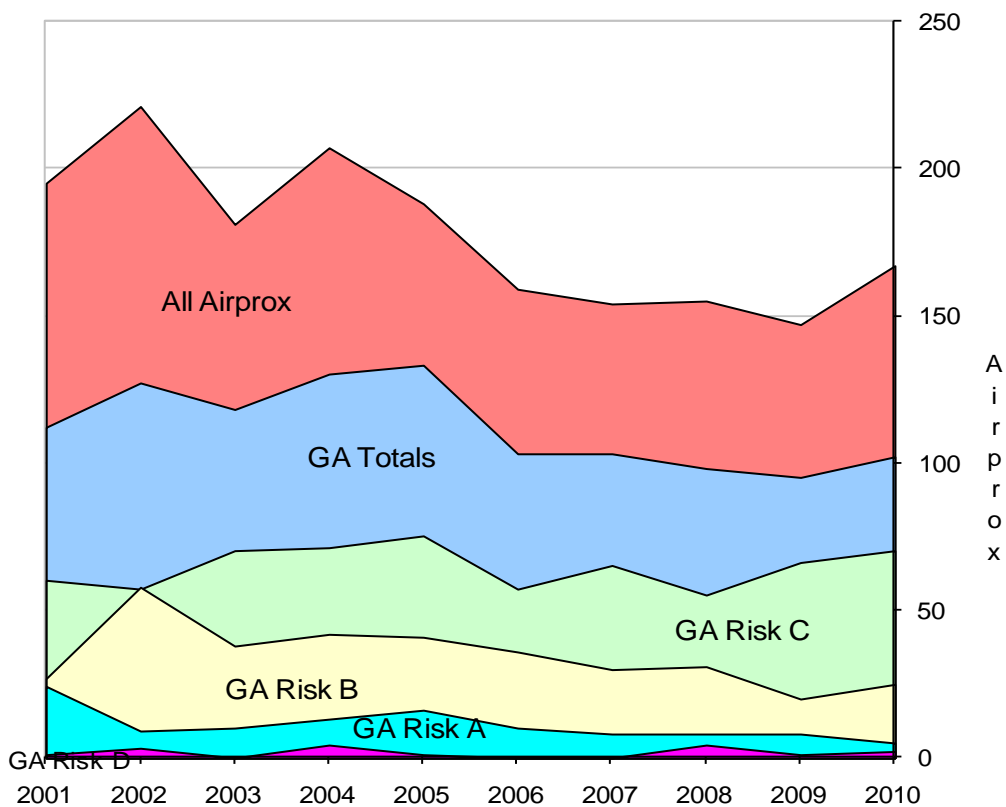


Figure 8. GA Risk Distribution 2001 - 2010

GA Airprox Rates

GA annual flying hours comprise an estimate based on a variety of sources; the estimates are revised as more accurate figures become available. Therefore, although the figures allow reasonable reliable comparisons over a 10 year period, caution is required comparing 2010 with the previous year. Table 8 and Figure 9 show that the rates of GA Airprox and GA Risk Bearing Airprox per flying hour have both declined over the 10 year period.

GA Rates	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Rate for (A+B)	4.22	5.41	3.82	4.33	4.52	3.78	3.15	3.57	2.58	2.66
Rate for (A+B+C+D)	9.27	10.25	9.39	10.23	10.54	8.47	8.53	8.98	8.76	9.03
Hours flown x 1000	1,209	1,239	1,256	1,271	1,262	1,215	1,208	1,092	1,085	1,130

Table 8. GA Airprox Rates per 100 000 Flying Hours

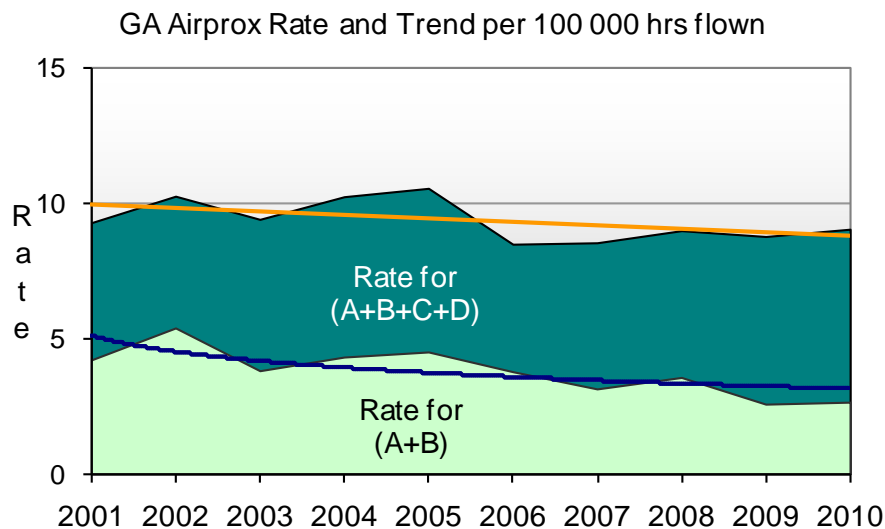


Figure 9. GA Risk Rates 2001 – 2010

GA Causal Factors

A total of 29 different causal factors were assigned to the 102 GA Airprox. Table 9 shows the top 12 causes.

Ser.	Cause	Totals	Attributed to:
1	DID NOT SEE CONFLICTING TRAFFIC	36	PILOT
2	LATE SIGHTING OF CONFLICTING TRAFFIC	25	PILOT
3	FIR CONFLICT	20	OTHER
4	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	14	PILOT
5	FLYING CLOSE TO/OVER GLIDER, PARADROP OR MICROLIGHT SITE	8	PILOT
6	PENETRATION OF CAS/ATZ WITHOUT CLEARANCE	7	PILOT
7	DID NOT PASS OR LATE PASSING OF TRAFFIC INFO	6	CONTROLLER
8	CONFLICT WITHIN OR ON BOUNDARY OF ATZ/CTR/CTA/AAA	5	OTHER
9	DID NOT ADHERE TO PRESCRIBED PROCEDURES	5	PILOT
10	DID NOT SEPARATE/POOR JUDGEMENT	4	CONTROLLER
11	SIGHTING REPORT	4	OTHER
12	INAPPROPRIATE ATC INSTRUCTIONS, USE OF INVALID FL	4	CONTROLLER

Table 9. Most Common Causal Factors in GA Airprox in 2010

Sighting issues were again the most common cause of Airprox involving GA aircraft and the top 4 causes in 2010 were all in the top 5 for 2009. The 8 Airprox involving over-flights of glider, para-drop or micro-light sites are a particular concern when the hazard is exacerbated by the risk of collision with the winch cable. Other scenarios that regularly feature in Airprox reports include pilots join airfield circuits without regard to aircraft already established in the pattern; training flights and especially IF training flights; and aerial survey work.

MILITARY (MIL) SECTION

Mil Risk

With the number of Airprox involving at least one Mil aircraft rising from 70 in 2009 to 98 in 2010, the percentage of Airprox in which there was Mil involvement rose from 48% in 2009 to 59% in 2010. However, the percentage of Mil Airprox assessed to be risk-bearing (RB) fell from 44% to 26%. Table 10 and Figure 10 show the details.

Mil Risk	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Mil Risk A	27	14	8	5	10	7	2	7	8	7
Mil Risk B	19	33	35	26	27	17	15	15	23	18
Mil Risk C	47	59	48	58	48	35	35	34	38	70
Mil Risk D	1	2	1	4	0	1	0	0	1	3
Mil Totals	94	108	92	93	85	60	52	56	70	98
All Airprox	195	221	181	207	188	159	154	155	147	167
Mil as % of Total	48%	49%	51%	45%	45%	38%	34%	36%	48%	59%
RB as % of Mil	49%	44%	47%	33%	44%	40%	33%	39%	44%	26%

Table 10. Military Risk Data 2001 – 2010

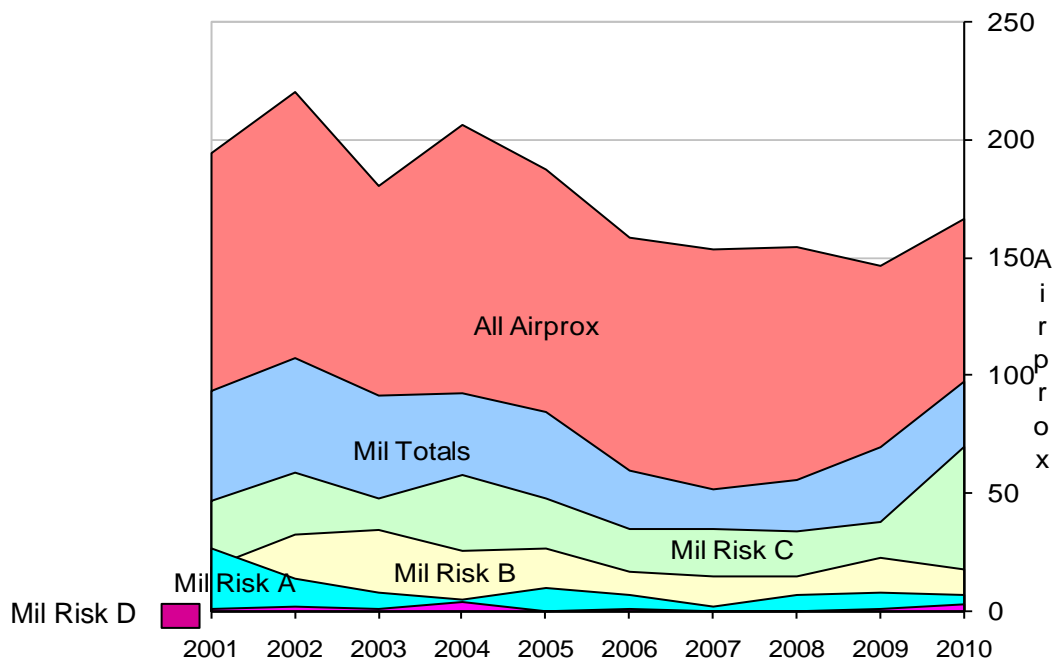


Figure 10. Mil Risk Distribution 2001 - 2010

Mil Rates

The numerical rate of Airprox per flying hour involving Mil ac (Figure 11) requires caution because of the difficulty in separating hours flown inside UK airspace from those flown in operational

theatres over the ten year period. However, it is possible to say with confidence that the rate has increased due to a combination of more conscientious reporting and a reduction overall in flying hours. The lower rate of increase in risk-bearing Airprox supports this conclusion.

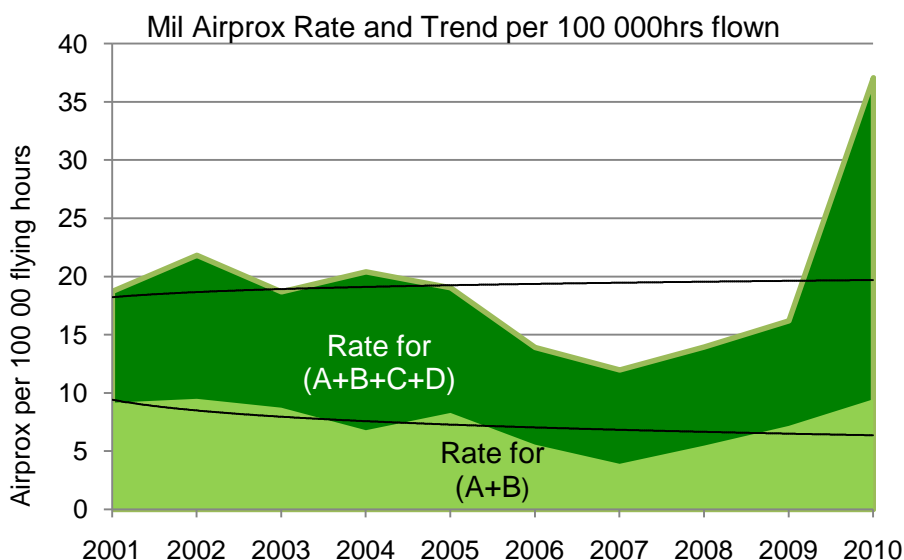


Figure 11. Mil Airprox Rate

Mil Causal Factors

A total of 28 different causal factors were assigned to the Airprox involving at least one Mil aircraft in 2010. The top 5 all featured in the top 5 in 2009. Table 12 lists the causes that were assigned 3 or more times.

Ser.	Cause	Totals	Atributed to
1	DID NOT SEE CONFLICTING TRAFFIC	35	PILOT
2	LATE SIGHTING OF CONFLICTING TRAFFIC	27	PILOT
3	FIR CONFLICT	21	OTHER
4	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	14	PILOT
5	SIGHTING REPORT	7	OTHER
6	DID NOT PASS OR LATE PASSING OF TRAFFIC INFO	7	CONTROLLER
7	CONFLICT IN OTHER TYPE OF AIRSPACE	6	OTHER
8	DID NOT ADHERE TO PRESCRIBED PROCEDURES	5	PILOT
9	INAPPROPRIATE ATC INSTRUCTIONS, USE OF INVALID FL	4	CONTROLLER
10	DID NOT ADHERE TO PRESC'D PROCED'S/OPERAT INSTR'S	3	CONTROLLER
11	POOR AIRMANSHIP	3	PILOT
12	PENETRATION OF PROHIBITED/RESTRICTED/DANGER AREA	3	PILOT
13	CLIMBED/DESCENDED THROUGH ASSIGNED LEVEL	3	PILOT

Table 12. Most Common Causal factors in Airprox involving at least one Mil aircraft in 2010.

As with GA, instructional sorties on training aircraft feature in many Airprox involving Mil aircraft; frequently instructors elect to operate without any ATS, or with a Basic Service, in order to be able to communicate with the trainee. However, it was operational fixed and rotary wing types that were predominantly involved in the Airprox assessed to have involved the highest level of risk.

UKAB SAFETY RECOMMENDATIONS

UKAB Safety Recommendations are made when, following its consideration of any given Airprox, the Board believes that action needs to be taken to address a particular safety matter. It is for the organisation(s) concerned to decide how to respond to a UKAB Safety Recommendation. The information that follows updates actions being taken in response to those Safety Recommendations published in the last UKAB Report. Also listed are Safety Recommendations made more recently together with responses where available. Updates will continue to be published until action is complete, indicated by 'CLOSED' in the 'STATUS' sections below.

2008-44 **16 Apr 08 involving an ATR72 and an EMB195** **Risk C**

RECOMMENDATION:

In the light of this Airprox, the CAA should initiate a review of the currently promulgated London Gatwick SIDs in relation to NPRs to ensure clarity.

ACTION: The CAA accepts this Safety Recommendation.

UPDATE 23 March 2011: The CAA's Directorate of Airspace Policy has reviewed the relevant UK AIP pages. A minor discrepancy between the turn point described in the Noise Preferential Route and that specified in the SID has been detected and will be corrected. Additionally, the CAA intends to clarify the diagram for the London Gatwick Southampton SID as it appears in the UK AIP. There are ongoing discussions between the CAA and the air traffic service provider regarding these amendments, however it is anticipated that the revisions will be included in AIRAC 7/2011 (effective 30 June 2011).

STATUS – ACCEPTED – OPEN

2009-76 **5 Jul 09 involving a PA28 and an ASK21 GLIDER** **Risk B**

RECOMMENDATIONS

- (i) Dunkeswell Aerodrome and the Operator of North Hill Gliding Site should jointly develop a LoA and promulgate agreed procedures that will ensure the safe integration of air traffic at these closely located airfields.
- (ii) The CAA should review the disparate operations within the ATZ at Dunkeswell aerodrome and at North Hill Glider Site, to ensure their continued operation is in accord with the requirements of Rule 45 of the Rules of the Air Regulations.

ACTION:

- (i) With Air Westward Ltd + Devon & Somerset Gliding Club.
- (ii) With CAA – Head of SDU

INTERIM UPDATE AT 10 Mar 2011

Dunkeswell Aerodrome and the Operator of North Hill Gliding Site have jointly developed a LoA, which has been reviewed by the CAA. Advice on improvements to this LoA has been given by the CAA, but to date the Operators have not implemented the advice given on two aspects of the LoA - inclusion in the AIP of a diagram showing the division of the ATZ and subsequent review of the LoA to ensure that it continues to fulfil its function.

STATUS – OPEN

2010014 **9 Mar 2010 involving an S92A and a Tornado Risk B**

RECOMMENDATIONS

1. The MoD is recommended to amend the Low Flying Handbook to provide more comprehensive guidance on SAR training flights.
2. The Maritime Coastguard Agency considers using existing CANP procedures to notify military crews about Coastguard training flights.

ACTION:

A meeting of relevant civilian and military representatives was held on 20 May 2011. The outcome was agreement to conduct a trial of “SAR boxes” with nominated RT frequencies to be used for SAR training. The trial is due to conclude on 13 Dec 2011. There will be a publicity campaign to ensure that all crews are familiar with the trial.

STATUS – CLOSED

2010018 **5 Mar 10 involving a B737 and an F15E Risk C**

RECOMMENDATIONS

The CAA and MoD are recommended to:

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

ACTION: CAA Safety Notice SN-2011/012 issued on 8 Sep 2011.

STATUS – CLOSED

2010053 **19 May 10 involving 2 Grob Tutors Risk C**

RECOMMENDATION:

It is recommended that outside CAS, where local procedures deem that an ATS may be automatically provided, that controllers state the actual service on the RT as a reminder to pilots of the ATS actually being given.

ACTION: AOBM

UPDATE AT 10 Mar 2011

Subsequent to this Airprox, the ATSU involved elected to change their local procedures so that the ATS provided is stated to pilots on the RT. Following consideration of the UKAB's Safety Recommendation the Dep ATM Force Cmdr contacted all RAF ATM units reminding them that the type of ATS is to be stated on RT iaw CAP 774 and that the practice highlighted by the investigation of this Airprox was not to be utilised.

STATUS – CLOSED

2010145

16 Sep 10 involving a Hawk and a Lynx Risk C

RECOMMENDATION:

It is recommended that RAF Valley reviews its procedures for co-ordinating helicopter movements under fixed-wing circuit traffic.

ACTION: HQ AIR Command

STATUS – OPEN

2010153 TUCANO v 2 HAWKS – 7 OCT 2010

RECOMMENDATION:

It is recommended that RAF Linton-on-Ouse reviews the SOP requiring visiting ac to squawk standby when transferring to TWR'.

ACTION: HQ Air Command

Response:

Further analysis subsequent to the UKAB deliberation has determined that there was not in fact a formal SOP at RAF Linton-on-Ouse for visiting aircraft to squawk standby when entering the visual circuit. At the time of the Airprox the lead pilot advised the Director that he was transferring to Tower and squawking standby - the controller did not pick up on this, so did not issue an instruction to the pilot to continue squawking. RAF Linton-on-Ouse controllers have been rebriefed to instruct visiting aircraft to squawk the discrete visual circuit squawk (4506) used at Linton-on-Ouse when transferring to the TWR frequency in accordance with the Unit's Flying Order Book.

STATUS – CLOSED

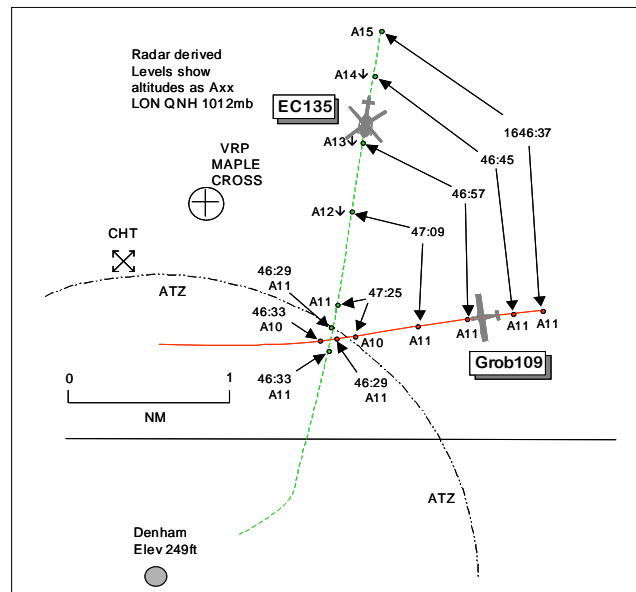
aal	above aerodrome level	FAT	Final Approach Track
ac	aircraft	FIR	Flight Information Region
ACAS	Airborne Collision Avoidance System	FISO	Flight Information Service Officer
ACC	Area Control Centre	FMS	Flight Management System
ACN	Airspace Co-ordination Notice	FO	First Officer
A/D	aerodrome	FPL	Filed Flight Plan
ADC	Aerodrome Control(ler)	fpm	Feet per Minute
ADR	Advisory Route	FPS	Flight Progress Strip
AEF	Air Experience Flight	GAT	General Air Traffic
AEW	Airborne Early Warning	GCA	Ground Controlled Approach
AFIS(O)	Aerodrome Flight Information Service (Officer)	GH	General Handling
agl	above ground level	GMC	Ground Movement Controller
AIAA	Area of Intense Aerial Activity	GP	Glide Path
AIC	Aeronautical Information Circular	GS	Groundspeed
AIP	Aeronautical Information Publication	H	horizontal
AIS	Aeronautical Information Services	HISL	High Intensity Strobe Light
alt	altitude	HLS	Helicopter Landing Site
amsl	above mean sea level	HMR	Helicopter Main Route
ANSP	Air Navigation Service Provider	HPa	Hecto Pascals
AOB	Angle of Bank	HPZ	Helicopter Protected Zone
A/P	Autopilot	HQ Air	HQ Air Command
APP	Approach Control(ler)	HUD	Head Up Display
ACR	Approach Control Room	IAS	Indicated Air Speed
APR	Approach Radar Control(ler)	iaw	In accordance with
ARP	Aerodrome Reference Point	ICF	Initial Contact Frequency
ASR	Airfield Surveillance Radar	IFR	Instrument Flight Rules
ATC	Air Traffic Control	ILS	Instrument Landing System
ATCC	Air Traffic Control Centre	IMC	Instrument Meteorological Conditions
ATCO	Air Traffic Control Officer	JSP	Joint Services Publication
ATCRU	Air Traffic Control Radar Unit	KHz	Kilohertz
ATIS	Automatic Terminal Information Service	kt	Knots
ATM	Aerodrome Traffic Monitor	km	Kilometres
ATS	Air Traffic Service	L	Left
ATSA	Air Traffic Service Assistant	LACC	London Area Control Centre (Swanwick)
ATSOCAS	ATSs Outside Controlled Airspace	LARS	Lower Airspace Radar Service
ATSI	Air Traffic Services Investigations	LATCC(Mil)	London Air Traffic Control Centre (Military)
ATSU	Air Traffic Service Unit	LFA	Low Flying Area
ATZ	Aerodrome Traffic Zone	LFC	Low Flying Chart
AWACS	Airborne Warning and Control System	LH	Left Hand
AWR	Air Weapons Range	LJAO	London Joint Area Organisation
BGA	British Gliding Association	LoA	Letter of Agreement
BHPA	British Hang Gliding and Paragliding Association	LOC	Localizer
BMAA	British Microlight Aircraft Association	LTMA	London TMA
BMFA	British Model Flying Association	MATS	Manual of Air Traffic Services
BS	Basic Service	MATZ	Military Aerodrome Traffic Zone
CC	Colour Code - Aerodrome Weather State	METAR	Aviation routine weather report
CANP	Civil Air Notification Procedure	MHz	Megahertz
CAS	Controlled Airspace	MOD	Ministry of Defence
CAT	Commercial Air Transport	MRP	Military Regulatory Publication
CAVOK	Visibility, cloud and present weather better than prescribed values or conditions	MSD	Minimum Separation Distance
cct	Circuit	N	North
CFI	Chief Flying Instructor	NATS	National Air Traffic Services
CLAC	Clear Above Cloud	NDB	Non-Directional Beacon
CLAH	Clear Above Haze	nm	Nautical Miles
CLBC	Clear Below Cloud	NMC	No Mode C
CLBL	Clear Between Layers	NK	Not Known
CLNC	Clear No Cloud	NR	Not Recorded
CLOC	Clear of Cloud	NVD	Night Vision Devices
CMATZ	Combined MATZ	NVG	Night Vision Goggles
CPA	Closest Point of Approach	OACC	Oceanic Area Control Centre
C/S	Callsign	OAT	Operational Air Traffic
CTA	Control Area	O/H	Overhead
CTR/CTZ	Control Zone	OJTI	On-the-Job Training Instructor
CWS	Collision Warning System	OOS	Out of Service
DA	Decision Altitude	PAR	Precision Approach Radar
DAP	Directorate of Airspace Policy CAA	PCAS	Portable Collision Avoidance System
DF	Direction Finding (Finder)	PFL	Practice Forced Landing
DH	Decision Height	PF	Pilot Flying
DME	Distance Measuring Equipment	PI	Practice Interception
DS	Deconfliction Service	PIC	Pilot-in-Command
E	East	PINS	Pipeline Inspection Notification System
EAT	Expected Approach Time	PNF	Pilot Non-flying
elev	elevation	PS	Procedural Service
ERS	En Route Supplement	QFE	Atmospheric pressure at aerodrome elevation
est	estimated	QFI	Qualified Flying Instructor

QHI	Qualified Helicopter Instructor
QNH	Altimeter sub-scale setting to obtain elevation when on the ground
R	Right
RA	Resolution Advisory (TCAS)
RAT	Restricted Area (Temporary)
RCO	Range Control Officer
RH	Right Hand
ROC	Rate of Climb
ROD	Rate of Descent
RPAR	Replacement PAR
RPS	Regional Pressure Setting
RT	Radio Telephony
RTB	Return to base
RVSM	Reduced Vertical Separation Minimum
RW	Runway
RVR	Runway Visual Range
S	South
SA	Situational Awareness
SAP	Simulated Attack Profile
SAS	Standard Altimeter Setting
ScATCC(Mil)	Scottish Air Traffic Control Centre (Military)
ScACC	Scottish Area Control Centre (Prestwick)
SFL	Selected Flight Level [Mode S]
SID	Standard Instrument Departure
SMF	Separation Monitoring Function
SOPs	Standard Operating Procedures
SRA	Surveillance Radar Approach
SSR	Secondary Surveillance Radar
STAR	Standard Instrument Arrival Route
STCA	Short Term Conflict Alert
Sup	Supervisor
SVFR	Special VFR
TA	Traffic Advisory (TCAS)
TAS	True Air Speed
TC	Terminal Control
TCAS	Traffic Alert & Collision Avoidance System
TRA	Temporary Restricted Area
TFR	Terrain Following Radar
TI	Traffic Information
TMA	Terminal Control Area
TRUCE	Training in Unusual Circumstances and Emergencies
TS	Traffic Service
TWR	ATC Tower
UAR	Upper Air Route
UHF	Ultra High Frequency
UIR	Upper Flight Information Region
UKDLFS	United Kingdom Day Low Flying System
UKNLFS	United Kingdom Night Low Flying System
unltd	unlimited
USAF(E)	United States Air Force (Europe)
U/S	Unserviceable
UT	Under Training
UTC	Co-ordinated Universal Time
V	Vertical
VCR	Visual Control Room
VDF	Very High Frequency Direction Finder
VFR	Visual Flight Rules
VHF	Very High Frequency
VMC	Visual Meteorological Conditions
VOR	Very High Frequency Omni Range
VRP	Visual Reporting Point
W	West
Wx	Weather

AIRPROX REPORT No 2010081

AIRPROX REPORT NO 2010081

Date/Time: 2 Jul 2010 1647Z
Position: 5137N 00029W
(1.9nm NE Denham - elev 249ft)
Airspace: ATZ (Class: G)
Reporting Ac Reported Ac
Type: EC135 Grob 109
Operator: Civ Comm Civ Pte
Alt/FL: 1000ft 1000ft
(QNH 1012mb) (QNH 1012mb)
Weather: VMC CLBC VMC CLBC
Visibility: >10km >10km
Reported Separation:
20ft V/30m H 50ft V/250ft H
Recorded Separation:
<100ft V/<0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EC135 PILOT reports inbound to Denham VFR and in receipt of an AFIS on 119.475MHz squawking 7000 with Modes S and C. The visibility was >10km flying 2000ft below cloud in VMC and the ac was coloured black/cream/silver; no lighting was mentioned. He was joining the cct heading 180° at 130kt and 1000ft QNH 1012mb on R base leg for RW24 from the Maple Cross VRP. There was one other ac in the cct to his R, which he was looking for when he received a TCAS 'traffic' alert a 1nm range in his 11 o'clock indicating the same level. The bearing remained constant but he could not see the other ac, which might have been shielded by part of his own ac's structure. He finally saw the other ac, a Grob 109 Motorglider, at about 50m range and initiated a hard pull-up, the Grob passing 20ft beneath and 30m clear. He assessed the risk as high.

THE GROB 109 PILOT reports en-route to a private site in Wiltshire VFR and listening out with Elstree on 122.4MHz squawking 7000 with Modes S and C; Flarm was fitted. The visibility was >10km flying 1500ft below cloud in VMC and the ac was coloured white/blue with strobes and landing lights switched on. When to the NNE of Denham heading 270° at 90kt and 1000ft QNH 1012mb he saw a helicopter as it came into his 2 o'clock. He moved the stick forward -1G to avoid the helicopter which did not appear to move, believing the pilot had not seen his ac. The helicopter passed 50ft above and 250ft clear horizontally and he assessed the risk as medium. The Flarm trace clearly records the incident captured from the Flarm microphone; however, he was unsure whether the noise was him swearing, objects coming back down onto the parcel shelf or the noise of the helicopter. He opined that he was intending to listen with Denham as he went past but his mental speed was behind that of the Grob. The incident was a big wake-up call and it took a few minutes for him to calm down. He had flown into Denham many times and knew the joining procedure but why he was flying at that height and not looking R or L for traffic he could not say. At the time he was flying towards the lowering sun and spending much time looking forward.

UKAB Note (1): The UK AIP at AD 2-EGLD-1-4 Para 2.17 ATS Airspace promulgates Denham ATZ as a circle radius 2nm centred on the longest notified RW (06/24) at 513518N 0003047W from surface to 2000ft aal; airfield elevation 249ft. Para AD 2.18 ATS Communication Facilities promulgates Denham Information as 0700-1900 Summer. Page 1-5 Para 2.22 Flight Procedures states at 1. c) 'Circuit joining is achieved by establishing a long base leg and giving a position report at Chalfont St Giles for left hand circuits or Maple Cross for right hand circuits. The ATZ should be entered at a height of 750ft agl (1000ft amsl). Joining traffic should give way to circuit traffic.' Also at 1. f) 'Helicopters should follow the fixed-wing procedures unless alternative arrangements have been made.'

UKAB Note (2): The ANO Section 2 The Rules of the Air 2007 Rule 45 Flight within aerodrome traffic zones Para 1) shall apply to those aerodromes in Table III c) 'An aerodrome having a flight information service unit' at such times 'During the notified hours of watch of the flight information service unit'. Para (4) states 'If the aerodrome has a flight information service unit the commander shall obtain information from the flight information service unit to enable the flight to be conducted safely within the zone.'

UKAB Note (3): The radar recording at 1646:37 shows the EC135 3.9nm NNE of Denham tracking 190° indicating altitude 1500ft QNH 1012mb with the Grob 109 in its 11 o'clock range 2.1nm tracking 260° indicating altitude 1100ft QNH. The ac continue on steady tracks, closing on a line of constant bearing, the EC135 commencing a slow descent at 1646:45. Forty seconds later at 1647:25 separation has reduced to 0.2nm, the EC135 level at altitude 1100ft, 100ft above the Grob 109, which is on the boundary of the ATZ. The next sweep at 1647:29 separation reduces to 0.1nm, the EC135 is entering the ATZ with both ac showing altitude 1100ft. The CPA then occurs before the next sweep, as 4sec later the ac are separated by 0.1nm with the ac having crossed, the EC135 still showing 1100ft 100ft above the Grob 109 now showing 1000ft. The CPA therefore is assessed to <0.1nm and <100ft. Thereafter the EC135 tracks towards the extended C/L for RW24 whilst the Grob 109 tracks W'ly, passing 1.5nm N of Denham; this track is confirmed from the Grob 109's GPS trace.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts of the relevant RT frequencies and radar video recordings.

The Board noted that the Grob pilot did not comply with the requirements of Rule 45 of the Rules of the Air. Had the Grob pilot called on the Denham frequency he probably would have heard the EC135 pilot's transmissions and therefore improved his SA with respect to any potential conflicts. Members agreed that this element had contributed to the Airprox. That said, without this additional information the crux of this incident boiled down to both pilots being responsible for their own separation from other traffic through see and avoid. The EC135 flight had right of way and its pilot received a traffic warning on TCAS of the approaching Grob in his 11 o'clock range 1nm. However he was unable to visually acquire the Grob until very late. As the ac were approaching on a line of constant bearing, the Grob may well have been obscured by part of the EC135's cockpit structure; however, best practice to mitigate this known degradation to lookout is for the pilot to move his head or move the ac's flightpath. The Grob pilot reported that he was flying into sun and concentrating on looking ahead when he saw the helicopter very late in his 2 o'clock. The opportunity for both pilots to see each other's ac was there for some time prior to the CPA; however, it was not to be and it was these late sightings that had caused the Airprox.

Turning to risk, after seeing the confliction both pilots reacted promptly and robustly in a complementary manner, the EC135 pilot pulling up whilst the Grob pilot bunted, with both pilots reporting reduced separation margins at the CPA. These avoiding action manoeuvres flown were enough to convince the Board that the actual risk of collision had been removed but that safety had been compromised during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by the pilots of both ac.

Degree of Risk: B.

Contributory Factors: The Grob pilot did not comply with RoA Rule 45.

AIRPROX REPORT No 2010082

AIRPROX REPORT NO 2010082

Date/Time: 2 Jul 2010 1506Z

Position: 5316N 00250W
(S Liverpool Airport - elev 81ft)

Airspace: Liverpool CTR (Class: D)

Reporting Ac Reported Ac

Type: A319 PA38

Operator: CAT Civ Trg

Alt/FL: 2000ft 1500ft

(QNH 1010mb) (QNH 1010mb)

Weather: VMC CLOC VMC CLBC

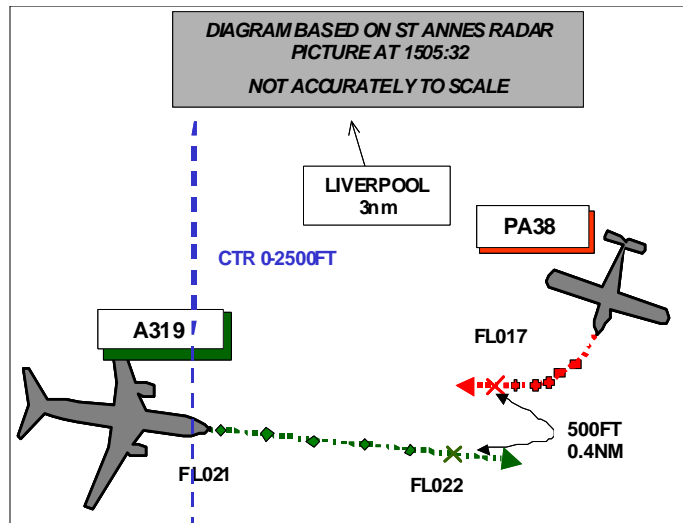
Visibility: 10km 10km

Reported Separation:

300ft V/0m H NR

Recorded Separation:

500ft V/0.4nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A319 PILOT reports flying a scheduled passenger flight inbound to Liverpool under IFR, squawking 7216 with Modes C and S, while in receipt of a RCS from them. Heading 090° at 220kt they were cleared from 2500ft (QNH 1010mb) down to 2000ft and Liverpool ATC informed of an ac below, VFR not above 1500ft, which they identified on TCAS. The ac did not maintain 1500ft; he thought it had climbed above its cleared altitude and passed 300ft under them as they were reacting to a TCAS RA. They reported the RA to Liverpool APR using standard phraseology, but it was not acknowledged [he thought]. He assessed the risk as being medium and reported the incident to ATC by telephone after landing to ensure that they were aware of it.

THE PA38 PILOT reports that he was informed of the Airprox about 2 weeks after the event so his recollection of events might not be complete. He was the instructor on a VFR CPL training flight returning to Liverpool squawking with Mode C. They entered Liverpool CTR at Tarvin under an ATC clearance of VFR not above 1500ft on the QNH of 1010mb, and his recollection was that ATC routed them to Helsby, which is the aerodrome clearance limit for GA traffic for RW27. After reporting the field in sight he believed that they had been transferred from Liverpool APR to Liverpool TWR. Normally, if the airport is busy, ATC hold GA ac at Helsby while large ac position overhead at 2500ft for LH downwind for RW27; this traffic passes over Helsby Hill, or to the S of it, on the downwind leg. He does not believe that they climbed above their 1500ft clearance at any time.

UKAB Note (1): The Liverpool METAR for 1450 was:

EGGP 021450Z 24012KT 9999 FEW035 22/12 Q1010

UKAB Note (2): The recording of the St Annes radar shows the incident clearly. At the start of the recording at 1505:00 the A319 approaches the CPA from the W tracking 095° level at FL021 (alt 2010ft) with the PA38, squawking 0260 with Mode C in its 11 o'clock Level at FL017 (alt 1610ft), in a wide right-hand orbit. The ac continue to converge with their alts unchanged and at the CPA the A319 has just commenced the TCAS RA response and is climbing through FL022 (alt 2110ft). It passes 0.4nm to the S of the PA38's orbit, on a directly opposing track, the latter still level at FL017 (alt 1610ft).

ATSI reports that the Airprox occurred at 1505:36, 4nm SE of Liverpool Airport, within the Liverpool CTR, which is Class D airspace extending from surface to 2500ft amsl. RW27 was the RW in use. ATSI assessed the controller's workload as moderate.

The PA38 was a locally based ac on a VFR flight from Sleaf Airfield to Liverpool Airport. The PA38 was instructed to enter the Liverpool CTR from the S, routeing via Tarvin and Helsby for RW27.

The UK AIP entry AD 2-EGGP-1-11 (8 Apr 10) paragraph 6(g) states:

‘In order to integrate VFR flights to/from Liverpool Airport with the IFR traffic flow, standard routes are established along which VFR clearance will be issued subject to the conditions specified above. The routes provide a uni-directional traffic flow, dependant upon the runway in use at Liverpool Airport. The routes are detailed in paragraph 7 below and shown on the chart at AD-2-EGGP-4-1. Non-standard routes may be requested but ATC approval will only be granted if the traffic situation allows. Pilots are reminded of the requirements to remain in VMC at all times and to comply with the relevant parts of the Low Flying Rules, and must advise ATC if at any time they are unable to comply with instructions.’

Paragraph 7 – Standard VFR entry route from the South:

‘Enter CTR via Oulton Park, route to the western edge of HELSBY then as directed by ATC – Max Altitude 1500ft.’

The Liverpool MATS Pt 2 (24/01/10), Section 1, Chapter 18, Page 1, Paragraph 2.3, states:

‘Mode A code 0260 should be allocated to all locally based VFR flights, except training circuit flights, and other flights as required. This code is used for conspicuity and need not be verified. It is notified as such in the AIP.’

Paragraph 6.3, states:

‘Approach Radar Controllers may utilise the SSR filter system on the GUI if necessary to reduce the amount of SSR codes visible around the ATZ.’

The A319 was on an IFR flight to Liverpool Airport and was being vectored downwind left hand for RW27. The Liverpool MATS P2 (24/01/10), Section 4, Chapter 4, page 8, paragraph 8.5, states:

‘For vectoring Runway 27 (when Manchester using Runway 23)

.....aircraft can be turned LEFT hand downwind on reaching altitude 3500 ft descending and will comply with altitude profile areas C-E.

AREA E MUST BE ENTERED AT 2000 FEET or BELOW.’

(Note: left base for RW27 lies within area E.)

ATSI had access to the RTF transcript, radar recordings provided by NATS Swanwick, written reports from the pilots and controller. Liverpool ATSU was not immediately aware of an Airprox and reported a TCAS RA event. A time discrepancy of 1min and 15sec was noted between the RTF recording and the Radar recording (certified as correct). An appropriate correction was made to RTF recording and the ATSU has been asked to investigate the discrepancy.

At 1455:35, Radar cleared the PA38 to join controlled airspace VFR at Tarvin, not above 1500ft QNH1010, and the pilot acknowledged correctly. (Tarvin is situated 8.5nm to the SSE of Liverpool airport). At 1458:45 the A319 called Radar, *“passing FL100 descending FL080 direct KEGUN and speed reducing to 250kt”*.

At 1459:05 the PA38 was instructed to squawk 0260 and the pilot reported approaching Tarvin. A change of controller then took place and, at 1559:35, Radar transmitted to the PA38, *“(PA38)c/s route to Helsby report field in sight and it’s a Radar Control service”*, and the pilot replied, *“Route to Helsby report field in sight (PA38) c/s”*. (Helsby is situated 5nm SSE of Liverpool airport). The PA38 pilot reported field in sight and was transferred to the TWR frequency. At this point the radar recording showed both ac in the vicinity of Tarvin. The PA38 was indicating FL016 (alt 1510ft) and the A319 was tracking W at FL091. At 1459:42 the A319 was given descent to alt 5000ft QNH 1010 and advised of a left hand pattern, and the pilot acknowledged correctly.

At 1501:52 the A319 was given a right turn heading 360° with descent to an alt of 3500ft QNH 1010 and shortly afterwards a further instruction to turn right heading 090° downwind. At 1500:53, the radar recording showed the PA38 entering the CTR indicating FL017 (alt 1610ft). At 1501:58 the PA38 called the TWR and reported 3nm S

AIRPROX REPORT No 2010082

of Helsby and they instructed, "...join left base for runway two seven report crossing the motorway" and this was acknowledged correctly.

At 1503:58 the PA38 reported crossing the motorway and Tower instructed, "...on reaching erm left base er for runway two seven take up a right hand orbit." (This was to allow an A320 on final to land). At the same time Radar instructed the A319, "(A319)c/s turn right heading one zero zero degrees descend to altitude two thousand feet." The A319 replied, "Right turn heading one zero zero degrees descend altitude two thousand feet (A319)c/s." At 1504:47 Radar advised the A319 about the PA38, "(A319)c/s traffic in your twelve o'clock a range of four miles in the right hand orbit it's a V F R Cherokee not above fifteen hundred feet" and the pilot responded, "Roger..". (It was noted that the Radar controller incorrectly passed the type as a Cherokee).

At this point, radar recording showed the PA38, 3.5nm SE of Liverpool Airport, in a right hand orbit descending to FL014 (alt 1310 ft). At 1504:41 the distance between the ac was 4.2nm and the radar recording showed the PA38 rolling out of the orbit, tracking SW towards the A319. The Mode C then indicated a climb to FL017 (converts to 1610ft QNH 1010); at 1505:16 the A319 was indicating FL021 and the distance between the two ac was 1.6nm on almost reciprocal tracks. At 1505:37 the A319 pilot advised: "(A319)c/s TA, RA" and Radar replied, "(A319) c/s Roger and it's that previously mentioned Cherokee not above fifteen hundred feet." It was noted that the pilot did not use the phrase TCAS but advised, "TA" followed immediately by, "RA". The Radar controller correctly acknowledged the TCAS RA with "Roger" and then passed TI on the PA38. MATS Part 1, Section 1, Chapter 9, Page 3, Paragraph 5.3, states:

'The passing of traffic information by controllers to ac conducting, or affected by a TCAS RA, is not proscribed, but such information has, if provided inappropriately, the potential to be misheard or to distract flight crews during a period of very high workload. Consequently, controllers should not routinely pass traffic information to ac conducting RA manoeuvres, or other ac affected by such manoeuvres, nevertheless, there may be circumstances where the passing of traffic information is justified; consequently, controllers may provide traffic information under the following circumstances:

To ac conducting an RA manoeuvre if it is considered essential for flight safety.'

Radar recordings show the A319 reacting to the RA and climb through FL022 at the CPA [up to FL026] and passing 0.4nm S of the PA38, which was in a right turn away from it. At 1506:27 the A319 pilot advised, "Radar c/s Clear of Conflict" and Radar replied, "(A319)c/s thanks." Both ac continued and landed without further incident. The complexity of the airspace surrounding Liverpool and Manchester, requires that IFR inbounds, vectored left hand for RW27, are at alt 2000ft before entering Area E on base leg while VFR traffic is required to remain not above an alt of 1500ft using the entry/exit lanes.

Liverpool Radar transferred the PA38 to the TWR with an expectation that the ac would be not above alt 1500ft. The Radar controller is normally required to monitor the primary radar returns of VFR traffic and has the option to reduce the number of SSR codes visible around the ATZ using the SSR filter system. The Radar controller's report indicated that the controller could not recall seeing the PA38 displaying Mode C.

The radar recording shows that when TI was passed to the A319 regarding the PA38 4nm ahead, the PA38 was in a right hand turn indicating FL014 (alt 1310ft) [for 2 sweeps]. Shortly afterwards the PA38 can be seen to track SW and climb to FL017 (alt 1610ft), at a point when the two ac are 1.7nm apart; this resulted in the A319's TCAS RA.

Liverpool ATSU indicated that, within the known Class D environment, IFR traffic at 2000ft is passed TI on VFR traffic operating not above alt 1500ft within the entry/exit lanes. Radar controllers use only the primary radar information on VFR traffic, as conspicuity codes are not validated or verified. The ATSU reported that, historically, [see UKAB post –meeting Note: (1)] there had been no similar incidents and added that controllers have the option to hold VFR traffic or to give tactical vectors to IFR inbounds when appropriate. MATS Pt 1, Section 3. Chapter 4, Page 1, Paragraph 3.4, states:

'Instructions issued to VFR flights in Class D airspace are mandatory. These may comprise routeing instructions, visual holding instructions, level restrictions, and information on collision hazards, in order to establish a safe, orderly and expeditious flow of traffic and to provide for the effective management of overall ATC workload.'

Although the PA38 was locally based, the pilot's report indicated that he believed the IFR traffic downwind would be at an alt of 2500ft. The radar recording showed that whilst the PA38 was holding in a right hand orbit, the ac appeared to lose altitude and then apparently climb 100ft above the level restriction of alt 1500ft when in close proximity to the A319.

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 authorities.

Members noted that the pilots of both ac had been complying with the respective IFR and VFR arrival procedures for Liverpool Airport. Although the altitude of the PA38 on the radar recording appeared about 100ft higher than that instructed by APR, it was within both prescribed Mode C and altimeter tolerances. Members noted that there had been minor altitude deviations during the PA38's orbit but considered these to be reasonable for a student pilot and they did not breach the ATC altitude restriction. That being the case, Members agreed that it had been the very small climb as the PA38 was pointing towards the A319 in the orbit that had triggered the TCAS RA in the A319; controller Members also agreed that in situations where 500ft separation is used, such RAs are not uncommon. A controller Member noted that the Airspace at Liverpool and the procedures are complex, but it was pointed out that this was necessarily so due to the proximity of Manchester and the associated CTA.

The Secretariat informed the Board that they could recall several similar incidents in the Liverpool CTR.

[UKAB Post-Meeting Note (1): A search of the Joint Airprox Reporting System Database showed that there had been 10 Airprox between VFR and IFR traffic in the period 1 Jan 2000 - 31 Dec 2009 in which a TCAS warning had been generated. (Airprox: 2002036, 2003192, 2005125, 2005139, 2005196, 2006142, 2007031, 2008037, 2009118 and 2009143)].

Members agreed however, that the procedures were sound but that TCAS RAs would inevitably result. That being the case, and since all involved had complied with the procedures, Members agreed that there had been no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

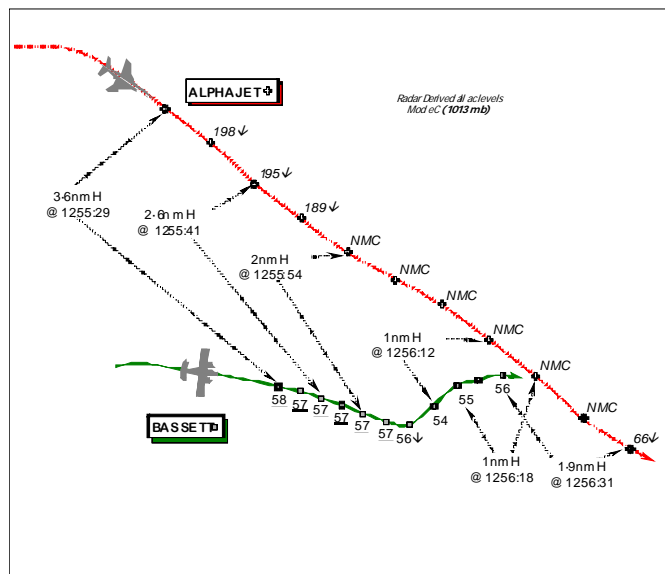
Cause: Sighting report (TCAS).

Degree of Risk: C.

AIRPROX REPORT No 2010083

AIRPROX REPORT NO 2010083

Date/Time: 1 Jul 2010 1256Z
Position: 5110N 00208W (14nm W of Boscombe Down A/D - elev 407ft)
Airspace: London FIR (Class: G)
Reporting Ac Reporting Ac
Type: Basset CC1 Dornier Alphajet
Operator: MOD ATEC MOD ATEC
Alt/FL: FL55 ↓FL50
SAS SAS
Weather: VMC CLOC VMC CLOC
Visibility: 30km 30km
Reported Separation:
1000ft V Not seen
Recorded Separation:
1nm H



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BEAGLE BASSET CC1 PILOT reports he was conducting a local dual training flight from Boscombe Down whilst in receipt of a TS from Boscombe RAD. A squawk of A2611 was selected with Mode C; neither Mode S nor TCAS are fitted. He was operating in a block between FL40-100 on a discrete frequency of 243.4MHz [Stud 15] in VMC with excellent horizontal visibility and visibility to the ground. Heading 100° at 135kt, he observed an Alphajet directly overhead and overtaking, about 1000ft above his ac on the same course. No avoiding action was necessary, but no TI had been passed about the Alphajet. The controller was challenged three times, but no reply was received to either transmission. A channel change to Stud 5, the common RAD frequency, was made and contact regained. At the same time, a Tornado reported airborne and eventually crossed overhead 1000ft above his ac without being called out either. After challenging RAD, the controller replied, 'we are busy', so an Airprox was filed.

After landing a telephone call to the ATC Supervisor revealed that the RAD controller was under training supervised by another controller. The crew of the Alphajet was also questioned as well; they claimed they had never received any TI about his Basset under their TS either, had not seen or been aware of his ac's location, whilst descending out of his block FL50-200 for recovery. He assessed the Risk as 'Medium'

The ac has a white, blue and red colour-scheme.

THE DASSAULT-DORNIER ALPHA JET PILOT reports he had been conducting dynamic flight test techniques training in a block from FL50 to FL240 under a TS from Boscombe Down ATC. The assigned squawk was selected with Mode C on; the ac is black with white wing tips and the white HISLs were on.

On completion of the medium altitude training, the aircraft was turned onto a suitable heading and a descent was carried out in VMC at 0.7Mach for recovery to base. During the descent, no warning of any proximate traffic was received from ATC; the aircraft's flight path was cleared by lookout. After landing, the crew was made aware that an Airprox had occurred during the recovery descent. The Beagle Basset was not seen, therefore, he was unable to make an assessment of the Risk.

He added that the pilot workload was low during the recovery phase and stressed that the vision from the front of the cockpit to clear his ac's flight path was good.

THE BOSCOMBE DOWN RADAR CONTROLLER (RAD) reports that at the time of the incident, the Basset was manoeuvring some 15nm W and NW of Boscombe Down and operating on frequency 243.4MHz. The Alphajet was about 25nm W of the aerodrome at FL150 operating on Stud 5 and a Tornado was preparing to depart, the crew having been instructed to contact Stud 5 once airborne.

As the Basset started to fly S at FL60, the Alphajet crew called for a GCA recovery to RW23 and was vectored towards Boscombe Down and instructed to descend to 3000ft QFE. During the internal handover to DIRECTOR (DIR), a Tornado crew reported airborne, climbing not above FL240. The Alphajet descended quickly and was about 4000–5000ft 10nm W of the aerodrome, therefore, it was called to the Tornado crew, who reported visual so the handover was continued. As the handover was taking place, the Basset crew made a couple of RT calls on 243.4MHz [Stud 15] and was instructed to standby. Once the handover was complete, the Basset pilot called on Stud 5 questioning why he was not receiving any calls on 243.4MHz, why he had not been told about the inbound Alphajet or the departing ac and reporting that he was filing an Airprox.

THE BOSCOMBE DOWN ATC SUPERVISOR (SUP) provided a full and frank account. He reports that at the time of the Airprox all positions were manned, with fresh controllers. The Unit is under substantial pressure to train controllers as quickly as possible but had struggled with meagre traffic levels throughout the week. However, there was suddenly an increasing level of traffic during the period 1200-1300Z. The Zone position - C/S RADAR - had 4 ac working in the Boscombe 'Triangle', 3 of which were on 371.825MHz (Stud 5) and one on 234.4MHz (Stud 15), which would provide excellent training value so he decided to reshuffle some personnel in order to get a trainee into the RAD seat. The trainee in question had only had half of her lunch break but was happy to go on console.

In addition to this, as the Local Examining Officer (LEO), he had previously been trying to complete a Supervisor check on another controller who was in the DIRECTOR (DIR) seat. The desperately needed radar pattern traffic was now about to materialise as some of the ac in the 'Triangle' started to recover. Although not under formal examination conditions because he was on duty as Supervisor, he was watching what the candidate in DIR was doing from his adjacent Supervisor position as the controller was about to have 3 ac in the pattern. BDN Approach (APP) had very little workload and was also a qualified and experienced Supervisor who was therefore asked to keep an eye on RAD's traffic levels, as the greater proportion of his own attention was focused on the DIR position.

An ac called for recovery from the NE of Yeovilton, which was handed over to DIR, who by this time had recovered the preceding ac into the visual cct and had a Tutor downwind on his second approach. Very shortly after this, the Alphajet crew called for recovery about 8-9nm W of BDN. He instructed RAD to descend the Alphajet down to 2500ft and hand it over to DIR as the slower Tutor, ahead in the pattern, was descending through 2000ft. RAD complied with this instruction, but then her workload began to increase with a Tornado on departure. Although a 'Call for Release' (CFR) was in place, APP had released the Tornado without a climb out restriction (COR) against the inbound Alphajet. The reason for this was that at the time of the take-off clearance, the inbound was sufficiently far away not to be a problem. Unfortunately, due to the length of time between the take-off clearance and the Tornado actually leaving the RW, this separation had reduced to a point where, in hindsight, a COR was needed.

The trainee RAD controller was working the Basset on the quiet frequency, the Alphajet descending inbound towards the aerodrome ready for handover and about to get the Tornado outbound on a reciprocal track. DIR had traffic downwind in the pattern, another ac inbound from about 20nm W and was about to be handed the Alphajet at about 7nm W. APP had only one or two ac on under BS, and LARS was not busy. RAD was fairly busy on Stud 5, having just completed a radar handover and about to commence another, whilst also receiving a further outbound track. The RAD mentor did not hear the Basset pilot on Stud 15; however, having heard the RT tape replay, the mentor is now aware that the Basset crew had called several times without reply and had then been told to 'standby' twice whilst the handovers were in progress. During this period, the RAD mentor had removed her headset several times so that she could liaise verbally with the controllers and had lost SA on the departing Tornado. His [the SUP's] instruction, which in hindsight was unnecessary, to RAD to descend the inbound Alphajet had caused a confliction against the Tornado, which was climbing. To make matters worse, the Tornado, flying VFR, had turned onto a westerly track directly towards the inbound Alphajet, having had no information on its position and although there was approximately 5-6nm separation at this point, a dangerous situation was now developing. APP suggested to RAD that the inbound jet be turned onto 070° to resolve the confliction, however he did not believe that RAD heard this as she was busy providing TI to each of the conflicting ac. The Tornado crew called visual with the Alphajet and vice versa and both ac continued on course. All of this took place on 371.825MHz - Stud 5. The Basset crew had been on the quiet frequency of 234.4MHz – Stud 15 - and had not

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been given TI on the two occasions it would have been beneficial. In addition, RAD had perhaps also neglected the Basset during the handovers to the DIR. The Basset crew then switched to Stud 5, which caused some confusion as RAD was trying to reply on Stud 15, not knowing that the crew had changed frequency. The Basset pilot announced that he was now on Stud 5 and asked if there was a problem with the other frequency, as he had not heard any calls for some time. RAD informed him that they had been busy on Stud 5. He appeared to be annoyed that he hadn't been told about this, and asked for guidance as he believed that he had come within 2000ft of two ac, which were not called. At this point, the RAD mentor stepped in and stated that traffic had not been called as (in her opinion) it was irrelevant. He believed this may have upset the Basset pilot further, who declared that he would file an Airprox, which the mentor acknowledged. A relief was then organised for RAD first and reporting action commenced.

The situation that had developed regarding the Alphajet and Tornado on Stud 5 was a more pressing matter to resolve than providing TI to the Basset. Whilst the TS provided for the Basset had been deficient, due to workload, he did not believe that an Airprox occurred. Nevertheless, he was sympathetic to the pilot's complaint and it is clear that the incident warranted reporting action.

From his perspective he was:

Under operational pressure to provide as much training as possible.

Also under similar pressure to complete the Supervisor check ride.

The live traffic that was needed for both occurred at the same time.

His attention as Supervisor was not equally divided amongst the control staff.

He lost SA on the departing Tornado and inadvertently created a problematic situation for RAD, which increased their workload and contributed to degradation of service for the Basset crew.

This was a lesson in priorities for him; he incorrectly placed the needs of training and endorsement above his immediate duties as Supervisor, as a result, a potentially unsafe situation developed.

SATCO BOSCOMBE DOWN comments that whilst acknowledging the Basset pilot's concerns, he did not feel that an Airprox actually occurred, more that the pilot correctly wished to highlight certain points and see what lessons can be learnt. The whole situation arose due to a number of human factors that could possibly have been either avoided or mitigated against and the controllers involved have been de-briefed as to their part.

The RAD controller on whose frequency the incident occurred was instructing at the time and was in the area of 'how much do I allow the UT to continue on her present course' to gain the experience as to when or if he should have taken control. Had all ac been on the same frequency everyone would have been aware of the workload; however, the instructor was dealing with the priority and did not assess the Basset to be in unsafe confliction. Had the controller cross-coupled the frequencies each pilot would have known the work rate, or alternatively and as a minimum, a reduction of service due to workload should have been broadcast to all involved.

The SUP has been overly critical of himself. Despite his best intentions there is still a limit to how much a Supervisor can assimilate and although his attention was more focused on DIR, which is the traditional position where problems occur, he had an extremely experienced controller in each of the other positions who could have been more proactive in this situation. The point that all Stations are under pressure to endorse controllers is nothing new and although possibly a contributory factor, did not in his opinion, have an over bearing impact on this situation.

There have been lessons learnt in which my controllers have taken on board but it bears more to experience levels rather than to changes in procedures.

HQ 1Gp BM ATC SM reports that although from the RAD perspective the transcript commences at 1256:15, the Unit Safety Management Officer at Boscombe Down (BDN) has confirmed that there are no transmissions on the RAD frequencies for the 5min leading up the occurrence timeline.

Both ac involved in the Airprox and the Tornado were operating under a TS and no reductions of service were issued. The Alphajet entered a descent from FL200 at 1255:29 and is shown descending through FL195 at 1255:41, at which point the Basset is about 2.6 nm SSE indicating a level cruise at FL57. The indicated level at 1255:47 was FL189; the Alphajet's Mode C data then 'drops out' and is not shown again until 1256:31, indicating FL66 [1000ft above the Basset]. Consequently, the Alphajet descended 12300 feet in 37sec over a distance of approximately 4.3nm, equating to a RoD of broadly 16800ft/min, assuming the descent was maintained throughout this period. This high RoD will have caused the SSR Mode C information to 'drop out' and it is highly likely that a similar effect will have been witnessed on the BDN radar displays, although this is impossible to determine conclusively.

The Alphajet crew called RAD at 1256:15 requesting a, "*pickup for radar PAR*" at which point the Basset was about 1nm SW at FL54. The end of the Alphajet pilot's transmission on Stud 5 was co-incident with the Basset crew's transmission on Stud 15. The CPA of 1nm horizontally is maintained through 1256:18, but it is impossible to determine the vertical separation in the absence of Mode C data. At this point RAD had 2 ac on frequency (the Alphajet on Stud 5 and the Basset on Stud 15) with a 3rd (the Tornado) about to get airborne. CAP774 states that

"..traffic is normally considered to be relevant when, in the judgement of the controller, the conflicting aircraft's observed flight profile indicates that it will pass within 3nm and, where level information is available, 3000 ft of the aircraft in receipt of the Traffic Service. However, controllers may also use their judgement to decide on occasions when such traffic is not relevant, e.g. passing behind or within the parameters but diverging."

When RAD responded to the Alphajet pilot at 1256:24, the radar replay shows that the 2 ac were no longer a factor to each other and that there was no longer a requirement for RAD to pass TI to these ac about each other. However, an earlier opportunity to pass TI to the Basset and the Alphajet existed. Had RAD had access to Mode C for the Alphajet they would have been expected to be aware of the risk of conflict between the 2 ac. However the BDN USMO has confirmed that there were no transmissions on the RAD freq for 5min prior to the Alphajet crew calling for recovery, which suggests that the RAD controller did not perceive a risk of conflict. This supports the hypothesis that the high RoD of the Alphajet caused the ac's SSR Mode C information to drop off BDN's radar display, thereby removing the visual prompt for the impending conflict. However, this characteristic is well known and, given that the Mode C data was not displayed for around 37sec, this should have provided an opportunity for RAD to recognise the conflict and provide TI to the Basset and Alphajet crews before the latter called for recovery.

BDN reports that the RAD position was manned by a trainee and an experienced mentor. It is possible that the trainee was unaware of the problems associated with high RoD/RoC and their impact upon Mode C data. The absence of any input from the RAD mentor suggests that they did not detect that the Mode C information was not being displayed, which could have alerted them to the high RoD of the Alphajet towards the Basset. Given the length of time that the Mode C had not been displayed the level of oversight provided by the screen controller to the trainee is questionable. Normally, the SUP would provide an additional level of oversight at this point; however, the SUP had tasked another SUP qualified controller on APP with monitoring RAD, allowing the SUP to focus on DIR. Whilst it is unclear what APP understood were their responsibilities towards RAD, the SUP reports asking them to 'keep an eye on the RAD traffic levels' which does not imply the level of oversight that a SUP normally exercises. This lack of supervision can be seen to be a further contributory factor to the Airprox.

From 1256:15, when the Alphajet crew called for recovery, until 1258:41, it is clear that RAD's workload was high, with no opportunity to respond either to the Basset crew's RT call or to pass TI to them about the Alphajet, given that RAD had, arguably, higher priority tasks. CAP774 states that: 'controllers shall aim to pass information on relevant traffic before the conflicting aircraft is within 5nm'. Given RAD's workload, it is clear that the TI passed to the Tornado crew about the Basset at 1257:57, "*traffic 12 o'clock 2 miles crossing right left at flight level 5-5*" represented the first opportunity to pass any information. At this point, although RAD described the range between the Tornado and the Basset as "*..2 miles..*" the radar recording reveals it was about 3.5nm, with the Tornado climbing through FL65, already some 900ft above the Basset.

[UKAB Note (1): Minimum horizontal separation between the Basset and the Tornado occurred at 1258:56, as the westbound Tornado passed 0.6nm astern of the southbound Basset; vertical separation of 3600ft was evident at this point - the Basset indicating FL56 and the Tornado FL92 respectively.]

CAP774 states that:

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“..there may be circumstances that prevent controllers from passing timely traffic information ... e.g. high workload... Controllers shall inform the pilot of reductions in traffic information along with the reason and the probable duration; however, it may not always be possible to provide these warnings in a timely fashion.”

Insofar as it applies to the Basset and the Tornado, RAD's workload prevented them passing TI to the Basset crew and prevented them passing a reduction of service to all ac on their frequency. RAD was however able to supply TI to the Tornado on the Basset. This was clearly a short burst of intense workload affecting the RAD position that was exacerbated by operating 2 separate frequencies. Whilst SATCO BDN has stated that the RAD mentor was trying to ensure that the trainee received the most training value, CAP774 states that 'controllers shall aim to pass information on relevant traffic before the conflicting aircraft is within 5 NM.' Insofar as it applies to the reported Airprox between the Basset and the Alphajet, the 37sec absence of Mode C data should have allowed both the trainee to assimilate the information and pass TI and for the mentor to interject to provide TI in the absence of a response from the trainee. The fact that this did not occur suggests that neither controller perceived the risk of conflict, drawing into question the level of oversight provided by the screen to the trainee.

The self imposed pressure on the SUP to eke out the maximum utility from this busy session for ATC training, seeing them delegate part of their Supervisory responsibility can be seen to have been a contributory factor to this Airprox. Insofar as the Basset and the Tornado was concerned, within the limitations imposed by their workload, RAD fulfilled their obligations for the provision of TI under a TS.

BDN ATC are completing work to include high RoC and RoD profiles and their subsequent impact on the surveillance picture within local training materials. When operating at high intensity levels, all ac will be put onto one frequency if BDN controllers believe that the provision of TI to all ac may be prejudiced. All BDN mentor and instructor controllers have been briefed that whilst they should give trainees every opportunity to learn, this should not be at the expense of safety and expedition.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that the recorded LATCC (Mil) data shows that the Alphajet's Mode C was not captured by the Burrington SSR recording in the period of 44 sec before the point of minimum horizontal separation. Members were aware that, in general, a RoD in excess of 10000ft/min will not be captured by ground based SSR interrogators or TCAS equipment. So when the Alphajet crew initiated their recovery to base, their high RoD – in the order of 16800ft/min - had prevented the Burrington SSR interrogator from displaying their descent because their steep descent caused the SSR Mode C information to 'drop out'. Pilots should always bear in mind that a RoD in excess of 10000ft/min could mask their ac's Mode C from SSR interrogators and importantly, make their ac invisible to TCAS, which might well prevent an RA from being triggered when warranted.

The LATCC (Mil) radar recording was all that was available to the Board, as Boscombe Down ATC does not record their data separately. Controller Members accepted that, in all probability, the Boscombe Down SSR would also have been affected in a similar manner (albeit that it rotates at a higher rate than the Burrington SSR and provides a quicker data refresh rate) and probably did not display the Alphajet's Mode C to the controllers as the ac descended. It was understandable that the Basset pilot was concerned when he did not get a reply on the quiet frequency he was operating on. If RADAR had seen the Alphajet's Mode C winding down then the controllers would almost certainly have proffered TI if they had the capacity to do so. However, the report from HQ 1Gp ATC shows that the RADAR controllers' workload was a factor here and both were apparently unaware of the Alphajet's descent before it passed the Basset. The Basset pilot was somewhat mistaken when he reported the Alphajet had passed directly overhead as the radar recording had shown that the minimum horizontal separation was 1nm as the Alphajet crossed from L - R ahead, just moments before its crew called RADAR. Moreover, when the Alphajet's Mode C was next evident it was 1.9nm away to the SE of the Basset and shown to be 1000ft above the latter whilst clearing rapidly to the SE. Although not illustrated here, when the Tornado passed by about 2½min later it flew clear astern of the southbound Basset with vertical separation of 3600ft.

There were clearly several points within the provision of the ATS, together with the Supervisory aspects, that had warranted review here and it was evident that the Unit had drawn some useful learning points from this report. However, the HQ Air (Ops) Member stressed that if the Basset pilot had been concerned about the absence of TI,

then a better reporting mechanism was that of a Hazard Report on a DFSOR. As it was, given the geometry of this encounter and the separation evident, the Board agreed that this report had been the result of a sighting by the Basset pilot and no Risk of a collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

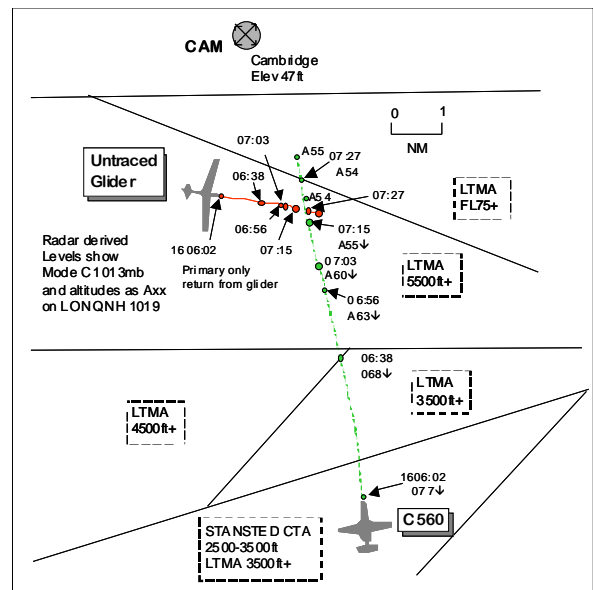
Cause: A sighting report.

Degree of Risk: C.

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Date/Time: 3 Jul 2010 1607Z (Saturday)
Position: 5209N 00012E
(4nm SSE Cambridge - elev 47ft)
Airspace: LFIR (Class: G)
Reporting Ac Reported Ac
Type: C560XLS Untraced glider
Operator: Civ Comm N/K
Alt/FL: 5500ft ↓
(QNH) (N/K)
Weather: VMC CLBC NK NR
Visibility: >10km NR
Reported Separation:
10ft V/20m H NR
Recorded Separation:
0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C560XLS PILOT reports heading inbound to Cambridge IFR at 250kt and in communication with London squawking an assigned code with Modes S and C; TCAS was fitted. London instructed them to leave CAS in the descent to Cambridge although he was not sure if this was the cleared point or if a heading was given. They broke a layer of cloud at about 6000ft and, while receiving a call from London stating that they were leaving CAS and that Cambridge was closed, something reflected the sun on his LHS. He looked out of the L window and spotted a glider flying towards his ac very close, 15ft below and 25m away. Touch Control Steering (TCS) was initiated and he rolled to the R and pointed the ac's nose up to break the descent and move away from the glider, estimating separation was 10ft vertically and 20m horizontally at the CPA. After the avoiding action ATC repeated the transmission and he replied. After switching to Cambridge he reported the Airprox but no radar echo was spotted. The flight was continued with no further events.

RAC MIL reports that despite extensive tracing action the identity of the reported glider remains unknown. The glider could not be back-tracked to a departure airfield and it faded from radar 12nm SE of Cambridge. Procedural tracing action was then commenced and, although numerous gliding sites were contacted, no gliders were proffered as being a likely ac so unfortunately the reported ac remains untraced.

THE ESSEX RADAR CONTROLLER reports the C560 flight was descended to altitude 4000ft to leave CAS in the descent for Cambridge. As the ac was just leaving CAS Cambridge telephoned stating that they were closed due to the RW breaking up and that the C560 would have to hold at the CAM NDB. This was relayed to the C560 pilot who didn't reply straight away so the information was passed again and on receipt the flight was transferred to Cambridge.

ATSI reports that the Airprox occurred 3-8nm to the SSE of Cambridge Airport, at or just below altitude 5500ft, the base of London TMA-9, CAS. The LTC Essex Radar controller was operating in bandboxed mode, using the Stansted 10cm radar on a 30nm range. The controller considered traffic levels within the limits considered appropriate for bandboxed operations.

The Cambridge METAR was 031550Z 300/07kt 230V020 9999 SCT047 24/07 Q1018=.

Cambridge is situated in Class G airspace and lies just to the N of the boundary of CAS, London TMA-9 and TMA-18. The C560 was on a flight from Dublin to Cambridge and in receipt of a RCS; the ac was required to leave CAS for the last portion of the flight to Cambridge.

The glider was routing W to E below the base of CAS. Tracing action after the incident did not identify the glider involved. The C560 pilot's written report stated that the event occurred at altitude 5500ft and 400ft below cloud.

With fine weather conditions on the day, radar recording shows that there was considerable activity outside CAS, with a high density of GA traffic in the area to the NW of Stansted and around Cambridge. Many of these were primary radar contacts, with the probability of a number being gliders.

The Essex Radar controller was experienced and had operated at the unit for a period of 15yr, holding a valid APR competency certificate for both Stansted and Gatwick. The controller had been in position for 30min prior to the incident and reported being fully rested prior to the start of shift. During the period prior to the event the workload was assessed by ATSI as being moderate.

The C560 was transferred to Essex Radar by LTC NE Deps and at 1604:25, the flight contacted Essex Radar, 6.9nm NW of Stansted Airport, in a L turn onto a heading 050° and maintaining FL90. The C560 flight was instructed to descend to altitude 6000ft on QNH 1018mb and was then given a direct routing to Cambridge and at 1605:43 was given further descent, *"C560 c/s descend to altitude four thousand feet in the descent you will leave controlled airspace."* The pilot did not acknowledge this and Essex Radar repeated the instruction. At 1606:03, the pilot responded, *"descending altitude four thousand feet and we'll leave controlled airspace in the descent C560 c/s."* It was noted that the C560 was instructed to descend to an altitude of 4000ft and that may have given the impression of an executive, protected clearance, rather than the MATS 1 phraseology 'Cleared to leave controlled airspace by descent', with an acceptance level from Cambridge. The pilot was not asked what type of service was required outside CAS.

At 1606:02, radar recording shows the C560, passing FL77, 10.5nm N of Stansted in a L turn, with a slow moving primary contact tracking E, 6.5nm NW of the C560. The controller later commented that the glider was not seen.

At 1606:37, a phone call from Cambridge was accepted by the Essex Radar controller. Cambridge reported that the main RW had been closed and would result in the C560 having to divert. It was agreed that the C560 would be routed to the CAM hold whilst diversion arrangements were made. At this point the radar recording shows the C560 passing FL68, with a slow moving primary contact in the ac's 1130 position at range 3.4nm. During the phone conversation, an ac inbound to Stansted twice requested distance to run, without an acknowledgement. At 1606:56, the radar recording shows the C560 passing altitude 6300ft QNH with the unknown contact in its 1130 position at range 2.4nm. Essex Radar then replied, *"Sorry I was on the phone there station calling say again."* A flight responded and the distance to touchdown was provided.

The C560 pilot's written report indicated the cloud base was 6000ft. At 1607:03, the radar recording shows the C560 passing altitude 6000ft and the glider in its 1130 position at range 1.4nm. The Essex Radar controller informed the C560, *"And C560 c/s the unfortunately Cambridge has just had to close because of a runway deterioration erm so you won't be able to land there but if you wanna contact them now on one two three decimal six and they'll come back to me okay."* At 1607:16, the C560 pilot replied, *"Standby."*

[UKAB Note (1): The radar recording at 1607:15 shows the C560 at altitude 5500ft, which is the base of CAS, with the glider in its 10 o'clock range 0.4nm. On the next sweep 6sec later the glider has faded from radar whilst the C560 is seen to level at altitude 5400ft QNH. The glider reappears on the next sweep at 1607:27 in the C560's 6 o'clock range 0.7nm, the C560 still level at altitude 5400ft. The next sweep show the C560's Mode C indicating a climb to 5500ft before it then commences a descent towards Cambridge. The CPA occurs just after the glider fades and, taking into account the glider's track and speed prior to and post fade, it is estimated the C560 passed about 0.1nm ahead of the glider.]

The controller later explained that the supervisor was informed regarding the situation at Cambridge and then assisted in answering further phone calls.

At 1607:36, the C560 responded, *"Er C560 c/s sorry er we almost hit a glider that's why I had to put you on standby could you please say again last information."* The controller passed the same message, *"Affirm Cambridge er the runway's had to close er due to runway deterioration er you won't be able to land there if you want to hold at the Charlie Alpha Mike and contact Cambridge one two three decimal six they'll keep you advised."* The pilot of the C560 replied, *"Okay er we'll enter the hold at Charlie Alpha Mike and er one two three decimal six er C560 c/s."*

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The Essex Radar controller later stated that at no point was he aware of the primary contact and the controller did not hear the pilot reporting that the ac had almost hit a glider. It only became apparent to the controller, who was very surprised, when listening to a replay of events at a later stage. The controller was unable to explain why he had not seen the primary contact and accepted that it must have been visible on radar. It may have been that the contact was one of many, moving very slowly and not very noticeable, compared with the more prominent ac in CAS with SSR labels.

In discussing the sequence of events, the controller explained that he could not recall events exactly, but remembers the phone call from Cambridge being an unusual occurrence and distraction at a point when the C560 was about to leave the base of CAS. The controller described how, after the phone conversation, the supervisor had been informed about the situation at Cambridge, probably at the time when the pilot reported the glider and this may have been a cause for the controller miss-hearing a portion of the pilot's transmission.

When asked about the change of service, the controller explained that, because Cambridge is close to the boundary of CAS, ac are routinely transferred and the RCS terminated, at the boundary. The controller recognised that when the C560 left CAS, the radar service had not been terminated or changed. CAP493, Manual of Air Traffic Services, Part 1 (MATS Pt1), Section 1, Chapter 5, page 1, Paragraph 1.2.2, states:

'Pilots must be advised if a service commences, terminates or changes when:

- a) they are operating outside controlled airspace; or
- b) they cross the boundary of controlled airspace.'

The controller was asked if, prior to aircraft leaving CAS, it was normal to scan ahead for conflicting traffic operating in the adjacent uncontrolled airspace. The controller confirmed that this was normal practice and could not remember scanning ahead or seeing the slow moving primary contact. The controller added that the radar service would normally have been terminated as the C560 approached the base of CAS and the flight transferred to Cambridge. Had the controller noticed the unknown primary contact, TI would have been passed.

The controller accepted that workload was moderate, but considered traffic levels within the limits for boxed operations however, it is not always possible to predict workload increases due to unusual events.

NATS Swanwick have undertaken a number of actions as a result of this incident, including a review of current safety risks and MATS Pt2 procedures relating to aircraft leaving and joining CAS.

A Safety Notice SIN 002/10 SWN was issued by NATS Swanwick on 16/07/10 to raise awareness of the incident and emphasise the importance of changing service for ac leaving CAS by descent.

A Supplementary Instruction SI 139/10 LTC, was issued by NATS Swanwick on 14/12/10, making the following addition to TC MATS Pt 2, GEN section:

'A pilots ultimate responsibility to avoid collisions within Class F and G airspace is detailed in MATS Part 1, Section 1, Chapter 11 Page 1. According to MATS Part 1, Section 1, Chapter 5, controllers must advise a pilot if a service terminates or changes when they cross the boundary of CAS. If due to workload or other factors the exact point at which the aircraft leaves CAS cannot be monitored, controllers must advise the pilot what type of service will be provided outside CAS before the aircraft has left CAS. If the anticipated service is passed to the pilot before the aircraft leaves CAS, the point at which the service will change should be stated with reference to a FL/Alt or distance.'

The Essex Radar controller instructed the C560 to descend to 4000ft, leaving CAS in the descent. The pilot was not advised of the point at which the radar service would be terminated and therefore may not have been fully aware of the transition into Class G airspace. MATS Pt1, Section 1, Chapter 11 page 1, Paragraph 2.2.1, states:

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

At the crucial point when the C560 was approaching the base of CAS, with the glider displayed on the radar, (albeit as a slow moving, less prominent radar return), the Essex controller's attention was concentrated on the ILS traffic and phone call from Cambridge.

The Essex Radar controller considered traffic levels to be within the limits for bandboxed operations. It is recognised that it is not always possible to predict in advance unforeseen events or factors that can quickly generate additional workload. However, CAA ATSI assesses that the workload and distraction were factors which diverted the controller's attention away from the C560 as it left CAS and resulted in:

- a) the controller not detecting the radar return of the slow moving glider and consequently not passing a warning or avoiding action.
- b) the controller not hearing the pilot's transmission concerning the gliders proximity.

The C560 left CAS by descent and the Essex Radar controller did not properly terminate or change the level of service. In examining MATS Pt1, CAA ATSI considered that little guidance is provided to controllers with regard to duty of care and the changing responsibilities of pilots and controllers when ac transition from controlled to uncontrolled airspace or vice versa.

ATSI RECOMMENDATIONS.

It is recommended that:

The CAA review the guidance, phraseology and procedures for air traffic controllers and pilots with regard to aircraft leaving and joining controlled airspace, with particular reference to the changing responsibilities of pilots and controllers when aircraft transition from uncontrolled to controlled airspace and vice versa.

NATS Swanwick LTC review their procedures for bandboxed operations.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of the C560, transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

Although the Essex Radar controller had informed the C560 crew that they would be leaving CAS in descent, it was not stated when this would occur. Airspace boundary levels are depicted on en-route charts and would normally be shown on a moving map display if the ac was EFIS equipped. However, it would not always be obvious to the crew from their Approach charts. Therefore best practice would be for the controller to inform a flight precisely when/where it will cross the boundary or pass through the level when the ac transitions into Class G airspace, and whether the ATS will be changed or terminated. This information would alert or remind the crew about their impending change of responsibilities. Nevertheless, the Board was satisfied that the pilot had assimilated the message that he was leaving CAS and that he understood the implications.

Owing to the short track distance to the airport Members thought that it was unlikely that Essex Radar intended to provide ATSOCAS, the controller just releasing Cambridge inbound traffic early by terminating the service and transferring communication and control to Cambridge Approach. This did not occur in this Airprox owing to the RW closure message and subsequent coordinated course of action being agreed on the telephone between both ATSUs. Consequently by the time the Essex controller had returned his attention to the C560 and passed the message, the Airprox was occurring. An early transfer of flights leaving CAS does allow the receiving ATSU to establish and agree the ATSOCAS with the ac's crew in good time.

The glider was flying just below the base level of CAS in VMC when the C560 broke cloud at 6000ft, 500ft above the base level. This would have only allowed the C560 crew about 10sec to visually acquire the glider, which they did as they transitioned through 5500ft into Class G. Mindful of this, a CAT Member stated that had Essex seen the glider's primary only contact and passed TI or a warning, it would have alerted the C560 crew to the confliction but would probably not have affected the outcome. Without a report from the glider pilot, it was not known whether he saw the C560 in the limited time available before the CPA. Members agreed that the C560 crew had no

AIRPROX REPORT No 2010084

opportunity to see the glider any earlier and that this Airprox had been a conflict on the boundary of CAS and Class G airspace.

Turning to risk, with only one viewpoint of the incident quoting minimal separation distances, Members looked closely at the recorded radar data for the geometry of this close encounter. The C560 pilot seated on the LHS saw the glider on his L very close and instinctively rolled R and pointed the ac's nose up to avoid a collision, estimating separation as 15ft vertically and 25m horizontally. Although the glider's radar return faded as the ac passed, the CPA was within 0.1nm (185m): a close call. Members were acutely aware of the difficulty in accurately judging separation by eye, particularly when faced with a sudden surprise situation. On the balance of probability, taking the radar distances into account, it was thought that the distances, although close, might have been underestimated. From the information available, the Board believed that the actions taken by the C560 crew had been enough to remove the actual risk of collision but the ac had passed with margins significantly reduced such that safety had not been assured.

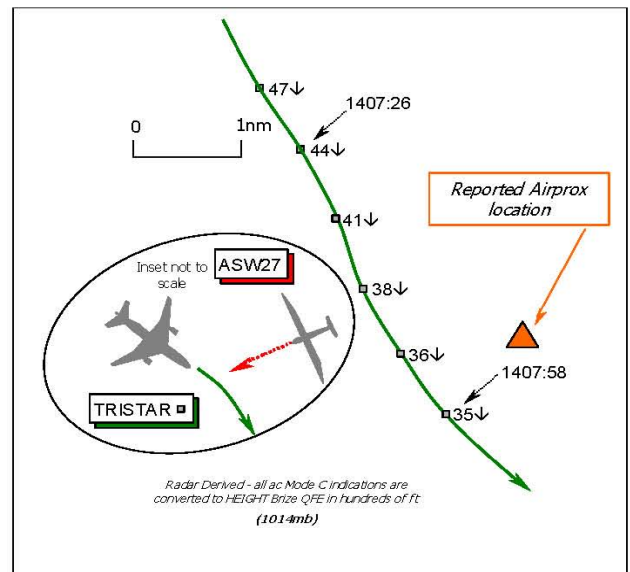
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict on the boundary of CAS and Class G airspace.

Degree of Risk: B.

AIRPROX REPORT NO 2010086

Date/Time: 6 Jul 2010 1407Z
Position: 5150N 00158W (15nm NW of Brize Norton - elev 287ft)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Lockheed L1011 ASW 27 Glider
Operator: HQ Air (Ops) Civ Pte
Alt/FL: ↓3500ft 3500ft
 QFE (1014mb) QFE
Weather: VMC CBCL NR
Visibility: 30km 10nm
Reported Separation:
 200-300ft slant range 25-50m H
Recorded Separation:
 Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LOCKHEED L1011 TRI-STAR PILOT reports he was inbound to Brize Norton under IFR in VMC and was in receipt of a TS from Brize DIRECTOR (DIR) on 133.750MHz. The assigned squawk of A3743 was selected with Mode C; TCAS and Mode S are fitted. The ac has a grey colour-scheme but the HISLs and anti-collision lights were all on.

In a gradual L turn towards the BZN TACAN, his ac was approaching a position about 15nm NW of Brize Norton at 250kt whilst levelling at their assigned altitude of 3500ft, he thought, when DIR called TI on an intermittent contact in their 11 o'clock with no Mode C readout. A white glider was eventually seen with difficulty at 11 o'clock about ½nm away, [whilst actually descending through 4700ft QFE according to the RT transcript] against the slightly low horizon on what appeared to be a constant relative bearing. To avoid it he initiated a gentle R turn away from the glider, which passed within 200-300ft of his ac to port and slightly low. Assessing the Risk as 'medium', he stressed that there were four crewmembers on the flight deck all looking out due to their being multiple contacts in the vicinity. He was subsequently informed about a gliding competition.

THE SCHLEICHER ASW 27 GLIDER PILOT reports he had departed from, and was returning to Nympsfield, in VMC in a level cruise at a height of 3500ft some 1500ft below cloud. Flying a SW'ly course, approaching a position some 7nm E of Staverton at 60kt, the other ac was seen [the range was not specified] and a dive executed to avoid it. Minimum horizontal separation was about 25-50m as the other ac crossed ahead from R-L 'too close for comfort' he opined.

BRIZE NORTON DIRECTOR (DIR) reports that the Tristar was inbound to Brize Norton for a procedural TACAN approach and was descending to 3500ft QFE (1014mb). There was a mass of contacts in the sky as there was a gliding competition in progress. She called TI with no height information to the Tristar pilot, who reported visual and said that he would be filing an Airprox.

THE BRIZE NORTON ATC SUPERVISOR (SUP) reports that the controller was working 1 ac on recovery and 4 tracks crossing the Brize CTR; her workload was well within her capability. There were multiple glider contacts all around Brize Norton, due to several competitions from different glider sites. However, there was less traffic along the route of the inbound ac. The conflicting glider was called in good time at a range of 10nm by the controller and the TI was updated again at 2nm. The pilot subsequently reported visual with the glider, but opined in a later telephone conversation that it had been a late sighting, possibly due to the background conditions and the size and colour of the glider. In the Supervisor's view, the controller fulfilled her responsibilities under the TS.

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HQ 1Gp BM SM reports that as the AIRPROX is not shown on the Cleve Hill Radar recording, this analysis is based wholly upon the reports raised by the Tristar pilot, Brize DIR and the SUP together with the DIR RT transcript.

The Tristar crew was in receipt of a TS from DIR, whilst inbound for a procedural TACAN approach to RW26 at Brize Norton. At 1405:37, DIR passed TI to the Tristar crew on an intermittent primary radar contact, “..traffic 12 o'clock 10 miles intermittent contact no height”, which was acknowledged by the crew. This TI was updated by DIR at 1407:05, with the primary only contact described as, “..left 11 o'clock, 2 miles manoeuvring.” Some 12sec later at 1407:17, the Tristar crew reported that they were, “..visual with glider” and in the background it is possible to hear a voice stating “coming right”, which accords with the pilot's report that they entered a gentle R turn to avoid the conflict.

Whilst DIR could have included as additional information with the TI that the contact may have been a glider, given the notified competition, the reverse argument is that had the ac not been a glider, this may have provided the crew of the Tristar crew with a false expectation, thereby introducing a further hazard to the situation. Consequently, from an ATM perspective, DIR fulfilled their responsibilities for the provision of TI in line with CAP774.

The CAA has been examining options for the carriage of Low Power SSR Transponders (LPST) on gliders. It is likely that in this instance, the carriage of a LPST by the glider would have provided increased SA for both the Tristar crew and ATC, facilitating a more focussed visual search for the crew and the operation of the Tristar's TCAS as the final safety barriers.

It was recommended that further work was conducted to mandate the carriage of transponders throughout UK airspace.

UKAB Note (1): This Airprox is not shown on recorded radar as the glider is not evident at all. The Tristar is shown descending through 4700ft QFE (1014mb) at 1407:18, when the crew reported visual contact on the glider. The descent is maintained as the Tristar turns gently R in accordance with the reported avoiding action turn whilst maintaining the descent at about 1800ft/min.

HQ AIR (OPS) comments that with the TI given and the nature of the conflicting traffic, the Tristar crew did well to see and avoid the glider by the margin they did. ATC also provided a good service given the constraints. If the glider had been able to squawk with a Mode C readout there would have been a significantly improved opportunity for the Tristar to achieve a greater separation. Small, white ac with no conspicuity aids such as HISL or SSR operating without RT contact in the vicinity of busy aerodromes will always present a hazard.

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.

Members discussed the difficulty of detecting gliders on radar. The DAP Advisor briefed the Board that work was ongoing by the CAA, following recent AAIB Safety Recommendations on this topic, to investigate a variety of glider conspicuity measures, including the increased use of RT by glider pilots for communication with ATSU's and the radar conspicuity of gliders with a composite structure. With the Tristar pilot reporting it was difficult to see the white glider, the carriage of some form of lightweight SSR transponder with altitude reporting would have made the glider conspicuous to the Tristar's TCAS and enhanced the crew's SA.

As it was the radar controller had seen the glider's primary radar contact and passed TI to the Tristar crew when the range was 10nm. She then updated the TI at a range of 2nm and it was plain to the Members that the controller had done a good job here in forewarning the Tristar crew about the approaching glider. These two transmissions had been instrumental in helping the Tristar crew to acquire the ASW27 visually – with difficulty ½nm away the Tristar pilot reported - allowing them to turn away from it and maximise what separation there was. Whilst it was unclear at what range the ASW27 pilot had spotted the Tristar, it appeared to have been quite close but in sufficient time to enable him to take robust avoiding action by diving away from the Tristar. As the glider was not shown on recorded radar it was not possible to determine the minimum separation that applied here; the Tristar pilot reported a minimum of 200ft and the ASW27 pilot a maximum of 50m. The Members agreed unanimously that this Airprox had been the result of a conflict in Class G airspace, but whilst the separation was undoubtedly less than ideal,

the Board agreed that the combined action of the pilots involved ensured that any Risk of a collision was effectively forestalled.

PART C: ASSESSMENT OF CAUSE AND RISK

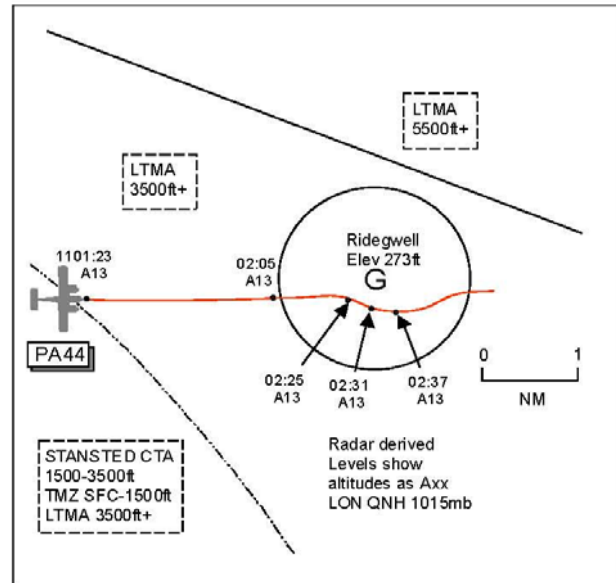
Cause: A conflict in Class G airspace.

Degree of Risk: C.

AIRPROX REPORT No 2010087

AIRPROX REPORT NO 2010087

Date/Time: 11 Jul 2010 1102Z (Sunday)
Position: 5203N 00033E
(0-25nm SW Ridgewell G/S - elev 273ft)
Airspace: LFIR (Class: G)
Reporting Ac Reported Ac
Type: ASK21 PA44
Operator: Civ Club Civ Pte
Alt/FL: 1000ft ↑ 1400ft
(QFE) (QNH)
Weather: VMC CLBC VMC CLBC
Visibility: NR >10km
Reported Separation:
Nil V/100ft H 100ft V/900m H
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ASK21 PILOT reports flying a dual 'trial lesson' sortie from Ridgewell seated in the rear seat. The Wx was VMC with about a 5000ft cloud base and his ac was coloured white; no radio, lighting or transponder was fitted. When close to the top of the winch launch on RW23, as the glider was levelled-off prior to release at 1000ft QFE a maroon/black coloured twin-engine ac was first seen by the front seat pilot before it passed very close in front of his ac, about 100ft away at the same level, from R to L. The passenger in the front seat commented that the other ac had had to deviate to avoid a collision before it was seen to turn onto an E'ly heading to their L once passed.

THE PA44 PILOT reports en-route to Germany VFR and in communication with London Information on 124.6MHz squawking 7000 with Modes S and C. The visibility was >10km flying below cloud although in turbulent air in VMC and the ac was coloured white/blue with strobe lights switched on. Cruising at 1400ft QNH heading 100° at 140kt he had opened his flight plan with London Information and was monitoring the frequency. He was on course from the S edge of the Duxford ATZ direct to Felixstowe and planning to route S of Ridgewell glider site [pilot's chart shows planned track passing 1.5nm S of Ridgewell]. Whilst scanning the airspace and watching out for the glider site he spotted an ac more or less head-on, therefore with a small silhouette, in his 11 o'clock at range 2.5km and well below. Shortly afterwards he realised that it could be a climbing glider on a winch launch and it was obvious to him that the glider would stay on his LHS of his flightpath. He turned R about 50° with significant bank to stay clear and increase separation, estimating he passed 100ft above and 900m distant. He assessed the risk as low.

UKAB Note (1): The UK AIP at ENR 5-5-1-5 promulgates Ridgewell as a Glider Launching Site centred on 520253N 0003330E where aerotow launches take place and winch launches may be encountered up to 2000ft agl during daylight hours, site elevation 273ft amsl.

UKAB Note (2): The radar recording does not capture the Airprox as the ASK21 glider does not show at all, but the PA44's track can be verified. At 1101:23 the PA44 is seen 3nm W of Ridgewell tracking 090° indicating unverified altitude 1300ft QNH 1015mb. This track is maintained until 1102:25 when the PA44 is seen to commence a R turn when 0.3nm SW of Ridgewell still indicating 1300ft. Six seconds later at 1102:31 the PA44 passes just under 0.4nm S abeam before it then turns L to regain its original track about 1nm E of Ridgewell.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Although the PA44 pilot had intended to fly S of the glider site, the radar recording clearly shows the ac tracking towards the Ridgewell O/H at altitude 1300ft. Although the ASK21 does not show on the recording, the PA44's R turn away from the glider, as reported, is seen as it passes almost O/H. The PA44's track through the O/H at an altitude below the promulgated winch cable release height placed it into conflict with the launching glider, and this had caused the Airprox. Members could not reconcile the disparate separation distances reported by both pilots. The ASK21 pilot only saw the PA44 as he levelled out towards the top of the launch, estimating it passed 100ft in front from R to L at the same level. Although the PA44 pilot saw the ASK21 at a reasonable distance well below, it was only when he realised that it was on a winch launch that he made a R turn away to increase separation, estimating it passed 100ft below and 900m clear to his L. From the limited information available Members believed that, on the balance of probability, the PA44's sighting and avoidance of the ASK21 had resulted in a separation somewhere between the 2 pilot's estimates; as such, his actions had been effective in removing any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA44 pilot flew over a notified and active glider launching site below the promulgated winch cable release height and into conflict with the ASK21 glider.

Degree of Risk: C.

AIRPROX REPORT No 2010088

AIRPROX REPORT NO 2010088

Date/Time: 14 Jul 2010 (Wednesday) 0953Z

Position: 5250N 00028W
(12nm SSE Cranwell)

Airspace: Lincolnshire AIAA (Class: G)

Reporting Ac Reported Ac

Type: Tutor Tutor

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

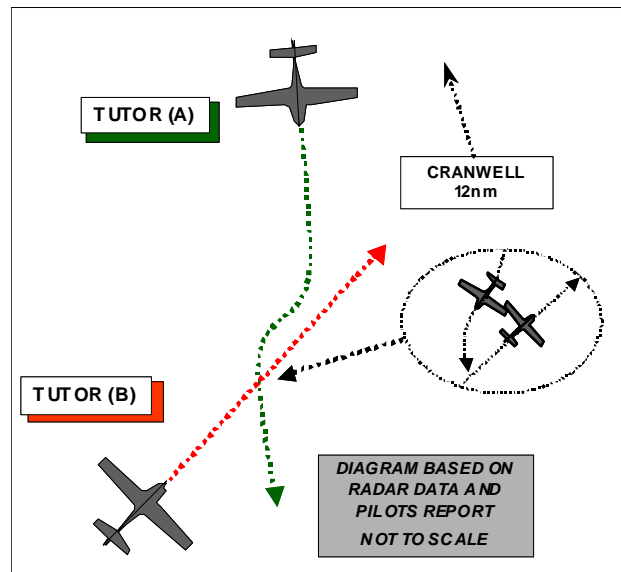
Alt/FL: 6000ft NR
(RPS 994mb)

Weather: VMC CLOC NR

Visibility: 30km NR

Reported Separation:
100ft V/ 100m H NR

Recorded Separation:
100ft V/0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

TUTOR (A) PILOT reports flying an instructional flight from Cranwell in a white ac, not in contact with any unit but squawking a Cranwell conspicuity code. During the climb, heading 180° at 80kt and passing 6000ft, the student pilot flew a gentle pitch up and right turn to avoid another Tutor ac, and subsequently reported the sighting to the instructor. The opposing Tutor was first seen in the 2 o'clock low position, at a distance of 100M and about 100ft below. The instructor only saw the ac as it passed below departing towards their 8 o'clock. In retrospect, having not seen the other ac until after it passed, the instructor considered the risk of collision as medium.

TUTOR (B) PILOT reports that 2 months after the incident he was informed that he had been involved in an Airprox. Given that it has been 2 months since the incident, he was unable to recollect the flight and could not recall feeling that ac separation and thus safety was compromised at any time.

UKAB Note (1): The time of the Airprox given by the reporting pilot (Tutor (A)) was 1 hour in error and the incident could not be correlated with the radar recording. Immediately after the event the pilot was on leave and only after he returned to duty could the amended time be reconciled with the radar data. When this was completed the pilot of Tutor (B) was contacted and an ASIMS report requested.

UKAB Note (2): The recording of the Claxby radar shows the incident clearly. In the lead up to the CPA at 0952:30, Tutor (A) can be seen climbing through FL062 in a Southerly direction and Tutor (B) is in its 2 o'clock, tracking 040° and level at FL065 (i.e. Tutor (A) is in Tutor (B)'s 1130, 1.6nm away and 300ft below it). The ac continue to close on unaltered headings until 0952:53 when Tutor (A) at FL064 commences a descending right to pass behind Tutor (B), which has descended by 200ft. The CPA with the separation of 100ft V/0.1nm H is at 0952:59, with Tutor (A) passing above and behind Tutor (B).

HQ AIR (TRG) comments that out of the 4 crew members involved in this Airprox it is disappointing that only one saw the other ac before the CPA. However, even though the sighting was late it was in time to allow a gentle avoiding action to be flown removing any risk of collision. The Tutor fleet is about to fitted with a CWS that will assist with SA thereby reducing the risk of repeating this type of Airprox.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that both ac had been operating legitimately and independently in the busy airspace of the Lincolnshire AIAA where the principal means of collision avoidance was the Rules of the Air - 'see and avoid' principle. Under these Rules Tutor (A) should have given way to Tutor (B) and, albeit perhaps later than optimum, the pilot did so. Although the pilot of Tutor (B) did not see Tutor (A), since its (student) pilot had the other ac in sight throughout and deemed that only a gentle avoidance manoeuvre was required, Members agreed that there had been no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

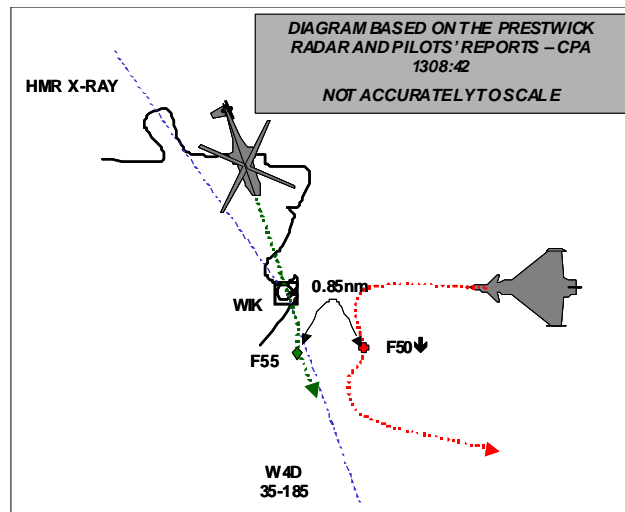
Cause: A non-sighting by the crew of Tutor (B) and a late sighting by the crew of Tutor (A) .

Degree of Risk: C.

AIRPROX REPORT No 2010089

AIRPROX REPORT NO 2010089

Date/Time: 13 Jul 2010 1309Z
Position: 5822N 00302W (5nm S Wick)
Airspace: W4D (Class: F)
Reporting Ac Reported Ac
Type: EC225 Typhoon
Operator: CAT (H) HQ Air (OPps)
Alt/FL: FL55 NR
Weather: VMC CLBL NR
Visibility: >10km NR
Reported Separation:
0 V/1.0nm H 0 V/1.0nm H
Recorded Separation:
500ft V/0.85nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EC225 PILOT reports flying a scheduled passenger flight inbound Aberdeen on ADR W4D from an oil rig, in receipt of a TS from ScACC, squawking 3610 with Modes C and S. When they had just passed WIK ScACC reported a military ac to the W, he thought, of their position and shortly after TCAS gave a TA. They then saw a Typhoon ac 2-3nm away in their 9 o'clock, belly-up in a left hand turn so they turned right for 2-3sec but the Typhoon then manoeuvred around their position for about 30sec before departing to the N.

The Typhoon pilot called the following day to apologise and explain that he thought they were a military helicopter participating in an exercise.

He assessed the risk as being Medium.

THE TYPHOON PILOT reports flying dual and leading a pair of ac on an exercise mission, in receipt of a TS from an AWACS and squawking an exercise squawk with Mode C. They were tasked with area defence, including a side mission to visually identify a slow moving Cessna 152 (an exercise player) and military Puma helicopters.

They were tasked by the AWACS to intercept a 'bogey', a slow moving track S of Wick at 5000ft and the track matched the characteristics of the expected exercise traffic. Of note the controlling AWACS was not using Modes 3A or C for training reasons. They achieved radar contact with the track at 25nm and visual contact at 10nm; they continued to close in order to identify the ac type and rolled out on the same track as the helicopter, line abreast at 1nm. From that position they noted visually that the helicopter was not a [military] Puma and exercise player and initiated a breakaway to depart.

THE ScACC CONTROLLER reported that he was the Moray bandboxed [high and low] controller and the traffic level was low.

An EC225 [Super Puma] was transiting from Foinavon to Aberdeen via the Wick overhead. He identified the helicopter well to the N of Wick; the pilot requested a TS, which he gave but limited the service to SSR traffic only. Prior to WIK he cleared the EC225 to join W4D at FL55. He then dealt briefly with a Kirkwall outbound that was in conflict with unknown traffic. When he returned his scan to the helicopter, he saw military traffic on exercise squawks heading towards it from the E, one descending from just above, so he called the traffic. He updated the TI shortly afterwards as the conflicting ac was then at a similar level and the EC225 pilot reported that he was visual with a Typhoon.

At the range scale he was using it was difficult to determine how close the returns were or whether the helicopter deviated from its track, but the pilot reported that he had taken avoiding action and the returns came close to merging. He asked the EC225 pilot if he wished to file an Airprox to which he replied that he did.

Under normal operations he would offer an upgrade to a DS service when ac join the ADR but in this case the incident occurred just after Wick and he decided that it would be futile, even dangerous, to try to and give avoiding action, as the helicopter was extremely slow compared with the conflicting ac and there were many other ac around. Also the large range scale that he was using would have made it difficult to assess the best course of action.

UKAB Note (1): The exercise in which the Typhoon was participating was the subject of an ACN (2010-07-0020) and a NOTAM. The ACN stated:

'Surface to Below FL100. NOTAM action by AUS. Crews are reminded that this airspace is **not segregated** and is in no way protected or reserved for this Exercise. **CQWI crews must expect to encounter non-participating military and civil ac operating in the area.** Caution; Advisory Routes (ADRs) and Helicopter Main Routes (HMRs) (See Para 20).'

And also:

'd. Advisory Routes (ADRs). Pilots operating on the ADRs listed below are requested to take note of the intense aerial activity associated with FAOR operations and exercise extreme caution when transiting the associated airspace. Exercise participants are to be extra vigilant when manoeuvring in the vicinity of ADRs, particularly those listed below which are located in the vicinity of, or directly below, the FAOR North and associated Exercise Areas:

(1) N560D from BONBY to SUM.

(2) W4D from ADN to WIK.'

Et seq.

THE AWACS CONTROLLER reported that as part of the exercise there would be an inject whereby a light ac would be operating from near Wick. Their instructions for that exercise were to visually identify the ac and determine its registration.

During the exercise, his supervisor drew his attention to a low slow contact near Wick and so he tasked 2 Typhoons to identify the ac visually, believing it to be the exercise ac. The Typhoon leader called that he was visual with the traffic at about 10nm and he continued to close for a visual identification. At about 4nm leader reported that the ac was a helicopter; however, as a military Puma helicopter was also taking part in the exercise, this was not considered unusual. As the Typhoon leader closed the pilot reported that the ac was not a military helicopter and so they 'hailed off'.

The Typhoons were fully aware of the traffic at all times and were deliberately closing in to identify it visually. There was never any threat of collision.

THE AWACS SUPERVISOR reported the incident occurred on the 7th Mission of the exercise and that their equipment was fully serviceable. The workload of the Typhoon Controller was low-moderate. He was also supervising 2 other positions and they were controlling over 45 ac in the exercise area of about 200 x 150nm. This was the busiest airspace that he had encountered during this and similar exercises. All ac under their control were receiving a BS due to the potential of communications jamming, but no jamming was apparent at the time.

[UKAB Note (1): Since there was no RT recording or transcript, it cannot be determined if the Typhoons were in receipt of a BS or TS.]

The exercise scenario for the day meant that the mission priority for their ac was the identification and (simulated) engagement of an Unmanned Aerial System/drones which were being simulated by a light ac or helicopters, based 10nm North of Wick, which were to track S towards their target. The Typhoon formation was planned to be the asset used to identify these ac. The SSR intentions of the light ac were not known, so the controllers' attention was directed towards searching for a low, slow ac, climbing out of the Wick area.

From about 1255, the Typhoons were controlled by the Offensive Counter Air Controller and the main exercise 'push' was expected at 1315. The Typhoons concerned pushed early behind 4 other Typhoons, all searching for

AIRPROX REPORT No 2010089

'enemy' ac and the Controller had a total of 6 ac on frequency near Wick but his scan also required him to build an initial picture on enemy fast jet ac over Stornoway/West Scotland. At about 1305 a contact matching the criteria given for the 'enemy' light ac appeared S of Wick, so the Typhoons were tasked with identifying it. At 1308, Typhoon Leader called "*visual helo*" and the controller instructed them to haul off and investigate another ac. The Typhoons called visual with the helicopter at 10nm but closed further in the belief that it was an exercise ac; on realising that the ac was civilian, they broke off.

HQ 1GP BM SM reports that the Sqn concerned conducted a thorough investigation into this incident but no tape transcript was available due to the limitations of the E3 recording system.

The surveillance team on the AWACS initially located and identified the EC225 as a civilian helicopter when it was about 80nm NNW of Wick. The identity track remained on the helicopter until it crossed overland near Dunnet Head. At that point the surveillance team changed its identity track to a 'friendly general' track, which is often used for general civilian ATC traffic, but is less specific than the previous track. As the EC225 continued SE, the Tactical Director [safety controller] made radio contact with the exercise light ac on the ground 10nm NW Wick and the pilot informed him that he would be getting airborne shortly and he re-briefed the crew.

The Surveillance Team Leader produced an identity matrix during mission planning, which allowed his team to categorise the identities of all ac within radar coverage. This plan was heavily operationally focused and did not account for non-exercise traffic. Although civilian traffic was often easily identified using the matrix, there was a weak area whereby any civilian traffic that might be considered as 'exercise suspicious' (i.e. near Wick when enemy activity was expected there) became labelled as an exercise player.

Shortly after the Tactical Director (TD) re-briefed the crew, the identity of the EC225 was changed to an 'exercise identity' of 'bogey' (unknown ac). The evidence suggests that given the weakness in the identity matrix, the workload of the surveillance team, the fatigue of the individual controller and the operational imperative of the exercise scenario, the surveillance controller suffered a cognitive failure and re-identified the EC225 as 'exercise suspicious'. This change of identification caused the Weapons Director to task the Typhoons to conduct a visual identification of the EC225.

The Typhoons gained radar contact with the ac at a range of 25nm, becoming visual at a range of 10nm. The radar replay accords with the Typhoon pilot's report, showing that the leader positioned 1nm laterally displaced to the helicopter's port side to confirm the visual identification before hauling off. At the point where the Typhoons commenced the haul-off, the Range Training Officer also called them on the control freq to instruct them to haul-off, having also become aware that the EC225 was not an 'exercise player'.

From an ATM perspective the weakness of the identity matrix indicated a flawed mission planning process and caused a chain of events that led to the Typhoons being tasked with conducting the visual ID of the EC225. The Squadron concerned has proposed a number of recommendations to militate against recurrences and is commended on the depth of the analysis undertaken.

ATSI reports that (in addition to the EC225 pilot's report) an Airprox was reported by the ScACC Moray (MOR) sector controller, in the Class F Airspace of ADR W4D, S of Wick at FL055.

The EC225 had departed Foinavon for Aberdeen and was in receipt of a limited TS from the ScACC MOR. At the time of the Airprox a large-scale military exercise was underway in Scottish airspace. The MOR controller reported that he had been in the same position on previous exercise days and that the sector was combined with MOR High and MOR Low being operated by a single controller working with a display range set to 100nm.

At 1242:15 the EC225 called the MOR sector maintaining FL055, the pilot was instructed to squawk 3610 and asked what service he required; he requested a TS, to join ADR W4D at FL055, and gave an estimate for WIK of 1306. The controller identified the EC225 at 1243:00 and placed it under a TS, limited to transponding traffic only and this was read-back by the pilot.

Code 3610 is allocated to 'Scottish ATSOCA Purposes' and is considered validated and verified.

The UK AIP ENR 1-1-1-4 (paragraph 4.2.1.2) in respect of ADRs states:

'The ICAO requirements for an Air Traffic Advisory Service are met in the UK through the provision of a Deconfliction Service or Procedural Service to IFR ac that have flight planned to fly along ADRs.'

At 1301:53 MOR cleared the EC225 to join Advisory Airspace at WIK, routing W4D to Aberdeen at FL055, and the clearance was read-back correctly. The EC225 passed overhead WIK at 1306:56 and its ground speed was about 150kt. At 1307:40, when the EC225 was 1.7nm S of WIK on the ADR, the MOR controller passed TI to the EC225, "...traffic left ten o'clock six miles er crossing left to right indicating flight level seven zero descending" and the pilot responded that the traffic was showing on TCAS. The STCA, low level, activated at 1307:42 followed by a high level alert at 1308:02 and at the same time, the MOR controller updated the TI, "... now left ten o'clock at three miles er still descending through flight level six five". Ten sec later, having received no reply from the EC225, the controller asked if the pilot was visual with the traffic and he responded at 1308:18, "... we've just got it visual actually it's a fast jet and he's turning towards us we're just taking avoiding action"

As the Typhoon approached the EC225 from the E it reduced speed to 330kt and the EC225 began diverge off the ADR to the right and at 1308:35 reported, "... we got it on ACAS with a traffic alert ... looks like a Typhoon and he's taking avoiding action on us"; this was acknowledged by the controller who asked if the EC225 wished to file an Airprox and he replied, "Affirm".

[UKAB Note (2): The EC225 is equipped with TCAS 1 therefore no RAs are generated.]

Prestwick Multi-Radar Tracking radar recording shows that at 1308:37 the Typhoon, having been on a track which took it behind the EC225, made a sharp left turn to parallel it displaced by 0.8nm in its 9 o'clock, and 500ft below and this was the CPA. The Typhoon, having commenced a southeasterly diverging track from the EC225 then turned back across the EC225's track, 1.5nm ahead of it at FL051 resulting in another STCA activation at 1309:07. At 1309:32 the MOR controller passed further TI on the Typhoon, "... traffic manoeuvring to your left ... nine o'clock at er three miles same height you still visual?" and the pilot replied, "... yeah ... he's clearing us now ...". The pair of Typhoons then cleared the ADR to the NW.

The EC225's route took it through Class F uncontrolled airspace along an ADR. Having identified the ac and issued it with instructions for transit of the ADR the MOR controller chose to provide a limited TS. Based on the controller's experience of the effect of the military exercise on the sector and the EC225's slow speed, this was the most appropriate level of service available and was agreed by the EC225 pilot.

The EC225 was transponding a civil validated and verified SSR code; however, it's appearance on a southbound track from Wick, gave it the expected characteristics of a participant in the military exercise and 2 Typhoons were tasked with intercepting and identifying the ac. The display of the civil purpose SSR code was insufficient to alert the military controlling authority that the EC225 was not an exercise participant. ATSI was unable to establish if the military controlling authority were able to see the SSR code 3610 on their displays or, if so, whether this was assimilated as a civil code.

The MOR controller gave TI as the Typhoon approached the EC225 and this was further updated as the Typhoon came closer to the EC225 and high-level STCA activated. The EC225 pilot initiated his own avoiding action by diverging from the ADR and reported visual with the Typhoon as it passed ahead of the EC225, along its left-hand side at 0.8nm and 500ft below.

HQ AIR (OPS) comments that the circumstances that led to the ambiguous tagging of the EC225 were discovered during the investigation and a number of recommendations to militate against recurrences have been made. The Typhoon pilot had good situational awareness on the location of his intended target and prosecuted his tasked mission to the point where he became aware that it was not an exercise player. Safety was not compromised.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The ASACS Advisor informed the Board that, technically, the Typhoons had been in receipt of a BS outside CAS from the AWACS since communication jamming was anticipated; this however did not change substantially the

AIRPROX REPORT No 2010089

method of control employed by the crew. He also informed the Board that the TD had overall responsibility for the 'rear end' operation, was responsible for safety and had a full picture of all aspects of the exercise. The HQ Air (Ops) Member informed the Board that the Typhoons were JTIDS equipped and would have had a full tactical air picture of the exercise area. The Secretariat advised the Board that the C152 did not show on radar at any time and, although its intentions were not known, it was thought unlikely that it would route over the Moray Firth or near the ADR.

Members were surprised that the Exercise Planners had planned the 'Slow Moving Target' inject to take place in the Wick area, which is known to be busy with both civil fixed-wing and helicopter traffic and has no radar. There was discussion about the implications of military ac operating in and around ADRs such as W4D; the CAA ATC Policy and Standards Advisor stated, however, that ADRs are technically a centre-line only without any lateral dimensions but for ATC purposes are regarded as Class F airspace. He also stated that the future of Class F airspace, including W4D, is currently under review by the CAA. The Civil Helicopter Member, who has previous military experience, considered that poor, inconsiderate exercise planning and had been a significant factor in the incident. Had the inject been planned to have taken place elsewhere in the exercise area, then it is unlikely that the Airprox would have occurred. The HQ Air (Ops) Member stated that practising VID's of all types of ac is a routine but essential part of such exercises. There was discussion about the possibility of military ac conducting VID's using a discrete Mode 3 squawk so that civil controllers could easily identify them; however, this was considered impracticable by military pilot Members due to cockpit workload. There was also discussion as to whether ADR's should be placed out of bounds for exercise participants; however, it was agreed that this would be unnecessarily restrictive, providing that exercise participants pay due regard to civil traffic operating therein (as had not happened in this incident). Civil Controller Members were surprised that the AWACS controllers (all of them) had either not seen the helicopter's civil Mode 3 Squawk or that it had not prevented them from tasking a VID on the EC225. The HQ Air BM SM and ASACS Advisors explained that the IFF/SSR situation in AWACS is complex, that exercise training considerations had precluded full use of IFF/SSR and that the civil helicopter had not been 'tagged' as a non participant as a result of human rather than systemic error(s). That being the case, Members agreed that the co-ordination arrangements and the ensuing ACN had been appropriate.

When considering the part played by the Typhoon pilot, Members agreed that he could not have been expected to ascertain the identity of the 'target' any earlier; one Member was surprised however, that he had not been aware that the ac was in the ADR and was squawking appropriately. They also agreed that the Typhoon pilot had broken off as soon as the error became apparent, but could not determine whether this had been directed or of his own volition; in any case it was not considered relevant to the circumstances of the Airprox, coming after the event.

A civil controller Member stated that neither the EC225 pilot nor the ScACC controller had been in a position to influence events in any meaningful way. The ScACC controller was unable to communicate or co-ordinate his ac with the AWACS and was faced with a traffic density such that he would not have been able to provide the EC225 with a full DS while still meeting the objective of progressing it along the ADR to Aberdeen; further the pilot had agreed to a TS. Although not strictly in accordance with MATS Pt1 procedures for ADRs, the application of a TS to the helicopter had, the Board agreed, been the best option in that it gave the pilot the highest level of information possible, thus enabling him to make his own judgement regarding avoidance or track progression; this gave the pilot significantly more information than the controller could offer with a Procedural Service that would have only informed the pilot about other participating IFR traffic in the ADR (in this case there was none). The civilian controller Member was familiar with ScACC and suggested that an AWACS liaison officer present in the appropriate sector might help to reduce the number of such events during exercises.

Despite the other factors mentioned above, Members agreed that this had been a simple case of mistaken identity by the AWACS mission crew caused by incorrect 'tagging' of the EC225; as a result of the Exercise constraints placed on them, and possibly a determination to complete the task in hand, the AWACS controllers had not considered the bigger picture and none of them noted the error until the Typhoon pilot informed them that the helicopter was not an exercise player. The Typhoon pilot had not closed to an unreasonable distance and Members agreed that he had broken away as soon as the error was discovered.

Due to the Typhoon pilot's early visual contact with the helicopter and the controlled manner in which he conducted the VID, the Board agreed that there had been no compromise of safety or risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

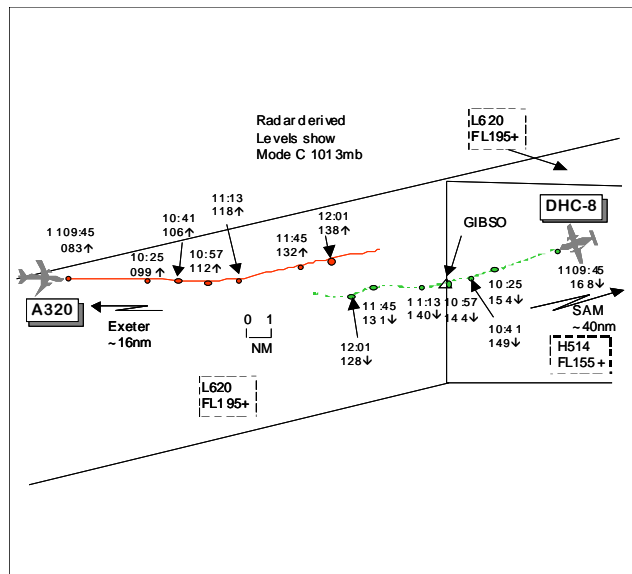
Cause: The AWACS crew misidentified the EC225 as an exercise participant and directed the Typhoon pilot to visually identify it, causing the EC225 crew concern.

Degree of Risk: C.

AIRPROX REPORT No 2010090

AIRPROX REPORT NO 2010090

Date/Time: 8 Jul 2010 1612Z
Position: 5045N 00238W (5nm W GIBSO)
Airspace: LFIR (Class: G)
Reporting Ac Reported Ac
Type: DHC-8 A320
Operator: CAT CAT
Alt/FL: FL145↓ FL145↑
Weather: VMC CAVOK VMC CLOC
Visibility: 10km
Reported Separation:
1000ft V/2.5nm H NR
Recorded Separation:
1000ft V/1.9nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DHC-8 PILOT reports inbound to Exeter IFR and in communication with London squawking 6260 with Modes S and C. Descending from FL180 to FL100 outside CAS in the area of GIBSO heading 270° at 340kt they were not under Western Radar cover. They saw proximate traffic on TCAS before seeing the A320 flying level, he thought, on their R in the opposite direction. As they descended through its level, a TCAS TA was generated; they turned L due S away from the A320 to avoid, estimating 1000ft vertical and 2.5nm horizontal separation at the CPA. They heard the A320 flight report a TCAS RA. He assessed the risk as low.

THE A320 PILOT reports outbound from Exeter IFR squawking an assigned code with Mode S and C. During the climb at 240kt towards GIBSO to FL160 they were handed over early to London, given a TS and informed of a descending ac leaving GIBSO for Exeter. They made a request to turn L to avoid the traffic and increase their track distance to GIBSO, as they were unable to make GIBSO level FL160 in accordance with their clearance owing to an increasing tailwind component. They picked up the descending ac on TCAS and visually, and saw that it would pass down their RHS. However a TCAS TA and then a brief RA - <1sec - was received and they carried out the RA actions.

THE S20T CONTROLLER reports the DHC-8 was an Exeter inbound who had been cleared to leave CAS; Exeter had accepted the flight at FL100. The A320 then became airborne from Exeter, cleared to join CAS at GIBSO at FL160. TI was passed to the DHC-8 flight about the A320 and again when the A320 was 25nm W of GIBSO. The A320 flight called passing FL85 and was given TI about the DHC-8. As the A320 was climbing through FL105 the crew advised that they could not make their clearance and asked for a heading for extra track miles to make their joining clearance; the crew took a L turn of 15°. The DHC-8 was now outside CAS and the crew also asked for a turn, which they did by L 15°. After the ac passed the A320 flight was given joining clearance on track SAM and the DHC-8 was transferred to Exeter. The A320 crew reported having a TCAS RA whilst the DHC-8 crew stated they didn't but they were visual with the A320.

ATSI reports that the Airprox occurred in Class G, uncontrolled airspace and was reported by the pilot of a DHC-8 in the vicinity of GIBSO at FL145. The DHC-8 was inbound Exeter from Amsterdam via SAM – GIBSO and was in contact with LAC Sector 20 (S20) on 129.425 MHz. The A320 was outbound from Exeter to Dalaman via GIBSO and was also on the S20 frequency. S20 was being operated by a Tactical Controller (T) and Planning Controller (P). The Airprox occurred at 1612 and at this time there was no Western Radar service available for traffic into and out of Exeter: operational hours on the date of the incident were between 0630 and 1330 (UTC).

At 1557 the DHC-8 flight called S20, maintaining FL240 and routing towards SAM. The DHC-8 was under a RCS and shortly after this, the S20(T) instructed the DHC-8 to route direct to GIBSO and descend to FL190. S20(P)

issued an airways joining clearance direct to Exeter for the departing A320 in accordance with MATS Part 2 procedures: on-track GIBSO, FL160.

For Exeter departures excluding LATCC (Mil): (paragraph 2.6.4.1.2) states:

'All Exeter departures flight-planned to join the ATS route structure at GIBSO/SAM will require Exeter ATC to request a joining clearance from S20. The aircraft shall be transferred directly from Exeter to S20.

... the S20 Planner..., subject to the traffic situation, will issue a joining clearance (which will be passed to Exeter by the S20 Assistant).

... Exeter ATC will turn (the aircraft) on track GIBSO/SAM, subject all traffic.

... The aircraft will be released to LAC S20, on the notified contact frequency, when the aircraft is clear of all traffic'.

At 1603:38 the DHC-8 flight was informed that, "...Exeter will accept you at flight level one hundred you're to be [part word] cleared to leave controlled airspace by descent". This was read-back correctly by the DHC-8 pilot and the Mode S SFL on the situation display was observed to change to FL100. At 1606:09 the A320 was observed to become airborne from Exeter, passing FL010 for FL050. The flight worked Exeter Approach before transfer to S20. Shortly after this at 1606:20 the DHC-8 was advised, "...just be advised there is erm opposite direction traffic there's one just getting airborne off Exeter will be joining GIBSO at flight level one six zero". This was acknowledged and the TI was updated at 1608:10, "...the er previously mentioned traffic is passing flight level four five and he's oh at two five twenty-five miles to run to GIBSO". At this time the DHC-8 was 12nm E of GIBSO passing FL205 in the descent to FL100.

The A320 flight called S20 at 1609:20 routeing direct to GIBSO and climbing FL160. S20(T) immediately informed the A320, "...be advised there is opposite direction traffic is five miles to the east of GIBSO passing flight level one seven three in the descent flight level one hundred". The A320 pilot replied, "Er sorry you were stepped on say again please". S20(T) then transmitted 1609:42, "...traffic information there is five miles to the east of GIBSO a opposite direction traffic descending out of flight level one six seven in the drop to descend to flight level one hundred".

CAP493 Manual of Air Traffic Services Part 1, Section 1 Chapter 5 paragraph 1.2.2 Type of Surveillance Services states:

'Pilots must be advised if a service commences, terminates or changes when:

- a) they are operating outside controlled airspace; or
- b) they cross the boundary of controlled airspace'.

The A320 pilot reported being given a TS. The UK AIP ENR 1.1.2 Para 2 Service Principles states:

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

A pilot shall determine the appropriate service for the various phases and conditions of flight and request that service from the controller/FISO. ...

Controllers will make all reasonable endeavours to provide the service that a pilot requests. However, due to finite resources or controller workload, tactical priorities may influence service availability. ...

Agreements can be established between a controller and a pilot such that the operation of an aircraft is laterally or vertically restricted beyond the core terms of the Basic Service or Traffic Service.'

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CAP493 Section 1 Chapter 11 paragraph 2.7.1 Appropriate Type of Service states:

'A pilot shall determine the appropriate service for the various phases and conditions of flight and request that service from the controller. If a pilot fails to request a service, the controller should normally ask the pilot to specify the service required...'

In addition, paragraph 2.8.1 Standard Application of Service states:

'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 the service...'

At 1610:25 the DHC-8 left CAS 2.5nm E of GIBSO, passing FL154 in the descent.

At 1610:40 the A320 pilot reported that the ac would not make the required FL160 by GIBSO and requested a turn to increase track mileage. The S20(T) replied, "*A320 c/s you can turn left er fifteen degrees*". At this time the A320 was 13nm W of GIBSO passing FL106 in the climb. The DHC-8 crossed GIBSO at 1610:57, making a slight R turn towards Exeter. The S20(T) then updated the DHC-8's TI on the A320, "*...the traffic is now in your one o'clock range of ten miles passing flight level one one six*". At 1611:15 the DHC-8 flight replied "*...er we'd like to turn left to avoid this traffic if possible*". S20(T) then stated, "*...you are now outside controlled airspace turn left fifteen degrees it's an information service*". The DHC-8 pilot read-back, "*information service turning left er fifteen degrees DHC-8 c/s er we are visual with the traffic now*". S20(T)'s report indicated that a BS was being provided to both ac. The DHC-8 pilot's report stated that the service being provided was 'not advised'. The ANSPs Incident Report stated that: '*... the controller was aware ... incorrect phraseology (was used)... (the controller's) intention was to provide a Traffic Service.*'

At 1611:45 the distance between the ac was 3.3nm laterally and 100ft vertically, the A320 climbing through FL132 in the DHC-8's 1 o'clock and the DHC-8 descending through FL131. At this point the DHC-8's L turn is seen to commence. Vertical distance between the 2 ac increased and the lateral distance between the 2 decreased. At 1612:01, as the ac pass abeam each other 5nm W of GIBSO, the lateral distance between the 2 ac was 1.9nm with 1000ft vertical distance.

At 1612 the S20(T) informed the A320 flight, "*...the traffic's passed down your right hand side you're clear to join controlled airspace on track Southampton in the climb flight level two nine zero*". The A320 pilot read-back the amended clearance correctly and reported receiving a "*Resolution Advisory in that er climb*". S20(T) replied, "*Roger you're not yet in controlled airspace*". At 1612:30 the S20(T) instructed the DHC-8 flight to, "*...resume own navigation for Exeter*" and stated, "*my radar service terminates*". The DHC-8 was then transferred to Exeter Approach. The A320 entered CAS at 1613:03, 2.5nm N of GIBSO passing FL155 and later, at 1614:20, S20(T) informed the A320 flight, "*radar control service*".

The Airprox occurred when, further to the A320's clearance to join CAS E'bound at GIBSO FL160, the DHC-8 flight was instructed to leave CAS W'bound through GIBSO to an acceptance level of FL100. Standard procedures were followed for the A320 Exeter departure to join CAS at GIBSO. The A320 flight reported being in receipt of a TS at the time of the Airprox however, the type of service required was not stated by the A320 pilot nor requested by the S20(T) on first contact. It is likely, but unconfirmed, that the perceived TS was initially established between Exeter Approach and the A320. The provision of TI to the A320 crew on first contact with S20(T) would enhance the A320 pilot's belief that the ac continued to be subject to a TS. The crew of the A320 was operating under the belief that they were in receipt of a TS; therefore they had ultimate responsibility for collision avoidance. The DHC-8 flight was cleared to leave CAS in the descent to FL100. Whilst still within CAS, S20(T) passed the DHC-8 TI on the A320. The DHC-8 pilot did not state the service required outside CAS nor did the S20(T) controller request the type of service required. The omission of establishing an accord/contract for service provision between the ac and S20(T) was not commensurate with the fundamental provision of flight information services outside CAS, i.e. there was a lack of standard application. The DHC-8 flight was outside CAS for approximately 1min before being informed as such and was then informed by S20(T) that it was under an 'information service'. An 'information service' is not one of the UK Flight Information Services. The DHC-8 pilot read-back 'information service' but did not challenge the controller as to what this service was. The S20(T) controller's report stated that a BS was being provided to both flights; however, the ANSP showed that the controller had intended to give a TS. This may be

borne-out by the provision and updating of TI by S20(T) to both ac. The provision of TI would indicate that S20(T) considered the 2 ac to be in likely conflict. The A320 crew requested a deviation of track to the L in order to attain the required level at GIBSO and this took the A320 N of the DHC-8's track to GIBSO. However, the DHC-8's own navigation to Exeter, after GIBSO, continued to take the DHC-8 towards the A320. Both crews were visual with each other's ac and the DHC-8 crew instigated, by request, a manoeuvre to the L to avoid the A320.

The Airprox resulted from 2 conflicting clearances through GIBSO issued by the S20 controlling team. S20(T)'s TI to both flights aided the pilots' awareness of each others' ac and an avoiding manoeuvre was undertaken by the DHC-8. This Airprox highlighted a lack of standard application of the UK Flight Information Services, with particular respect to ac leaving and joining CAS. The type of service provision outside CAS was not established between the pilots and controller involved and, whilst not considered directly contributory to this Airprox, was considered to be outside the prescribed requirements for service provision as stated in CAP493 and the UK AIP.

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.

The discussion initially focussed on the provision of ATSOCAS to both flights in the absence of Western Radar. The NATS Advisor informed Members that from the ANSP perspective, both flights were not on clearances per se. The DHC-8 had been cleared to leave CAS by descent and had been given an acceptance level from Exeter whilst the A320 had been given a level at GIBSO to enter CAS. A CAT Member believed that normal SOPs for these CAT flights would be for the crews to seek a DS whilst within the Class G airspace portion of their flight W of GIBSO. In this case, although the level of service was not stated to the A320 flight - the crew thought they were under a TS - and an 'Information service' was offered and accepted by the DHC-8 crew, it appeared that the S20T was endeavouring to provide a TS to both flights. Both crews were responsible for requesting the level of service from the ATSU although S20T might not have been able or willing to give a DS, a secondary task to the primary task of providing RCS within CAS. A controller Member thought that Exeter would have been aware of the potential conflict and the Western Radar closure so could have provided a DS to both. That said, Exeter had transferred the A320 in accordance with the MATS Part 2 procedures, which Members believed was appropriate as the DHC-8 still within CAS and the subject ac were going to pass when very close to GIBSO. The information passed by S20T to both flights was, for all intents and purposes, the same as would have been given under a TS. Both crews' SA was enhanced by the TI given and had afforded them a reasonable time to assimilate and act on the information. Both crews saw each other's ac on TCAS; the A320 crew had requested a L turn to increase track distance for their climb and to avoid the DHC-8, whose crew also saw the potential conflict and requested a L turn. TCAS TAs were generated on both flightdecks and visual acquisition was made, the ac passing separated by 1000ft vertically and 1.9nm horizontally on parallel opposing tracks; the A320 crew received a momentary RA as they passed. Members agreed that both crews had fully discharged their responsibilities with respect to maintaining their own separation from other traffic within Class G airspace and this Airprox could be classified as a sighting report where the actions taken had removed any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

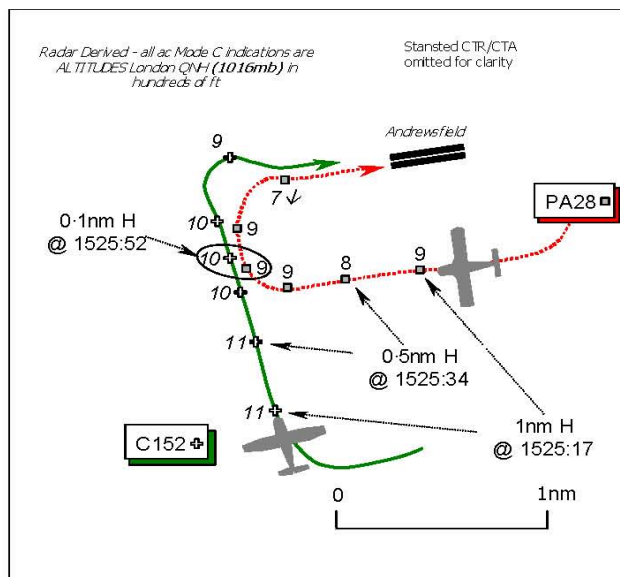
Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT No 2010091

AIRPROX REPORT NO 2010091

Date/Time: 10 Jul 2010 (Saturday) 1525Z
Position: 5153N 00026E (Andrewsfield A/D - base leg RW09RHC - elev: 286ft.)
Airspace: Andrewsfield ATZ (Class: G)
Reporting Ac Reported Ac
Type: Cessna 152 PA28B
Operator: Civ Trg Civ Pte
Alt/FL: 600ft 600ft
QFE (1006mb) QFE (1005mb)
Weather: VMC VMC Sky Clear
Visibility: >20nm >20km
Reported Separation:
Nil V/150m H Not seen
Recorded Separation:
100ft V/0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CESSNA 152 PILOT reports that he was instructing a student flying in the cct at Andrewsfield and in communication with Andrewsfield RADIO A/G Station. He occupied the RH seat as the instructor, with his student the PF in the LH seat. The visibility was excellent, but there was significant thermal and mechanical turbulence from a strong southerly wind and, especially on base leg, there were noticeable updrafts.

After take-off and one cct on RW27, the runway-in-use was changed to RW09. Ccts at Andrewsfield are RH and are unusually wide for noise-abatement reasons. The downwind leg of the RH cct for RW09 (RW09RHC) takes ac S of the A120 dual-carriageway. The pilot of a PA28 called for joining instructions and stated that his was the first of 7 ac arriving from Peterborough. 'Joining instructions' [aerodrome information] for RW09RHC were given to the PA28 pilot by Andrewsfield RADIO and subsequently repeated. After his student called downwind for RW09RHC, the PA28 pilot called joining overhead but despite scanning opposite runway ends and beyond he was unable to see the ac. The PA28 pilot called downwind and again he could not locate the ac, which concerned him as visibility was excellent. On base leg, about to turn final at 70kt descending through 600ft QFE (1005mb) with 20° of flap, he spotted the PA28 in his immediate R 3 o'clock at the same height, [a telephone call with UKAB Staff suggested this was at a range of about 200m] on what would have been the downwind leg of a close-in cct to RW09RHC. Initially he thought the PA28 would position behind his C152 and he started to make a call on the RT requesting the PA28 pilot's intentions. He noted in hindsight that he got the registration wrong and the actual phraseology he used was very ambiguous, so all in all it was a rather pointless call. As he called he realised that the PA28 pilot had not seen his C152 as the PA28 had started to turn onto final. If he had continued his approach the two ac would have been at the same place at the same time, so he took control from his student increased power and turned L away from base leg. As he had lost visual contact with the PA28 he then turned R, back onto final. At this point the PA28 was now on short final about to land. Once they were re-established on final, he commenced a go-around for another cct and reported the Airprox on the RT. During this cct two more ac of the visiting group called at various positions in the cct, but he was unable to locate them at the stated points. So he made a rather unprofessional radio call '[C152 C/S] downwind and NOT visual with any other traffic'.

After landing he met with the pilot of the PA28, who was very apologetic. It was his first visit to Andrewsfield and had relied on his co-pilot/front-passenger, a licensed pilot, who had previously visited Andrewsfield on several occasions. The PA28 pilot agreed that as P-I-C he should have checked the cct details. The PA28 pilot said he had consulted his flight manual before flight, but, unfortunately, the page for Andrewsfield does not detail the cct location. The PA28 pilot had not seen his C152 at all whilst concentrating on the runway, or noticed their RT calls, even though the calls had been answered by Andrewsfield RADIO.

Subsequently, he checked both the UK AIP and a popular chart manufacturers VFR manual; neither publication provide much detail on the cct location, but both state that Andrewsfield is strictly PPR by telephone only.

THE PA28B PILOT reports that he contacted Andrewsfield RADIO about 10nm out to obtain aerodrome information and was told the RW in use was RW09R [two 18m wide parallel runways are used by day], RH cct, with the QFE 1005mb. He reconfirmed the RW in use and then announced his intention to join crosswind from the N. He approached Andrewsfield from the N, taking care to remain clear below the 1500ft base of the Stansted CTA and shortly before reaching the aerodrome called that he was approaching crosswind for RW09, which the A/G operator acknowledged. Completing the pre-landing checks and selecting the first stage of flap, he adjusted the power to maintain cct height of 700ft and a speed of 100kt. Upon reaching crosswind he announced on the RT, '[PA28B C/S] crosswind for 0-9 right hand', which again was acknowledged by Andrewsfield RADIO. His passenger, an experienced pilot who had obtained the PPR briefing from Andrewsfield earlier, assisted him with positioning advice. Turning downwind A/G acknowledged his 'downwind 0-9 right hand' RT call and, as advised by his passenger, he continued downwind aiming for a lake to the SW of the aerodrome that he said would be the correct place to turn base leg. He took a good look around but the only other ac he saw was a distant airliner. Repeating his pre-landing checks and approaching the lakes, he selected the second stage of flap adjusting power to maintain 100kt at 700ft and turned base leg calling on RT '[PA28B C/S] base 0-9'. The wind was from the S necessitating a short base leg and almost immediate turn onto final. During the turn onto final, another pilot [the C152 instructor] announced his ac registration, called going around and reported an Airprox. Since he could not see the C152, he decided the safest course of action would simply be to continue his approach to land and did so. During the approach from the N and during the whole of the cct he did not hear any transmissions from any other ac.

After the C152 landed he sought out the pilot and discussed the event with him. The C152 pilot identified himself as an instructor based at Andrewsfield whose student had been the PF. The C152 pilot informed him that the correct cct at Andrewsfield has the downwind leg to the S of the A120 whereas his PA28 was N of that line; this had confused the C152 instructor about his PA28's position – he said that in spite of looking for the PA28 the C152 instructor could not see it. It seemed the C152 instructor had heard all the RT calls but stated that he had only seen the PA28 at the very last moment while on his base leg and had to take avoiding action. He also said that pilots new to Andrewsfield often fly too close in and that PPR conversations often do not cover this point.

He opined that there are some interesting contributory factors to this Airprox:

His passenger reported that the PPR request discussion had not included any information that ccts should be S of the A120 dual carriageway.

He has an up-to-date plate for Andrewsfield from a major purveyor of aeronautical information, dated 25 Feb 98. It does not show the preferred cct pattern or the A120 dual carriageway.

His passenger also has a plate, from a different supplier, that specifies PPR is only required for non-radio fitted ac and makes no mention of a preferred cct pattern.

Accepting that he was distracted whilst positioning to avoid causing a noise nuisance to the surrounding villages, this led to less effective lookout. The southerly wind made the turns onto base leg and final tighter than normal and this caused him to crane his neck to see the RW position, again hindering his lookout.

Following this Airprox he considers:

He will be much more cognisant of the danger of other ac being present in the cct who are not transmitting and will not permit other pressures to distract him from his lookout again. Moreover, when ac commander, he will take responsibility for dealing with PPR next time.

He would also like to point out that the plate for Andrewsfield from the major purveyor of aeronautical information should be updated to show the preferred cct and the current position of the dual carriageway. If this had been shown, he would have followed it. Similarly, the plate from the other supplier needs to be updated.

PPR discussions should emphasise this preferred cct. To be more than a mile away from the aerodrome at a height of only 700ft does not feel like a safe procedure and he did not believe any pilot would choose this in favour

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of a closer cct given the required cct height - an engine failure at 700ft downwind would result in an emergency landing with little prospect of being able to turn into wind.

The C152 instructor was aware that pilots new to Andrewsfield often make the mistake of flying their downwind leg N of the A120. In these circumstances, he would have expected any experienced pilot who was at all concerned to have made a radio call to confirm his position. In fact any call from him would have alerted him to the presence of another ac in the cct and thereby avoided this Airprox.

His aeroplane has a white, grey and red livery; the red fin strobe and white wingtip HISLs were on.

UKAB Note (1): The UK AIP at AD 2-EGSL-1 – 3 notifies the Andrewsfield Aerodrome Traffic Zone (ATZ) as a circle radius 2nm centred on the midpoint of RW09/27, extending from the surface to 2000ft above the aerodrome elevation of 286ft. An A/G Station - C/S Andrewsfield RADIO - operates on 130.550MHz.

UKAB Note (2): The UK AIP at AD 2-EGSL AD 2.22 — FLIGHT PROCEDURES, specifies:

Circuit height 700ft QFE, normal direction: Runway 09/27 - RH. Microlight circuits at 500ft QFE inside the normal circuit pattern.

b.i. Andrewsfield Local Flying Area (LFA) and Procedures: Part of the Andrewsfield ATZ (to the northwest of the Aerodrome) lies within the London Stansted CTR and the remainder lies partly within and partly beneath the London Stansted CTA. Subject to any listed restrictions, flights without reference to Stansted ATC may be made within the confines of the LFA [which exists within the same lateral limits as the ATZ with a vertical limit of 1500 ft QNH.]

UKAB Note (3): The Stansted 10cm Radar recording illustrates this Airprox clearly. The C152 is shown steadying on a base leg for RW09RHC at 1100ft London QNH (1016mb) – equating to a cct height of 700ft – with the PA28 downwind indicating 900ft London QNH (1016mb) 1nm away but inside the pattern established by the C152. The ac close to a horizontal separation of 0.2nm, where the PA28 turns R onto a parallel base leg to the C152 and at 1525:52, is in the latter's 4 o'clock at the CPA of 0.1nm/100ft. Thereafter, the PA28 turns inbound onto final as the C152 pilot executes the reported delaying manoeuvre before following the PA28 onto final and then executing a go-around.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board recognised that A/G Stations are not required to record their RT frequencies and it was not possible to determine independently what actual RT transmissions were made during the period of this Airprox, or by whom. There was no indication that the C152 might have been mentioned by the A/G Operator at some stage, moreover, the PA28 pilot reported that he heard no other transmissions that indicated to him that there was another ac in the cct, until he had overtaken the C152 and had turned onto final. Nevertheless, the PA28 pilot had called at a range of 10nm and he should have been able to hear several RT calls from the C152 pilots, who could potentially have executed two ccts in that period. The C152 instructor had emphasised that his student had made a downwind call before the PA28 pilot called joining. Therefore, it was not clear why the PA28 pilot had not heard that transmission, but there was no reason to suppose that the C152 instructor would not have been ensuring that his Student was making the requisite transmissions correctly during their cct. Pilot members emphasised that it was the responsibility of the pilot joining the circuit at uncontrolled aerodromes to look out and listen for other ac already circuiting to ensure their safe integration into the cct.

Conversely, the C152 instructor pilot was aware of the PA28 joining the cct from the latter pilot's transmissions and had been endeavouring to spot the ac, but it might have been quite difficult to see the PA28 astern, whilst flying the downwind leg and would only have been clearly in the C152 instructor's field of view when they turned onto base-leg. The PA28 pilot should have been looking out for other ac in the cct and the C152 should have been visible to him in the clear sky. Whilst pilot Members recognised that the PA28 pilot was unfamiliar with Andrewsfield and his focus would have been on the RW to his R, the radar recording clearly illustrated the geometry of this encounter and that the C152 was in the PA28 pilot's field of view. Regardless of any RT calls, as there may well have been ac joining non-RT, the C152 was already established in the aerodrome cct and was there

to be seen by the PA28 pilot who did not conform to the pattern of traffic formed by the ac ahead of him. The Members agreed unanimously that part of the Cause was that the PA28 pilot did not integrate into the circuit pattern established by the C152.

The C152 pilot had mentioned that he had not seen the PA28 earlier because the visiting pilot had not flown the recommended cct pattern. Consequently, the C152 instructor had been looking in the wrong place for the other ac. The Board was briefed that the locally based C152 pilot had stressed his concern that the preferred cct pattern was not well promulgated and the foreshortened cct flown by the PA28 with the downwind leg N of the A120 dual-carriageway is often flown by visitors who are unfamiliar with the preferred cct pattern. Moreover it was suggested that the PPR brief was not always as detailed as it might be. Certainly the PA28 pilot reported that when his passenger had 'booked in' their ac with Andrewsfield before the flight and obtained the PPR, nothing was mentioned about the location of the cct pattern. Whilst the Andrewsfield website clearly showed the preferred pattern, the Board was briefed that the PA28 pilot was correct in stating that this cct was not replicated in either of the popular commercially available aeronautical guides and more importantly it was not detailed in the Andrewsfield entry within the UK AIP. Visiting pilots were expected to read the website prior to visiting it seemed, because of the LoA detailing the arrangements for the LFA within the Stansted CTR. The Board was briefed on the aerodrome details contained on the website entry which stated that:

'.....we have developed a circuit pattern which is in agreement with everyone and we ask visitors wherever possible to fly these patterns.'

Although the PA28 pilot had not flown the non-standard pattern specified, it appeared to be optional. Nevertheless pilot Members stressed that this information on the non-standard cct should be promulgated in the AIP, which commercial aeronautical information suppliers would then extract from this authoritative source and include in their own publications as a matter of course. This Airprox illustrated clearly what can ensue when important procedural details are omitted from National aeronautical publications. If such details of the non-standard cct had been available in the UK AIP to the PA28 pilot there was no reason to suppose that he would not have followed it, but clearly he could not do so if it is not incorporated. The Board concluded therefore, that the other part of the Cause was that the non-standard Andrewsfield circuit pattern is not published in the UK AIP. Moreover, Members agreed unanimously that a Safety Recommendation was warranted; thus the Board recommended that the aerodrome operator review the Andrewsfield AIP entry, with a view to including details of the stipulated non-standard cct pattern.

Turning to the inherent Risk, it was plain that the PA28 pilot was unaware of his proximity to the C152 less than 200m to port of his aeroplane as he flew his base-leg and then turned onto final ahead of it. It was only when the C152 instructor made his RT call that the PA28 pilot was aware of the other ac now astern. The C152 instructor had little time to react when the PA28 was first spotted in his 3 o'clock, about 200m away. However, his robust avoidance manoeuvre, confirmed on the radar recording, effectively giving way to the PA28 at close quarters was a wise decision, which the Members agreed unanimously had removed the Risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: i. The PA28 pilot did not integrate into the circuit pattern established by the C152.

ii. The non-standard Andrewsfield circuit pattern is not published in the UK AIP.

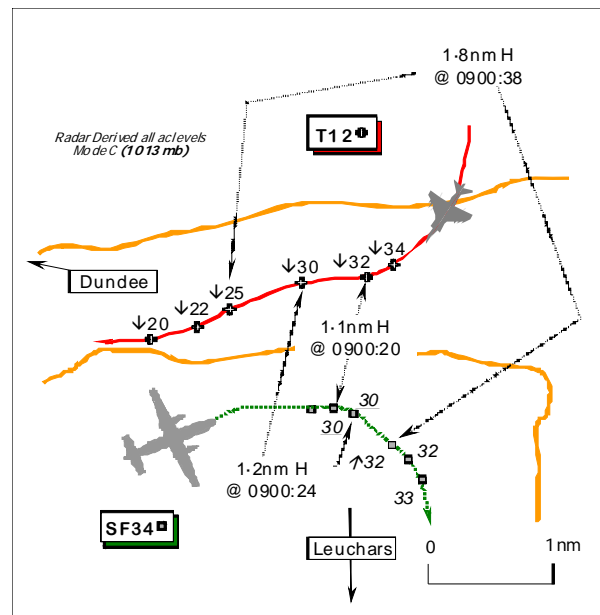
Degree of Risk: C.

Safety Recommendation: The Aerodrome Operator is recommended to review the Andrewsfield AIP entry.

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Date/Time: 20 Jul 2010 0900Z
Position: 5626N 00252W
(3.7nm N of Leuchars - elev 38ft)
Airspace: Leuchars MATZ/FIR (Class: G)
Reporting Ac Reported Ac
Type: SAAB 340B Harrier T12
Operator: CAT HQ Air (Ops)
Alt/FL: 3000ft 3000ft
QNH (1009mb) QFE (1008mb)
Weather: VMC CLAC VMC CLBC
Visibility: 40km 20km
Reported Separation:
100ft V/2nm H 1500ft V/3nm H
Recorded Separation:
200ft V @ 1.1nm Min H
Nil V @ 1.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SAAB 340B (SF34) PILOT reports he was inbound to Dundee from the S at 7000ft under VFR and in receipt of a TS from Leuchars APP. He was instructed by Leuchars APP to descend to 3000ft Dundee QNH (1009mb) and asked to report visual with Dundee Airport. At a range of 6nm DME, in good VMC, they reported visual with the Airport and requested to transfer to Dundee APPROACH if Leuchars had nothing further [to affect their flight]. They were handed over, he thought, [free-called following a pre-note] to Dundee whilst maintaining level flight at 3000ft and began to position L base for RW27 with the A/P engaged, when a TCAS contact appeared on the screen to the NE rapidly approaching their position, displayed at +900ft and at a range of 8nm. The TCAS contact continued to converge on a constant 'heading' whilst descending and both he and his 1st Officer looked for the other ac but could not see it. TCAS then enunciated a 'TRAFFIC' alert. At this point, heading 070° at 180kt, with the TCAS contact about 2nm away, the Captain (PF) disconnected the A/P and turned R into a climbing turn avoidance manoeuvre. TCAS then enunciated an RA - MONITOR VERTICAL SPEED. The other ac was now showing red on the TCAS display at +100ft. Within a few seconds TCAS enunciated CLEAR OF CONFLICT. Despite good visual conditions and a good lookout from both pilots the other ac was never visually identified.

They contacted Leuchars APP on VHF box 2 and were told the other ac was a Harrier on a practice diversion (PD) into Leuchars. The pilots then reconfirmed their position with Dundee ATC and continued inbound for a visual approach to RW27. He assessed the Risk as 'high'.

After shutdown a Dundee ATCO visited the flight deck to discuss the situation and asked them to contact Leuchars by telephone. The Captain duly contacted the Leuchars ATC Supervisor and was informed the inbound Harrier with an instructor and student had made a very late call at 6nm from Leuchars requesting the PD. They were also informed that Leuchars had attempted to pass them TI on the Harrier, but they had already switched over to Dundee ATC and been cleared for the visual approach. The Leuchars ATC Supervisor also stated that as the event took place in Class G airspace there was nothing they could do about it. After discussion with the Chief Pilot a report was filed of a suspected Airprox.

THE BAe HARRIER T12 PILOT reports he was flying a dual VFR PD into Leuchars and in receipt of a TS from Leuchars APP on 308.875Mhz; the assigned squawk was selected with Mode C. The ac has a grey low-visibility colour-scheme but the HISLs were on.

Turning R through 250° at 300kt, about 6nm N of Leuchars at 3000ft, APP informed them that another ac was recovering into Dundee Airport. Both aircrew were visual with the low-wing twin from 5nm away during their recovery into Leuchars and maintained visual separation criteria throughout. No avoiding action was taken and

the twin passed about 3nm away to port with minimum vertical separation of about 1500ft. There was never any Risk of a collision, as their flight paths did not cross. Both ac were in class G airspace throughout the period of the Airprox.

THE LEUCHARS APPROACH (APP) CONTROLLER reports he was mentor for a trainee. APP was bandboxed with DEPS/LARS, operating from the APP control position and monitoring the 2 LARS frequencies along with APP [308-875MHz] and DIR UHF. Digital Readout Direction Finder (DRDF) was u/s.

His trainee had only one ac under an ATS on VHF - 126.5MHz - the SF34 under a TS. The SF34 crew was given a L base visual join to RW27 at Dundee and just prior to being switched to Dundee ATC was descending through about 4000ft Dundee QNH (1009mb). Traffic was observed 6nm NNE of the SF34 tracking SSE squawking A7000 and indicating 4000ft (1013mb) and was called to the SF34 crew. The Saab pilot informed them that they had the other ac on TCAS and he thought the trainee released the SF34 crew to call Dundee for their visual approach at that point.

The moment the Saab was released, the ac squawking A7000 called Leuchars on UHF - 308-875MHz - for an approach with a simulated emergency. This ac – the Harrier T12 - was now only 6nm N of Leuchars tracking S. The T12 crew requested a visual join and was subsequently given the duty RW [RW27RH and the A/D CC – BLUE]. The T12 pilot then read back RW07 and proceeded to turn to the W to set up for an approach to the wrong RW, which was also towards the SF34 inbound to Dundee. [UKAB Note (1): It was at this point – 0859:31, that the SF34 crew was actually instructed to “...squawk 7 thousand continue with Dundee 1-2-2 decimal 9”.] The T12 pilot was informed of his error and turned his ac back towards the correct RW. During this period the SF34 pilot came back on frequency and asked for a traffic update on the ac that had flown close-by and was informed that it was the previously reported traffic – the Harrier T12.

THE LEUCHARS ATC SUPERVISOR reports that APP was band-boxed with LARS, with a trainee in position. No station-based fast jet traffic was notified to fly until early afternoon. He noticed traffic inbound to Dundee at 3500ft some 4nm N of Leuchars turning SE towards the Leuchars visual cct, which APP informed him had been free-called to Dundee ATC. The Harrier T12 had free-called APP 7nm N requesting a visual join and then the SF34 pilot recalled LARS to say that he was manoeuvring in accordance with a TCAS RA and requesting further information on the traffic. He spoke to the Dundee controller and requested that the SF34 pilot call once on the ground. The SF34 Captain informed him that he was filing an Air Safety Report (ASR) as a result of the TCAS RA.

HQ 1GP BM SM reports that Leuchars ATC provide a surveillance-based ATS to ac inbound to Dundee Airport and the SF34 crew had been in receipt of a TS from APP on VHF before the Airprox occurred. APP was manned by a controller under training and Mentor who, at 0858:42, provided timely TI to the SF34 crew on an unknown ac squawking A7000, “..traffic north 6 miles tracking south east indicating 8 hundred feet below”, which subsequently proved to be the reported Harrier T12 inbound to LEU with a simulated emergency. Although APP reported the range between the ac as “6 miles” the radar recording shows that it was about 9nm away. The SF34 crew acknowledged the TI, stating that they could see the contact on TCAS.

Coinciding with this TI transmitted on VHF, the Harrier T12 crew free-called APP on UHF at 0858:40. Whilst this does not accord with the APP controller’s report, which states that the Harrier T12 crew called after the SF34 crew had been released to Dundee, the tape transcript provides a clearer view of events.

At 0858:56, the Harrier T12 crew transmitted to APP, “...with a simulated engine emergency requesting a straight in approach runway 2-5”. At this point, the Harrier T12 was approximately 9nm NW of LEU. The LEU entry in the RAF FLIP En-Route Supplement ERS (BINA) states that all ac inbound to LEU are to call APP by 40nm. Notwithstanding the importance of the training value afforded to fast-jet pilots of practising no-notice emergency PDs into aerodromes, the instruction to visiting aircrew to call APP by 40nm is to facilitate the integration and sequencing of LEU and Dundee traffic. In this case, the late call from the Harrier T12 crew served to increase the workload of LEU APP and degraded that integration process.

APP passed the ‘short’ weather to the Harrier crew at 0859:08, “[C/S] squawk 0-2-4-6 with ident Leuchars runway 2-7 right hand colour code blue fully serviceable set Q-F-E 1-0-0-8”. Unfortunately, APP did not detect the incorrect readback from the crew of “..runway 0-7..”, instead of “..2-7..” when they responded at 0859:21, “squawking 0-2-4-6 1-0-0-8 and apologies that will be a straight in for runway 0-7”. DRDF was u/s, so the first confirmation to APP about the proximity of the Harrier to the SF34 was when the Harrier’s SSR of A0246 appeared

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at 0859:25; however, this was when the squawk was apparent on the radar recording and not necessarily the time that it appeared on the controller's Watchman ASR display. Overlapping the end of the weather transmission by about 2sec is a transmission on VHF from the SF34 crew at 0859:27 that they were, *"..happy to change.."* frequency to Dundee; it is possible that the overlapping transmissions caused APP to miss the incorrect read-back from the Harrier crew. The transmission from the SF34 crew will have forced APP to change their visual focus from the radar display to their RT frequency selector panel to de-select UHF and then re-select VHF in order to transmit to the SF34 crew. APP's quick response to the SF34 crew's call at 0859:31, transferring the flight to Dundee ATC without any TI update, suggests that they did not perceive a conflict between the two ac at this point. It is possible that this was based upon an assessment of the acs' relative flight paths, such that there was no requirement to update the TI. Alternatively, the increased cognitive arousal caused by the Harrier crew free-calling with a simulated emergency could have induced attentional tunnelling in the trainee such that he provided an automatic response to the SF34 crew, without consideration of the circumstances, to allow the trainee to focus their cognitive resource on the Harrier. Additionally, the fast RT response from the trainee in approving the transfer of the SF34 to Dundee would have prevented the mentor from intervening. However, it is impossible to determine conclusively the reason for the lack of updated TI to the SF34 crew.

At 0859:47, APP commenced a transmission to the Harrier crew on UHF placing the flight under the requested TS. The conflict between the two ac was evident from about 0859:49, following the Harrier crew's turn onto S, towards the SF34. It is likely that this turn onto S was a positioning turn for an approach to RW07, which the Harrier crew erroneously believed was the duty runway. At 0900:14, APP passed TI to the Harrier crew about the SF34, *"[C/S] traffic 12 o'clock half a mile tracking east believed to be civil traffic inbound to Dundee"*. [The diagram commences at 0900:16 during this transmission.] The crew replied immediately that they were visual, [with separation of about 1.4nm evident – not the ½ mile reported by APP.] APP believed that the Harrier crew would have been positioning for RW27 and would not therefore have expected the turn onto S commenced at 0859:49, it is reasonable to argue that there was no reason for APP to provide the Harrier crew with TI about the SF34 before 0859:49. Furthermore, given that APP was already transmitting as the conflict became evident, they would not have been able to provide TI until at best 0859:54. However, an opportunity did exist to provide TI from this point, which best practice dictates should have been issued, given the developing situation.

[UKAB Note (1): Minimum horizontal separation occurred at 0900:20, as the Harrier turned R through W descending through 3200ft Mode C (1013mb), with the SF34 1.1nm to the S and 200ft below it. Horizontal separation starts to increase through 1.2nm as the Harrier descends through the SF34's level on the next sweep, both ac indicating similar levels on Mode C. The climb reported by the SF34 pilot is evident on the recording at 0900:38, as the range increases to 1.8nm with vertical separation of 700ft apparent.]

In part, the decision by the Harrier crew to call APP late, contrary to the LEU entry in the ERS BINA, began a chain of events that led to this Airprox because of its effect on the APP controller's workload. Notwithstanding that the Airprox occurred after the SF34 crew left APP's freq and that they had reported that they had contact with the Harrier on TCAS, best practice suggests that the SF34 crew should have been given updated TI on the Harrier before being transferring to Dundee. However, it is unlikely that the provision of this updated TI would have affected the outcome of the occurrence.

As the Harrier crew report maintaining visual separation throughout, it is impossible to state whether the provision of additional TI by APP to the Harrier crew would have resulted in a different outcome. Certainly, the SF34 crew had received timely TI on the Harrier, were monitoring its progress on TCAS and responsible for maintaining their own separation. Whilst not a contributory factor to the Airprox, it is clear that APP should have provided more timely TI to the Harrier T12 crew.

ATSI reports that the Airprox occurred in Class G airspace, 8nm E of Dundee Airport. Dundee Aerodrome and Approach control were operating combined without the aid of surveillance equipment, which is not provisioned at Dundee. The SF34 was IFR in receipt of a Procedural Service and had reported E of Tayport [350° Leuchars 4½nm] with the aerodrome in sight. The SF34 was cleared for a visual approach to RW27. Shortly afterwards Leuchars RADAR rang Dundee, concerned that the SF34 was turning E towards the Leuchars cct. Leuchars RADAR requested that the SF34 pilot contact Leuchars after landing. The Dundee controller was not aware of other traffic in the vicinity and not immediately aware that an Airprox had occurred.

The pilot of the SF34 was in receipt of a Procedural Service. CAP493 MATS Pt1 (01/07/10), Section 1, Chapter 11, page 10, paragraph 6.1.1, states:

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

The Dundee 0850UTC weather was reported as: Surface Wind 220°/3kt; Visibility >10km; Cloud FEW @ 1500ft; Temp 17/15; QNH 1009mb.

HQ AIR (OPS) comments that the Harrier was visual with the Saab from 5nm and whilst manoeuvring towards the intended final approach path maintained adequate separation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Although the SF34 pilot reported that he was flying under VFR at the time of the Airprox it was evident that he had not cancelled their flight plan and was still operating under IFR, even though the crew was flying a visual approach into RW27 at Dundee. As this ATSU is not radar equipped, the Board recognised the Dundee controller would have been unaware of the Harrier's presence and would not have been able to provide any TI under the Procedural Service unless Leuchars had told him about it. Moreover, Dundee ATC could only separate the IFR SF34 from other IFR flights under their control. With the SF34 just inside the northern boundary of the Leuchars MATZ, after the radar based TS with Leuchars ATC had been terminated and the Harrier still just outside the MATZ under a TS when this Airprox occurred in Class G airspace, the responsibility to effect separation between these two flights under 'see and avoid' remained with the crews themselves.

It was apparent that the SF34 crew had been given TI about the Harrier before both crews called their respective destinations, actually when it was 9nm away the HQ Air ATC report revealed, and a controller Member emphasised that it was unknown traffic at that stage. This had alerted the SF34 crew who reported that it was displayed to them on their TCAS and that would have reassured APP when later advised that the flight wanted to switch to Dundee ATC. However, having been told originally that the unknown traffic was *"..indicating 8 hundred feet below"*, a CAT pilot Member suggested that the SF34 crew would have been concerned when, not being able to detect it visually, their TCAS enunciated the TA followed by the fleeting RA triggered by traffic descending from above, in all probability not realising at the time it was the same ac they had been told about earlier when it was below them. Following the TA, the SF34 Captain reports he disengaged the A/P, turned R and climbed to avoid the Harrier shown on their TCAS, before the RA commanding the crew to MONITOR VERTICAL SPEED was triggered. The radar recording showed the climb in response to the RA had been initiated after the CPA when the Harrier was already 500ft below the SF34's altitude and some 1.8nm astern, so it seemed that the crew's reaction to their TCAS RA had little impact on the overall outcome here. Whilst manoeuvring on the basis of a TA alone is contrary to established practice, CAT pilot Members recognised that the SF34 crew would have been greatly concerned at the possibility of a conflict with the fast moving ac and would want to preserve whatever separation they could. In the vertical plane TCAS information is entirely accurate, whereas azimuth indications can give a misleading impression of the actual geometry.

Whilst HQ 1 Gp had suggested the Harrier should have called APP for the PD at an earlier opportunity, the HQ Air Ops Member expected military ATSUs to be able to accommodate short or no notice practice emergencies such as these whenever at all possible. During training great emphasis is placed on the potential for such emergencies, which are practised at every opportunity. Military aircrew and controller training must contain this essential element and it was important that ATC should react promptly to such requests. Furthermore, the Air Ops Member contended that the Harrier instructor might well have realised that his student was turning to approach the A/D from the wrong direction and wanted to see how his student would subsequently react. A CAT pilot Member identified that this turn for the wrong RW was significant and in his view the catalyst to the conflict. The Harrier was originally heading SE and would not have flown into conflict as the Harrier's course for a visual straight in approach to RW27 would not have conflicted with the SF34. APP was not busy and it was unfortunate that the trainee, and more especially the mentor, had not subsequently detected the incorrect read-back from the Harrier crew which resulted in the Harrier turning westerly toward the SF34. Whilst APP would not have been expecting this, a military controller Member suggested that the APP mentor was not paying sufficient attention to his trainee

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and should have spotted the Harrier crew's mistake earlier. Another controller Member perceived that the TI passed to the Harrier crew about the SF34 could have been passed earlier; indeed the HQ 1 Gp report concluded that an opportunity did exist to provide more timely TI to the Harrier crew. Controller Members agreed that in this situation, given the Harrier crew's unexpected turn for the wrong RW and thus toward the SF34, the mentor should have recognised the potential for a conflict and ensured that TI was promptly issued to the Harrier crew.

It was plain that TI about the SF34 was actually passed at a range of 1.4nm not the ½nm transmitted, but it was unfortunate that APP had not appreciated what was happening earlier. Nevertheless, the Harrier pilot reported they had sighted the SF34 from about 5nm away, well before this TI was given, and responded immediately that they had it in sight. However, despite maintaining visual contact on the SF34 throughout the encounter it was evident the Harrier crew had flown closer to it than they had realised during their initial manoeuvring for their approach. The radar recording revealed that the horizontal separation was 1.2nm, when the Harrier descended through the twin's level and somewhat less than the 3nm/1500ft the Harrier pilot subsequently reported. Nevertheless, the HQ Air Member opined that the Harrier crew had spotted the SF34 in good time and had avoided it by a suitable margin. The Board concluded therefore that this Airprox had resulted because the Harrier crew flew close enough to the SAAB 340B to trigger a TCAS RA. However, with the Harrier crew entirely cognisant of their position relative to the SF34 and able to manoeuvre their nimble ac whatever the SF34 crew might do, no Risk of a collision had existed.

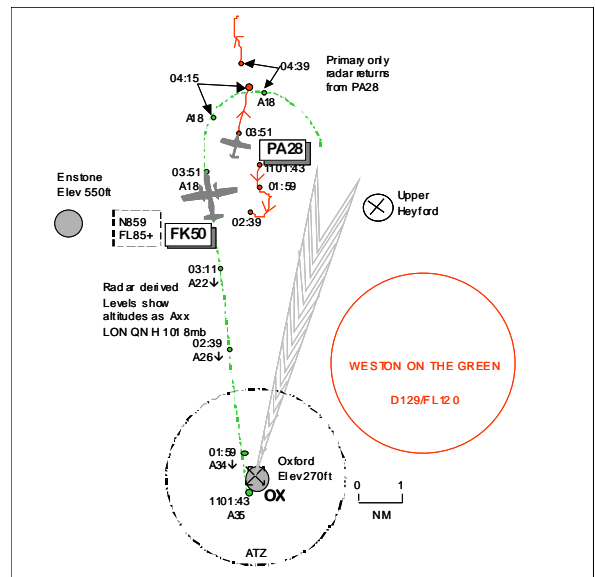
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Harrier crew flew close enough to the SAAB 340B to trigger a TCAS RA.

Degree of Risk: C.

AIRPROX REPORT NO 2010094

Date/Time: 10 Jul 2010 1105Z (Saturday)
Position: 5159N 00120W
 (9nm N Oxford - elev 270ft)
Airspace: Oxford AIAA (Class: G)
Reporting Ac Reported Ac
Type: FK50 PA28
Operator: CAT Civ Trg
Alt/FL: 1800ft 2000ft
 (QNH 1018mb) (QNH 1018mb)
Weather: VMC CLBC VMC CLBC
Visibility: 10km 10km
Reported Separation:
 Nil V/<0.5nm H 500ft V/0.5nm H
Recorded Separation:
 <0.5nm



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE FK50 PILOT reports inbound to Oxford, IFR and in communication with Oxford Approach squawking an assigned code with Modes S and C. They were positioning for RW19, level at 1800ft QNH 1018mb at 150kt. Although they had been informed of several ac in the proximity of Oxford, they did not expect to see a PA28 a couple of hundred metres away (<0.5nm) on a conflicting course during their inbound turn towards the LLZ at the same altitude. They increased their AoB to tighten the turn towards the LLZ, later informing ATC of the incident after landing.

THE PA28 PILOT reports flying a trial lesson from Oxford, VFR and in receipt of a BS from Oxford Approach squawking 7000 with Mode C, he thought [no squawk seen on the radar recording]. The visibility was 10km flying 1000ft below cloud in VMC and the ac was coloured blue with nav lights switched on. He believed he was approximately 6.5nm bearing 340° from Oxford at the time at 2000ft QNH and 90kt when he thought he heard APP informing an FK50 flight of a PA28 [actually an AA5 overflight] to the NW of Oxford and that APP was referring to his ac. APP then asked him to “hold off” for the FK50, which he acknowledged and made his heading 360°. He became visual with the FK50 about 3-5km away and considered that he should continue until it turned inbound, which it did 500ft below and 0.5nm away behind his ac. He did not believe there was a chance of collision as both he and the FK50 crew were visual with each other – after landing he heard the FK50 crew state they had seen a PA28, which they were told to expect, he thought – and he believed he would have appeared on the FK50’s TCAS. Also, owing to his speed, he did not believe that the FK50 would catch up. He assessed the risk as low.

THE OXFORD APPROACH CONTROLLER reports the FK50 was handed over from LACC descending to altitude 3500ft and was cleared to the OX and onto the NDB ILS approach for RW19 on reaching. The PA28 flight called in the Upper Heyford area (7nm N) for a VFR straight-in approach to RW19 and was told to hold N of Upper Heyford, he thought, due inbound IFR traffic having priority. The base turn for the RW19 ILS approach commences at 6.5nm, S of Upper Heyford. Without radar it was impossible to say when the FK50 commenced the turn or where the PA28 was holding off. The FK50 crew reported commencing the turn and was asked to report established on the LLZ, the crew then reported visual with the PA28. The FK50 completed the approach without further incident and the PA28 positioned behind.

ATSI reports that the Airprox occurred at 1104:32 in Class G airspace 9nm to the N of Oxford Airport and 3.9nm to the NW of Upper Heyford. Oxford ADC and Oxford APP were operating split positions, without the aid of surveillance equipment. The FK50 was inbound to Oxford from Jersey in receipt of a PS whilst the PA28 was operating on a local VFR detail from Oxford airport and in receipt of a BS. No METAR was available for Oxford; however, the Brize Norton weather was reported as: METAR EGVN 101050Z 23007KT 9999 FEW030 BKN042 BKN230 23/14 Q1018 BLU NOSIG=

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The PA28 flight departed Oxford and at 1053:56 called Oxford Approach. A BS was agreed and the PA28 pilot was asked to call when changing frequency or when ready to rejoin. At 1059:16 the FK50 flight reported 8nm S of the 'OX' in the descent to 3500ft on QNH 1017mb, requesting an ILS approach for RW19. At 1059:48 APP advised, "*(FK50)c/s roger Weston on the Green danger area one two niner is active to flight level one three zero on reaching the Oscar X-ray route outbound for the ILS runway one nine to report beacon outbound*"; this was acknowledged by the FK50 crew. About 40sec later at 1100:45 an AA5 flight called APP overhead Enstone at 2800ft, routeing from Wellesbourne to Lydd via the Oxford O/H and requested a BS. A BS was agreed and APP passed TI on the FK50 routeing through the Oxford O/H going outbound at 3500ft descending to 1800ft for the ILS. The AA5 pilot acknowledged the TI and advised, "*The traffic's copied Basic Service and we're looking (AA5)c/s*". APP then passed TI on the AA5, "*(FK50)c/s that traffic just called me an AA five Tiger overhead Enstone which is approx ten miles to the northwest of Oxford routeing towards the overhead two thousand eight hundred feet VFR*". At 1101:47, the FK50 crew reported, "*Understood Sir and we're presently overhead er Oscar Xray and proceeding outbound er it's the (FK50)c/s*". The FK50 crew was asked to report localiser established. Immediately after this at 1101:56 the PA28 pilot called APP, "*(PA28)c/s is Upper Heyford request straight in runway 19*". APP replied "*(PA28)c/s negative er hold off at Upper Heyford er there's Fokker fifty traffic just outbound on the ILS you can come in behind him*". The PA28 pilot responds, "*OK Wilco (PA28)c/s*".

The main procedure for ILS RW19 requires an ac to proceed outbound on QDR 001 (Cat A & B), QDR 354 for (CAT C), descend altitude 1800ft, at 6.5nm commence a R turn to intercept the LLZ. Upper Heyford is positioned 6.6nm to the NNE of Oxford Airport and lies just to the E of the extended C/L for RW19.

[UKAB Note (1): The radar recording between 1101:43 and 1102:39 shows an intermittent primary contact, believed to be the PA28, manoeuvring 6-7nm N of Oxford airport and 3nm WNW of Upper Heyford, close to the instrument let down area. The primary only return fades after the sweep at 1102:39, when it is 3nm N of the FK50 and turning through a NW'ly heading.]

In response to a request from Approach the FK50 pilot reports at 1103:10, "*now passing two thousand two hundred feet er (FK50)c/s*". APP then approved the transit of the AA5 via the Oxford O/H at 2800ft VFR on QNH 1017 and asked the AA5 pilot to report in the O/H. The radar recording shows a contact displaying a squawk of 7000, routeing from Enstone towards the Oxford O/H and passing 2.7nm SW of the FK50.

[UKAB Note (2): The PA28 reappears on radar at 1103:51 7.5nm N of Oxford tracking 010° in the FK50's 0130 position range 1.1nm, the FK50 level at 1800ft QNH 1018mb.]

At 1104:18 the FK50 crew reported, "*traffic in sight er (FK50)c/s*". The Approach controller responds, "*(FK50)c/s roger I see you in the right turn report localiser established*". It is probable that the traffic that the FK50 crew reports in sight is the PA28. Shortly afterwards, at 1104:29, the AA5 pilot reports O/H Oxford.

[UKAB Note (3): At 1104:15 the radar recording shows the FK50 in a R turn with the PA28 crossing through its 12 o'clock range 1nm tracking N; the PA28 then fades from radar. The PA28 reappears 24sec later at 1104:39 tracking N 0.8nm NW of the FK50, which is turning though an E'ly heading. The CPA is not captured but it is estimated to be <0.5nm]

At 1105:19 FK50 flight reports localiser established and is transferred to the Tower. Immediately after this at 1105:25 APP asked the PA28 flight, "*(PA28)c/s are you visual with the Fokker fifty inbound*" and the PA28 pilot replies, "*Affirm just descending behind him (PA28)c/s*". APP then informs the pilot, "*(PA28)c/s roger er caution the vortex wake recommended spacing is four miles*". The PA28 flight is advised to continue for a straight in approach RW19 and passed the QNH 1017. The PA28 is then transferred to the Tower at 1107:11 when the pilot reports the field in sight.

At 1117:33 the FK50 pilot contacted the Tower to report the occurrence, "*Er just to inform you that we are er we were during the turn inbound towards er to intercept the localiser err and a piper aircraft what it seemed to be a piper at about half a mile same altitude one thousand eight hundred feet*". The ADC acknowledged the call, "*(FK50)c/s er roger I believe the approach controller was aware of that traffic and er if er you want to take it further then you'll have to you you're happy er give us a call in the tower.*"

The APP in his written report states that without radar it was impossible to say when the FK50 commenced the turn or where the PA28 was holding off.

CAP493 Manual of Air Traffic Services MATS Pt1 (01/07/10), Section 3, Chapter 1, page 5, paragraph 8, states:

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

The pilot of the PA28 was in receipt of a BS and reported at Upper Heyford, requesting a straight in approach. It appears that the position report from the pilot was incorrect. The PA28 pilot did not report, nor did the controller request level information from the PA28. For traffic in receipt of a PS, MATS Pt 1 requires that the controller shall provide TI, if it is considered that a confliction may exist, on ac being provided with a BS. Based on the position report from the PA28 at Upper Heyford, it is probable that APP considered the PA28 was not conflicting traffic and was holding E of the final approach and instrument let down. However, because the reported position of the PA28 was close to the final approach sector, albeit to the E, it would have been appropriate for the controller to have passed TI to the FK50.

The PA28 was in receipt of a BS and MATS Pt1 (01/07/10), Section 1, Chapter 11, page 4, paragraph 3.1.1, states:

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

The pilot of the FK50 was in receipt of a PS and MATS Pt1 (01/07/10), Section 1, Chapter 11, page 10, paragraph 6, states:

‘Procedural Service

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

Traffic Information

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

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.

Although the FK50 flight was carrying out an instrument approach under IFR and was receiving a PS, the incident occurred in Class G airspace where pilots are responsible for maintaining their own separation from other traffic through see and avoid. The FK50 crew were surprised when they saw the PA28 during their turn towards the LLZ particularly as no TI had been passed on the PA28 by APP. Moreover, the PA28’s transponder was either unserviceable or not switched on so that the FK50 crew were not aware of the ac’s presence from the FK50’s TCAS equipment. Pilots are strongly encouraged to ensure that their transponders are working correctly and selected to transmit Mode C throughout their flight in accordance with national procedures. That said, it would not be unusual for there to be ac flying VFR in the area not working ATC who, in the procedural environment at Oxford, would be unaware of all of the traffic. It was unclear why Oxford APP did not pass TI for, although it appears that the PA28 pilot’s position report at Upper Heyford was inaccurate, the proximity of the disused aerodrome to the FAT, where APP told the PA28 pilot to hold, was close enough for the passing of TI to be warranted. This RT exchange between the PA28 pilot and ATC was there to be heard by all flights on frequency and could have

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improved the FK50 crew's SA to the potential confliction if they had heard and assimilated it. One controller Member opined that the D/F equipment at Oxford should have indicated the PA28's bearing and indicated its position relative to the FAT; however, the serviceability of the equipment was unknown. The PA28 pilot was told about the FK50 and saw the airliner at some distance and elected to continue on a N'ly track until the FK50 turned inbound towards the ILS behind his ac, about 0.5nm away. The FK50 crew saw the PA28 ahead and increased the AoB to tighten their turn watching it pass clear to their L by 0.5nm. In the Board's view, the PA28 pilot had fulfilled his responsibilities and this Airprox was the result of a sighting by the IFR FK50 crew of the VFR PA28 traffic, where the actions taken by both crews had removed any risk of collision during the encounter.

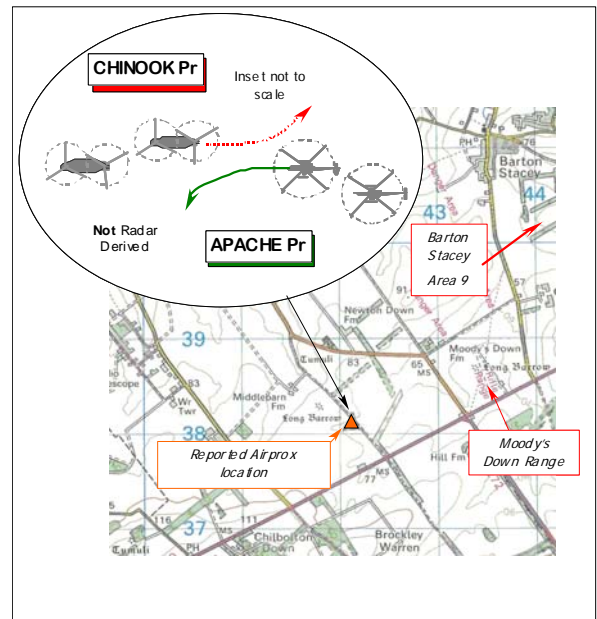
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A sighting report.

Degree of Risk: C.

AIRPROX REPORT NO 2010096

Date/Time: 21 Jul 2010 2216Z NIGHT
Position: 5108N 00122W
 (6½nm E of Middle Wallop)
Airspace: NLFS NRR1 (Class: G)
Reporting Ac Reported Ac
Type: Apache AH1 x2 Chinook HC1 x2
Operator: HQ JHC HQ JHC
Alt/FL: 115ft 250ft
 agl agl
Weather: VMC CLBC VMC CLBC
Visibility: 15km 20km
Reported Separation:
 100ft V/nil H 100ft V/50ft H
Recorded Separation:
 Not recorded

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE APACHE AH1 HELICOPTER PILOT, a QHI, reports he was leading a pair of Apache ac, flying dual with a student as the PF, on a pairs final handling test for conversion to type. He was flying approximately 4-5 rotor spans in front of the No2 Apache. In accordance with SOPs, his lead helicopter was showing IR lighting and the No2 was fully lit; both ac were displaying glimmers [non-NVG compatible tactical lights not visible all round] and conventional navigation lights on steady bright; in addition his No 2 also had red HISLs on. He was not in receipt of an ATS but monitoring UHF LFS Common - 278.00MHz. A squawk of A2676 was selected [unverified Middle Wallop conspicuity] with Modes C & S on; TCAS is not fitted.

Whilst in a level transit at a height of 115ft, S of Moody Down range [1½nm S of Barton Stacey] prior to starting field ccts to an area 1nm W of Moody Down Range, he heard a call from Middle Wallop ATC, transmitting blind on LFS Common, that 2 Chinooks were approaching Barton Stacey from the SW. He perceived that these two helicopters were N of his formation. However, to assist the Chinook crew's situational awareness he transmitted blind that his formation of 2 Apaches were transiting S of Moody Down range to operate 1nm W of the range. A few minutes later, heading 270°(T) at 120kt, he spotted a single Chinook on Forward Looking Infra Red (FLIR), at very close range, head-on to his Apache pair. He took control from his student and rolled his ac L and down, away from the Chinook, which was high and to the R of his helicopter. He then saw the second Chinook fly 100ft directly above his Apache. At this point he transmitted blind on LFS Common declaring his position and his general concern about what had just happened. Avoidance between the 2 pairs was purely down to luck, the closing speed probably in excess of 250kt and the Risk of collision 'very high'. He noted that flying on FLIR it is not easy to see conventional lighting. His own workload was high, instructing and leading a pair, while the instructor in the No 2 ac had a very high workload monitoring his student flying in formation at low level.

He was concerned that they had no prior notice before departing Middle Wallop that there would be any low-level Chinook traffic in the area. Under normal operational conditions this would be acceptable, but the ability of QHIs to monitor a 'chat' frequency and conduct suitable instruction to train new Apache student pilots can cause considerable difficulties. If prior notice of the Chinooks routeing had been given then they would have been much more conscious of the potential for a conflict and pro-actively looking for them.

THE CHINOOK HC1 PILOT reports that he was the No2 of a pair of Chinook helicopters on a night tactical formation check conducted by his leader. They were based on Salisbury Plain and had departed Netheravon bound for Odiham. The lead helicopter had NVG formation lights on and NVG upper (IR) strobes ('Glimmer up 2 & Moonrise'); his No2 ac was displaying conventional 'white light' navigation lights and upper red HISLs as per SOP.

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Approximately 1½ hours into the sortie his formation was approaching Barton Stacey from the SW at 250ft msd and receiving a BS from Middle Wallop APP. However, the lead was in the process of changing to Odiham INFORMATION on VHF, whilst retaining LFS Common set on UHF. They positively identified a red strobe in the formation's 12 o'clock in the vicinity of Barton Stacey and he called this information to his leader on air-to-air (VHF FM) who acknowledged the call. The strobe was moving slowly from L to R about 3–4nm ahead, which then became stationary indicating the other ac was now either travelling away from, or heading towards the formation. At this point he transmitted blind on LFS Common that 2 Chinooks were approaching Barton Stacey from the SW, to pass to the S and then departing to the E. This call was acknowledged by another crew who stated they were established in a cct at Barton Stacey [UKAB Note (1): A Lynx AH Mk 7 QHI was circuiting within Barton Stacey Area 9 at the time of this Airprox – the Lynx pilot's report is included below. The transcript of LFS Common revealed that another Chinook was also operating in the vicinity, it was subsequently ascertained this activity was N of the A303, circuiting to Longparish.] No other call on LFS Common was heard or acknowledged. Heading 090° at 120kt, the single red strobe then began moving from R to L before again becoming stationary, however at a closer distance and closing. He began to flash his NVG landing lamp for about 5secs as did the lead Chinook; however, the red strobe remained stationary. At this point his leader called to break L, which both Chinooks did. During the turn he saw an Apache appear out of the darkness and pass down his starboard side about 100ft below his helicopter and some 50ft away. No lights could be seen on or off 'goggles' from this ac by either the pilot or the No2 crewman. The red strobe that had been previously identified then passed a few seconds later to starboard of the formation, again lower, where it then became apparent that this was the No2 of a pair of Apache helicopters. The lead Apache pilot then called on LFS Common stating his concern, which was acknowledged with their callsign. He assessed the Risk as 'medium' and added that whilst switching from Middle Wallop to Odiham, there was a short period when the Chinook formation was 'not under a radar service' [sic].

THE LYNX AH MK 7 pilot, a QHI, was requested to provide an account and reports that he was conducting confined area training for the rear crew at Barton Stacey Area 9 when he heard a radio broadcast from Wallop APP on 278.00MHz LFS Common about a pair of Chinooks transiting to the N of Barton Stacey. Shortly after this a blind call on LFS Common was heard from an Apache pair, stating that they were operating in the area of Moody Down. He acknowledged this call with his location and intentions. Another call was then heard, again on LFS Common, from one of the Apache pilots directed at the Chinook pair that had approached the area from the S and had apparently flown very close to the leading Apache helicopter. The Apache pilot stated that he was unhappy with the proximity of the Chinook and the lack of SA.

UKAB Note (2): A transcript of LFS Common 278.00MHz and the Middle Wallop APP frequency was helpfully provided by the Unit. All relevant transmissions received on the Middle Wallop recording are included below. However, it should be noted that some UHF transmissions made by ac operating at low-level might not have been received because of terrain shielding.

THE MIDDLE WALLOP APPROACH RADAR CONTROLLER (APR) reports that the Chinook formation called Wallop APP requesting a BS and MATZ transit routeing eastbound from a position 8nm SW of Middle Wallop at a height of 250ft agl passing no closer than 4nm to the aerodrome. The Chinook formation was placed under a BS, the Middle Wallop QFE issued and a warning passed that Barton Stacey was active. He then made a broadcast [at 2209:52] on LFS Common - 278.0MHz – giving the position, route and height of the Chinook formation. [At 2210:22, APP advised the Chinook Leader, "...I've just had (heard) a broadcast on 2-7-8 decimal 0 I believe there are a couple of cabs operating in the vicinity of Barton Stacey at this time", which was acknowledged, "that traffics all copied [C/S]..".] A second broadcast was transmitted by APP on LFS Common with an updated position of the Chinook formation as they passed Stockbridge [some 3½nm SE of Middle Wallop]. [At 2213:17, APP broadcast, "Wallop Approach blind call on 2-7-8 decimal 0 previously reported Middle Wallop MATZ transit traffic 2 Chinooks 1 mile south of Stockbridge tracking east 250 feet Wallop Q-F-E Wallop broadcast out." The Chinook leader reported switching en-route to LFS Common and Odiham on VHF at 2214:02]. Shortly after this there was an exchange of RT messages on LFS Common between the leader of the Apache formation and the Chinook formation, the former saying he was filing against two Chinooks that had affected their sortie activity. The Apache formation leader then called Wallop APP for the callsign of the conflicting traffic.

UKAB Note (3): At 2213:50, the Apache formation reported on LFS Common, "L-F-A-1 2 Apaches routeing south of Moody Down range to operate to the area just west of Moody Down range by 1 mile L-F-A 1 transmitting blind". The Lynx crew operating at Barton Stacey responded at 2214:05, "L-F-A-1 – 1 Lynx operating in area 9 field circuits on goggles L-F-A-1". At 2214:48, the Chinook formation broadcast, "Barton Stacey 2 Chinooks approaching from the southwest passing south routeing east Barton Stacey", which was followed by a transmission from another

single Chinook operating N of the A303 at Longparish, *"Barton Stacey 1 Chinook operating at Barton Stacey in the circuit"*. The Chinook formation then reported at 2215:04, that they were visual with traffic at Barton Stacey, *"..in your south west now"*. Just over one minute later at 2216:12, the Apache formation advised, *"[C/S] south of Barton Stacey you just went head to head with me there not happy"*. A further transmission was then made by the Apache formation, *"[C/S] south of Barton Stacey this is [C/S] formation a pair of Apaches routeing now west"*. The Chinook formation responded at 2216:31, *"Apache callsign this is [Chinook formation C/S] on Stud 9 we were visual with you and broke left we didn't see the pair (sic) at the front we saw the trail aircraft thought we'd keep clear of that"*. The formation leaders then agreed to discuss the incident after landing.

UKAB Note (4): This Airprox is not shown on recorded radar.

SATCO MIDDLE WALLOP confirmed that the formation of 2 Chinook Helicopters transited through the Middle Wallop MATZ receiving a BS from Middle Wallop APP on 280-625MHz. Meanwhile, the formation of 2 Apache helicopters was operating to the E of Middle Wallop in the vicinity of Barton Stacey on LFS Common - a frequency that was being proactively monitored by the APR. Recognising the potential for a confliction between these ac, the APR informed the Chinook formation of the activity at Barton Stacey, which was acknowledged. Then outwith his normal remit, the APR conscientiously transmitted two broadcasts on LFS Common endeavouring to assist the Apache crews' SA by informing them of the potential confliction. At 2214 the Chinook pair exited the Middle Wallop MATZ, as cleared with APP, and switched to LFS Common, checking in immediately on that frequency with a broadcast as is required. The Airprox occurred 2min later.

The Chinook pair was operating out of Netheravon as part of an exercise; therefore, they did not have advance notification of the Middle Wallop night flying routes. Similarly, the Apache crews did not have advance notification of the Chinooks routeing. None of the crews involved had the opportunity to deconflict whilst still on the ground. However, the RT transmissions should more than mitigate this fact. It should also be noted that Middle Wallop is currently trialling the Centralised Aviation Data System (CADS) [a Web based low-flying route notification tool], which is not used by all other LFA users.

However, he was puzzled as to why the Chinook pair was such a surprise to the Apache pair as the APR had done his best to pass them TI. The Apache pair had two early 'heads-up' broadcasts from the APR, followed by the call from the Chinook pair on LFS Common. If they were not visual, there was an opportunity to reply to their transmission.

ATSI had nothing further to add.

HQ JHC comments that this was a very serious event that nearly had a catastrophic outcome. There was a high degree of chance that led to this being an Airprox, rather than a mid-air collision. This head-to-head Airprox between two formations occurred in very congested airspace at night - a result of the imperative to train at night for current operations. The lack of notification of the Chinook formation's route has been resolved through fixed and portable versions of CADS, although this measure alone will not solve all conflictions. This HQ recognises the high risks involved with multiple ac operating in the same vicinity and is actively pursuing all mitigating measures. The difficulties involved with the identification of conflicting traffic, some of whom are in formation with different light set-ups and perhaps through different media (some on NVG, some on FLIR) are well understood by crews and this Airprox will be widely publicized.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

This Airprox was one of two incidents to be considered by the Board involving Apache and Chinook helicopters operating at night with NVDs in NRR1 - the other being Airprox 2010097. Significantly in this case, however, the two formations had not spotted each other before they flew into close quarters.

The Apache pilot reports he was not aware of the Chinook's transit through NRR1 before take-off and it was apparent the Chinook formation had been operating from an exercise location within the Salisbury Plain Training Area. The HQ JHC Member advised that the Chinook crews were unable to pass details of their flight for the

AIRPROX REPORT No 2010096

benefit of other NRR1 users beforehand. Board members were pleased to learn that the shortcomings in the notification system had been identified and addressed. The HQ JHC Member stressed that since this Airprox had occurred CADS was now being trialled by Odiham and other participants who operate in NRR1 so that information could now be exchanged at the flight planning stage. This would undoubtedly improve crews' SA if planned routes and timings could be adhered to. However, military pilot Members were acutely aware that many factors could intervene to upset a carefully balanced programme so that 'see and avoid' was still the essential method for averting any conflict. Indeed civilian ac might well be encountered at night with no notification whatsoever, albeit that only Police helicopters would be likely to be using NVDs or operating at the heights involved in this incident. This seemed to the Board to be quite a congested training area with 6 airframes/4 speaking units in an area of a few square miles. However, the Board's low-flying Advisor pointed out that all the crews here were flying in conformity with procedures for NRR1. The HQ AAC Member stressed the very high demands placed on Units to accomplish their training objectives and instructors were operating under a considerable workload. Training night field circuits is a difficult task demanding rapt concentration. Disturbances and distractions to this complex activity were not welcome, but these crews followed all applicable procedures in an effort to ensure the safe conduct of their sorties yet still a conflict resulted in this 'see and avoid' environment.

The HQ Air pilot Members questioned whether the ac involved here were sufficiently well lit. The JHC Member contended that the lighting displayed by the helicopters was in accordance with SOPs for such sorties and the Command had no concerns on that topic. However, he went on to explain to the Board that the FLIR used by the Apaches has a narrow field of view and for the Chinook crews, relative distance/depth perception is one of the most difficult aspects of operating with NVDs. Whilst it was accepted this was a difficult task it was imperative to train crews in the use of these devices. The HQ JHC Member stressed that night conflicts are not accepted lightly; these Airprox have been considered most seriously and the Command continues to investigate ways of minimising the potential Risk.

The Board commended the Middle Wallop APR for recognising the potential for a conflict between the Chinook formation as they transited past Barton Stacey and the other helicopters known to be circuiting there. The controller's positive stance in making blind calls on LFS Common about the Chinook formation's transit had alerted the lead Apache pilot, but the latter reported he was expecting them to transit further to the N and their appearance was a surprise when encountered to the S of Barton Stacey. The Board was briefed that there are three locations in the vicinity of Barton Stacey that are commonly used by military helicopter units for training sorties and some confusion might have arisen over which was being referred to on the RT. The blind call from the lead Apache, which had been answered by the Lynx pilot operating in Area 9, was evidently made 1min before the Chinook pair switched to LFS Common and made their own transmission. However, the Chinook's call, "*..approaching from the southwest passing south routeing east..*" should have made it plain where they were intending to fly. This was answered in turn by the singleton Chinook crew operating at Longparish. Therefore the presence of the Apache pair, S of Barton Stacey heading SW, would not have been immediately apparent to the Chinook pair who would have only expected to see traffic circuiting further to the N. It was evident that the Chinook formation had 'positively identified' a moving red strobe at range in the formation's 12 o'clock in the vicinity of Barton Stacey, which they reported sighting on RT subsequent to the singleton Chinook's call. With a Lynx helicopter also in the vicinity of Barton Stacey the Board was unable to confirm with certainty the identity of the 'red strobe' first seen. Evidently, the Chinook pilots were not aware that another formation was flying toward them until the single red strobe subsequently bloomed into the No2 Apache, and not immediately aware that the Apache they saw was the No2 of a pair. Members noted that the flashing of the Chinooks' NVG landing lamps did not alert the Apache lead pilot who only spotted the lead Chinook on his FLIR display - at very close range he said. While it was possible that each could have done more to advertise their ac's presence, it was stressed that there was a significant amount of cultural lighting potentially affecting both crews in this vicinity from the A303, the A34, the city lights of Salisbury and Andover to the SW. The HQ AAC Member opined that as they were approaching their landing site the lead Apache crew would have been scanning the ground more, but when the lead QHI saw the leading Chinook he took control from his student, rolled L and down to avoid it, unaware that the No2 Chinook was also just about to overfly him. It seems that this was about the same time that the lead Chinook pilot recognised the situation and called the L break to his wingman, based on observation of the No2 Apache, but significantly neither the Chinook leader nor his No2 were aware of the closer leading Apache until after they had turned and the No2 Chinook pilot saw the leading Apache fly past to starboard. After a comprehensive debate, the Board concluded that this Airprox had been the result of a conflict in Night Rotary Region 1 between two helicopter formations.

The crews of both formations had eventually seen and avoided each other but, in the absence of radar data, the actual separation between them could not be determined independently. Both pilots' reports agreed that the

vertical separation was a mere 100ft; from the No2 Chinook pilot's perspective the horizontal separation was no more than 50ft and he assessed the Risk as 'medium', whereas the reporting Apache pilot considered that the horizontal separation was 'nil' as the No2 Chinook overflew his ac and the Risk 'very high'. Fortuitously, both formation leaders had elected to turn L, but this was an uncoordinated manoeuvre and the Board agreed that it was a very close encounter indeed between four helicopters, where chance had played a significant part in the outcome. Members agreed unanimously and that an actual Risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Night Rotary Region 1 between two helicopter formations.

Degree of Risk: A.

AIRPROX REPORT No 2010097

AIRPROX REPORT NO 2010097

Date/Time: 22 Jul 2010 2130Z NIGHT

Position: 5120N 00131W
(1½nm SE of Rivar Hill GS - elev 730ft)

Airspace: NLFS (Class: G)

Reporting Ac Reported Ac

Type: Apache AH1 pr Chinook HC1

Operator: HQ JHC HQ JHC

Alt/FL: 300ft 250ft

agl agl

Weather: VMC CLOC VMC N/R

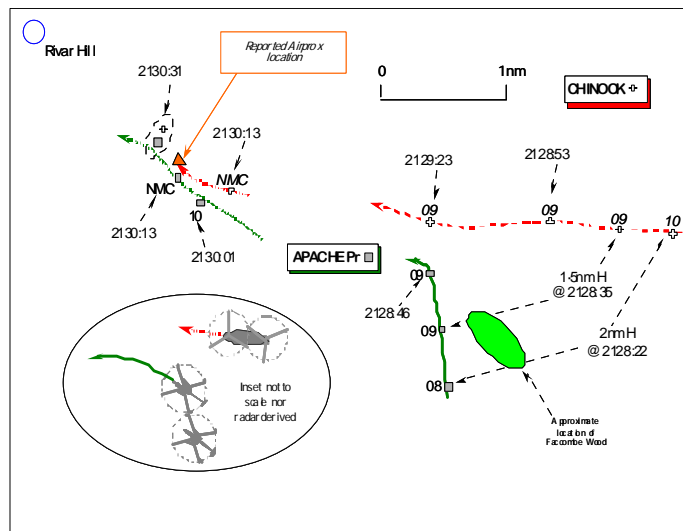
Visibility: 15km 10km

Reported Separation:

Nil V/150m H 400m H

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE APACHE AH 1 PILOT reports he was leading a pairs night low-level conversion training sortie departing from Middle Wallop and routeing N from Andover at 300ft agl, VFR and not in receipt of an ATS. A squawk of A2676 was selected [unverified Middle Wallop conspicuity] with Mode C on; TCAS is not fitted. Both ac were displaying glimmers [non-NVG compatible tactical lights not visible all round] and conventional navigation lights on steady bright; in addition his No 2 also had red HISLs on.

Monitoring LFS Common – 278.0MHz – he heard a Chinook crew making a blind call on the frequency stating that they would be routeing Newbury - Burbage [about 4½nm W of Rivar Hill] - Westbury. As the formation commander he made a blind call on LFS Common that the 2 Apaches were routeing N from Andover and thence N to Faccombe Wood, before turning W towards Rivar Hill Gliding Site (GS) [at 51° 20' 38"N 001° 32' 35"W]. From the Chinook crew's call he knew that they would be roughly in the same area at the same time so he tried to get a formal acknowledgement that they had received his RT call. No response was heard from the Chinook crew after 2 attempts, but he then gained visual contact on the Chinook and realised that it would be behind them; his No 2 remained visual with the Chinook until he also turned away routeing to the W [leaving the Chinook astern]. About 2nm out from Rivar Hill GS he then heard the Chinook crew call 'routeing Burbage following a formation of 2 ahead'. This gave the Apache formation leader the impression that the Chinook would remain behind his formation. About 1 min later heading 300°(T) at 80kt his No 2 called 'break left and climb', which he started to do. At this point he saw the Chinook on his starboard side overtaking his helicopter at the same height. To avoid the Chinook he rolled L and entered a slight climb as it passed about 150m away to starboard with a 'high' Risk of collision. The Airprox occurred at OS Grid SU 338 591 - 51° 19' 46"N 001° 30' 53" – about 1½nm SE of Rivar Hill. He established communication with the Chinook crew and voiced his displeasure over the RT. The Chinook then continued to fly across his intended flight path, which took it over Rivar Hill GS. After discussing events with his No2 he then reported an Airprox with Wallop APP.

His concern was that the Chinook came too close and then overflew his intended landing point. He was unaware that the Chinook crew intended to overtake his formation as close as they did. Having spoken to the Chinook Captain after landing he had been assured that the Chinook crew had both Apaches visual and therefore the risk of collision was relatively low, if they had maintained their respective flight paths. However if he had manoeuvred his formation to the R the chance of a collision would have been 'very high' due to the unnecessary proximity of the Chinook. He added that if the Chinook pilots wanted to pass, then simple deconfliction could have been achieved on the RT and all the crews involved would have then been aware of what was happening.

THE CHINOOK HC1 PILOT reports that he had departed Odiham for a dual night low-level NVD transit and was flying from Bramley to Burbage within NRR1. He was not in receipt of an ATS but monitoring LFS Common; a

squawk of A3646 [unverified Odiham conspicuity] was selected with Mode C on. Navigation lights and the red upper HSL were on.

Approaching Rivar Hill from the E at 250ft agl heading 275° at 140kt, he acquired a formation of 2 Apache helicopters from a distance of about 4nm. His crew positively identified both ac in the formation, even though the lead Apache was not displaying any external lights. They initially slowed their Chinook to a TAS of about 90kt to allow time to assess the actions of the Apache formation and whilst flying at reduced speed an information call was broadcast on LFS Common, stating that their Chinook was routeing to Burbage behind a formation of two ac; no response was heard initially from the formation. Once the Apache formation's track was established, because of the slow speed of the formation a decision was made to overtake the Apache formation to their R, whilst accelerating to 140kt. During the overtake, his co-pilot and No 1 crewman maintained positive visual identification on both Apache helicopters within the formation to port and both crew members considered the separation between their Chinook and the Apache formation to be sufficient to allow the Apache crews tactical freedom of manoeuvre. Shortly after passing the Apache formation an RT call was heard from the lead pilot expressing concern at their helicopter's proximity. The RT call was acknowledged and their callsign passed to the Apache formation.

The crew was surprised at the radio call from the lead Apache pilot as they believed the separation they had afforded was adequate throughout. Neither he nor any of his the crew believed they had flown closer than 400m to the Apache formation and assessed the Risk as 'low'.

UKAB Note (1): The LATCC (Mil) radar recording does not illustrate this Airprox clearly. However, the Apache formation and the Chinook are both shown on the Pease Pottage Radar at the extremity of coverage as intermittent SSR contacts only, but not always at the same time. The Chinook is shown westbound toward the Airprox location, at an indicated altitude of 900ft London QNH (1015mb) unverified Mode C and radar ground speed (RGS) of 120-125kt, as the Apache pair follow a northbound track from the vicinity of Andover at a RGS of about 120kt. At 2128:35, the Apache formation is in the Chinook's L 11 o'clock - 1.5nm at the same altitude of 900ft unverified Mode C. After passing the vicinity of Faccombe Woods, secondary contact becomes very intermittent following the Apache pair's westbound turn. With only one ac generally shown it is not possible to differentiate which ac is the lead ac. The Chinook seems to maintain a broadly westerly course maintaining an altitude of 900ft, before fading for a while with only intermittent returns evident thereafter. The Apache formation are displayed again, intermittently but now definitely tracking NW'y, approaching the reported Airprox location maintaining an altitude of 1000ft QNH at a RGS of 70-75kt with occasional paints from the Chinook suggesting it was flying a WNW'y course. No contacts are evident on either ac after 2130:31. The intermittent nature of the recording does not allow the geometry nor the minimum separation of this encounter to be assessed with confidence.

UKAB Note (2): A transcript of LFS Common 278.00MHz was provided by Middle Wallop ATC; all relevant transmissions received on the Middle Wallop recording are included herewith. However, it should be noted that some UHF transmissions made by ac operating at low-level might not have been received because of terrain shielding. Whilst unlikely, it was feasible that not all transmissions had been captured.

The Apache formation checked-in on frequency and broadcast at 2124:14, "*blind call L-F-A 1, [Apache C/S] north of Andover descending low level to operate Ink Pen Ridge*" [2nm ENE of Rivar Hill]. A further call was made at 2124:28, "*blind call [Apache C/S] Andover routeing north Faccombe Wood turning left..to route west towards Rivar to operate there for circuits L-F-A 1*".

The first recorded transmission from the Chinook crew was at 2126:57, when they called, "*Chinook crossing the A 34 south of Burbage (sic)..south of Newbury enroute Burbage*". Moments later the Apache formation advised the Chinook crew at 2127:23, "*Chinook entering L-F-A 1 south of Newbury 2 Apaches routeing north to the area of Rivar gliding site for circuits.*" No reply is recorded from the Chinook crew. A further call was made by the Apache formation at 2128:05, "*[Apache C/S] the Chinook..just..to the..south of..Newbury..2 Apaches turning left [one word unintelligible] Rivar*". The Apache Leader then queried at 2128:24, "*[Apache C/S] Chinook routing to Burbage 2 Apaches routeing to Rivar are you visual?*" No reply is recorded from the Chinook crew, however, at 2129:45 they transmitted, "*L-F-A 1 Chinook approach..(part of word followed by short break) approaching Burbage enroute Westbury following tw..(part of word) a formation of 2.*"

AIRPROX REPORT No 2010097

After the Airprox had occurred at 2130:31, the Apache pilot queried, “..Chinook just north of Rivar did you have us visual”, whose crew responded, “..affirm”. In his next transmission the Apache pilot expressed his concern about the proximity of the Chinook during the overtaking manoeuvre and the Chinook pilot advised the Apache pilot “..we transmitted that we were coming up behind you”.

THE MIDDLE WALLOP APPROACH RADAR CONTROLLER (APR) reports that at 2130 the Apache pilot called on RT and reported an Airprox with a Chinook close to Rivar Hill. The pilot estimated the Chinook passed within 100m of his Apache formation. Neither crew were in receipt of an ATS from Middle Wallop APP at the time of the Airprox.

SATCO MIDDLE WALLOP added that the formation of 2 Apache Helicopters was operating in the vicinity of Rivar Hill GS on a low-level pairs training sortie. Meanwhile, a Chinook was transiting through the area, crossing the A34 S of Newbury then routeing westbound towards Burbage. The Airprox took place at 2130z and all the crews involved were operating on LFS Common – 278.0MHz - and transmitting broadcasts in accordance with the LFA agreement. No ATS was being provided to any of these flights.

It should be noted that Middle Wallop is currently trialling the Centralised Aviation Data System (CADS); [a Web based low-flying route notification tool], which at the time of the Airprox was not in use by all other LFA users. The Chinook routeing was not entered onto CADS by Odiham, nor by any user at Middle Wallop due to the late notification and lack of specific route information; instead this information was provided in textual format for OC Night Flying to brief Middle Wallop crews verbally.

HQ JHC comments that this is an unfortunate event where all involved were aware of each other at the time due to the recent change to LFA1 procedures, one element of which requires blind call transmissions passing certain line features. The Chinook crew did not give warning of their intention to overtake. There was an opportunity for the Chinook crew to declare their intentions as the Apache crew were expecting the Chinook to trail them due to the Chinook transmission on LFS Common.

A causal factor identified by the Command within this report and Airprox 2010 096 was the lack of detail with the night flying information being passed from Odiham to Middle Wallop – the routeing information was vague. There have since been two LFA 1 meetings when both these Airprox were the subject of much discussion. The shortcomings in the notification system were identified and have been addressed. A Systems trial of a new planning tool - CADS - is underway on a limited number of units at Middle Wallop, Benson and Odiham to ascertain the utility of the system. This HQ emphasises that this is a deconfliction planning tool – without TCAS or an ATS, the principle of ‘see and avoid’ prevails over ‘plan to avoid’.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was reported that the Apache crews were not aware of the Chinook’s transit before take-off and that the night flying information passed from Odiham to Middle Wallop lacked detail. The Command’s view was that the shortcomings in the notification system had been identified and addressed by the use of the CADS, which was being trialled. Moreover, as all of the crews involved were aware of each other’s presence before the Airprox occurred, earlier notification would not have affected the outcome. Indeed civilian ac might well be encountered at night with no notification whatsoever, albeit that only Police helicopters would be likely to be using NVDs or operating at the heights involved in this encounter.

The HQ JHC Member briefed the Board that the lighting displayed by the respective helicopters was in accordance with SOPs for such sorties and that the Command had no concerns over that aspect. However, the demands placed on aircrew when operating and training with these highly sophisticated helicopters should not be underestimated and in this scenario the instructors were working under significant pressure. Nonetheless, it seemed to the Board that the lead Apache pilot had shown sound SA and done all he could to make the Chinook crew aware of his presence and intentions. Indeed the radar recording reflected that the Apache leader’s query, “...Chinook routing to Burbage 2 Apaches routeing to Rivar are you visual?”, was transmitted whilst the pair was still northbound and before they turned W, when the Chinook was about 2nm away. In the other cockpit, the Chinook crew had acquired the two Apache helicopters at an earlier stage – the Chinook pilot reported he had

them in sight from a range of 5nm. This had been helpfully transmitted to the Apache crews ahead as the Chinook approached from astern, but not until later, about 1min after the pair had turned L and slowed to a RGS of about 70-75kt the radar recording reflected. Whilst the Apache leader reports hearing the Chinook pilot's call being visual with the Apache formation, no RT call was evident on the transcript that the former was overtaking. After the event the Chinook pilot advised the Apache pilot "*..we transmitted that we were coming up behind you*", but the words he had actually used "*...following..a formation of 2*" clearly led the Apache leader to believe that the Chinook would follow his formation and remain clear astern. The JHC Member explained that all was in order until the Chinook pilot decided to overtake without passing a warning on the RT. In the Command's view, better airmanship dictated that the Chinook pilot should have made his intentions more plain on the RT, and it was surprising to the Members that he had not done so, which evidently took the Apache leader by surprise. Whereas the Apache pilot reported the Chinook passed 150m away, the Chinook crew reported they had not flown closer than 400m. Without better radar data it was not possible to resolve the differing perceptions of the minimum horizontal separation. With the Chinook overtaking the Apaches on their starboard side, as is required by the Rules of the Air, the Chinook PF in the right hand seat was relying on his co-pilot and crewman to judge the separation. It was suggested that the westbound Chinook crew – using NVDs – might not have realised that the Apache pair had taken up a NW'ly course toward Rivar Hill resulting in unexpectedly converging tracks with the Chinook, albeit that Rivar Hill had been mentioned on RT as their destination. The JHC pilot Member explained that relative distance/depth perception is one of the most difficult aspects of operating with NVDs, suggesting to other Members that this might have been a factor here.

It was clear to the Board that the Chinook Captain, in the overtaking ac, was responsible for the separation between himself and the overtaken Apache pair until he had passed and was well clear. The Apache crews would have been unable to see the Chinook until it started to draw almost abeam and they would not have been able to monitor the separation or affect the outcome until the No 2 saw it first and called the break. Whatever that distance, it was plain the Apache pair were surprised by the Chinook Captain's actions and felt obliged to take avoiding action. Consequently, the Board concluded that the Cause of this Airprox was that whilst overtaking, the Chinook pilot flew sufficiently close to cause the Apache formation concern. However, the Board was briefed that the Chinook is a very manoeuvrable helicopter and, visual with both Apaches, the Chinook pilot was always able to manoeuvre and give them a wider berth if needs be. The Members agreed, therefore, that there was no Risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

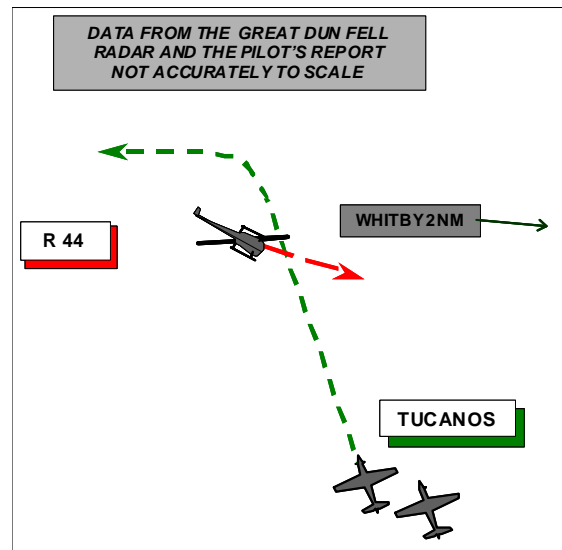
Cause: Whilst overtaking, the Chinook pilot flew sufficiently close to cause the Apache formation concern.

Degree of Risk: C.

AIRPROX REPORT No 2010098

AIRPROX REPORT NO 2010098

Date/Time: 21 Jul 2010 1504Z
Position: 5429N 00040W (2nm W Whitby)
Airspace: UKDLFS/Lon FIR (Class: G)
Reporting Ac Reported Ac
Type: Tucano R44
Operator: HQ Air (Trg) N/K
Alt/FL: 400ft NK
(RPS 999mb) (N/K)
Weather: VMC CLBC NK
Visibility: 30km NK
Reported Separation:
100ft V/ 0 H NK
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TUCANO PILOT reports he was flying as No2 of a pair of black ac, with an instructor in the rear seat, with all lights switched on, Squawking 7001 with Mode C on a basic training LL navigation exercise in LFA 11; TCAS 1 was fitted but they were not in receipt of an ATC service. At a turning point just to the W of Whitby their attention was drawn to a large flock of birds that were resting on the ground. While heading 350° at 240kt, just after seeing the birds he saw a helicopter ½nm away, tracking from left to right, at about 250ft agl but bunting aggressively to avoid their formation - the helicopter was dark blue with white lettering, the top of the rotor blades could be seen as the ac pitched nose down and the flight path of the helicopter was such that it disturbed the birds on the ground and passed directly underneath both the leader and the No2. At the time both formation members had climbed from a nominal 250ft agl to around 400ft agl since they were near a town and in a busy phase of flight approaching a turning point. The crew considered that this combined with the helicopter's bunt had prevented a collision with one or other of the ac.

UKAB Note (1): The radar recording shows the ac to be loose arrow formation with the leader on the left.

Neither crew received any TCAS information regarding the helicopter so it appeared to them that it had not been squawking with Mode C.

No avoiding action was possible and he assessed the risk as being high.

THE R44 PIPELINE INSPECTION PILOT, his secretary and his company were contacted on at least 7 occasions and although it was confirmed that he was flying the ac involved, he did not provide a report. It is understood that the helicopter was operating from a private farm strip 7nm N of Driffield [~20nm S of the incident position].

UKAB Note (2): The recording of the Great Dun Fell radar shows both Tucano ac throughout the period operating at low level indicating about FL013 (1000ft amsl – terrain variable up to 980ft amsl) in the vicinity of Whitby. The Helicopter does not paint as either a primary or a SSR contact at any time.

THE TUCANO UNIT comments that this appears to have been a close call. During a recent Flight Safety visit to the Station it was pointed out to HQ staff that probably the biggest airborne threat to Tucano operations is a mid-air-collision with a non-squawking GA aircraft or glider. TCAS is not a panacea and cannot replace effective lookout but the MoD should apply as much pressure as possible to make Squawking in all UK airspace mandatory.

HQ AIR (TRG) comments that it is disappointing the helicopter pilot has not responded to the UKAB request for comment. This was a close encounter in the UKDLFS but it seems that the Tucano formation pilots and helicopter

pilot saw each other with sufficient time to take effective avoiding action. Of note, non-squawking ac do not show on TCAS therefore lookout continues to be the primary tool in 'see and avoid' airspace.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the Tucano pilot, radar recordings and a report from the Tucano Station and operating authority.

Members were concerned that despite repeated requests and apparent concern about the incident, the R44 pilot did not provide a report. They were also concerned that he did not make use of the PINS process and was apparently not squawking, both of which would have made his presence known to the TCAS-equipped Tucano crews. It was emphasised that all operators should embrace the significant safety initiatives taken in the pipeline inspection industry consistently and proactively.

Nevertheless the incident occurred in the Class G airspace where pilots share an equal responsibility to see and avoid other ac. Given only the report by the Tucano pilot, it seemed that the R44 pilot saw the Tucano late, but in time for an avoidance manoeuvre. Members also concluded that the sighting of the small helicopter at ½nm was later than optimum, but since no additional avoidance was required there had been no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by the Tucano crews and a probable late sighting by the R44 pilot.

Degree of Risk: C.

AIRPROX REPORT No 2010099

AIRPROX REPORT NO 2010099

Date/Time: 23 Jul 2010 0857Z

Position: 5151N 00121W
(1.5 nm NW Oxford - elev 270ft)

Airspace: ATZ/Oxford AIAA (Class: G)

Reporter: Oxford ADC

1st Ac PA34 2nd Ac PA31T

Type: PA34 PA31T

Operator: Civ Trg Civ Comm

Alt/FL: 3500ft ↓ ↑2500ft

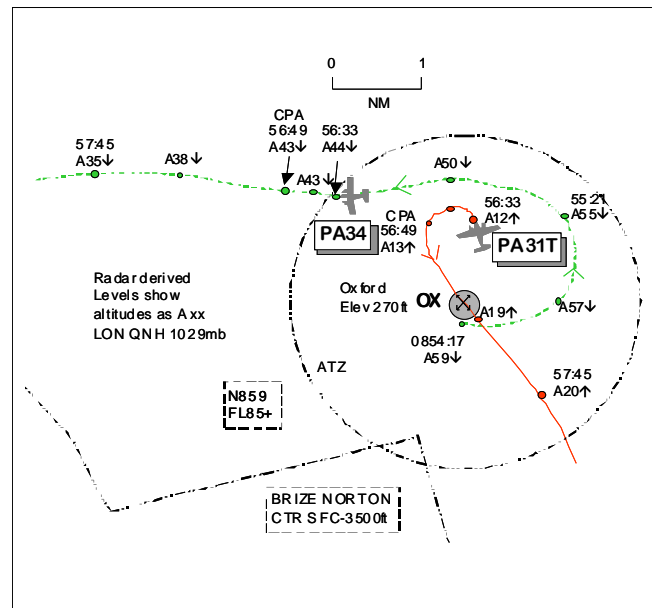
(QNH) (QNH)

Weather: IMC KLWD IMC KLWD

Visibility:

Reported Separation:
Not seen Not seen

Recorded Separation:
3000ft V/1.6nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE OXFORD ADC reports that there was a quiet traffic situation with IMC above altitude 1500ft, 1 ac departing VFR and the subject PA31T taxiing to the hold for an IFR CPT airways departure. APP was working 2 IFR inbound ac and made comment that one of the inbounds, the subject PA34 flight, was requesting an Expected Approach Time (EAT). ADC was not sure of the significance of this until later discovering that the flight had been 'held-off' in the WCO NDB area at FL60 for some time. The PA31T pilot requested departure clearance and was passed the instructions given by APP, "PA31T c/s cleared standard CPT departure hold at Botly climb FL50 remain outside CAS squawk 2234 onward frequency London Control 120.475". The flight was released subject to APP so the ac was kept on the ground awaiting release. APP then advised that the PA34 was "Beacon outbound NDB100 procedure" which placed the IFR ac to the NW of the OX descending. APP then told the ADC to change the outbound clearance on the PA31T to climb to 2500ft QNH 1020mb, making comment to suggest that a form of non-standard separation was being used. APP then released the flight which the ADC queried owing to the IFR NDB100 traffic (the PA34) but APP confirmed again that the PA31T was released. ADC was unaware of APP's traffic situation i.e. had any descent restrictions been applied to the PA34, so ADC carried out the APP's instruction and cleared the PA31T for take-off before transferring the flight to APP once airborne. As the PA31T flight contacted APP the relieving ATCO for that position was told by APP "not to take over until it was sorted out".

The Oxford METAR shows EGTK0730 02007KT 9000 FEW013 BKN016 BKN019 14/11 Q1020=

THE OXFORD APP reports that the PA34 flight routed to the OX at FL60 to enable departure of the PA31T to CPT climbing FL50. The PA34 pilot asked for an EAT and was given 0913. For expediency the outbound PA31T was told to climb to altitude 2500ft initially and to report S of Oxford. Visibility was such that the PA31T was clearly visible from the end of RW to 2500ft and the PA34 flight was asked if they were happy to commence the NDB100 procedure from FL60. This was agreed and the flight was descended initially to altitude 3500ft and asked to report beacon outbound. With the PA31T continuously visible his plan was to hold the PA34 at 3500ft if necessary as it went outbound, as it would not descend below 3500ft until 1min later. The PA34 flight reported outbound and the PA31T flight called APP. As the PA34 was turning N and then W from OX and the PA31T was already S of OX en-route to CPT, the PA31T flight was climbed to FL50 and transferred to LACC.

THE PA34 PILOT reports returning from a local IFR training sortie and being instructed by Brize Radar to climb to FL60 for the NDB100 hold at Oxford. About 7DME E of Oxford they were handed over to Oxford Approach. At 0852 they entered the hold at FL60 and 115kt and shortly after this they requested an EAT, which was given as 0913. They were then asked by APP if they were operating IFR or VFR but considering the Wx they had no other choice than to maintain IFR. Within 2min they were asked if they could fly beacon outbound promptly to which he

replied that they were able and that they were 1-5D on the inbound axis. They were subsequently cleared for the NDB DME 100 approach for landing RW01. They reported beacon outbound and were requested to report passing altitude 3500ft. To his surprise, as he was about to report passing 3500ft he heard another pilot make his initial call to APP announcing he was on a standard CPT departure climbing FL50. Owing to IMC he was not able to see this ac and owing to the conflicting tracks of the NDB100 procedure and the CPT departure and the similar altitudes of both ac he felt safety was at risk.

THE PA31T PILOT reports being unaware of being involved in an Airprox until contacted by UKAB post incident. He was outbound from Oxford IFR and had been cleared initially to 2500ft and then FL50 but the point at which the amended clearance was given was unknown.

ATSI reports that the Airprox occurred at 0857:38 (UTC), in the vicinity of Oxford Airport, which is situated in Class G airspace. Oxford Tower (TWR) and Oxford Approach (APP) were operating as split positions, without the aid of surveillance equipment. Traffic levels and workload were assessed as light to medium.

The PA34 was operating IFR, on a training flight returning to Oxford from the W whilst the PA31T was on an IFR flight, from Oxford to Cannes. Both flights were in receipt of a PS from Oxford APP.

CAP493 Manual of Air Traffic Services (MATS Pt1), Section 1, Chapter 11, page 10, paragraph 6.1.1, states:

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

At 0846:52, on release from Brize Radar, the PA34 flight called Oxford Approach, *“PA34 c/s we er maintain flight level six zero.”* Approach replied, *“PA34 c/s Oxford Approach Weston on the Green Danger Area one nine two active to flight level one two zero are you operating IFR or VFR.”* The PA34 pilot responded, *“er we’re IFR PA34 c/s.”* Approach then passed a clearance, *“PA34 c/s roger at the instructors discretion route to the Oscar Xray at flight level six zero report entering the hold for the NDB one hundred procedure landing runway zero one.”* The PA34 pilot responded, *“Flight level six ???? PA34 c/s.”*

For ac in the hold, where the inbound heading is 100°, the alternative NDB 100 procedure is:

‘From overhead NDB(L) OX(IAF) at 3500, extend outbound leg of holding pattern, after passing abeam NDB(L) OX descend to 1900(1630). At I-OXF DME6.5 turn left onto extended FAT. When established continue as for main procedure.’

At 0849:37, the TWR passed departure instructions to the outbound PA31T flight, *“PA31T c/s hold at the holding point after departure left turn standard Compton departure hold at BOTLY climb flight level five zero squawk two two three four remaining outside controlled airspace London when instructed one two zero decimal four seven five.”* The pilot gave a correct read-back.

At 0850:53, the PA34 pilot reported entering the hold and APP instructed the flight to maintain FL60. This was acknowledged by the pilot of the PA34, who subsequently requested an EAT. The pilot was asked to standby and at 0851:34 an EAT of 0913 was passed and acknowledged by the pilot.

APP later explained that the plan was then changed in order to improve the EAT and provide a more expeditious approach for the PA34. At 0853:22, APP asked the PA34 flight, *“PA34 c/s if I can give you descent can you go er straight outbound.”* The pilot replied, *“Affirm PA34 c/s we’re er just er one er point five miles from the beacon inbound.”* APP instructed the pilot, *“PA34 c/s thank you in which case descend to altitude three thousand five hundred feet on the QNH one zero two zero report beacon outbound for the NDB one hundred procedure landing runway zero one.”* The PA34 pilot replied, *“Three thousand five hundred feet one zero two zero wilco PA34 c/s.”*

APP then issued a revised clearance for the outbound and, at 0854:15, this was passed to the PA31 by TWR, *“PA31T c/s hold at BOTLY altitude two thousand five hundred feet and to contact Oxford Approach er when instructed before London for further climb one two five three two five.”* The pilot replied, *“Okay hold at BOTLY two thousand five hundred feet and to approach initially one two five three two five PA31T c/s.”*

AIRPROX REPORT No 2010099

The PA34 pilot reported beacon outbound at 0854:19 and Approach responded, *“PA34 c/s report passing altitude three thousand five hundred feet.”* This was acknowledged by the PA34 pilot. Allowing the PA34 to descend below 3500ft would result in a loss of the 1000ft deconfliction minima against the outbound PA31T, restricted to 2500ft.

At 0855 the PA31T departed from RW01. APP later stated that the PA31T was monitored visually as it passed O/H the airfield and then routed to the SE of the airfield in the climb to 2500ft.

[UKAB Note (1): The PA31T first appears on recorded radar at 0856:33 1nm N of Oxford in a L turn passing through heading 350° and climbing through altitude 1200ft QNH with the PA34 1.6nm to its W tracking W'ly descending through altitude 4400ft QNH. The horizontal separation distance of 1.6nm remains the same for the next 2 sweeps, the second of which is the CPA, at 0856:49, when vertical separation has decreased to 3000ft, the PA34 descending through 4300ft with the PA31T turning through a SW'ly heading climbing through 1300ft.]

At 0857:45, the radar recording shows the PA31T to be 1.5nm SE of the airfield indicating altitude 2000ft. At this point the PA31T called Approach, *“Approach hello PA31T c/s with you passing two thousand for two thousand five hundred feet towards BOTLY.”* APP replied, *“PA31T c/s Oxford Approach er good morning to you continue climb flight level five zero report passing altitude two thousand five hundred feet.”* This was acknowledged, *“Continue climb flight level five zero and Wilco PA31T c/s.”* APP later explained that he considered separation existed between the 2 ac, as the PA31T was visual to the SE and direction finding (D/F), indicated the PA34T to be WNW of the airfield.

Almost immediately, at 0857:58, the PA34 flight called, *“PA34 c/s passing altitude three thousand five hundred feet.”* APP responded with, *“PA34 c/s roger report base turn complete”* which was acknowledged by the pilot.

At 0858:20, the PA31T pilot reported passing 2500ft and was transferred to London control. The PA34 pilot reported base turn complete and was transferred to the Tower.

APP later explained that the intention was to monitor visually the departing PA31T as it turned L off RW01 and passed through the O/H not above 2500ft. An aerodrome controller may apply reduced separation in the vicinity of an aerodrome when each ac is continuously visible to the controller; however, this does not apply to an Approach controller providing a PS. The Oxford MATS Part 2 does not have any additional provision for a reduction in the separation minima or for any form of deemed separation.

The PA34 was above cloud and cleared for the procedure without any restriction on the descent. The controller had an expectation that the PA34 would maintain 3500ft until NW of the airfield, passing abeam the OX in accordance with the published procedure and intended to use D/F to establish a form of geographical separation.

APP did not have access to surveillance equipment and was not sure of the exact position of the PA34. No TI or details of the plan were conveyed to the pilots. APP recognised that the procedure adopted was non-standard and resulted in the technical loss of the 1000ft deconfliction minima. This caused the pilot of the PA34 to be concerned that the safety of his ac might have been compromised. MATS Pt1, Section 1, Chapter 2, page 11, paragraph 1.3, states:

‘In Class G airspace, separation between aircraft is ultimately the responsibility of the pilot; however, in providing a Deconfliction Service or a Procedural Service, controllers will provide information and advice aimed at achieving a defined deconfliction minima.’

Although there was a technical and procedural loss of the deconfliction minima, the radar recording shows that, at the point when the PA31T was SE of the airfield and cleared to climb above 2500ft, the distance between the ac was 6nm horizontal with 1500ft vertical separation.

The Oxford Approach controller applied a non-standard procedure that was not approved in the Oxford MATS Part 2 and that did not properly take into account any attendant risk of error. This resulted in a loss of procedural separation that reduced the required deconfliction minima to be technically less than 1000ft between the two IFR ac participating in the PS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members could add little to this incident. Without any procedures for reduced separation or deemed separation available to the APP in the procedural environment, his non-standard technique employed had led to a loss of procedural separation. The exact position of the PA34 was not known, so that when he allowed PA34 to descend below 3500ft separation was lost and this was exacerbated when the PA31T was cleared to FL50. Although this had had the potential to have been a more serious incident, it was clear from the radar recording that the actual flightpaths flown by both ac - the PA34 was high in the NDB100 procedure whilst the PA31T's low ROC whilst turning to the S – had resulted in the ac diverging rapidly as the PA31T turned through a S'ly heading back towards the O/H, 3000ft below and 1.6nm clear of the PA34. This allowed the Board to conclude unanimously that there had not been any risk of collision during this occurrence.

PART C: ASSESSMENT OF CAUSE AND RISK

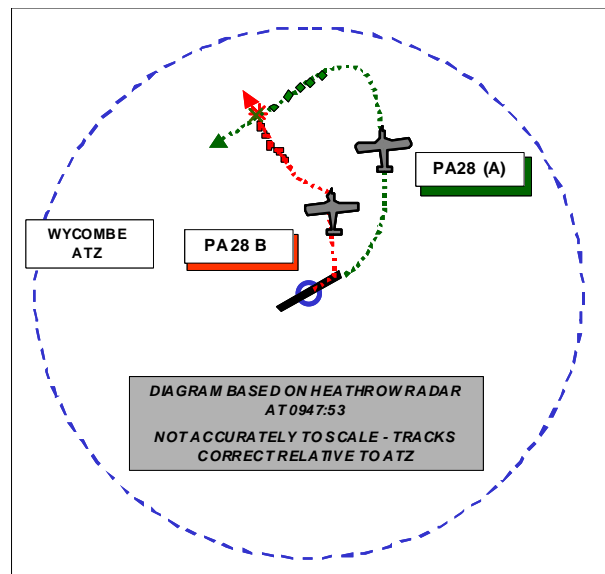
Cause: Loss of procedural separation.

Degree of Risk: C.

AIRPROX REPORT No 2010100

AIRPROX REPORT NO 2010100

Date/Time: 23 Jul 2010 0948Z
Position: 5238N 00050W
(1nm NW Wycombe - elev 520ft)
Airspace: Wycombe ATZ (Class: G)
Reporting Ac Reported Ac
Type: PA28 PA28
Operator: Civ Trg Civ Pte
Alt/FL: 1000ft 600ft
(QFE 1001mb) (QNH)
Weather: VMC CLBC VMC CLBC
Visibility: 10km 8km
Reported Separation:
0ft V/100m H Not Seen
Recorded Separation:
0ft V/ <0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA28 PILOT (A) reports that she was conducting a CPL Skills test (partial) in the cct in a white ac with orange stripes and was squawking 7000 with Mode C, while in receipt of an Aerodrome Control Service from Wycombe TWR. The cct traffic was light and only a few transmissions were heard on the RT. While at the mid-point downwind for RW06 (LH) heading 240° at 120kt, and discussing what type of approach to do next, her candidate saw another PA28 (with wheel spats) 150m away in their 10 o'clock, crossing their flightpath from left to right, at a similar height. As he exclaimed the ac passed 100m ahead of them heading in a northerly direction.

The examiner asked the controller if he had transit traffic, to which he replied "No, just a departure to Halton". Since a test was being conducted she did not report the incident until they were on the ground and assessed the risk of collision as being high.

THE PA28 PILOT (B) reports that he was flying a private flight from Wycombe to RAF Halton in a white and red ac squawking 7000. On arrival at Halton he was informed of an Airprox but saw no other ac.

Prior to departure at checkout he enquired about the noise abatement procedure and he had a chart showing the details.

On departure ATC told him to proceed to point Alpha [the N end of the parking apron] and hold, which he did. They then told him to move to the grass taxiway [S and parallel to the asphalt RW] indicated by the white markers but he held his position for a moment as a stationary ac was facing him at point Bravo [on the taxiway at the end of the grass parallel RW] but he was urged to move, which he did and subsequently taxied to the run up position for RW06 and advised that he was ready for departure. ATC then asked him to hold for incoming ac, which he did; after the incoming ac had passed they told him to line up and he was then cleared for take off. While initially heading 020° at 80kt he was aware of an ac ahead in the climb-out, which he subsequently assumed to be the incoming ac doing a touch and go. He is fairly certain that he called, 'C/S taking off', as this is his normal procedure and that he flew the appropriate noise abatement turns which end on a track of 360° then headed north towards Halton. He does not recall hearing any other messages from ATC but before he made the frequency change he thanked Wycombe for their help.

He thought he had maintained a good lookout throughout and could not understand why, having been cleared for take off, there was another ac in the vicinity.

ATSI reports that the Airprox occurred at 0948:39 in Class G airspace, 1.7nm NW of Wycombe Air Park and within the ATZ (radius 2nm up to 2000ft aal 520ft).

Wycombe Air Park provide an Aerodrome Control Service (ADC) and RW06, with LH ccts, was the notified RW.

The Wycombe unofficial weather observation was reported as: 230955Z 020/05-10kts 9999 BKN020 Q1021.

ATSI had access to controller and pilot reports, together with radar recordings but, due to an administrative oversight, the original RTF recordings were not available. The controller was therefore questioned some time after the incident in order to clarify events.

The Wycombe Air Park AIP entry for noise abatement, AIP AD2-EGTB-1-5 (22 Oct 09 i.e. the version valid at the time of the incident) paragraph 2.21, stated:

'a. Pilots of departing aircraft are required to conform to strict Noise Abatement Procedures. These are available from the Aerodrome Operator.'

When Runway 06 is in use the Sands Noise Abatement Zone, which lies to the northeast, is active. Wycombe Air Park MATS Part 2, Section 1, Chapter 5, Page 1, paragraph 1, together with the Aerodrome pilot briefing diagram and sheet states:

'Runway 06 In Use:

As soon as **safely** possible, before reaching the M40 (e.g., at the windsock), turn left to maintain a track 020° M. Upon reaching 600 feet turn crosswind to track 360° M and maintain to circuit height.

WARNING: *Close proximity of helicopters during initial climb.*

Practice Engine Failures after Take Off are forbidden.

If remaining in the circuit, commence turn downwind to remain inside the Aerodrome Traffic Zone following the published downwind track for 24/06. DO NOT OVERFLY LANE END OR FRIETH whilst on the Downwind leg.

The fixed wing circuit is to be flown at 1000ft QFE.'

The PA28-201 (PA28 (A)) was an exam VFR flight, conducting visual LH ccts on RW06 while PA28-161 (PA28 (B)) was on a VFR flight from Wycombe Air Park to Halton Airfield and was given taxi clearance for departure RW06. When the pilot called ready for departure, PA28 (A) was turning final and had been cleared for a 'touch and go'. The PA28 (B) was given a conditional clearance, "*after the landing Cherokee line-up and wait*". Once the PA28 (A) completed the 'touch and go', the controller gave the PA28 take off clearance with an instruction to follow the noise abatement procedures. The controller expected PA28 (B) to take up a heading 020° until reaching 600ft and then turn onto a heading of 360° to leave the ATZ. PA28 (B) reported changing frequency to Halton Radio shortly after departure. The controller then passed instructions to a helicopter on the apron and did not observe the PA28 (B) as it tracked N.

The controller indicated that when the PA28 (A) reported downwind, the pilot asked whether he was aware of an over flight and described the ac that was in close proximity. The controller recognised that the ac described was probably the outbound PA28 (B) but he was unsure if the PA28 (B) had been given TI on the PA28 (A) in the cct; he believed, however, that it was evident that the cct was active and considered that the instruction to follow the noise abatement procedure would ensure that both ac initially followed the same track with PA28 (B) passing behind PA28 (A) as it turned downwind.

AIP AD2-EGTB-1-5 (22 Oct 09) paragraph 2.22, 3/iii, states:

'Pilots of aircraft flying within the confines of the Wycombe ATZ are responsible for providing their own separation from other aircraft operating within the ATZ.

MATS Pt1, Section 1, Chapter 12, Page 3, paragraph 2, states:

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

AIRPROX REPORT No 2010100

aircraft flying in, and in the vicinity of, the ATZ.'

The Airprox occurred within the ATZ. It is not clear if the Controller passed TI to the PA28 (B) regarding the PA28 (A) ahead in the cct but he issued instructions to the PA28 (B) to ensure that after departure, the ac followed the noise abatement procedures. The Controller believed that both ac would follow the same noise abatement procedure, with the PA28 (A) turning downwind, while the PA28 (B) departed the ATZ on a northerly track towards Halton, which lies NNE of Wycombe. The PA28 (B) reported changing to Halton Radio but the controller did not see it turning onto a northwesterly track and was therefore not aware of the potential conflict.

Radar recording shows the PA28 (A) follow the noise abatement procedure for a standard circuit with the PA28 (B) turning left at 480ft aal. PA28 (B) can be seen tracking 330° and climbing to circuit height, crossing the midpoint of the downwind leg in close proximity to PA28 (A).

UKAB Note (1): Although there is no transcript, it is understood that, while taxiing out (due to his unfamiliarity with Wycombe) the pilot of PA28 (B) had difficulty in assimilating the instructions passed to him by TWR. On further questioning it became apparent that both ac were using RW06 (Asphalt) and that PA28 (B) was instructed to backtrack down RW24 (Grass) to the holding point for RW06 (Asphalt).

UKAB Note (2): The incident shows clearly on the recording of the Heathrow 23cm radar (and others). The geometry is as described in the ATSI report above and as depicted in the diagram.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that the respective pilots, one a locally based examiner and the other a visitor, had seemingly interpreted the published (mandatory) noise abatement procedures differently; PA28 (A) pilot apparently continuing to the airfield boundary before turning onto 020°, while PA28 (B) turned just after getting airborne and possibly about half way down the RW. [It was not possible from the information available to determine what precise track either ac flew on getting airborne as it was not mentioned in any of the reports and the ac were below the base of recorded radar coverage]. Having been briefed on the procedures in force at the time of the incident, the Board agreed that both interpretations were understandable. There was however, an expectation from both the controller and PA28 (A) crew that the correct procedure [for RW06] was to fly the ground track as depicted in both the locally produced handout and in Pooley's Flight Guide, which continues straight ahead to the airfield boundary, rather than turning onto 020° 'as soon as safely possible', which in many cases can involve a significantly different ground track.

Although the ADC did not see the incident, and was therefore not able to provide any warning to the respective pilots, without the benefit of a transcript Members could not determine whether or not his actions had been reasonable.

Notwithstanding the factors above, both ac were operating in the area of the visual cct, which is a 'see and avoid' environment. The crew of PA28 (A) were engaged on a high-pressure check flight and, although they saw the opposing ac pass 100m ahead of them, the sighting was too late to take any effective avoiding action. PA28 (B) pilot on the other hand did not see, nor was he aware of (A), at any time. That being the case, the 'built-in' avoidance of about 150m [radar verified] had occurred purely by happenstance.

Members debated whether or not there had been an actual collision risk; considering the crossing geometry, however, they agreed that had there been an actual risk then PA28 (A) would have been in PA28 (B)'s forward field of view for some time, albeit possibly on a constant bearing. Since apparently this was not the case, the Board agreed that, although safety had not been assured, there had been no risk of a collision.

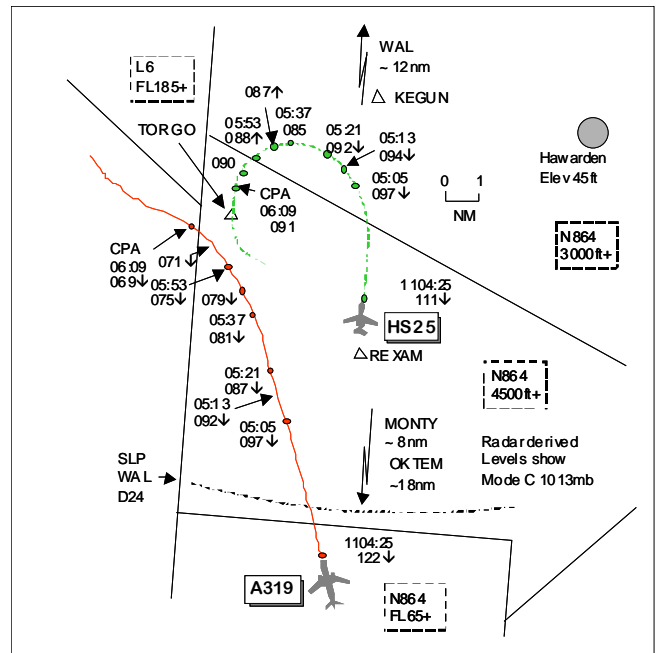
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: PA28 (B) turned into conflict with PA28 (A) in the Wycombe ATZ.

Degree of Risk: B.

AIRPROX REPORT NO 2010101

Date/Time: 14 Jul 2010 1106Z
Position: 5308N 00317W
 (11nm WSW Hawarden - elev 45ft)
Airspace: N864 (Class: A)
Reporter: Hawarden APR
1st Ac 2nd Ac
Type: HS25 A319
Operator: Civ Comm CAT
Alt/FL: 8000ft ↓ ↓
 (QNH 999mb)
Weather: IMC KLWD NK NR
Visibility: NR NR
Reported Separation:
 APR 200ft V/3nm H
 300ft V/4nm H NR
Recorded Separation:
 2200ft V/1.8nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWARDEN APR reports he was the relief radar controller and took over the position at 1042. At approximately 1055 the Liverpool Radar Controller (RC) telephoned with a release on the HS25 descending to FL70 released passing FL80 straight from ScACC. Also, Liverpool RC told him about traffic 10nm behind the HS25 which was inbound to Liverpool squawking 7455 that would be descended on top of the HS25; both ac were much higher than normal. He was about to ring ScACC to confirm that he could turn the HS25 early when Liverpool RC telephoned to say that ScACC had apologised for the level of the 2 ac and asked what he was doing with the HS25. Believing that Liverpool were working the second ac he proposed to turn the HS25 L heading 090° and descend it to 3500ft. The Liverpool RC asked if it could turn R but soon realised that this course of action would not achieve the descent profile; he agreed to the L turn and confirmed that the ac had clearance into Liverpool airspace. Now believing that the HS25 was now no longer restricted to a FL80 release he turned the HS25 L onto 090°. The second ac then began to descend very rapidly and it became clear that this ac was not going to remain above the HS25 as previously agreed with Liverpool. He warned the HS25 crew, stopped the flight's descent and then tried to speak to the Liverpool RC to ask what was happening. The Liverpool Radar Assistant answered the telephone and stated that the RC was busy so Hawarden APR told the Assistant that he had stopped the HS25 at FL90 and to inform the RC. ScACC then telephoned stating that they were continuing N with the 7455 traffic having seen that the HS25 had stopped at FL90. It was only at this point that he realised that the second ac had been working ScACC throughout.

THE LIVERPOOL APR reports receiving 2 releases from Scottish, the first being the HS25 descending to FL70 and released passing 80. Approximately 10nm behind was the A319 descending to FL80 and released passing FL90. Scottish was advised to pass the HS25 straight to Hawarden, as it was the APR's intention to descend the A319 on top. The release details were passed to Hawarden along with the squawk and position of the A319 as well as the APR's intention to descend the A319 on top of the HS25. Scottish called to ask whether, as the HS25 was not descending very well, the APR would like the A319 on a heading to save putting the flight into the hold. The APR asked Scottish to pass both flights over so that the APR could deal with it; however, Scottish stated that the HS25 had already been transferred to Hawarden. The APR then asked Scottish to put the A319 on a heading of 350° to widen it out a little bit as it was still high and told Scottish that Hawarden would be informed. Hawarden were called and they advised that they were going to turn the HS25 L all the way around onto 090° and descend to 3500ft. The APR initially asked Hawarden to turn the ac R, as this would have vectored it away from the RH base leg for Liverpool RW09, but as the A319 was still high anyway and the HS25 had not yet reached its release point, the original plan to turn it L was acknowledged. Whilst waiting for the A319 to come over from Scottish it was noticed that the HS25 was commencing its L turn before its release point but it was assumed it was

AIRPROX REPORT No 2010101

descending to 3500ft. The APR immediately called Scottish to advise them to stop the descent of the A319 and to inform them of what Hawarden were believed to be doing with the HS25. Scottish issued avoiding action to the A319 and then Hawarden called stating they were climbing the HS25 against the A319.

THE SCACC W/IOM RADAR CONTROLLER reports that 2 ac were routeing to KEGUN. The first was an HS25 for Hawarden released to FL70 out of FL80, which was transferred to Hawarden through about FL140. The HS25 flight was instructed to expedite descent but in his opinion did not. The second ac was an A319 flight inbound to Liverpool which was constantly asking for descent and it was initially descending on top of the HS25. He turned the A319 L and descended it to FL80 believing that his Planner had told him to, following further coordination with Liverpool Radar. The HS25 turned L passing FL100 so he turned the A319 a further 20° L. As the HS25 kept turning L and the A319 was already just through the level of the HS25 he instructed the A319 flight to descend to FL60 and expedite. He then saw that avoiding action was necessary and gave the A319 an avoiding action L turn onto 270°. Separation was regained and he continued until he was relieved shortly afterwards.

THE SCACC W/IOM PLANNER CONTROLLER reports she released the HS25 to FL70 to KEGUN out of FL80 and the A319 to FL80 out of FL90 to Liverpool. Liverpool advised that the HS25 could be transferred straight to Hawarden and she wrote this on the fps. From the radar display she could see both ac were running high so she called Liverpool to inform them and they said that they were happy and to transfer both flights to them. She told Liverpool that the HS25 had already been transferred to Hawarden and so to prevent the A319 having to enter the hold could they accept the A319 on a heading. Liverpool agreed and asked them to put the flight on heading 350°. She conveyed this to the Tactical controller who said, "that was good as that was the heading he had just put the ac onto". At this point she saw that the A319's Mode S SFL indicated FL80; although the A319 flight had been requesting further descent from Tactical, she was surprised to see that it had been given. At 1105 Liverpool called and said, "watch the descent on the 'A319 company' as Hawarden were turning the 'HS25 company' left onto 090° (both before reaching KEGUN and contrary to the RH holding pattern) and descending to altitude 3500". The HS25 was passing through approximately FL98 and the A319 FL96 at this point. She told Tactical to stop the A319's descent and informed him what Hawarden were doing with the HS25. She told Tactical that he should give avoiding action to the A319. Tactical gave avoiding action but said that as the A319 was below the HS25 he gave further descent; STCA was activating red. She telephoned Hawarden and, at the same time saw that the HS25 was climbing, told Hawarden that they were avoiding and that the A319 was also descending to FL60. She next called Liverpool and re-released the A319 when it was clear of the HS25 before informing the LAS that a loss of separation had occurred. She believed that Liverpool and Hawarden agreed an amendment to the original releases issued without her authority.

THE HS25 PILOT reports inbound to Hawarden IFR, routeing EXMOR OKTEM for a KEGUN 2D arrival, squawking an assigned code with Modes S and C. He was unsure of the frequency he was on at the time; the last frequency noted was Scottish on 119.025MHz [actually Hawarden 123.35MHz] but he thought he was under a TS. On initial descent towards Hawarden at 230kt they were cleared to 6000ft QNH inbound KEGUN before they were told to start a L turn to a S'y heading; they were under control and IMC at the time. On passing 8000ft they received a call to, "stop descent FL90". The AP was disconnected and the ac was transitioned from a 1500fpm descent to a steep climb – pitch 10° nose up. With QNH 999mb they were approximately FL84 at the transition to climb. A couple of seconds after transitioning to the climb they received a TCAS TA which lasted a couple of seconds before clearing, the other ac appearing in their 10 o'clock range 4nm and about 300ft low. They notified ATC of their level and ATC responded apologising for a 'mix up with Liverpool ATC'. At no point did they visually acquire the other ac owing to IMC in cloud, assessing the risk of collision, based on TCAS, as low. He did not report an Airprox as they did not feel an Airprox occurred. It was clear to them that a communication issue between ATSU's had led to a clearance that was not intended but which was aggressively rectified by them at the time.

THE A319 PILOT reports inbound to Liverpool IFR and in communication with Scottish, squawking an assigned code with Modes S and C. In the EXMOR area another flight – the HS25 – was ahead of them on the same route. They were receiving delayed descent clearances owing to the HS25 ahead apparently not complying with ATC requests. On at least 3 occasions they heard the HS25 flight being asked to expedite descents but to no avail. Consequently they were receiving limited descents and level-offs, going high on profile. Finally they were asked to reduce speed to an unusually slow 220kt (FL200ish) to help the situation. He made comment to the FO that this was unusual and that he was beginning to feel uncomfortable. To make a point they told ATC they were getting close to minimum 'clean' speed and didn't want further speed reductions at height. They couldn't understand why the HS25 was reluctant to lose height, as they were high for Liverpool so the HS25 must have been very high for

Hawarden. Eventually the HS25 changed to another frequency and they were put on a heading L of their track to KEGUN. They continued their descent and shortly after received a further 30° L turn owing to conflicting traffic. They complied with ATC instructions with AP 'in' and, of note, did not receive a TCAS RA but neither he nor the FO can remember if a TA was generated. He assessed the risk as low.

ATSI reports that at the time of the Airprox, the HS25 was under the control of the Hawarden APR. The A319 had not yet been transferred to Liverpool but had remained with the Prestwick Control (PC) Wallasey/IOM Sector. In accordance with local procedures, the Liverpool APR had received the inbound releases for both ac from PC and had advised Hawarden accordingly.

Both the Liverpool and Hawarden Controllers described their respective workload as light and the Wallasey/IOM Tactical Controller reported his as light to moderate.

The procedures for Airways flights into Hawarden and Liverpool from the S via Airway N864 are stated in the UK AIP (i.e. KEGUN 1D STAR: 'Arrival via N864 to **MONTY** continue on **WAL VOR** R186 to **KEGUN** then turn left to **TORGO**, then turn left to intercept **WAL VOR** R186 to **KEGUN**'). The only level restriction is FL200 before **OKTEM**. Additionally, a separate box within the arrival chart, which is titled 'DESCENT PLANNING – ATC REQUIREMENTS,' states: "When determining top of descent point, pilots should anticipate possible descent clearance to the level shown in the table above (i.e. FL200) and possible clearance to FL70 by the SLPs (Speed Limit Points). Pilots unable to comply must notify ATC as soon as possible.' The KEGUN 1D SLP is WAL D24.

The subject ac were routeing N'bound on Airway N864, in communication with the Wallasey/IOM Sector. The Sector Planner telephoned Liverpool Approach at 1100, in accordance with agreed procedures, to pass inbound releases for the 2 ac (i.e. HS25 "At KEGUN we'll do Seven Zero erm out of Eight Zero followed by"). Liverpool acknowledged only with, "Yeah", then, "A319 c/s Eight out of Nine". The Liverpool APR read back, "eight out of nine," and continued, "the er HS25 operator can go straight to Hawarden", which was acknowledged by the Planner. Flights inbound to Hawarden from the S via N864 (as described previously in paragraph above) follow the same routeing as Liverpool inbound. The Liverpool APR later commented that there was no requirement to work the HS25, as it was ahead and below the A319 and there were no other ac likely to conflict with it. The intention was to provide separation between the 2 ac by descending the A319, when in contact, on top of the HS25, ensuring that the required 1000ft vertical separation was maintained. When the releases were passed by PC, the HS25 was approximately 26nm S of KEGUN, passing FL179 for FL90 and the A319 was 9.6nm behind, passing FL206 for FL160. The Wallasey/IOM Planner stated in her report that she could see that the 2 ac were "running high", which reportedly is not an unusual occurrence for ac being transferred on that route from Swanwick Centre.

The Liverpool APR informed Hawarden, by telephone, of the HS25's release, "Seven released out of eight", which the Hawarden Controller read back correctly. Additionally, Liverpool passed information about the A319, stating it would, "descend on top". The RW in use at Hawarden was RW22. Instrument approaches to RW22 require entry into the Liverpool CTR. A section of the CTR is delegated to Hawarden for instrument approaches, (when coordinated with Liverpool). This is the Hawarden Radar Manoeuvring Area (HRMA), which stretches from the surface to 2500ft. Hawarden inbound vectored for RW22, should be descended to 2000ft and must be at or below 2500ft upon entering the HRMA. In order to avoid conflicting with Manchester SID traffic, Hawarden shall not vector inbound traffic E of a line drawn N/S through Liverpool Airport, at levels above 3500ft. At 1101:35, Hawarden requested permission to enter the HRMA but were asked to check again later.

At 1102:37, in accordance with its release, the Wallasey/IOM Tactical Controller instructed the HS25 flight to, "descend Flight Level Seven Zero expedite your descent all the way down please". The pilot replied, "Okay we'll expedite down to Seven Zero". The HS25 was passing FL149; the A319 was 8.9nm behind, passing FL166, having been cleared to FL140 after requesting further descent. The HS25 was then transferred to Hawarden Approach as had been agreed; no "level by" restriction was issued to the flight before transfer. On first contact with Hawarden, the HS25 flight was instructed to descend to altitude 3500ft and at the pilot's request, the Hawarden weather was passed, "surface wind One Six Zero degrees at One Two knots visibility in excess of ten kilometres the cloud is few at One Thousand feet scattered One Thousand Five Hundred feet...". At about the same time, the A319 again requested further descent with PC. The controller explained to the pilot that there was slow descending Hawarden traffic ahead. The pilot responded, "Yeah we can see that erm we're just er got a bit of a tail wind as well about six thousand feet high at the minute". The controller replied, "in that case then turn left ten degrees and descend Flight Level Eight Zero". The Wallasey/IOM Tactical explained later that he believed that the Planner had agreed FL80 for the A319 with Liverpool, although, with hindsight, he realised that no coordination

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had taken place between him and the Planner. It is possible he overheard the discussion between the Planner and Liverpool and noted FL80 on the A319's fps, which had been annotated at the time of its release. His assumption was that Hawarden would route the HS25 to the E after it had passed its release level (FL80). Depending on its descent profile, this would be either before, or after, it had passed KEGUN. Consequently, by positioning the A319 to the W of the traffic, he assessed that it was not necessary to maintain vertical separation of 1000ft between the 2 ac. He confirmed that he was aware of the Hawarden vectoring restrictions and the direction of the KEGUN holding procedure.

[UKAB Note (1): In the 2min prior to the Wallasey/IOM Tactical clearing the HS25 flight to expedite descent to FL70, the ac's ROD averaged 1750fpm which increased to 2200fpm over the period of the next 3min.]

Whilst the Tactical Controller was instructing the A319 to descend and turn (1103:35), the Planner was in discussion with Liverpool about the traffic situation with the subject ac, especially the slow descent of the HS25. Liverpool offered to work both flights but was informed that the HS25 had already been transferred to Hawarden. The Planner asked if the A319 should be placed on a heading to avoid entering the hold at KEGUN. Liverpool suggested heading 350°, which was accepted. Liverpool said they would talk to Hawarden. Incidentally, this was the heading already issued by the Tactical Controller, which reinforced his belief that the HS25 would be routeing to the E of KEGUN, away from the A319's track.

Liverpool telephoned Hawarden, saying that Scottish had apologised for the ac being high. Hawarden were asked, *"What are you intending to do with your HS25 c/s"*. The call continued, Hawarden: *"er well if you're happy I'll turn him now left long way round and turn him on to a heading of about Zero Nine Zero"*.

Liverpool: *"Can you turn him right"*.

Hawarden: *"Right"*.

Liverpool: *"Awe well you want to turn him le- no that's fine you know Manch-er Scot-he's have you given him further descent"*.

Hawarden: *"Er down to three and a half yeah"*.

Liverpool: *"Yeah that'll be great thanks left on Zero Nine Zero's fine and the R M A's yours"*.

Hawarden: *"Thanks very much"*.

Shortly afterwards, at 1104:29, Hawarden instructed the HS25 flight to, *"turn left long way round heading Zero Nine Zero degrees"*. The radar shows the HS25 passing FL110, approximately 5nm from KEGUN. The A319 is passing FL122 descending to FL80, on heading 350°, 7.6nm to its SSW. The turn issued to the HS25 would result in it turning back towards the A319, with no provision of vertical separation.

Later the Hawarden APR admitted that he had turned the HS25 before it was released (i.e. before it passed FL80). He explained that, when he was discussing his plan for the HS25's arrival routeing with Liverpool, he believed that they were controlling the A319. Consequently, he believed that they were agreeing with his plan, allowing him to turn the HS25 early, especially as he had stated his intention to turn the ac *"now"* (see paragraph above). However, the Wallasey/IOM Sector had still not transferred the A319 to Liverpool. The Hawarden APR's decision to turn the HS25 L was to allow him to comply with the altitude restrictions as the ac was vectored downwind. Additionally, it also followed the direction of turn of the KEGUN hold, although any hold at KEGUN would need to be co-ordinated with PC, as well as Liverpool. The Liverpool APR did not believe that Hawarden were intending to turn the HS25 straight away, expecting the controller to comply with its release and probably turn it at KEGUN. The Liverpool APR commented that if a change of its release with PC had been coordinated, the APR would have informed Hawarden accordingly. The Liverpool APR did suggest a R turn initially, as that would result in it turning away from the A319, which was positioning to the NW for Liverpool's RW09. Initially, both controllers believed that the Wallasey/IOM Sector was descending the A319 on top of the HS25, maintaining a vertical separation of 1000ft. If this had been the case, the direction of turn would not have affected the separation between the 2 ac.

At 1105:09, the Hawarden APR realised that vertical separation was not being maintained between the 2 ac; his initial reaction was to instruct the HS25 flight to expedite descent. The radar shows the HS25 descending through

FL97, 7.2nm N of the A319, which is also passing FL97. After trying, unsuccessfully, to contact Liverpool to establish the cleared level of the A319 (he still believed it was under Liverpool's control), he changed his plan. Observing that the A319 was descending quicker than the HS25, he instructed the pilot of the HS25 (1105:20) to stop its descent at FL90; he recollected that the Mode C SSR return of the ac showed it was passing FL92 at the time. The radar recordings at 1105:37 reveal that the pilot was unable to stop the ac's descent until it reached FL85. The pilot did comment that he was climbing back to FL90. By this time, the HS25 was 5nm N of the A319, which was passing FL81. At 1105:47, the Hawarden APR telephoned Liverpool to inform them that he had climbed the HS25 back to FL90. The call was taken by the Liverpool Radar Assistant, who was asked to pass the message to the controller.

At 1105:17, the Liverpool APR, also realising the potential confliction between the 2 ac, telephoned the Wallasey/IOM Sector to request them to stop the A319's descent. The Tactical Controller had just instructed the A319 flight to turn L heading 330°. The radar shows the HS25 in its L turn passing through a NW'ly heading, 6.8nm N of the A319. The HS25 is passing FL94 and the A319 FL92. Liverpool advised the Wallasey/IOM Planner that Hawarden were turning the HS25 L heading 090° and descending to 3500ft. The background of the RTF recording reveals that the Planner advised the Tactical Controller, *"You'll have to stop the descent on the (A319 company)"*. The Planner then realised that Hawarden were climbing the HS25 and made a comment off telephone to the Tactical Controller, *"They they're going to Three and a Half Three Thousand feet with that HS25 company you'll have to do avoiding action and go"*. *"Stop descent stop descent"*. The Planner then telephoned Hawarden to inform the controller of the action taken by the Wallasey/IOM Sector.

As soon as the Tactical Controller had received a read back from the pilot of the A319 of the instruction to turn L heading 330°, he instructed the flight to, *"expedite through FL60"* (NB: At the time it had been cleared to descend to FL80). The pilot replied, *"Descend Flight Level Six Zero and expediting all the way"*. Immediately afterwards avoiding action was issued (1105:35), *"A319 c/s in fact avoiding action turn left now heading Two Seven Zero degrees the traffic's in your one o'clock range five miles"*. The pilot read back the revised heading. Shortly afterwards the pilot was informed that he was clear of the traffic and was instructed to turn R heading 030°. Having resolved the confliction, the Planner coordinated with Hawarden and Liverpool the further course of action for the 2 ac. During the discussion with Hawarden, the latter controller realised (for the first time) that Scottish were working the A319 and not Liverpool. In the event, as a result of the avoiding action issued, the A319 left CAS, although the pilot was not informed, there was no observed traffic in its vicinity at the time.

(UKAB Note (2): After the HS25 arrests its descent at FL85 it commences a climb whilst the A319 continues its descent. Although lateral separation continues to decrease, vertical separation increases, the sweep at 1105:53 showing 3.4nm and 1300ft. The CPA occurs at 1106:09 as the HS25 turns through S at FL91 with the A319 1.8nm to its SW turning L through heading 310° and passing FL69 in descent.]

Discussion took place with all of the controllers concerned, about the action that should have been taken to prevent an Airprox and/or a loss of separation occurring. There is no requirement for Liverpool to control traffic to Hawarden when there are no other conflicting ac. Accordingly, there is no criticism of the Liverpool Controller for deciding not to work the HS25; however, if this had occurred, then the incident would probably not have happened. Having stated this factor, the situation could still have been resolved if coordination with the Wallasey/IOM Sector had taken place. The inbound release for the HS25 could have been agreed to allow an early turn or use of the hold at KEGUN in order to lose the height. The operational requirements for Hawarden traffic approaching KEGUN includes informing Liverpool APP and the Wallasey Sector whenever they are required to hold ac at KEGUN. Additionally, Hawarden will not vector traffic N of KEGUN, unless specifically coordinated. Notwithstanding any of the comments above, if the Wallasey/IOM Tactical had maintained 1000ft vertical separation above the HS25 as originally intended, separation would not have been lost.

Albeit, that if the current procedures had been followed, the incident would probably not have occurred, the ATC Units involved are reviewing their procedures to ascertain whether they need to be improved.

The initial factor, which led to the Airprox, was the higher than optimum level of the subject ac inbound to KEGUN. Thereafter, a number of erroneous beliefs and assumptions were made by the controllers involved. The Hawarden APR believed throughout that the Liverpool APR was controlling the A319; accordingly, when he was discussing his routeing plan for the HS25 with the Liverpool APR, he believed that coordination had been agreed to turn it L early (i.e. before its release level). He had been informed by Liverpool that the A319 would be descended 1000ft vertically above his traffic, so assumed that vertical separation would be maintained as the HS25 turned towards

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the A319. With hindsight, it is possible to understand why he may have made the assumption that the early L turn had been approved, especially when the Liverpool APR said, “*yeah that’ll be great thanks left on Zero Nine Zero’s fine*”. However, Hawarden should have realised that the Liverpool Controller was not able to change the release issued by the Wallasey/IOM Sector, without coordination with the sector. The Wallasey/IOM Tactical did not maintain vertical separation of 1000ft between the 2 ac as originally intended and descended the A319 to a level not vacated by the HS25. Consequently, it is assessed that the Hawarden APR and the Wallasey/IOM Tactical share the responsibility for this Airprox occurring. Additionally, the poor phraseology used by the Liverpool controller was considered a contributory factor. If the Liverpool APR had been more careful in the phraseology used during the coordination communication with Hawarden (i.e. when saying the L turn for the HS25 was “*fine*”), the incident may not have occurred.

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.

The comprehensive ATSI report was commended by Members, noting that the whole incident had occurred over a relatively short period of 6min. Pilot Members wondered why the HS25 crew had not expedited their descent. The A319 was 6000ft high for Liverpool so the HS25 was very high owing to the fewer track miles for Hawarden. For whatever reason, the HS25 had ended up higher than the preferred descent profile which had led to the A319 been held up following behind. The releases from ScACC had been given to Liverpool who passed the HS25 release to Hawarden as well as TI on the A319, stating that it would be descending on top. The Wallasey/IOM Tactical had then descended the HS25 to FL70 but had not given the flight any ‘level by’ restriction; such a restriction, stating the level was to be achieved by a designated fix (SLP), would have put an onus on the crew to inform the controller if they could not comply with the clearance. Notwithstanding, the clearance did include the phrase “...expedite your descent all the way down” which had elicited a slight increase in the ac’s ROD, up to 2200fpm. After the HS25 flight had been transferred to Hawarden, the A319 crew had asked for further descent. The Wallasey/IOM Tactical had assimilated the A319 crew’s “...6000ft high...” message and elected to turn the flight L 10° to create more track distance for a RW09 approach and descend it to FL80, the previously accepted level agreed with Liverpool. Members noted that the Wallasey/IOM Tactical had dispensed with vertical separation, which he was entitled to do as both the HS25 and A319 were still within his airspace and subject to releases, as he would have expected the HS25 to continue on its track until it passed FL80. However, it was clear to controller Members that the crux of the Airprox was the coordination carried out between Liverpool and Hawarden. Although there had been numerous assumptions made by all parties, the Liverpool APR had led the Hawarden APR to believe that the L turn onto 090° by the HS25 was approved when, clearly from the ATSI investigation report, it was inappropriate and beyond the remit of the Liverpool controller. This had led the Hawarden APR to turn the HS25 early and into conflict with the A319 which had caused the Airprox. Liverpool APR knew that the ScACC releases could only be amended following further coordination with the Wallasey/IOM Sector, and should have negotiated with ScACC before agreeing the turn before FL80 with Hawarden.

Fortunately, all controlling parties quickly took action when the HS25’s L turn and A319’s descent resulted in a confliction. The Hawarden APR stopped the HS25’s descent whilst the Wallasey/IOM Tactical expedited the A319’s descent to FL60. The Board agreed these two actions had quickly and effectively removed any risk of collision.

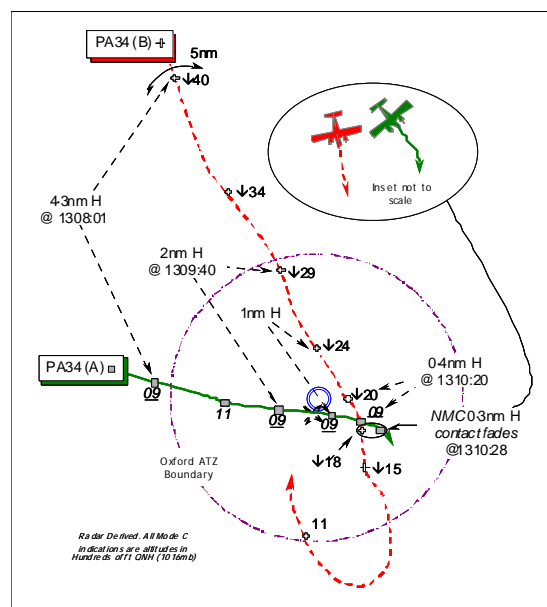
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Liverpool APR inappropriately agreed coordination with Hawarden APR, who turned the HS25 into conflict with the A319.

Degree of Risk: C.

AIRPROX REPORT NO 2010102

Date/Time: 29 Jul 2010 1310Z
Position: 5150N 00119W (Oxford/Kidlington
 RW01RHC - elev 270ft)
Airspace: Oxford ATZ (Class: G)
Reporting Ac Reported Ac
Type: PA34-200T PA34
Operator: Civ Trg Civ Pte
Alt/FL: 800ft NR
 QNH (1016mb) (N/K)
Weather: VMC VMC NR
Visibility: >10km >10km
Reported Separation:
 200ft V NR
Recorded Separation:
 >0.3nm H - see Note (2)

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE PILOT OF PA34-200T (A) reports that he was instructing a local instrument training flight at Oxford under VFR in VMC finishing with an NDB approach. The runway in use was RW01 and he was flying the published OXFORD/KIDLINGTON NDB (L)/DME 100° procedure with visual manoeuvring to the active RW. On completion of the approach, as instructed by Oxford TOWER, they were joining visually to RW01RHC - low level - at 800ft QNH (1016mb) [a height of about 530ft]. The controller had instructed them to position No2 to a Zlin on final approach but at the end of the downwind leg heading 190° at 120kt, TOWER alerted them to another ac joining the cct – another PA34 that was inside of them - and therefore to position as No3 in the pattern. Looking to their R nothing was seen until his student indicated the ac was above them, where it was seen 200ft above them, gear down and descending. No avoiding action was taken as they were visual with it and he assessed the Risk as 'low'.

His ac is coloured blue & white and the HISL was on; a squawk of A7000 was selected with Mode C.

THE PILOT OF PA34 (B) reports he was inbound to Oxford/Kidlington on an IFR flight plan from Durham Tees Valley Airport and was flying a visual approach from the NNW at 160kt. Descending to the cct pattern altitude and about to cross the runway mid-field to join RH downwind for RW01, 'the radar controller (*sic*)' [UKAB Note (1): actually the procedural APPROACH controller as there is no ASR provisioned at Oxford] drew his attention to opposite direction traffic below his ac several miles away, which he reported in sight. The controller made no mention of other general traffic in the vicinity or in particular other ac in the pattern. As he was switched to the TOWER frequency, he saw a light twin below and slightly to his L on approximately the same track and he remarked to the controller about seeing a small ac below his ac. The other ac was first seen about 500-700ft below his ac to the L, and as he had higher speed the other ac was immediately obscured by his port wing and engine nacelle. The controller's response was 'there are a lot of aircraft over Oxford not necessarily in contact with this unit'. This was a very chilling message, which he remembers very clearly. As the ac below was now invisible under his port wing and he was descending into the pattern altitude, to avoid it he made an instant decision to turn 90° to the R to join a tight RH downwind pattern. As he switched to TOWER frequency, he could hear the ADC asking another pilot – the pilot of PA34 (A) - to extend his pattern as the other Seneca was cutting inside. At this point he understood that his ac - PA34 (B) - was 'the other Seneca' and the ac he had seen was in the cct – PA34 (A). He said something like 'sorry about that' over the RT, but did not feel especially guilty as deciding on a tight pattern at this instant in time seemed the natural thing to do to avoid descending onto another ac believed to be on easterly track. Transitioning into a climb and executing a missed approach would possibly have been a better option, but he was not fully aware at this point about the boundaries of Brize Norton's CAS [just to the W].

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He added that although unfamiliar with Oxford airport, he was also unfamiliar with the practice that the radar controller (*sic*) omits to mention other landing traffic after being cleared for a visual approach. He assessed the Risk as low – medium. The ac's HISL was on.

THE OXFORD PROCEDURAL APPROACH CONTROLLER (APP) was not informed of the Airprox until a couple of days afterwards but provided a comprehensive report to the best of his recollection.

Traffic levels on APP at the time were moderate to high with PA34 (A) flying VFR on the 100° procedure, a number of other ac operating in the local area VFR, some over flights and PA34 (B). LTC pre-noted PA34 (B) leaving HON approaching the Airprox from the NNW. Upon first contact the pilot of PA34 (B) requested radar vectors to an ILS approach for RW19. The pilot was informed that Oxford is not radar equipped, that RW01RHC was in use and that the current procedure available was the 100° approach with visual manoeuvring to RW01 RHC. The pilot of PA34 (B) declined and stated he would join visually and had the field in sight. He requested the ac's range, which was 10 DME, before requesting that he report at 5 DME, to descend as required to 2500ft QNH and to expect a crosswind join for RW01RHC, which was all read back. The crosswind join had been co-ordinated with TOWER and approved by the ADC. Meanwhile, PA34 (A) already inbound on the 100° procedure had cancelled IFR and joined the cct. Basic TI was given on a couple of ac that were operating VFR out to the NW conducting general handling at various levels. When the pilot of PA34 (B) reported 5 DME field in sight, still indicating NNW, he was instructed to join crosswind at 1500ft QNH, which was read back. He advised the pilot of PA34 (B) that there were a number of ac in the cct and to contact the TOWER on 133.425MHz, which was read back by the pilot who then switched to TOWER. He was not aware that the pilot of PA34 (B) had any sort of difficulty in finding the field; visibility was good and he had reported field in sight at 10 DME.

THE OXFORD AERODROME CONTROLLER (ADC) reports that PA34 (A) was in the visual cct to RW01RHC and had called downwind. APP was working PA34 (B) inbound for a crosswind join and the controller had already commented on apparent language difficulties he was experiencing with the pilot and apparent lack of preparation for arrival at Oxford. PA34 (B)'s crosswind join was co-ordinated by APP and had been accepted with 1 ac in the cct. As is normal, the transfer of communication was to be at 5nm, and as the transfer was taking place he looked to check the position of PA34 (A) in the cct in order to give TI to the pilot of PA34 (B) when he called. From overhead the Control Tower, PA34 (B) suddenly appeared, apparently diving into the cct, straight at PA34 (A). TI was given to PA34 (A) but because of the angle of approach, apparently the instructor had not seen PA34 (B) until pointed out by his student. By this time PA34 (B) had turned inside PA34 (A) and had started to pull ahead. With language difficulty in mind, the crew of PA34 (A) was asked to reposition No2 to PA34 (B) in order to alleviate any further problems. The pilot of PA34 (B) then contacted TWR and was instructed to report final No1. Both ac landed safely without further incident.

ATSI reports that because of a problem with the recording equipment at Oxford, no RT data is available for the period of this Airprox. The Unit confirm that the problem has been rectified. Furthermore, a new recording system has been identified and replacement is now at an advanced stage. In the absence of any RTF recordings, information was taken from the controllers' recollection of events, together with reports from the pilots of the subject ac.

The Oxford unofficial 1250Z weather observation was: Surface wind 290°/10-15kt; Visibility 10km; Cloud: FEW @ 3300ft, BKN @ 4800ft; Temperature +19/+11; QNH 1016mb, QFE 1006mb. Oxford ATC is not equipped with any surveillance radar equipment.

PA34 (B) was inbound to Oxford IFR from Durham Tees Valley Airport. The flight exited CAS at HONILEY, the controller believing he had issued FL50 when the Airways Controller requested a level. On first contact, the pilot of PA34 (B) requested radar vectors to the ILS for RW19. The pilot was informed that no radar was available and the RW in use was RW01 with a right hand cct (RHC). The current procedure was the 100° approach with visual manoeuvring to RW01. The pilot then stated his intention of carrying out a visual approach and reported the airfield in sight, at a range of 10nm to the NNW. The pilot of PA34 (B) was requested to report at 5nm DME, to descend to 2500ft QNH (1016mb) and advised to expect a crosswind join for RW01RHC, which was read back. This join had been co-ordinated with the ADC. When the pilot of PA34 (B) reported at 5nm DME (still NNW of the airport), with the airport in sight, he was instructed to join crosswind at an altitude of 1500ft. This was read back correctly. The pilot was informed there were a number of ac in the cct and then transferred to the TOWER.

Meanwhile, PA34 (A) was returning to Oxford on an IRT, operating VFR, following an NDB approach and go around that was positioning into the RH cct to RW01. The pilot reported downwind with TOWER and was instructed to continue No2 to a Zlin ac.

The ADC heard APP transfer PA34 (B). The controller confirmed that it was normal for inbound ac to be transferred to the TOWER frequency at a range of 5nm. The ADC reported that, prior to the pilot of PA34 (B) contacting TOWER, he checked PA34 (A)'s cct position. As he was establishing this, he noticed PA34 (B) suddenly appearing from overhead the VCR, descending into the cct towards PA34 (A). He immediately warned the crew of PA34 (A) and instructed them to continue behind PA34 (B). By this time, PA34 (B), whose pilot was still not in contact on the TOWER frequency, had proceeded ahead of and inside PA34 (A).

The UK AIP, Page AD 2-EGTK-1-6, states the Noise Abatement procedures for Oxford. Included:

'Whenever possible aircraft joining the circuit should, subject to ATC approval, plan to join on base leg or via a straight-in approach, giving way to traffic already established in the circuit'.

Additionally, on the same page, Flight Procedures-Circuits states:

'Circuits variable. To be flown to the east of runway 01/19. To provide separation between fixed-wing and rotary-wing traffic, the circuit height for fixed-wing aircraft is 1200ft QFE'.

With no radar information, Oxford ATC relies on position reports from the pilots and DF indications. On this occasion, the ADC believed that PA34 (B) was some 5nm NNW of the airport, when he was transferred from APP. Accordingly, he checked the position of other traffic in the cct, so as to be able to inform the pilot of PA34 (B) of the cct situation on initial contact. Fortunately, he was able to observe PA34 (B) as it exited the VCR overhead and was able to warn the crew of PA34 (A) of its presence.

UKAB Note (2): The LACC System recording shows PA34 (A) approaching Oxford Airport from the W, level at an indicated altitude of 900ft QNH (1016mb); on completion of the 100° procedure the ac passes S abeam the Airport at a Radar Ground Speed (RGS) of 108kt. PA34 (B) is shown approaching the Airport in a continuous descent on a generally SSE'ly track. PA34 (B) is shown inside 5d from Oxford at 1308:01, 4.3nm N of PA34 (A). PA34 (B) descends into the ATZ at a RGS of about 190kt after crossing through the climb-out to RW01 ½nm N of the airport and descending through 2300ft QNH. At 1310:20, PA34 (A) is shown crossing through PA34 (B)'s 12 o'clock at a range of 0.4nm indicating 1100ft below the latter, before PA34 (A) commences a R turn downwind. PA34 (B) passes 0.3nm W of and inside PA34 (A) descending through 1800ft before PA34 (A) fades from coverage. Continuing on a southerly course PA34 (B) extends downwind to a range of 2.6nm from the Airport before turning in onto final approach for RW01RHC and fading from coverage

UKAB Note (3): The UK AIP at AD 2-EGTK-1 – 5 notifies the Oxford/Kidlington Aerodrome Traffic Zone (ATZ) as a circle radius 2nm centred on the midpoint of RW01/19, extending from the surface to 2000ft above the aerodrome elevation of 270ft.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authority.

The unserviceability of the Oxford RT recorders and hence the absence of an RT recording of the APP and TWR frequencies had hampered the investigation of this Airprox significantly. Controller Members were concerned that this should have occurred as usually a dual recorder system is proof against such difficulties. The Board was reassured that a new recording system was being procured. Nevertheless, without an RT transcript it was not feasible to resolve exactly what information was passed to the pilot of PA34 (B) or when he called. However, there was no reason to doubt the veracity of the accounts submitted by the controller's involved nor the report submitted by ATSI.

It was evident to the Board that the crux of this Airprox was the integration of an IFR visual approach with VFR cct traffic in a non-radar environment where APP could only provide a Procedural Service. A highly experienced GA Member believed it should have been plain to the pilot of PA34 (B) from his pre-flight planning that no radar

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services were available from Oxford and that radar vectors to the ILS were not an option. Noting that the IFR flight plan had not been cancelled, the Member opined that after refusing the offered 100° approach to circle for RW01RHC and instead electing to fly a visual approach, the pilot of PA34 (B) was obliged to set-up his visual arrival in an appropriate manner by complying with the APP controllers instructions and not by entering the cct area, fast, from above. CAT pilot Members agreed that if the pilot of PA34 (B) had done as instructed the Airprox would not have occurred.

Whilst the pilot of PA34 (B), as IFR traffic, expected to be given TI about other ac in the cct, he had reported that he was not advised that PA34 (A) was already in the pattern. This was at odds with APP's report that when the pilot of PA34 (B) reported he was at 5 DME, he was instructed to join crosswind at 1500ft QNH, that there were a number of ac in the cct and to contact TWR, which was all read back. Without a transcript it was not possible to resolve this discrepancy but it seemed to pilot Members that these instructions were plain enough and, if complied with, would have allowed sufficient time for TWR to update the cct information on PA34 (A), for the pilot of PA34 (B) to sight PA34 (A) ahead in the pattern and fit in with it. However, several controller Members disagreed. In their view APP had not done enough to integrate the arrival of the IFR PA34 (B) on his visual approach with the VFR PA34 (A) establishing downwind ahead. Although the pilot of PA34 (B) had refused the 100° procedure, APP should have done more and did not give an appropriate level of service to the IFR flight. A Member opined that APP could have insisted that the pilot of PA34 (B) execute the 100° procedure, which would have ensured the flight's safe integration. But it was evident that this was not what APP had coordinated with TWR and some controller Members did not believe that APP should have arranged PA34 (B)'s visual approach in this way.

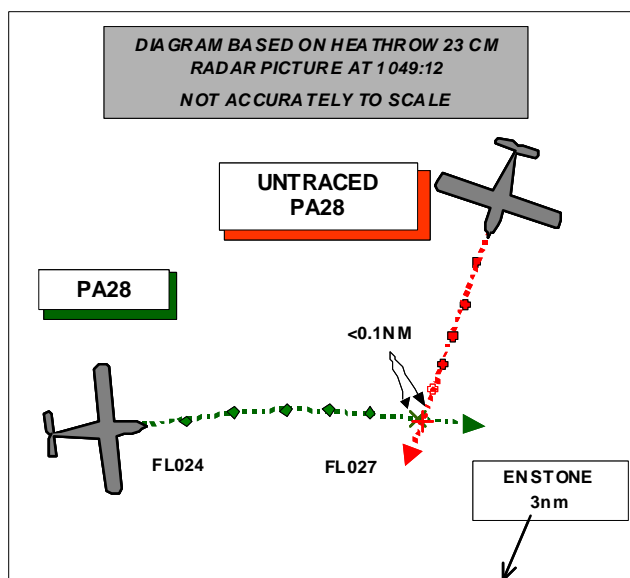
The ATSI Advisor explained that it was in order for APP to instruct the pilot of PA34 (B) to join crosswind at 1500ft QNH, clear of PA34 (A) and that is what TOWER expected. Whilst APP did not know exactly where PA34 (B) was in this non-radar environment until the pilot reported at 5DME, he instructed the pilot to call TOWER at that point and passed TI, albeit the detail of that information was not known. PA34 (B) pilot's actions were plain from his report, insofar as he was joining by descending to traffic pattern altitude whilst crossing the runway midfield to join right downwind for RWY01RHC when he saw PA34 (A) below his port wing. The radar recording shows that the pilot of PA34 (B) had flown his visual approach as he reported but this was at variance with APP's instructions. Moreover, he did not call TWR straight away it would seem; the pilot of PA34 (B) reports that as he switched to the TOWER frequency he saw the light twin - PA34 (A) - below and slightly to his L on approximately the same track. This occurred when both ac were to the SE of Oxford Airport, after PA34 (A) had crossed ahead and below PA34 (B), whose pilot therefore, could not have called TOWER when instructed at 5DME to the NNW.

TOWER had planned the cct pattern based on the co-ordination with APP and was expecting PA34 (B) crosswind for RW01RHC, level at 1500ft QNH a controller Member stressed, not descending into the cct late downwind. If the pilot of PA34 (B) had done as instructed accurate TI could have been issued on PA34 (A), visual contact by PA34 (B) confirmed and the order of landing established, or other instructions issued. PA34 (A) had little impact on the outcome. PA34 (B) entered the cct area fast, descending and still not in contact with TOWER the controller reported. This necessitated a swift adjustment of the landing order, which was communicated to the pilot of PA34 (B) as soon as he called. It was evident from the radar recording that PA34 (B) flew inside PA34 (A) descending through 1800ft QNH, still 300ft above the pattern altitude and probably about 900ft above PA34 (A) the recording suggests, although PA34 (A)'s Mode C is not evident at that point. Without the transcript it was impossible to be dogmatic about what was actually transmitted and when, but it was plain to pilot Members that this was a poorly planned and executed arrival and not in accord with the instructions given to integrate these two flights. The Board agreed therefore that this Airprox had resulted because the pilot of PA34 (B) did not comply with the APPROACH controller's instructions. However, at the distances recorded here the Members agreed unanimously that no Risk of a collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The pilot of PA34 (B) did not comply with the APPROACH controller's instructions.

Degree of Risk: C.

AIRPROX REPORT NO 2010103Date/Time: 24 Jul 2010 1049Z (Saturday)Position: 5156N 00126W
(near Enstone elev 550ft)Airspace: London FIR (Class: G)Reporting Ac Reported AcType: PA28 PA28Operator: Civ Pte NKAlt/FL: 3000ft (NR) NKWeather: VMC CAVOK NKVisibility: >10km NKReported Separation:
0ft V/100m H NKRecorded Separation:
NR V/ 0 H (see UKAB Note (2))**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE PA28 (A) PILOT reports that he planned to fly private VFR flight, with a student pilot in the RHS, from Kemble to Duxford in a blue and white ac with all lights on, squawking with Mode C. The route was initially via Northleach Roundabout VRP and then direct to Duxford. The route passed close to Little Rissington, Enstone and overhead Upper Heyford in order to keep them clear of the hazards at Croughton and Weston on the Green, then north of Henlow and to overhead Royston where the circuit joining instructions for Duxford were expected. They were in receipt of a TS from Brize Radar and had already sighted a number of contacts called to them. They also had a warning from the controller that there was a risk of late or no warning of traffic due his workload and the traffic density.

When they were in the vicinity of Enstone, heading 085° at 110kt, he conducted a routine lookout scan and then looked in to reconcile their position on the chart. While he was doing this a blue and cream PA28 flew past them, from left to right, immediately in front and apparently in a shallow descent but the incident was over too quickly to note the other ac's registration. He quickly scanned the area to make sure the ac was alone and then reported the occurrence to the Brize LARS controller.

He tried to estimate the distance by recalling his image of the ac in comparison with the size of his own ac while parked at various distances from him and he concluded that it had passed within 100m of them.

He assessed the risk as being high.

UKAB Note (1): Despite extensive procedural tracing action the 2nd ac could not be traced.

UKAB Note (2): The recording of the Clee Hill radar shows the incident. As the recording starts at 1045:30 the PA28, squawking 3710 with a Mode C readout of FL024 is tracking 080° towards the incident position. At 1045:41 a primary only contact appears manoeuvring 5nm N of Enstone, but it disappears at 1047:44 in approximately the same position. The primary then reappears at 1048:40 tracking SW towards the incident position. The CPA is at 1049:14 when the PA28 at FL027 and the primary contact are coincident. The ac cross and the primary contact departs to the SSE while the PA28 continues to the E.

HQ 1GP BM SM reports that reports from Brize LARS (RAD), the reporting pilot, a tape transcript and a radar replay were available with which to conduct the analysis; however, there are difficulties with the latter source. Firstly, the replay shows a picture that is heavily processed compared to the one that would have been available to RAD at the time of the occurrence. Consequently, it has not been possible to reconcile some pieces of TI passed by RAD to the PA28, to contacts on the replay. Furthermore, what is believed to be the reported ac

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appears as an intermittent primary only radar contact and this does not necessarily accord with what RAD may have seen.

In the build-up to the occurrence, RAD had a moderate workload and made a number of transmissions to the PA28 all passing accurate TI. At 1047:48, the TS was reduced due to high traffic density, probably due to a gliding competition around Bicester and other traffic. At the point that the reduction in service was passed, further TI was given relating to two contacts to the N that cannot be seen on the replay and also, "*further traffic left eleven o'clock five miles crossing left right no height information.*" Whilst this contact (AC2) does not appear on the replay at 1047:48, a contact can be seen on the replay in this position up to 1047:43; it is likely that this was the same ac.

A primary contact appears on the replay at 1048:39 NE of the PA28 at a range of approximately 1.6nm and, given the similarity of speeds and tracks; it is likely to be the same contact that had dropped-out at 1047:43. TI was passed at 1047:48 and seems to show AC2 cruising at around 100-120kts.

At 1049:03, the PA28 appears to turn from a track of around 080° to around 100°, onto a conflicting flight path with AC2 and at 1049:24, RAD issued a warning of manoeuvring traffic in the PA28's 12 o'clock at a range of half a mile with no height information. The PA28 pilot's response to the TI was that he was visual with the traffic and that, "*it's a glider.*" Again, this contact does not appear on the radar replay and at that point AC2 is around 0.3nms S of the PA28.

It is impossible to determine whether AC2 dropped out from RAD's Watchman display as it did with the radar replay; consequently, it is impossible to determine whether a sufficient window of opportunity existed for RAD to update the TI on AC2 passed at 1047:48. If the contact was permanently displayed on the Watchman display and given the fact that the controller does not seem to have been actively involved in another task, from the transcript it appears that there was an opportunity, in terms of time, for an update of TI to have been passed from 1048:33, at which point around 2nms lateral separation existed. However, analysis of the occurrence sequence demonstrates that RAD was providing a good level of service before and after the AIRPROX and had limited the service accordingly. Consequently, BM SM concludes that they seem to have been unable to perceive a requirement to update the TI, rather than not providing it outright. This notwithstanding, RAD did pass initial TI on AC2 in a timely manner and had made the PA28 pilot aware of the limitations of his service provision due to high traffic density, with CAP774 clearly stating the pilot's responsibilities for collision avoidance.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of PA28 (A), transcripts of the relevant RT frequencies, radar recordings and a report from the appropriate ATC authority.

Despite that the primary contact believed to be the untraced PA28 was intermittent and unpredictable, the Board was satisfied that the TI passed by Brize LARS to PA28 (A) was as comprehensive as the circumstances allowed and identified the correct ac rather than the glider mentioned in pilot's response to the call. The recording of the Clee Hill radar showed several slow moving primary contacts believed to be gliders including one that was in PA28 (A)'s 12 o'clock but at a greater range than the unidentified PA28 that was crossing from L to R just ahead. Although the pilot of PA28 (A) saw the ac later than optimum, the conflicting ac had changed direction about 40sec before the CPA onto a conflicting track that was a line of constant bearing. The pilot had also been distracted by the glider that was also in conflict. Bearing in mind these factors the Board agreed that the cause had been a late sighting by the pilot of PA28 (A) but they could not determine the part played by the pilot of the untraced PA28. Members accepted PA28 (A) pilot's estimate that there had been no vertical separation and this combined with the radar verified very close horizontal proximity led them to believe that normally accepted safety standards had been eroded.

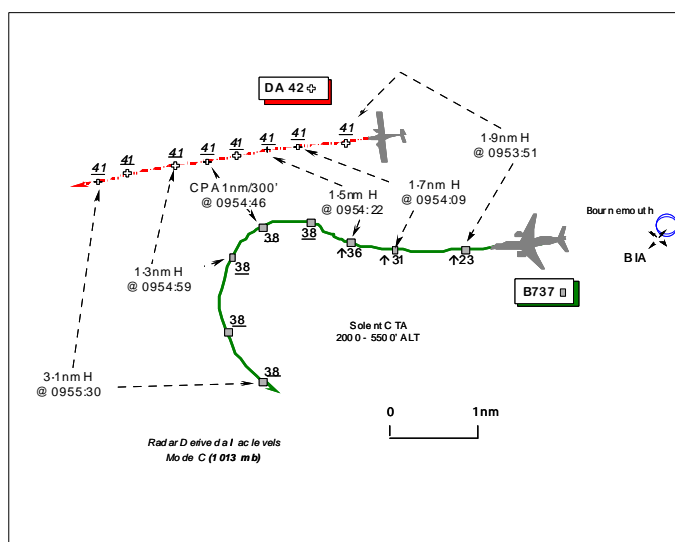
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively a non-sighting by the pilot of PA28 (A); it is not known whether or when the pilot of the untraced PA28 saw PA28 (A).

Degree of Risk: B.

AIRPROX REPORT NO 2010104

Date/Time: 10 Aug 2010 0954Z
Position: 5047N 00158W
 (5nm W of Bournemouth Airport
 elev: 38ft)
Airspace: Solent CTA (Class: D)
Reporter: Bournemouth ATC
1st Ac 2nd Ac
Type: B737-800 DA42
Operator: CAT Civ Trg
Alt/FL: 3700ft↑ 4000ft
 QNH (1011mb) QNH (1011mb)
Weather: IMC In Cloud IMC In Cloud
Visibility: Nil 500m
Reported Separation:
 300ft V/1nm H 200ft V/1nm H
Recorded Separation:
 300ft V/1nm H



CONTROLLER REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BOURNEMOUTH APPROACH RADAR CONTROLLER (RADAR) reports that the B737 was departing IFR under a RCS and released to stop climb at 3000ft Bournemouth QNH. The restriction was because of a DA42, operating IFR, holding on the BIA at 4000ft QNH to the WNW of the Airport. The DA42 had been 'locked' onto a heading of 260° and the B737 crew was instructed to fly a heading of 080°, which was queried by the B737 crew but the transmissions crossed. The B737 was then observed climbing through 3000ft, so the crew was instructed to 'stop climb now' by which time their ac was at an altitude of 3700ft. TI was passed to the B737 crew about the DA42 and the airliner was turned L onto a heading of 080°. Minimum separation was estimated to be 200-300ft/1nm; once horizontal separation was achieved the B737 was climbed to FL70.

THE B737-800 PILOT reports he was departing from RW26 at Bournemouth under IFR bound for Ibiza. They were cleared for an easterly departure climbing to an altitude of 4000ft QNH. Passing about 2000ft, IMC in cloud, they were switched to RADAR and checked in with their passing altitude and cleared altitude. RADAR then instructed them to fly a heading of 080° and they began a R turn at 165kt in line with the direction of their departure. A few seconds after commencing the R turn they spotted traffic on their TCAS display 3nm away in the direction they were turning and immediately reversed the turn and pressed ALT HOLD. They questioned the direction of the turn with RADAR who confirmed it should be a R turn and they were then told to level at 3000ft QNH. At this point they were at 3700ft and, as the ac was still levelling slowly with the other ac appearing to be close, they activated control wheel steering. They estimated from their TCAS that minimum horizontal separation was 2nm, with vertical separation of 300ft; subsequently ATC informed them that they had come within 1nm of the other ac. RADAR then instructed them to continue their L turn to a heading on 080°. He assessed the Risk as 'moderate'; neither a TA nor RA was enunciated.

THE DA42 PILOT, a flying instructor, reports he was conducting an instrument training flight, under IFR and in receipt of a RCS from Bournemouth RADAR. A squawk of A7357 was selected with Mode C; elementary Mode S is fitted.

Flying level at 4000ft QNH in the Bournemouth NDB hold for RW26 at 125kt, as they turned westbound in the hold they were instructed to maintain present heading, which they reported as 265°. A few moments later they heard the B737 crew call RADAR on frequency departing from Bournemouth stating they were climbing 4000ft. The

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controller then said to the B737 crew that their cleared altitude was 3000ft, which the B737 queried saying they had been cleared to 4000ft. ATC instructed the B737 crew to stop climb due to traffic above in the hold – his DA42 – whereupon they heard the B737 pilot state he was at 3700ft before ATC turned them S. These transmissions took only a few moments and in the meantime they maintained their heading of 265° and looked for the B737. No TCAS equipment is fitted to his DA42, therefore he waited for instructions from ATC as they did not know if the B737 was to their L or R, or beneath his ac as they were in solid IMC in cloud. No avoiding action was taken by him or issued by ATC.

In a later telephone conversation with Bournemouth ATC he was told that the B737 reached 3800ft, 1nm from his ac. He assessed the risk as 'medium'.

THE BOURNEMOUTH TOWER CONTROLLER reports that the B737 was lined up on RW26 when he received the release from RADAR, which was to stop climb at 3000ft QNH. As he wrote this down on the fps he was distracted by a call from the Airfield Ops vehicle about a fox that was approaching the RW. Instructing the Airfield Ops vehicle driver to enter the RW to remove the fox, he informed the B737 crew about this and a possible delay. Once the fox had been removed and the Airfield Ops vehicle had vacated the RW he looked at the B737's fps, saw the '3A' restriction that he thought he had passed and cleared the flight for take-off. As the B737 climbed through 1000ft he informed the crew that they might detect an ac holding at 4000ft on their TCAS and transferred the flight to RADAR. The B737 pilot read back the frequency and acknowledged the TI on the ac in the hold. It was not until a minute or so later that he became aware of what had actually occurred.

ATSI reports that the Airprox occurred within Class D CAS, 5nm W of Bournemouth Airport. Both flights were in receipt of a RCS from Bournemouth RADAR. Staffing levels were considered normal with AIR and GROUND combined as Bournemouth TOWER. The TOWER controller reported traffic levels as being 'medium' and had been in position for 50min before the Airprox occurred. Although not feeling 100%, the RADAR controller considered that she was nevertheless fit for duty and commenced work just before the incident occurred. RADAR reported traffic levels as medium, with a number of ac on frequency.

The Bournemouth 0950UTC weather was: surface wind 250/06kt; Visibility >10km; Cloud, FEW010 SCT034; QNH 1011mb.

The Bournemouth MATS Part 2, Section 1, Chapter 5, page 1, paragraph 1.5.3, Noise Abatement Procedure for Runway 26, states:

'Climb on runway QDM to 0.6 DME then track 270 deg Mag to 3.5 DME, to be no lower than altitude 2000ft before any further turn.'

Bournemouth MATS Part 2, Section 3, Chapter 2, page 4, paragraph 3.2.10, Turns after Departure, states:

'The direction of turn must be specified with the take-off clearance to all aircraft. In the case of aircraft subject to the Noise Abatement Procedure, the phrase "after noise abatement" must be included with the direction of turn instruction if any doubt exists that the preferential noise route would not be followed.'

Bournemouth MATS Part 2, Section 4, Chapter 2, page 2, paragraph 4.2.3, Departure Routes, states:

'All departures will comply with the published Preferential Noise Routes (PNR) and may only vary to suit ATC safety requirements. Airway Clearances will be referred to as "Standard" between APS & GMC/Air.' Standard Clearance Eastbound is stated as 'SAM-GWC'.

The BIA NDB (L) is located on the airport, with a holding pattern to the NW that comprises a 1 minute racetrack pattern, with an inbound track of 078°, turning L at the BIA NDB (L) and flying an outbound track of 258°. The unit had recently made a recommendation that controllers consider the need to vector holding traffic away from the BIA hold in order to facilitate continuous climb for commercial jet departures.

The DA42 had departed from RW26, 20min before the Airprox and been cleared by RADAR to take up the hold at the BIA NDB (L) at an altitude of 4000ft. The DA42 crew requested two holds followed by an NDB procedure.

At 0935:24, the B737 crew called TOWER, “..[B737 C/S] *stand 5 QNH 1-0-1-2 request clearance to Ibiza.*” TOWER replied, “[B737 C/S] *Bournemouth Tower standard departure clear Ibiza routeing SAM Goodwood 4 thousand feet squawk 7-7-1-7*”, which was acknowledged correctly. The B737 crew was given taxi clearance for RW26 at 0947:51.

Bournemouth MATS Part 2, Section 1, Chapter 17, page 2, paragraph 1.17.3, states:

‘All departing IFR/SVFR traffic is subject to a "Check Before Release (CBR)" from APS (Approach Procedural Surveillance)[RADAR]. This has the added advantage of alerting APS to the aircraft's imminent departure and an up-to-the-minute departure clearance can be issued.’

At 0948:23, the B737 crew was given line up clearance for RW26 that was correctly acknowledged. In response to a request from TOWER, the B737 was released by RADAR with a climb restriction of not above 3000ft ALT, due to traffic in the hold at 4000ft ALT. TOWER correctly annotated the departure restriction on the B737's fps, however, at 0950:45 the Airfield Ops vehicle driver called, “*Bournemouth Tower Safety 1 I have got a fox heading towards the runway.*” TOWER instructed the vehicle to enter the runway and advised the B737 crew, “*...there's a fox just coming up to the runway gonna clear him before we..let you go*”. During the period that the runway was obstructed, the controller reported that there was a certain amount of discussion regarding the fox. This break in the sequence of events caused a distraction. When the Airfield Ops driver called vacating the runway at 0951:54, the local departure climb restriction of 3000ft had not been passed to the B737 crew. At 0952:13, the B737 was given take off clearance, “[B737 C/S] *after noise right turn clear take off wind 2-5-0 degrees 5 knots*”. For IFR traffic departing Eastbound from RW26, a R turn is standard but the B737 crew's clearance and climb to 4000ft had not been amended. The B737 departed at 0953 and when safely airborne, TOWER passed TI to the crew, “[B737 C/S] *there's traffic in the hold at 4 thousand feet which you may pick up on your TCAS contact radar 1-1-9 decimal 4-7-5...*”. The B737 pilot replied, “*Yes have it on TCAS...1-1-9-4-7-5 [C/S]*”. TOWER subsequently stated that the B737 had been cleared for departure, in the belief that the local restriction of 3000ft had been passed. It was only after the Airprox, that the controller realised the fps and climb restriction had not been ticked to indicate the correct passing and read-back of the clearance.

Meanwhile at 0951:25, the DA42 crew established in the hold reported ready for an approach, so RADAR instructed them to maintain 4000ft QNH and to report beacon outbound. As the B737 took-off the radar recording shows the DA42 in the hold, 2nm NW of the airport, tracking W. Rather than allow the DA42 to turn back towards the overhead with a loss of radar contact, RADAR decided to change the plan by letting the DA42 continue W, which would keep it within good radar coverage and allow the B737 to make a R turn behind the DA42, facilitating an early climb from 3000ft. The DA42 crew was instructed, “*..change of plan continue present heading report your heading*”, which was 265°; RADAR then advised, “[DA42 C/S] *roger continue on that heading until advised there's gonna be traffic departing and he'll climb through your level.*”

MATS Part 2, Section 3, Chapter 1, Page 16, paragraph 20.7, states:

‘Pilots of all aircraft flying instrument departures are required, on first contact, to inform the approach/approach radar controller of their callsign, SID designator (if appropriate), current or passing level and their cleared level. If the SID involves a stepped climb profile then the initial altitude/flight level to which the aircraft is climbing will be given. If the pilot does not provide the cleared level then controllers shall, without delay, either confirm that the crew are climbing to the correct initial level or clear the aircraft to climb to a higher altitude or flight level.’

At 0953:50, the B737 crew called RADAR, “*...good morning [B737 C/S] passing altitude 2 thousand 4 hundred climbing altitude 4 thousand on an easterly departure*”. The B737's fps did not indicate that verification of the Mode C had been completed and the controller reported she had not heard the pilot's report, “*..passing altitude 2 thousand 4 hundred climbing altitude 4 thousand..*”. The controller believed that this was due to the workload and distraction in dealing with another ac, but could not recall the precise details of any coordination or conversations at the point when she missed hearing the report. The RADAR frequency was quiet during the minute prior to the first call from the B737. Telephone transcription was not available at the time of the investigation and it was not therefore possible to establish a precise reason for the reported distraction. [UKAB Note (1): Despite the absence of a landline transcript, the TOWER and RADAR controllers concurred that the landline co-ordination conversation relating to the 3000ft climb-out restriction for the B737 had actually taken place.]

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After the initial call was received from the B737 crew, RADAR replied, "[B737 C/S] Bournemouth RADAR good afternoon fly heading 0-8-0 degrees". A direction of turn was not specified by RADAR but had been passed previously by TOWER. The B737 was now climbing to 4000ft and the crew was aware of the DA42 in the hold at 4000ft. This prompted the B737 pilot to question the R turn towards the DA42, "right turn heading 0-8-0 degrees [B737 C/S]..is that a right turn can you confirm we have traffic on the TCAS around that area". At 0954:11, RADAR responded, "...you're maintaining altitude 3 thousand feet and right turn on to a heading of 0-8-6", and, "just confirm you're maintaining 3 thousand feet". (It was noted the controller specified 086° instead of 080°). At this point the NATS radar replay shows the B737 indicating 3100ft (1013mb) – equating to an altitude of 3040ft QNH (1011mb). This would have shown as 'A30' on RADAR's display. The B737 crew advised, "Negative we're not we're climbing altitude 4 thousand feet and we're turning back round again". At 0954:22, RADAR instructed the B737 crew, "roger stop your climb now"; the radar recording shows the two ac on parallel tracks with the B737 commencing a R turn indicating 3600ft (1013mb) – about 3540ft Bournemouth QNH – with the DA42 1.8nm NW of the B737, indicating 4100ft (1013mb) – about 4040ft QNH.

At 0954:23, the B737 crew reported that the climb had been stopped at 3800ft ALT and RADAR passed TI, "[B737 C/S] roger traffic information in your 11 o'clock now range of 1 mile maintaining 4 thousand feet in the hold is..a D-A 42". The B737 pilot responded, "Okay we're taking up runway heading again is that..good for you." RADAR advised "That's fine if you continue on the left turn now on to a heading of 0-8-0 degrees that turn will take you away". This was acknowledged by the B737 pilot at 0954:47. At this point the radar recording shows the minimum spacing between the 2 ac is 1nm and 300ft with the B737 turning L. RADAR then passed TI to the DA42 crew, "...traffic information for you a mile south of you 3 thousand 7 hundred feet maintaining that altitude on to an easterly heading is a 7-3-7", which was acknowledged. Once separation was re-established the B737 crew was climbed to FL70.

RADAR could not recall hearing the B737 pilot's level report of passing 2400ft for 4000ft and believed that this may have been due to the workload at the time. When questioned about the proximity of the 2 ac and the consideration of avoiding action, RADAR reported that the realisation of the situation came as a shock and having given a L turn to resolve the situation, considered this to be an avoiding action turn. The controller recognised that the correct phraseology was not used, but commented that this was probably due to the speed of events occurring and unexpected circumstances of the situation.

TOWER did not ensure that the 'standard clearance' was amended to include the climb-out restriction of 3000ft and did not check the fps to ensure that the amendment had been passed. The TOWER controller did pass TI about the DA42 in the hold, which aided the B737 crew's SA and alerted them to the position of the DA42 on TCAS. It was evident that the delay to the B737's departure caused by the fox, together with discussion amongst the VCR staff caused a distraction. This delay and distraction broke the natural sequence of events and interrupted TOWER's normal thought process. When the Airfield Ops vehicle reported clear of the runway, the controller resumed operations, wrongly considering that the climb restriction had already been passed and without the appropriate check of the ac's fps. Consequently, TOWER allowed the B737 to climb unrestricted to 4000ft, the level occupied by the DA42, resulting in a loss of separation.

Once the B737 was airborne and transferred to RADAR, the pilot's first transmission, correctly included the 'level reporting', with passing level and cleared level should have alerted the RADAR controller to the TOWER controller's error; however, the 'level reporting' was not heard. It was not possible to establish what caused the controller to miss the level reports, but the controller considered that it was due to workload and this is supported by the fact that RADAR had not marked the fps to signify that verification of Mode C had been achieved. The opportunity to detect and correct the error was therefore missed and this was considered by ATSI to have been a contributory factor.

With the B737 now climbing to 4000ft and the crew having been made aware of the DA42 in the hold also at 4000ft, the B737 pilot questioned the R turn towards the DA42. The RADAR controller, in the expectation that the B737 was levelling at altitude 3000ft, initially confirmed the R turn was correct. This belief was reinforced when at the time the B737 pilot queried the heading, but the controller's radar display will have shown the B737 climbing through 3000ft ALT. However the pilot reported that the B737 was in fact climbing to 4000ft and the RADAR controller immediately instructed the pilot to 'stop the climb', followed by a L turn to resolve the conflict. The term 'avoiding action' was not used. The RADAR controller reported that the continued climb of the B737 had been unexpected and she was surprised and shocked when the realisation of the situation became clear.

Subsequent to this Airprox, ATSI made a number of recommendations that:

- a. In addition to the Unit's review of the current procedures for amending a standard clearance before departure, that the unit ensure, whenever possible, these are passed before a departing ac is given clearance to line up.
- b. The Unit include, as part of their Training in Unusual Circumstances and Emergencies (TRUCE) programme, unusual events or circumstances that cause a period of delay or break in operations, with a view to ensuring that controllers pause to complete a situational check, before resuming normal operations.
- c. Unit controllers are reminded of the importance of ensuring that distractions in the operational room do not result in a lack of attention or lapse. (MATS Pt1, Section 8, Chapter 2, page, paragraph 5.3 refers.)
- d. Unit controllers are reminded of the importance of ensuring that the 'level reporting' of departing ac is used to verify the aircraft Mode C, and the cleared level, as soon as possible after departure.
- e. Unit controllers are reminded of the requirement to use the correct phraseology, when issuing 'avoiding action' in accordance with ATISIN 141.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was plain that the 3000ft climb-out restriction was not passed by TOWER to the B737 crew before they took-off. Although it had been written on the strip, the appropriate check mark was absent from the ac's fps, which should have alerted the controller to his omission if checked before he issued the take-off clearance. Controller Members recognised that TOWER had been distracted at a critical moment; the effectiveness of noting such restrictions on the fps with a check before clearing the flight to depart was not in doubt and if the controller had followed this simple procedure this Airprox could have been averted. This was a good example of what can go wrong when normal sequences are interrupted and the catalyst for the conflict with the DA42.

A controller Member suggested simply monitoring the TOWER frequency might have revealed the controller's error to RADAR, but not all Airports operate in this manner. At military aerodromes, a controller Member opined, the ATC SUPERVISOR might well have been monitoring what was happening and intervened. Nevertheless, it was apparent that RADAR had not assimilated what the B737 crew had said when they checked-in and reported, *"..passing altitude 2 thousand 4 hundred climbing altitude 4 thousand.."* and contrary to the restriction passed by RADAR to TOWER. In the absence of any Mode S derived selected level information being displayed to RADAR, the read-back from the B737 crew of their cleared altitude provided an opportunity for RADAR to forestall this Airprox, but it was missed. A CAT pilot Member believed that this was fundamentally part of the Cause; whilst there was general accord that it was certainly contributory to the outcome and a lost opportunity, the overwhelming view amongst the Members was that the fundamental Cause was TOWER's omission to pass the restriction in the first instance. The Board agreed, therefore, that the Cause of this Airprox was that TOWER did not pass the altitude restriction to the B737 crew resulting in a conflict with the DA42. Furthermore, it was agreed that a Contributory Factor was that RADAR did not assimilate the B737 crew's cleared level report on first contact.

Turning to the inherent Risk, when the B737 crew 'checked-in' with RADAR at 0953:50, the two ac were a little under 2nm apart but, forewarned by TOWER, the B737 pilots had subsequently spotted the DA42 on their TCAS and queried the situation with RADAR. A controller Member commended TOWER for wisely passing TI about the DA42 in the hold at 4000ft. This sound practice had ensured that the B737 crew were primed to look out for the other ac when they departed and, in his view, had ameliorated the Risk significantly. At this point it was the direction of turn not their cleared altitude that was at issue. Even when RADAR queried, just after 0954:11, *"just confirm you're maintaining 3 thousand feet"*, the controller would not have realised what was happening as the B737's Mode C would not have shown any excursion above 3000ft QNH at that stage with 'A30' on RADAR's display. So it was a full 30sec after their first call before RADAR realised what was happening and instructed the B737 crew to stop their climb. The B737 crew demonstrated sound appreciation here as they turned back onto the RW heading and then to the L following RADAR's revised instructions. The B737 crew's prompt response to the stop climb enabled them to level their ac 300ft below the DA42 that was still over 1nm away. The Board recognised that although the DA42 crew were cognisant of what was happening they had no impact on the

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outcome as they maintained their heading while the B737 crew promptly reversed into a L turn and passed no less than 1nm away, thereby averting any need for the B737's TCAS to intercede. This led Members to agree, unanimously, that no Risk of a collision had existed in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

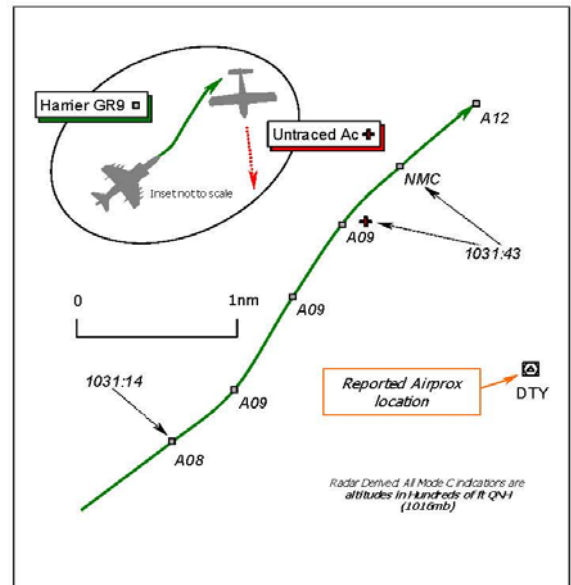
Cause: TOWER did not pass the altitude restriction to the B737 crew resulting in a conflict with the DA42.

Degree of Risk: C.

Contributory Factors: RADAR did not assimilate the B737 crew's cleared level report on first contact.

AIRPROX REPORT NO 2010105

Date/Time: 9 Aug 2010 1031Z
Position: 5012N 00110W
 (1½nm NW of Daventry)
Airspace: UK DLFS (Class: G)
Reporting Ac Reported Ac
Type: Harrier GR9 Untraced Ac
Operator: HQ Air (Ops) NK
Alt/FL: 340ft NK
 agl
Weather: VMC CLOC NK
Visibility: 30km NK
Reported Separation:
 ¼nm H NK
Recorded Separation:
 Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BAe HARRIER GR9 PILOT reports he was on the final leg of a low-level training flight from Wittering. He was not in receipt of an ATS; a squawk of A7001 was selected with Mode C. Neither TCAS nor Mode S is fitted.

In the vicinity of Daventry at 340ft agl, flying a NE'y course at 420kt a small high wing Cessna-type white coloured light ac (LA) was spotted in his 12o'clock about ½nm away crossing from L – R, slightly low, flying straight and level. To avoid the LA, he pulled 5G and climbed to the L as the LA passed about ¼nm away to starboard with a 'high' Risk of collision. He opined that his Harrier would have collided with the LA 2-3sec later if he had not taken avoiding action, adding that with the Sun behind him coupled with a low workload he had the best chance of spotting the LA, but 'it was still a late spot'.

LATCC (Mil) RADAR ANALYSIS CELL reports that the absence of radar data on the reported LA has inhibited tracing action. Despite checking the movements logs of numerous aviation facilities in the vicinity of the Airprox location and following several leads, all enquiries proved fruitless. Consequently, the identity of the reported white high-wing monoplane remains unknown.

UKAB Note (1): The LATCC (Mil) Radar recording shows the Harrier approaching the reported Airprox location at the time given, but no other radar contacts are evident in the vicinity. Just after 1031:14, when the Harrier indicated an altitude of 800ft unverified Mode C (1016mb), a climb to 900ft ALT and L turn are evident. As the Harrier passes abeam DAVENTRY VOR at 1031:43, a single solitary primary contact is shown directly astern of the Harrier, which might be the reported LA. Thereafter on the next return the Harrier displays 1200ft ALT Mode C, indicative of an avoiding action climb. No further radar returns are evident in the vicinity that might be associated with the reported LA.

HQ AIR (OPS) comments that this was a timely visual pick up by the Harrier pilot who took effective avoiding action. The use of a CWS may have reduced the risk by increasing the situational awareness of both pilots. Sadly the Harrier is not equipped and the LA was not squawking.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the Harrier pilot, radar video recordings and comment from the appropriate operating authority.

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It was unusual to encounter a civilian powered ac in this height range – below 500ft and therefore potentially operating contrary to the Rules of the Air, a GA Member pointed-out - unless it was landing or taking-off, but no other ac had been identified in this locality during the search for the reported ac. Members understood that the paucity of radar data on the reported LA had not helped here and there were no further clues to its identity. Without the LA pilot's report, the Board could only assess this Airprox on the basis of the Harrier pilot's account coupled with the radar data on his ac. Therefore, it was most unfortunate that the reported pilot's perspective on this encounter in Class G airspace was not available.

Sighting the LA at a range of ½nm crossing ahead, the Harrier pilot suggested frankly that he had seen it at a late stage. The Board accepted that a white LA with a small frontal cross-sectional area is difficult to spot at the same height, but without knowledge of the actual size or type of the reported ac pilot Members recognised that the Harrier pilot might well have seen it as soon as was practically feasible, which argued somewhat against a late sighting on his part. It was suggested that the Harrier pilot's robust 5G avoiding action climb, coupled with the L turn, enabled him to avoid the LA as best he could and was effective in preserving horizontal separation of about ¼nm clear astern. With these few facts, the Board could only conclude that this Airprox had been the result of a conflict in Class G airspace resolved by the Harrier pilot. Furthermore, with sufficient time to engineer vertical and horizontal separation, Members agreed unanimously that, on the evidence available, there was no actual Risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT NO 2010107

Date/Time: 12 Aug 2010 1401Z

Position: 5140N 00014W
(3nm E Elstree - elev 332ft)

Airspace: Lon FIR (Class: G)

Reporting Ac Reported Ac

Type: C150 PA46

Operator: Civ Pte Civ Pte

Alt/FL: 1300ft ↓ NR
(QFE 1003mb) (NK)

Weather: VMC CLBC VMC NK

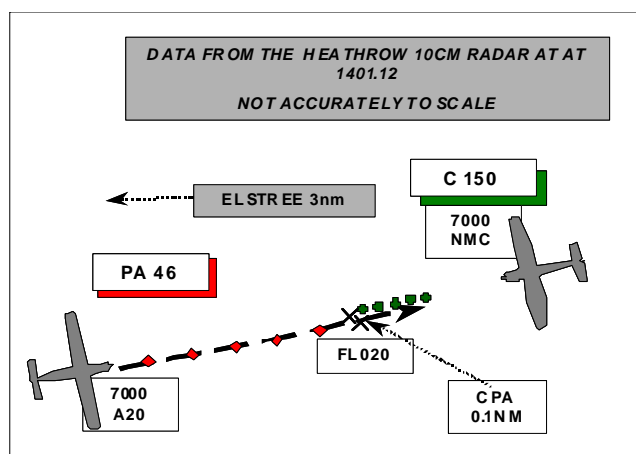
Visibility: 5nm NR

Reported Separation:

100-150ft V/100m H NK

Recorded Separation:

NR V/0.1nm H (See
UKAB Note: (1))

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE C150 PILOT reports flying a red white and blue ac with the tail HISL switched on, on a local private flight in communication with Elstree Information and squawking 7000, but Modes C and S were not fitted. He was heading 260° at 75kt, passing 4nm descending on the approach to RW26, having called at the Golf Course VRP, with patches of rain not affecting forward visibility to the N. He was concentrating on maintaining a stable approach when he became aware of a Piper Malibu, or similar type, flying straight and level on a reciprocal track slightly above and to the left of his track. Its landing light and white wingtip lights considerably aided his visual acquisition against the dark grey sky. He was perhaps too surprised to take avoiding action, though it was obvious that the ac would pass clear above and to the left, though as both ac maintained their respective courses, it would be very close.

He reported the reciprocal traffic to Elstree Information but initially heard no response from Elstree or the other pilot; later the FISO asked him for the height of encounter, which he estimated as being 1300ft QFE and at three miles (before the Tall Building VRP). The FISO informed him that he was in contact with a PA46, passing eastbound routing from Bournemouth to North Weald above the airfield cleared not below, 2000ft. Until entering the Elstree cct at Kings Langley, he had been squawking 5030 while in receipt of a BS from Farnborough North on the Regional QNH of 1017mb.

He assessed the risk as being Medium.

THE PA46 PILOT reports flying a new ac delivery flight from Bournemouth to North Weald under VFR in receipt of a BS from Elstree Squawking with Modes C and S.

He was not aware of any other ac in the Elstree area.

The FISO and ATSI did not comment

UKAB Note (1): The incident shows clearly on several radars. The Heathrow 10cm recording shows the PA46 squawking 7000 with Mode C and S approaching the incident area from the W tracking about 085° at an Alt of 2000ft (QNH 1017mb). The C150 squawking 7000 with no Mode C data displayed is initially tracking about 140° before turning right onto S initially then further right onto the centreline for RW26 at 1400:50 tracking towards the PA46. The CPA is at 1401:11 with the C150 less than 0.1nm N of the PA46, which is still indicating 2000ft amsl (as it does throughout the period). If the C150 was at 1300ft QFE as the pilot reported this equates to 1630ft amsl indicating the calculated vertical separation was of the order of 370ft.

AIRPROX REPORT No 2010107

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that both ac had been in receipt of a BS from Elstree at least for part of the incident period but, in the absence of a timed RT transcript, they assumed that neither pilot was aware of each other's presence from hearing one another's transmissions on the RT. Further, it appeared that despite being on opposing tracks, neither pilot had been given information by the FISO regarding one another; although he was not required to do so, one civil controller Member suggested that, in these circumstances it would have been good practice to do so.

The incident took place in an area of slightly reduced VMC conditions in Class G airspace where 'see and avoid' pertains. Despite the conditions the C150 pilot had first seen the PA46's lighting 600m away. Notwithstanding that he was surprised by its presence, he opted not to take any avoidance, indicating to Members that despite having time to react he considered that no risk of collision existed. The Board thought that the PA46 (solo) pilot had not seen the C150 possibly because it was obscured slightly below the nose of his ac.

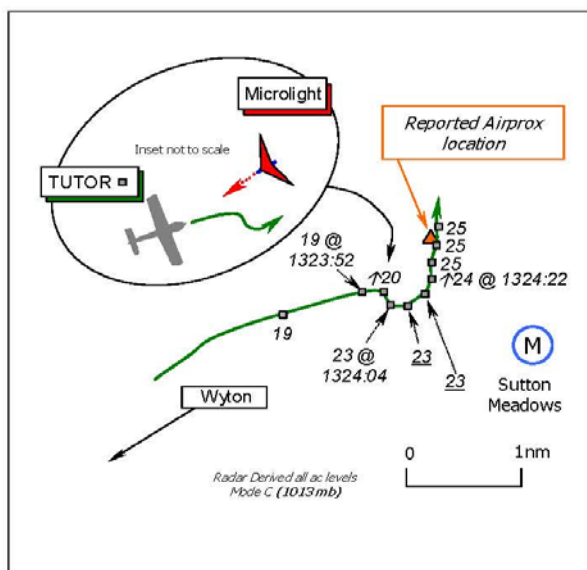
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the PA46 pilot and a late sighting by the C150 pilot.

Degree of Risk: C.

AIRPROX REPORT NO 2010108

Date/Time: 18 Aug 2010 1324Z
Position: 5224N 00001E
 (5½nm NE of Wyton - elev 135ft)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Grob Tutor II Unk Microlight
Operator: HQ Air (Trg) NK
Alt/FL: 2000ft NK
 RPS (1002mb)
Weather: VMC CLBC NK
Visibility: >10km
Reported Separation:
 50ft V/150m
Recorded Separation:
 Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GROB TUTOR II PILOT reports he was conducting a local VFR instructional sortie from Wyton and was in receipt of a BS from Wyton APP on 134.05MHz. A squawk of A7000 was selected with Mode C on; elementary Mode S is fitted but the aeroplane is not equipped with TCAS.

Flying in a level cruise at 2000ft Chatham RPS (1002mb) [he reported 1500ft on the RT] some 4000ft clear below cloud, approaching a position about 6nm NE of Wyton heading 060° at 100kt, a red flex-wing microlight was spotted at 11 o'clock about 300m away some 50ft below his aeroplane. The microlight was virtually head-on with a 'low profile', appearing in his field of view from below the horizon. To avoid it he executed a 3½G break to the R. The microlight passed about 150m to port and 50ft below his aeroplane with a 'moderate' Risk of collision. After breaking R, he reversed his turn to re-establish visual contact but the microlight did not appear to manoeuvre at any point and its pilot may not have seen his aeroplane. He reported the Airprox to Wyton APP on RT, and followed this up with a telephone report after landing.

His aeroplane is coloured white and the HISL was on.

LATCC (Mil) RADAR ANALYSIS CELL (RAC) reports that the position of the Airprox was reported as 1¼nm NW of Sutton Meadows Microlight Site. Following several conversations with the CFI, and despite some conflicting advice, it was ascertained that none of the pilots airborne from Sutton Meadows saw a Grob Tutor at all during their flights. Therefore, the search area was expanded to include, amongst others: Alconbury, Chatteris, Deenethorpe, Boston, Halton, Hunsdon, Ridgewell, Brooklands, Peterborough/Conington, Wingland, Sandy and Northampton/Sywell. During the course of tracing action some 15 microlight sites in the area were contacted whilst attempting to identify the reported microlight pilot, but all proved fruitless. Consequently, the reported microlight pilot remains untraced.

THE WYTON APPROACH CONTROLLER (APP) confirmed that he was providing a BS to the Grob pilot. Furthermore, he provided the detail of the Airprox report transmitted to him on RT by the Grob Tutor pilot. As this detail is contained within the pilot's account, in the interests of brevity, it is not repeated here. The actual Wyton weather was reported to be: visibility of 30km with cloud, FEW at 3500ft.

ATSI had nothing further to add.

UKAB Note (1): This Airprox is not shown on LATCC (Mil) radar recordings as the reported microlight is not evident at all. Only the Grob Tutor is shown squawking A7000 on a broadly ENE'ly course indicating 1900ft Mode C (1013mb) - equating to about 1570ft Chatham RPS (1002mb) - as it approaches the reported Airprox location. The

AIRPROX REPORT No 2010108

Airprox is presumed to have occurred just after 1323:52, when a tight R turn is evident as the Grob climbs through 2000ft Mode C, levelling initially at 2300ft (about 1970ft RPS) - in conformity with the reported avoiding action R break - before turning L onto a northerly track. A further climb is then evident to 2500ft Mode C.

HQ AIR (TRG) comments that this was an alarming incident for the Tutor pilot and was actioned and reported correctly. It serves as a reminder that despite every effort being taken to reduce collision risks through an appropriate ATS, threats will remain - particularly from small and hard to see ac. The importance of an effective lookout scan is paramount and should always be afforded an appropriate degree of effort and emphasis.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the Grob Tutor pilot, a transcript of the relevant RT frequency, radar video recordings, a report from the air traffic controller and comment from the appropriate operating authority.

It was evident to the Members that the RAC had expended considerable effort to identify the reported microlight, but all to no avail. Without the microlight pilot's report and in the absence of any radar data on the microlight, the Board could only assess this Airprox on the details contained in the Grob Tutor pilot's account, coupled with the radar plot available on his aeroplane. Therefore, it was most unfortunate that the reported pilot's viewpoint on this Airprox was not available to provide further insight into this close quarters encounter in Class G airspace.

The Board was well acquainted with the difficulties of sighting small ac such as the red flex-wing microlight reported here. The small frontal cross-sectional area, especially when viewed virtually head-on makes these ac very difficult to spot when they appear from below the horizon at a similar height. However, the Grob pilot had seen the flex-wing in his 11 o'clock at a range of about 300m, some 50ft below his aeroplane, and had taken robust avoiding action, which enabled him to maintain 150m separation from the flex-wing, and argued against a late sighting on his part. Although it seemed that none of those airborne from Sutton Meadows had been involved, a Member questioned whether the Grob pilot had flown too close to the Microlight Site that was about 1¼nm to the SE of the Airprox location. Pilot Members agreed it was only the Grob pilot's robust 3½G break to the R to avoid the microlight to port that had taken his aeroplane legitimately closer to Sutton Meadows than his original track, which in the Board's view was taking the Grob sufficiently clear to the NW. Moreover the Grob pilot had not loitered unnecessarily and had turned N without delay, whilst keeping careful watch on the microlight and climbing further above 2000ft RPS the radar recording revealed, thereby exiting the area expeditiously. With the limited information available, the Board could only conclude that this Airprox had been the result of a conflict in Class G airspace resolved by the Grob Tutor pilot.

Turning to the inherent Risk, some Members contended that with horizontal separation halved from the 300m at first sighting down to 150m, coupled with the Grob pilots robust 3½G break, safety had not been assured. However, other Members were of the view that whilst this might be less than ideal, the Grob pilot had seen the slower microlight in sufficient time to take appropriate action in his nimble aeroplane to remain as far away from it as he could. The Board seemed fairly evenly divided over this point and so the Chairman called for a vote. By a majority verdict, the Board concluded that there was no actual Risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT NO 2010109

Date/Time: 18 Aug 2010 1920Z

Position: 5140N 00104W (4nm N Benson)

Airspace: Benson MATZ (Class: G)

Reporting Ac Reported Ac

Type: Puma NK

Operator: HQ JHC NK

Due to the dynamic situation and the light ac frequently dropping below radar cover, a diagram is not possible

Alt/FL: 1200ft NK
(QFE 1000mb)

Weather: VMC CLBC NK

Visibility: 30km NK

Reported Separation:

300ft V/0m H NK

Recorded Separation:

NR

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PUMA PILOT reports that he was conducting an instrument recovery to RAF Benson following a local-area training sortie and was squawking 3617 with Mode C. They had climbed to above the Safety Alt, were remaining VMC below the cloud base due to the absence of an IF option since there were CBs reported. During the hold for the VOR-ILS/DME procedure for RW19 at Benson, the crew had been given a TS [by APP] and were visual with an ac, reported by ATC, conducting aerobatics about 1000ft below and 3nm away, but clear of the approach lane.

Following the hold the crew continued outbound with the procedure then turned onto the final approach for RW19 heading 190° at 100kt. When established on the localiser established the pilot began a descent on the glideslope and agreed a TS from Talkdown (PAR). Although VMC, the handling pilot was simulated IF and 'eyes in' flying the ILS. At 4nm on the approach, the Talkdown Controller warned the crew of traffic in their 1 o'clock at ½nm in a rapid climb and on looking up, the HP immediately saw the ac as it climbed vertically from below to above them. Both pilots were by then visual with the ac, which was conducting aerobatics, but the HP elected to hold course until after the ac's manoeuvre so that he could determine the direction that the ac would fly. Following what appeared to be a stall-turn or flick manoeuvre (the ac appeared to have zero velocity at the top of the climb), it began a rapid descent, moving right to left, towards them [still on the approach]. The HP called evasive action to the crew and initially banked left but as it became clear that the two ac were on converging tracks, he reversed the manoeuvre by breaking right, to pass beneath the other ac.

The crew estimated that the ac came within 300ft on a converging track while it was conducting high-energy manoeuvres before climbing away and departing to the E.

The crew then resumed the approach, landing at Benson without further incident.

They assessed the risk as being high.

The other ac was reported as being a low-wing dark coloured monoplane.

The PAR Controller provided a report but for brevity has not been included as it is summarised well below.

MIL ACC reports that while the radar replay does not start early enough to verify that the TI provided by Benson APP to the Puma referred to the reported ac, in a subsequent conversation APP has stated that this was the case. Furthermore, while the submitted tape transcript does not extend to cover the end sequence of the occurrence as the Puma avoided the reported ac, RAF Benson has confirmed after listening to the tape, that there are no further transmissions on the PAR frequency, other than those normal for ILS monitoring.

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Although it does not appear on the tape transcript, given that the tapes were only originally impounded to cover the period immediately before the Airprox, APP reported in a subsequent conversation that what he believed to have been the pilot of the reported ac, called on the RT around an hour before the occurrence to request a service and to conduct aerobatics at Benson. Since Benson was busy at the time, this request was declined and the pilot replied that they would conduct the aerobatics elsewhere also turning down the offer of an ATS.

As the Puma manoeuvred in the hold and then commenced the procedure, APP provided TI on a manoeuvring primary radar contact on four occasions, with the pilot reporting visual on the first, third and fourth occasions. Although the radar replay does not cover this period, it is clear from the transcript that the TI is related to a single ac and, based upon the controller's report, that APP believed it to be the same ac that had called him previously.

At 1819:43, the Puma pilot established contact with Benson PAR who was using the PAR to monitor the ILS approach. At 1821:15, PAR passed accurate TI to the Puma and the pilot responded that they were visual around 3sec later.

The CPA occurred at about 1821:45 with the radar returns merging, as the reported ac apparently completed a stall-turn manoeuvre and descended back through the level of the Puma.

Benson APP and PAR showed a sound appreciation of the situation and provided timely and relevant TI to the Puma crew, which enabled them to develop their SA, which in turn allowed them to avoid the reported ac.

Although understandably, the light ac pilot's request to conduct aerobatics at Benson was denied, he declined the further offer of an ATS and proceeding to conduct high energy manoeuvres, without an operative transponder, in the approach lane to a busy airfield. Whilst the CPA was in Class G airspace, and it is understood that there is no requirement for civil pilots to recognise MATZs, HQ Air BM SM considers that the pilot of the reported ac demonstrated a poor level of airmanship and decision-making.

UKAB Note (1): The Puma shows throughout the recordings of all nearby radar heads, squawking 3617, in the hold and subsequent instrument approach as described by its pilot. The light ac can be seen on the recording of the Heathrow 10cm radar as a primary only contact, first appearing in the region of Long Crendon, Bucks at 1813:30. It also shows intermittently on other radar heads. It flew aerobatics in approximately that position until 1816:40 before drifting to the S onto the Benson instrument approach lane and into the MATZ (but just outside the ATZ - over the M40 at 1818), before continuing further S and continuing its aerobatics 3nm N of Benson at 1820. The CPA is at 1821:45 but the aerobatic ac has disappeared below radar cover reappearing behind the Puma 4sec later. The ac then continues to fly aerobatics in the general area of the M40 NE of Benson until the end of the recording at 1831:48. Despite extensive procedural tracing action the other ac could not be traced.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members agreed that, although not specifically prohibited, conducting aerobatics near or in the MATZ of a busy airfield during its published operating hours and without the knowledge of ATC, is poor airmanship. Although they could not conclude that the pilot who called about an hour before the incident requesting that he conduct aerobatics over Benson, was the same one as the Puma pilot encountered later, Members considered that this could well have been the case; it was therefore disappointing that the identity of the ac was not captured on the RT recording. Pilot Members observed that, since the radar recording showed that the light ac had conducted what appeared to be several successive aerobatic sequences, it was most likely being flown by a competition (and therefore by implication experienced GA) pilot, so the lapse of airmanship was doubly disappointing.

In this incident, however, the accurate TI passed on several occasions by Benson concerning the manoeuvring ac, enabled the Puma crew to see it and keep a mental plot of its approximate position. At the CPA [by then with the Puma on the ILS localiser], however, and again prompted by TI from Benson at ½nm, they regained visual contact with it but were not able to take effective avoiding action, as they were unable to predict the other ac's flightpath. Even when unhindered by flying simulated IF, Members observed that avoiding an aggressively manoeuvring small ac can be very difficult as the intentions of the pilot are not predictable. That being the case, Members agreed that in this incident there had been a degradation of normally accepted safety standards.

The Board considered whether or not it was reasonable to expect the Puma crew to have seen the light ac earlier and broken off the approach. They reported on 2 earlier occasions that they had seen the ac, but Members thought that maintaining continuous visual contact with it would probably not have been possible due to the restricted vision from the Puma and the turns required by the instrument pattern being flown. That being the case they agreed that this had been a conflict between the 2 ac in Class G airspace.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict on the Benson instrument approach between a Puma and a light aircraft conducting aerobatics.

Degree of Risk: B

AIRPROX REPORT No 2010110

AIRPROX REPORT NO 2010110

Date/Time: 19 Aug 2010 1507Z

Position: 5239N 00008W
(12nm E RAF Wittering)

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

Type: HARRIER T12 PA28

Operator: HQ Air (Ops) Civ Club

Alt/FL: 2000ft NK

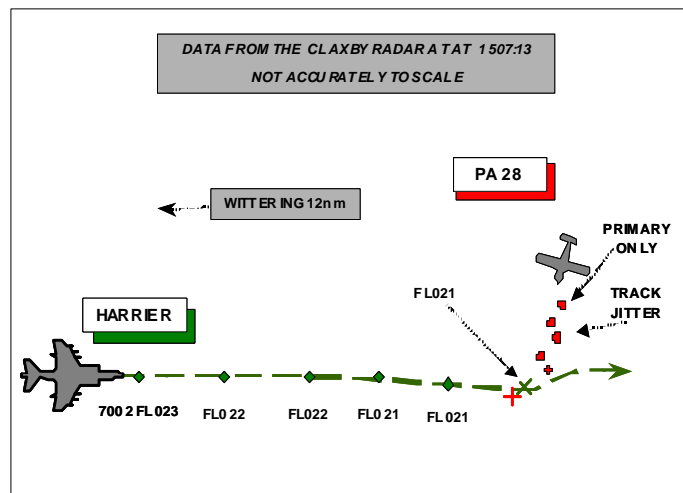
RPS (1006mb) QNH (NK)

Weather: VMC CLBC VMC NK

Visibility: 20km NK

Reported Separation:
50ft V/O H Not Seen

Recorded Separation:
NR V/ 0.1nm H (subject to severe track jitter)



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HARRIER PILOT reports flying a standard transit from RAF Wittering to Holbeach Air Weapons Range with an instructor in the rear seat. On exiting the MATZ heading 091° at 2000ft and 360kt he called "en-route", Cottesmore Departures acknowledged but did not call any conflicting traffic so they switched to the Range frequency but did not check in at that stage. They then accelerated to 420kt, selected a Squawk of 7002 and shortly after had a very close encounter with low-wing civil light ac passing from their left to right at the same alt. The ac was white with a dark lower half, the registration was painted in white and it was first seen 300ft away. He took avoiding action by performing a break manoeuvre up and to the left [behind it] into the clear airspace. The civil ac continued on its previous course throughout, the pilot having apparently not seen them. He assessed the risk as being Medium.

THE PA28 PILOT reports that she was advised by telephone and then email on 6th Oct that she had been involved in an Airprox while on a private flight on 19th August. She no longer had the Log for the route, but took the details from her logbook. She took off at 1450 and landed at 1600. She was not given any detail of the flight other than that an incident had occurred as she was departing from Fenland; that being the case she was the handling pilot for that leg of the flight. She has 200 hours flying time and her front-seat passenger has 14000 hrs and rear seat passenger, also a pilot has over 200hrs. The front seat passenger was acting as mentor and was conducting the lookout and monitoring the radio; the rear seat passenger was also looking out.

Prior to leaving Fenland she called Fenland Radio to advise of their departure and continued with them until they transferred to Conington for an overhead transit at 2000ft. The wind was 090/25 and the outbound track from Fenland was planned as 206°. The flight was under VFR in Class G airspace and no other ac was seen or heard. All three POB were unaware of an Airprox or any conflicting traffic. This was a private flight and although the Log was fully completed, it was not retained; hence she cannot be more precise.

UKAB Note (1): The delay in contacting the pilot flying was caused by late and incorrect information being passed to RAC by the registered owners of the ac who lease it to the flying club concerned; they, in turn, hire it to other users. When she was eventually traced and contacted, the handling pilot responded without delay.

UKAB Note (2): The recording of the Claxby Radar shows the incident. The Harrier can be seen getting airborne from Wittering at about 1504, squawking 3743 with Mode C. At that time a primary only contact, presumed to be the PA28, can be seen just to the SW of Fenland tracking about 220°. After TO the Harrier rolls out on a track of 065° before turning right onto 090° at FL021, changing Squawk to 7002 and tracking directly towards the PA28. The CPA is at 1507:13 when the PA28 is in the Harrier's 11 o'clock at 0.1nm but it suffers from significant track

jitter; the Harrier is at FL021 but the PA28 is not squawking. On the next 2 sweeps the Harrier can be seen to have turned hard left and climbing to FL025 before reversing back onto track and descending.

HQ AIR (OPS) comments that it is incumbent on all operating in Class G airspace to maintain a good lookout, especially in congested airspace. It is unclear from the above if the PA28 was equipped with a transponder, the use of which could have prevented this Airprox, as it would have made the PA28 more visible to Cottesmore Departures.

UKAB Note (3): The PA28 pilot reported that she was transponder equipped and was squawking 7000 with Mode C. This cannot be seen on any of the radar recordings available, the ac showing only as a primary contact.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

In light of no transponder data from the PA28 being displayed on the radar recording, a Member asked if any had shown on the outbound leg; the radar data, however, does not cover that period so it could not be determined whether or not the PA28's transponder was unserviceable or not switched on.

Members were briefed on the circumstances that led to the lengthy time taken to locate the PA28 pilot.

Both ac had been operating legitimately in Class G airspace and, at the incident time, neither pilot was in receipt of an ATC service to assist them with their 'see and avoid' responsibility. Members were surprised that the PA28 pilot or her passengers had not seen or heard the Harrier, bearing in mind its close proximity when the ac crossed.

Since the incident took place while the PA28 was not squawking and some time after the Harrier left the Wittering APP frequency, Members thought it reasonable that the controller did not warn the Harrier crew of the primary contact (the PA28) on leaving the frequency for Holbeach Range. A military pilot Member also suggested that at the time the crew might have been engaged in pre-range checks or instruction and allowed their lookout to have become degraded. The crew did, however, see the PA28, albeit at a distance they estimated as 100m. Had it actually been 100m away and the closing speed was, as reported, 420kt (215 m/sec) the Board agreed that the avoidance 'break' would not have had time to take effect before the ac crossed, as shown on the radar recording. That being the case, Members agreed unanimously that there had been a degradation of normally accepted safety standards.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the PA28 pilot and a late sighting by the Harrier crew.

Degree of Risk: B.

AIRPROX REPORT No 2010111

AIRPROX REPORT NO 2010111

Date/Time: 17 Aug 2010 1443Z

Position: 5353N 00122W
(6.5nm WNW Church Fenton - elev 29ft)

Airspace: Vale of York AIAA (Class: G)

Reporting Ac Reported Ac

Type: BH06 JetRanger Lynx AH7

Operator: Civ Pte HQ JHC

Alt/FL: 1500ft 2000ft

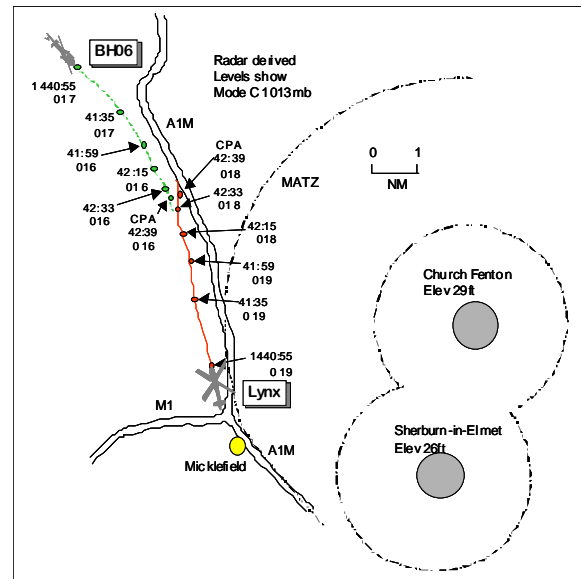
(QNH) (RPS)

Weather: VMC CLBC VMC CLBC

Visibility: 30km >10km

Reported Separation:
NR Nil V/300m H

Recorded Separation:
200ft V/<0.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BH06 JETRANGER PILOT reports en-route from a private site in N Yorks to Sherburn-in-Elmet (SIE) VFR and in receipt of a BS from Church Fenton on 126.5MHZ, squawking an assigned code with Mode C. The visibility was 30km flying 4000ft below cloud in VMC and the ac was coloured blue with anti-collision and nav lights switched on. Heading 160° at 110kt and 1500ft QNH he had been handed over from Leeming to Linton-on-Ouse then Church Fenton involving 3 frequencies and 3 squawk changes. He received a call from Church Fenton on opposing traffic, 0.5nm, slightly lower to which he responded, "He's just gone past my window". He saw the Army helicopter late and turned R to avoid it, assessing the risk as high. He spoke to Linton ATC after the Airprox who informed him that under a BS there was no requirement for ATC to report conflicting traffic. He asked ATC why did he receive a very late call and was told that ATC need not have done that either. Later he asked what would have happened if there had been a mid-air collision and was told that there would be an inquiry.

THE LYNX AH7 PILOT reports from Middle Wallop to Dishforth VFR and in receipt of a BS from Linton Zone squawking an assigned code with Modes S and C. The visibility was >10km flying 3000ft below cloud in VMC and the ac was painted in grey/green camouflage; no lighting was mentioned. About 6nm W of Church Fenton heading 330° at 120kt and 2000ft RPS during a period of low workload he saw a JetRanger helicopter in his 12 o'clock, range 1km at the same level so he turned R in good time to avoid, estimating separation at the CPA as 300m. The JetRanger took no avoiding action and he did not hear the flight on the Linton frequency for ATC deconfliction. As far as his crew was concerned, this was not an Airprox, assessing the risk as low.

THE CHURCH FENTON APPROACH (CFN APP) CONTROLLER reports that he was informed of the Airprox 3 months post incident so his recollection of the event was poor. Following the initial call from the JetRanger flight he asked the pilot if he was aware of the inbound routing to SIE, to which the pilot replied negative. CFN APP gave the JetRanger pilot instructions to follow the A1M motorway until Micklefield and then route direct to SIE not above 1500ft CFN QFE iaw the LoA with the SIE aeroclub. The JetRanger pilot requested and was given a BS. The pilot asked why he had to route in this manner and was told that it was in order to de-conflict with CFN operations. He had other traffic on UHF, possibly a radar PFL, therefore generating a reasonably high workload; on completion he scanned his display for the JetRanger and saw a conflicting ac flying in the opposite direction in close proximity. He called the traffic to the JetRanger flight whose pilot said that the call was late but did not state his intention to file an Airprox. He did not remember the Lynx being on frequency at the time and, if it was, whether he passed TI to its pilot on the JetRanger. The Supervisor told him the following day that the JetRanger pilot had telephoned and provided APP with a resume of the conversation but again no mention was made of the Airprox.

THE LINTON-ON-OUSE SUPERVISOR (LIN SUP) reports that he received a telephone call from the pilot of the JetRanger who complained about the late calling of traffic by CFN APP. Whilst working Linton Zone the pilot was

aware of the Army Lynx routing in the opposite direction also at 1500ft RPS but complained that he had been handed over to CFN APP and was no longer on the same frequency. Further complaint was made that CFN APP had not called the Lynx traffic soon enough and that the Lynx had had to take aggressive avoiding action to avoid a collision. Also the pilot questioned why he had been routed via Micklefield, a location he was not familiar with. SUP told the pilot that he was not aware of the incident but would listen to the RT tapes to ascertain the full details and would call the pilot back; however, the pilot appeared to be unhappy with his response. He telephoned the pilot and informed him that both ac were under a BS where both pilots are responsible for avoiding other traffic unaided by controllers and that controllers are not required to monitor the flight. The pilot was not content with this information and again asked why the traffic had been called late. He was informed that if a definite risk of collision existed, subject to workload, under duty of care a warning may be passed. The pilot stated that as the unit had radar and had issued a squawk, the controller should have been passing TI and should have been aware of his location. SUP read the pilot an extract from CAP774 describing the terms and provisions of a BS.

HQ 1Gp BM SM reports that the Airprox occurred between the Lynx AH7 routing N towards Dishforth in receipt of a BS from Linton (LIN) Zone and a Bell 206 JetRanger routing S towards SIE in receipt of a BS from Church Fenton (CFN) Approach (APP), situated at Linton.

Unfortunately, the unit was delayed in raising reports on the occurrence. However, whilst the APP controller has described their recollection of events as "poor", they accord reasonably well with the more detailed account of the SUP and the tape transcript. Whilst a report and transcript from LIN were not requested, the RT recordings were subsequently examined to provide additional information.

In order to facilitate the sequencing of CFN and SIE traffic, CFN APP provides ATS to SIE inbound and outbounds in accordance with a LoA between RAF Linton on Ouse and the Sherburn Aero Club.

Initially, as the JetRanger transits S it is handed over from Leeming to LIN ZONE, before subsequently being handed over to CFN APP for the transit to SIE, in accordance with the LoA. Examination of the LIN ZONE RT recordings demonstrates that ZONE's workload was moderate and that the JetRanger was on frequency at the point when the Lynx flight makes first contact with LIN ZONE at Ferrybridge (7nm SE of CFN) inbound to Dishforth. Furthermore, LIN SUP cites the JetRanger pilot as stating that they were aware of the Lynx travelling in the opposite direction at the same altitude. No further transmissions were made to or by the Lynx flight until it reached Newby Hall (15nm N of CFN) and went en-route; consequently, it can be seen that LIN ZONE did not provide any warning to the Lynx about the proximity of the JetRanger.

At 1440:56 the JetRanger flight contacted CFN APP "*Fenton ????? JetRanger c/s ????*"(words unintelligible). CFN APP transmitted, "*...JetRanger c/s Fenton Approach eh Basic Service Barnsley one zero zero two route inbound to Sherburn via Micklefield, are you familiar.*" The JetRanger pilot replied, "*Eh one zero zero two eh Basic Service I'm eh just North North-West of eh Sherburn by ten miles this time, not familiar with Micklefield and eh I've got Sherburn visual JetRanger c/s.*" CFN APP transmitted "*JetRanger c/s roger if you follow the A1 eh obviously southbound and the fork with the M1 that should be Micklefield and eh you turn left towards Sherburn direct there.*" The JetRanger pilot replied "*I don't fly straight lines with these things.*" CFN APP replied "*It's just to avoid the climb out lane at Fenton.*" The JetRanger pilot read back "*JetRanger c/s route via Micklefield JetRanger c/s.*" which was acknowledged by CFN APP. It is clear from LIN SUP's subsequent conversation with the JetRanger pilot and the CFN APP tape transcript that the JetRanger pilot was unaware of SIE recovery procedures and the requirement to route via Micklefield. Once CFN APP had completed briefing the JetRanger pilot of the arrival procedures at 1441:37, there were no further transmissions on the CFN APP freq until 1442:37 when a traffic warning was passed. CFN APP transmitted "*JetRanger c/s traffic South half a mile tracking North indicating slightly below.*" The JetRanger pilot replied "*He's just gone past me a bit higher in fact thanks.*"

[UKAB Note (1): The radar recording at 1440:55, when the JetRanger pilot makes initial contact with CFN APP, shows the JetRanger 9.7nm NW of Church Fenton tracking 135° indicating FL017 (1370ft RPS 1002). At the same time the Lynx is 5.4nm WSW of Church Fenton tracking 350° indicating FL019 (1670ft RPS), in the JetRanger's 1 o'clock range 6-7nm. Just over 1min later at 1441:59 the JetRanger has descended 100ft and turned R about 25° head-on to the Lynx in its 12 o'clock range 2.6nm. Both helicopters converge and by 1442:15 the Lynx is indicating FL018 (1470ft RPS) 1.5nm ahead of the JetRanger.]

Although CFN APP recalls their workload at the time of the occurrence being "reasonably high," this is not borne out by the tape transcript. Further investigation with the unit proved that the Airprox occurred immediately after a

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lengthy period of high workload for CFN APP, although their workload in the minute immediately prior to passing the warning to the JetRanger pilot was low, with no other transmissions being made. Consequently, best controlling practice suggests that the opportunity existed for a more timely warning to be given. Considering the length of time that has elapsed between the occurrence and the controller's completion of the DFSOR, the difference in recollection is understandable. However, research has demonstrated that psychophysiological alertness reduces significantly immediately following a high to low workload transition and remains so for up to 15min, regardless of the individual's motivation for the task. Further research has proved that humans consistently over-estimate their level of psychophysiological alertness. Whilst this poses a supervisory challenge for ATM, it is a fact not well known within the Specialisation.

At the point when the Lynx's avoiding turn to the R becomes evident at 1442:33, the JetRanger has entered a slight turn to the L, bringing it further into conflict with the Lynx, separation 0.5nm and 200ft. At 1442:37, CFN APP passes TI to the JetRanger flight and the CPA occurs 2sec later at 1442:39, with just under 0.2nm lateral separation existing - at this point the JetRanger has appeared to turn back to the R, away from the Lynx.

Whilst the opportunity existed for CFN APP to pass a more timely warning to the JetRanger, it is reasonable to suggest that given their workload history, they were suffering from reduced psychophysiological alertness, which served to delay their perception of the growing conflict. That notwithstanding, CAP774 is clear about the pilot's responsibilities for seeing and avoiding other ac stating that under a BS 'pilots should not expect any form of TI from a controller...and the pilot remains responsible for collision avoidance at all times.' CAP 774 does however permit a warning to be transmitted to the pilot, if the controller 'perceives a definite risk of collision,' but qualifies this by stating that 'whether or not TI has been passed, a pilot is expected to discharge his collision avoidance responsibility without assistance from the controller.'

Notwithstanding the fact that at the time of the Airprox the JetRanger and Lynx flights were operating on different frequencies, the information provided by the Lynx flight on its initial contact with LIN ZONE should have prompted the pilot of the JetRanger to focus their scan on their forward arc in order to visually acquire the Lynx. It appears from the SUP's record of his conversation with the pilot of the JetRanger, specifically relating to the use of radar, that the pilot may have been under a misunderstanding as to the level of information provided under a BS. This may have served to degrade his visual scan causing the effective non-sighting of the Lynx. Furthermore, despite not receiving any TI, the Lynx pilot reported that he had sighted the JetRanger at a range of approximately 1km and been able to take effective avoiding action. Unfortunately, the separation gained by this avoiding action was eroded by the JetRanger's L turn towards the Lynx. The JetRanger pilot does raise a potential issue that warrants further investigation in terms of the visibility of the SIE VFR arrival procedures to private pilots.

UKAB Note (2): The UK AIP at AD2-EGCJ-1-5 Para 2.22 Flight Procedures for Arrivals states:

'a. Pilots of inbound aircraft are to contact Fenton Approach on 126.5MHz when at 15nm or 5 minutes flying time from the MATZ boundary and are to enter the MATZ at 1500ft on the Sherburn QFE.'

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.

It was clear that the JetRanger pilot was expecting more from a BS than was likely to be provided; Members concurred with the Linton SUP's explanation of the service, reinforced by HQ 1Gp BM SM, it being important to ensure that there was no blurring of services under ATSOCAS. Members understood how pilots might be lulled into a false sense of security under a BS when working a radar equipped ATSU that issues a squawk; however, pilots requiring TI should request a TS. That said, under a TS as well as a BS, pilots should be in no doubt that they are still responsible for their own separation from other traffic, whether TI or warnings are passed or not. The JetRanger pilot, although unfamiliar with the SIE arrival procedure, was told of the preferred routeing, which necessitated following the A1M line feature under the RH traffic rule. The Lynx was routeing direct to Dishforth, situated just E of the A1M NW of Linton-on-Ouse, but its pilot was not mirroring the JetRanger pilot's RH traffic rule orientation. Pilots should always take due regard when a planned track coincides with a line feature by either adopting a track to follow the line feature on its R or moving clear of the line feature laterally if not following the RH rule. The Church Fenton APP passed a late warning to the JetRanger pilot who saw the Lynx slightly above, and turned R to avoid it. Given the geometry of the encounter, with a small target aspect visible of a helicopter

approaching head-on, Members accepted this sighting was as soon as practicable. Fortunately the Lynx pilot had seen the JetRanger slightly earlier (1km), and also turned R, estimating separation as 300m which was corroborated by the radar recording. Taking these elements into account, the Board agreed that this had been a conflict resolved by both pilots whose actions had been effective in removing any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace resolved by both pilots.

Degree of Risk: C.

AIRPROX REPORT No 2010113

AIRPROX REPORT NO 2010113

Date/Time: 17 Aug 2010 1225Z

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

Airspace: Linton ATZ (Class: G)

Reporting Ac Reported Ac

Type: Tucano GA-8

Operator: HQ Air (Trg) Civ Club

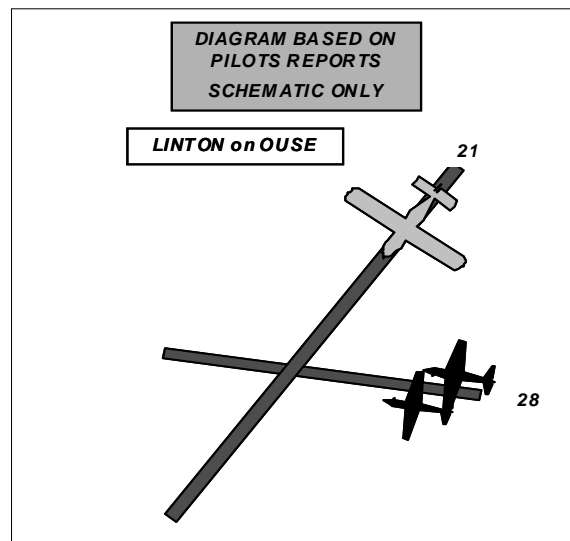
Alt/FL: 0ft 0ft

Weather: VMC VMC

Visibility: NK 15km

Reported Separation:
NR 50ft V/100m H

Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

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

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

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

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

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

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

As he was braking through 20kt to taxi speed, he saw 2 Tucano ac passing from left to right at about 50ft after take off so he stopped his ac immediately about 100m short of the RW intersection. From that position he called TWR and requested taxi instructions but their response was, 'You have landed on the wrong runway', which he considered to be stating the obvious and not at all helpful. He then asked for taxi and parking details twice but

again received no answer so he checked the RW to his left and right proceeded to taxi towards a marshaller in the dispersal.

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

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

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

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

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

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

As the GA-8 required a MATZ crossing of RAF Topcliffe, the handover from RAF Leeming Zone was initiated when it was clear of the RAF Topcliffe visual cct, as is standard practice. [The radar recording shows the GA-8 was transiting at 2500ft]. The handover between RAF Leeming Zone and Linton APP was standard but the pilot, being perhaps unfamiliar with local airspace, had expected an earlier handover.

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

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

When the GA-8 pilot called on VHF, his transmission was heard by GND who assumed that the ADC, having acknowledged the pre-note, had selected VHF 129.350 and was listening in. After the first few sec of the GA-8's

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transmission GND deselected the VHF 129.350 and continued talking to other traffic on UHF. As a result he was not listening out for a response from the ADC to the GA-8's call. Further there was no positive handover of VHF 129.350 between Linton GND and ADC.

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

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

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

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

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

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

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

HQ AIR (Trg) comments that the GA-8 pilot appears to have allowed himself to proceed with a pre-planned course of action without altering his plan in light of external situational indicators, leading to a dangerous outcome. It is not clear exactly what contributed to the 'high workload' that the pilot describes, on what appears to be a straightforward transit flight. This incident would have been identical had the lack of comms with the Linton ADC been the result of a RT failure, which the Supervisor suspected had happened at the time. The UI acknowledges issues with the operation of the VHF frequencies at Linton and appropriate changes will be mandated once the UI is released. However, while the outcome *may* have been different had the GA-8 pilot received an immediate reply to his first radio call to Linton ADC, his actions suggest that this is by no means certain. Furthermore, it is not reasonable for Linton ATC to have predicted the outcome of the failure to establish 2-way comms in this instance, as all the indicators were that the GA-8 pilot understood the RW in use and could therefore have been expected to integrate safely with the extant traffic pattern. It is also unreasonable to expect them to have held the formation taking off, as they would have expected an ac that could not talk to tower would join the visual circuit, or the overhead at the very least, and not proceed to land, deliberately as he implied, on the non-duty RW.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

Although accepting that this was clearly a very serious incident, many Members, both Controllers and pilots considered that the incident did not meet the normal criteria for an Airprox since the GA-8 was stationary (or almost

stationary) on the ground, about 100m short of the intersection, when the Tucanos crossed ahead at about 50ft agl.

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

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

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

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

PART C: ASSESSMENT OF CAUSE AND RISK

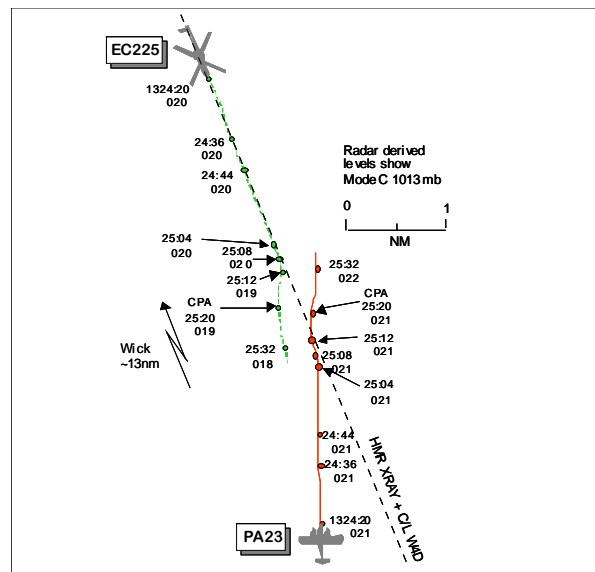
Cause: The GA-8 pilot landed on the out of use RW, without clearance, into conflict with the Tucano pair taking off on the duty RW.

Degree of Risk: C.

AIRPROX REPORT No 2010114

AIRPROX REPORT NO 2010114

Date/Time: 26 Aug 2010 1325Z
Position: 5816N 00257W (13nm SSE Wick)
Airspace: SFIR (Class: G)
Reporting Ac Reported Ac
Type: EC225 PA23
Operator: CAT Civ Comm
Alt/FL: 2000ft 2000ft
(QNH 1012mb) (QNH 1012mb)
Weather: VMC CAVOK VMC CLNC
Visibility: >10km 45km
Reported Separation:
Nil V/0.5nm H 500ft V/2nm H
Recorded Separation:
200ft V/0.3nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EC225 PILOT reports en-route to Aberdeen VFR and in receipt of a BS from Wick on 119.7MHz, squawking 3730 with Modes S and C; TCAS 1 was fitted. The visibility was >10km in CAVOK VMC and the ac was coloured red with nav, strobe and floodlights all switched on. In the cruise S of Wick, approaching the Wick 10nm handover point at 2000ft QNH 1012mb, heading 165° at 145kt they noticed and were monitoring an ACAS contact at a similar level. They were aware of a survey ac operating low level, not above 600ft, [not the subject PA23] in the vicinity of Beatrice Platform however, there was no ACAS indication for this ac in that area. At 10nm P1 contacted the survey ac on Comm Box 1 (122.8MHz) to pass information on position and intention whilst P2 reported '10nm S of Wick' on Comm Box 2 to Wick and was told to contact Lossie Departures on 119.35MHz. On contacting Lossie, ACAS generated a TA target and aural 'traffic' alert, simultaneously as both crewmembers became visual with an ac in their 12 o'clock range <1nm at a similar level flying in the opposite direction. P1 took avoiding action by turning R and descending whilst P2 asked Lossie to standby. As the other ac passed down their LHS about 0.5nm away they identified it as a white/blue coloured twin-engine Piper type. On subsequent communication with Lossie this was identified to them by c/s and Lossie were informed of their intention to file an Airprox. He assessed the risk as high.

THE PA23 PILOT reports conducting a wildlife survey in the Moray Firth at 2000ft alongside other company traffic conducting a similar survey at 600ft. He was receiving a BS from Lossie on frequency 119.35MHz and squawking 3721 with Modes S and C. The visibility was 45km in VMC and the ac was coloured white/blue with strobe and landing lights switched on. Prior to the flight faxes were sent informing various stations of their intentions that 2 ac would be operating in this particular area giving levels and times on survey. About 1325 when 5-8nm N of Beatrice HPZ, heading 360° at 130kt, Lossie passed TI on conflicting traffic 11 o'clock range 5nm. He responded 'visual' and he adjusted his heading R 5° to ensure the ac would pass down his port side without breaking-off his survey. The other ac continued on its heading and to his knowledge the flight was not working Lossie. He then saw the other ac, a red coloured twin-engine helicopter, make an avoiding turn to the R and descend when it was about 2nm away. Once the ac had passed he heard a pilot call on frequency reporting an Airprox and that he had had to take avoiding action. He then re-stated to ATC that he was visual with the traffic and that there had been no chance of collision. He was asked to contact Lossie ATC after landing. The helicopter pilot stated that he was aware of the survey ac operating at 600ft but not another [his PA23] at 2000ft. He assessed the risk as low. Later when he spoke to the Supervisor he was told that they had received the faxes from his operations dept which had clearly stated that on this particular day 2 ac would operate in the area; he was told that Aberdeen Information had also received the same faxes.

ATSI reports that the Airprox occurred in Class G uncontrolled airspace between an EC225 and a PA23, 13.6nm S of Wick (WIK) at altitude 2000ft. The EC225 had departed Foinavon for a flight to Aberdeen and had been in

contact with Wick Approach on 119.7MHz under a BS before transfer to Lossiemouth ATC. The PA23 was conducting a wildlife survey in the Moray Firth and was in contact with Lossiemouth on 119.35MHz under a BS. There was a second survey ac in the Moray Firth operating at 600ft amsl.

Wick ATSU provide Basic and Procedural, non-surveillance-based, services outside of CAS. No report was filed by the Wick ATSU in respect of this Airprox.

METAR EGPC 261320Z 14007KT 110V170 9999 FEW019 14/08 Q1012=

CAA DAP reported to ATSI that civil NOTAM action was not taken on the survey activity as the flights were to be in uncontrolled airspace where normal rules of the air applied. There was no ACN directly related to the survey activity in the Moray. ATSI were unable to verify the individual co-ordination activity that may have taken place between the operator and any ATSU.

AIS reported to ATSI that the Area En-Route Pre-Flight Information Bulletin for 26 August 2010 (0908 UTC) to 27 August 2010 (0908 UTC) contained no information on aerial activity in the Moray Firth.

At 1306:20 Wick APP called Lossiemouth with a pre-note on 2 ac, the second of which was the EC225. Wick passed the following information, which was read-back by the Lossiemouth controller, “...E C two two five ... Foinavon to Aberdeen ... two thousand feet on a Basic Service ... will be overhead Wick minute two zero”. The Lossiemouth controller issued squawk 3730 and frequency 119.35MHz. The conversation terminated at 1307:50. In accordance with UK AIP ENR 1-6-2-9, SSR code 3730 is allocated to RAF Lossiemouth and is considered validated and verified. The Wick MATS Part 2 (Section 5 Chapter 4 paragraph 3.2.1) states:

‘During the notified hours of Lossiemouth LARS the following coordination will normally be carried out: Traffic operating below FL100 and departing in the sector between W4D and N560D to the south of Wick, except traffic operating on the ADRs, should be pre-noted to Lossiemouth. Lossiemouth will issue an SSR code and any relevant traffic information.’

The EC225 flight called Wick Approach at 1307:40. Wick Approach responded by issuing the QNH and asking the EC225 to pass its message. The EC225 crew requested a BS and routeing via the Wick O/H. The EC225 flight reported on the WIK 355 radial at 28nm maintaining 2000ft. Wick APP agreed to provide a BS. The EC225 was squawking 0040 (allocated to ‘Civil North Sea Helicopters: considered unvalidated and unverified). Prestwick Multi Radar Tracking showed the EC225 on track WIK maintaining FL020. The PA23, squawking 3721 (RAF Lossiemouth - validated and verified), was operating within a 5nm radius of MORAY at FL021. A BS is provided for the purposes of giving advice and information useful for the safe and efficient conduct of flights. It may be provided with or without the use of ATS Surveillance Systems. The UK AIP ENR 1.1.2 paragraph 3 notifies that:

‘Pilots should not expect any form of traffic information from a controller/FISO and the pilot remains responsible for collision avoidance at all times. However, on initial contact the controller/FISO may provide traffic information in general terms to assist with the pilot’s situational awareness.’

The associated guidance material provided for CAP774, UK Flight Information Services, Chapter 2 paragraph 1 states:

‘It is essential that a pilot receiving [a Basic Service] remains alert to the fact that, unlike a Traffic Service and Deconfliction Service, the provider of a Basic Service is not required to monitor the flight.’

This guidance is re-iterated for civil controllers in CAP493 (Section 1 Chapter 11). There is no similar warning for pilots in the UK AIP ENR 1.1.2.

At 1319:50 the EC225 flight reported O/H Wick and was instructed, “EC225 c/s for Lossiemouth squawk three seven three zero... next report ten miles south”. This was acknowledged and the EC225’s squawk was observed to change at 1320:28. At this time the PA23 was 4nm W of MORAY maintaining FL020. The Wick MATS Part 2 (Section 5 Chapter 4 paragraph 4.2) states:

‘When co-ordinating traffic with Lossiemouth they will issue an SSR code. This should be...passed to the pilot prior to transfer to Lossiemouth.’

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There is no specific requirement in the Wick MATS Part 2 for pilots to be requested to make a 10nm S of Wick position report. The EC225 continued its flight S of Wick following, but underneath, Advisory Route W4D, on the WIK VOR 164 radial.

[UKAB Note (1): The WIK 164 radial under the ADR is the HMR X-Ray. The UK AIP ENR 1-15-6/7 states the HMR is bi-directional between Aberdeen and Wick. Altimeter setting outside 30 DME ADN is the appropriate RPS or as directed by ATC. Cruising altitudes S'bound 2000ft to SMOKI (44 DME WIK) and then as directed. Para 2.4.1.2 Fixed-Wing Procedures states:

'Crews of wildlife and aerial survey aircraft should consider utilising notification procedures detailed at ENR 1.1.4 [Non-Standard Flight (NSF) or Unusual Aerial Activity (UAA)] as well as contacting Aberdeen ATSU prior to commencing operations.'

At 1324:20 the EC225 flight reported 10nm S of Wick and was transferred to Lossiemouth on 119.35MHz. The PA23 was 5.3nm S of the EC225, in the EC225's 12 o'clock, maintaining FL021 on reciprocal track.

At 1325:08 the PA23 is observed to turn N'bound on to a track approximating the WIK 164 radial at FL021 whilst the EC225 is 1.1nm N of the PA23, S'bound on the WIK 164 radial at FL020, i.e. on a reciprocal track. Four seconds later at 1325:12 the EC225 is seen to commence a R turn, off the 164 radial, and descend to FL019 when it is 0.8nm N of the PA23, which is indicating FL021 on the WIK 164 radial northbound.

At the CPA, 1325:20, the 2 ac pass abeam each other 12.8nm S of WIK, the EC225 W of the PA23 by 0.3 NM, the EC225 at FL019 and the PA23 at FL021. The PA23 then made a R turn away from the 164 radial as lateral distance between the 2 ac increased. The PA23 climbs to FL022 and the EC225 continues its descent to FL018. The EC225 then returns to a S'ly track on the WIK 164 radial at FL020 and the PA23 continues its flight N'bound at FL021.

Prior to transferring the EC225 to Lossiemouth, Wick had received no advance TI on the PA23's presence on the EC225's intended route. ATSI were unable to establish why Lossiemouth did not relay the presence of the PA23 to Wick Approach. Lossiemouth was unable to give traffic information to the EC225 as Wick APP had elected to retain the EC225 on the Wick frequency until 10nm S of Wick. Whilst not considered contributory to this event, ATSI consider that there is insufficient warning to pilots in the UK that, when under a BS, even if transponding on a discrete code, there is no requirement for the controller to be monitoring the ac.

THE LOSSIEMOUTH DEPARTURES CONTROLLER reports screening a U/T controller when the PA23 was conducting a whale survey over the Moray Firth in the vicinity of Beatrice Oil Field at 2200ft Orkney RPS 1007mb under a BS. Wick pre-noted a helicopter S'bound on HMR-X at 2000ft VFR to Aberdeen and a 3730 squawk was issued. A 0040 squawk was observed coasting out S of Wick with the PA23 transiting towards the 0040 squawk. TI was passed when the PA23 was about 5nm S of the 0040 squawk indicating a similar altitude; the PA23 pilot reported visual. The 0040 squawk was seen to change to 3730, and there was about 2nm separation when the EC225 flight made its initial call. The EC225 was identified by the trainee, given the RPS and was asked what type of service was required. The EC225 crew told them to "standby" and the radar return was seen turning and descending away from the PA23. TI was then passed by the mentor to the EC225 flight as his trainee had not done so on its initial call. The radar returns were then seen to merge at similar altitudes before the EC225 crew asked if they were working the ac adjacent to their helicopter. He told the EC225 crew what the other ac was and what his intentions were before requesting what type of service was required. The EC225 crew requested a BS and that an Airprox would be filed after landing, having had to take avoiding action down and to the R. The EC225 crew then asked why the PA23 was not at 600ft amsl in accordance with his notice. He replied that the PA23 pilot had asked to operate at 2200ft amsl. The PA23 pilot then called stating that his company should have passed an amendment to his altitude; however, this had not been received by Lossiemouth.

HQ 1GP BM SM reports this Airprox involved a PA23 conducting a whale survey over the Moray Firth in receipt of a BS from Lossiemouth Departures (DEPS), with the position being filled by a controller under training, and an EC225 outbound from Wick. The Airprox occurred shortly after the EC225 flight contacted DEPS en-route to Aberdeen.

From the reports of the controllers involved it is apparent that they believed that the PA23 was operating on a task that was subject to a NOTAM or ACN action, for which the promulgated altitude was 2200ft AMSL. The PA23 pilot

believed that his ops had made this notification; however, it is clear from the transcript that the EC225 pilot expected the PA23 to be at 600ft AMSL.

At 1209:52, the PA23 was placed under a BS by DEPS, with Wick pre-noting the EC225 to DEPS just 1hr later at 1307:29 stating that the EC225 was flying at, "2000ft on a Basic Service at Wick minute 20."

At 1324:35, DEPS passed TI to the PA23 on the EC225 stating, "traffic 12 o'clock, opposite direction, indicating similar height." At this point 3-5nm lateral separation exists, with the PA23 indicating 100ft higher than the EC225 (SSR Mode C). Although DEPS passed no range information, the PA23 pilot immediately replies that his is "visual with the traffic."

At 1324:45, the EC225 flight called DEPS, was identified and asked what type of service was required. The EC225 crew responded at 1325:03 stating, "eh standby Lossie." At this point, approximately 1-3nm lateral separation exists between the EC225 and PA23. Realising the potential gravity of the situation, the DEPS screen controller stepped in on the frequency at 1325:08 and passed a traffic warning to the EC225 on the PA23, stating, "traffic twelve o'clock, 3 miles, opposite direction at similar height."

[UKAB Note (2): Radar separation is 1.1nm when the DEPS screen controller's transmission commences.]

There is then a pause of 72sec before the EC225 crew replied, "yeah were visual with that making avoiding action."

One of the causal factors of this Airprox was the operation of 2 survey ac which the PA23 pilot believed had been promulgated. The unit has identified that the provision of TI to Wick on the PA23 operating in their area may have prevented this occurrence and has taken action to raise awareness of this amongst their controllers; however, from an ATM perspective, DEPS passed timely TI to both ac, with both ac obtaining visual contact with the other.

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.

The DAP Advisor informed Members that AUS routinely consider the issue of an ACN for survey flights if contacted by the operator. Such an ACN, if raised, would be distributed to all relevant ATSUs, which may be able to provide a service to these flights, as pre-notification of intent. With respect to the issue of a NOTAM for survey flights, as the source information provided is normally generic i.e. only specifying overall activity areas, start and finish dates and max/min altitudes, and since the decision to carry out these flights is usually made at short notice (taking into account various factors including Wx, ac availability etc on the day), the production of a timely and/or meaningful NOTAM to cover such unpredictable activity is not usually possible nor deemed necessary. However, for activity at and below 2000ft amsl, survey operators are encouraged to notify the UK Military Low Flying Section under the CANP system. Furthermore, the AIP entry was not pertinent to this flight – a NSF is for flights within CAS and the wildlife survey was not an UAA; this explained the comment in the ATSI report where NOTAM action would not be taken for this Class G airspace activity. The notification by operators via fax or telephone to ATSUs was what would be expected as this would contain the precise details of the intended flight and could be linked to an associated ACN if previously generated. The LF Ops Advisor also commented that it was common practice that survey operators informed the LF Booking Cell who notified the activity to all users booking into the Low Flying System.

It was clear the EC225 crew were surprised to encounter the PA23 at a similar altitude when they were expecting a survey flight to be operating in the area well below their level at 600ft. That said, the crew were aware of the PA23 from their ACAS equipment display when they were approaching 10 DME WIK, i.e. when it was over 5nm away. The PA23's flightpath had triggered a TA alert - TCAS 1 cannot generate RAs – as the EC225 crew contacted Lossie. The PA23 was seen <1nm ahead and the P1, unhappy with the separation that pertained, initiated a R turn and a descent to avoid it, estimating 0.5nm separation. The PA23 pilot, although under a BS, was given a traffic warning by Lossie DEPS on the approaching EC225 and he immediately saw the helicopter over 3nm away and elected to turn R 5° to ensure it passed down his LHS but without breaking-off his survey and taking visual separation on it. However, in doing so, the PA23 had flown close enough to the EC225 to cause its crew concern and this had caused the Airprox. Members agreed the PA23 pilot had been overly task-focussed, for although he had taken due regard of the EC225 and discharged his responsibilities under 'see and avoid', he

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should have considered the situation more carefully and the separation that pertained – aiming to pass with minimum separation does not allow any margin for error by either party.

Wick APP had pre-noted Lossie DEPS about the EC225; however, DEPS had not told Wick about the PA23, in accordance with the MATS Part 2 procedure. After the initial RT exchange between the trainee and the EC225 flight, DEPS Mentor had stepped-in and passed a traffic warning, owing the proximity of the PA23, although by then the EC225 crew were already taking action. The radar recording shows 0.3nm and 200ft separation at the CPA, the ac passing port to port on opposite direction tracks. Although this had been an untidy affair, all of the actions taken, when combined, were enough to allow the Board to conclude that any risk of collision had been effectively removed.

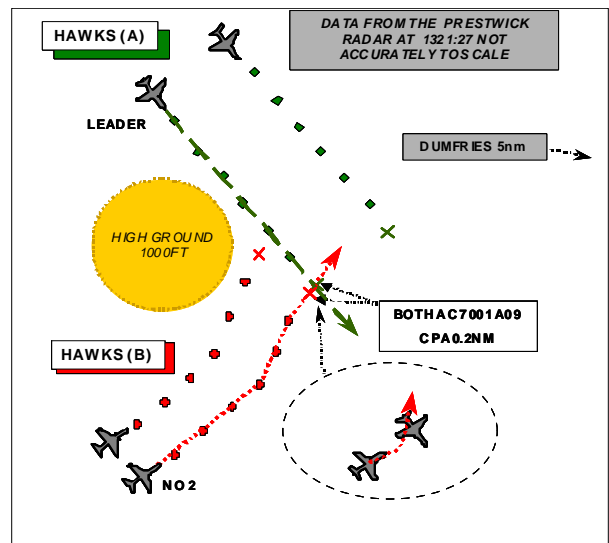
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA23 flew close enough to the EC225 to cause its crew concern.

Degree of Risk: C.

AIRPROX REPORT NO 2010115

Date/Time: 13 Aug 2010 1321:27Z
Position: 5504N 00346W (5nm W Dumfries)
Airspace: UKDLFS (Class: G)
Reporting Ac Reporting Ac
Type: HAWK HAWK
Operator: HQ Air (Trg) HQ Air (Ops)
Alt/FL: 250ft 350ft
(RPS 1010mb) (RPS 1010mb)
Weather: VMC NR VMC CLBC
Visibility: NR 30km
Reported Separation:
150ft V/500ft H V 100ft/H 100ft
Recorded Separation:
0 V/ 0.2nm H

**BOTH PILOTS FILED****PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE HAWK T Mk1 (A Leader) PILOT reports that he was leading a pair of black Hawk ac with HISL switched on, squawking 7001 with Mode C, on a low-level training flight in LFA16 operating on a tactical frequency. While heading 150° at 420kt and at a nominal 250ft agl, he initially saw the northerly ac of a pair of Hawks about 1.5nm away. He immediately searched for a second ac and saw another Hawk at a range of about 1nm away at a similar height in his 2 o'clock position and coming directly towards him. He immediately banked to the left before rolling out and commencing a climb and he saw the southerly Hawk passing below and behind him.

THE HAWK (B No2) PILOT reports that he was a student pilot of the No2 of a pair ac on a 2v1 low-level evasion flight with an instructor in the rear seat of black Hawk ac with HISL switched on, squawking 7001 with Mode C and operating on a [different] tactical frequency. While 5nm W of Dumfries in LFA 16 and about 30min into the sortie in a very high workload situation, heading 020° at 440kt, he was expecting to be engaged as part of the exercise and an ac was seen in the left 11 o'clock at 10km [See UKAB Notes (2) and (3) – the Bounce]. Shortly after this another ac [See UKAB Note (2) – Hawk (A) Leader] was seen to cross the nose of the leader and then his own ac at approx 2-3km; assuming this ac to be the bounce both formation members took 'practice air-to-air shots' on it. He did not have time to assimilate the status of the distant ac. Very shortly afterwards a previously unseen ac passed from left to left to right very close ahead of him (estimated as 100ft), at the same height. The timescale from first sighting to the Airprox was approx 5-7sec [See UKAB Note (3)]. He saw the other ac too late to take any avoiding action and estimated the risk as being very high. After discussion in the debrief he thought that the ac he had the Airprox with was not the Bounce but the wingman of the other formation.

UKAB Note (1): The recording of the Prestwick radar shows the incident. Hawk (A) formation is line abreast just over 1nm apart, tracking 140° at low level with the leader on the right (to the S). Meanwhile Hawk (B) formation is to the S of Hawk (A) formation, also in line abreast formation with leader on the left (to the W) tracking initially 050° before turning left onto 005°. The ac track towards one another until the CPA at 1321:27 when Hawk (A) Leader passes through Hawk (B) No2's 12 o'clock, from left to right, at the same alt (A09), 0.2nm (360m) ahead. Hawk (A) Leader's climb is only noticeable on the recording 10 sec after the ac cross. Hawk (B) Bounce is 6nm to the N of Hawk (B) formation.

UKAB Note (2): From the radar recording it appears that the first ac reported by Hawk (B) No2 was most likely Hawk (B) Bounce (another ac squawking 7001 with Mode C), which was 3nm to the N of Hawk (A) formation, also on a similar SSE track and possibly 'skylined'. The second one mentioned was Hawk (A) No2 and the third, the one involved in the Airprox, was Hawk (A) leader.

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UKAB Note (3): Seven sec before the CPA the Bounce ac was in Hawk (B) No2's 11 o'clock at a distance of about 6nm (11km) probably on a ridge. Hawk (A) No2 was also in his 11 o'clock but at a distance 2nm and probably on the far side of a valley and Hawk (A) Leader was in his 1030 at 1½ nm in the same valley.

HQ AIR (Ops) comments that the low level tactical environment is dynamic and challenging, hence the emphasis on training and achieving a mandated standard for Fast-Jet aircrew. This is a timely reminder of the importance of maintaining a good lookout and not assuming that you have seen all relevant traffic; it's the one you haven't seen that shoots (or hits) you. The Student pilot in Hawk (B) No.2 was looking for, expecting to see and aiming to negate the threat from a single Hawk Bounce, therefore it is considered that having seen the first Hawk he became fixated on neutralising that threat and his wider lookout scan was reduced as a result.

HQ AIR (TRG) comments that operating in the low level environment is all about avoiding detection which these formations achieved and being from different units they would not have known the exact routeing of each others formation. With both formations terrain masked and flying at 420kt or faster the crews did well to spot each other before CPA. This Airprox highlights the need for crews to maintain a high level of lookout at all times in the dynamic inhospitable low-level environment.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, radar recordings and reports from the respective Hawk operating authorities.

The Board noted that both pairs of ac had been operating legitimately in the UKDLFS but, being from different units, when 'booking out' they would only have been warned of 'mixed traffic' in the LFA and therefore there had been no route deconfliction.

Military ac practise low flying in order to use terrain screening, i.e. to shield each other from visual and/or electronic detection by opposing forces by using the terrain. In this, as with many other cases, it can also have the undesired effect of screening ac from non-opposing forces. However, the instructor pilot in of Hawk (A) leader saw the conflicting Hawk ((B) No2) about 1nm away and was able to take effective avoiding action, despite that the manoeuvre could not be seen on the radar recording. Hawk (B) No2 pilot, a supervised student, was concentrating on engaging Hawk (A) No 2 while under the mistaken impression that it was their bounce ac, and did not see Hawk (A) leader significantly closer to him but out to his left, until a distance he estimated as being 100ft and therefore to late to take any effective avoiding action.

The Board determined that, bearing in mind the terrain, both pilots had seen the conflicting ac without undue delay, but later than optimum and that this incident had been a conflict in the UKDLFS between 2 ac (pairs) both entitled to operate there. They also agreed that the existing height separation, probably assisted by the climb by Hawk (A) Leader, had ensured that there was no risk of collision.

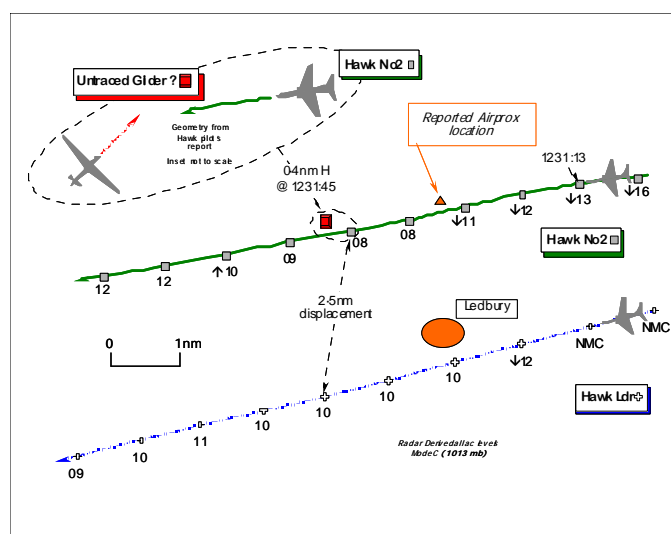
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the UKDLFS resolved by Hawk (A) Leader.

Degree of Risk: B.

AIRPROX REPORT NO 2010116

Date/Time: 11 Aug 2010 1231Z
Position: 5203N 00228W
 (2¼nm NW of Ledbury)
Airspace: UK DLFS/FIR (Class: G)
Reporting Ac **Reported Ac**
Type: Hawk T1 Untraced Glider
Operator: HQ Air (Trg) NK
Alt/FL: 500ft NR
 RPS (1006mb)
Weather: VMC NR NR
Visibility: 40km NR
Reported Separation:
 Nil V/200m H NR
Recorded Separation:
 Not recorded

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE BAe HAWK T1 PILOT, a QFI, reports he was the wingman of a pair of Hawks carrying out a dual instructional evasion sortie in LFA 4. They were not in receipt of an ATS but monitoring a discreet frequency. A squawk of A7001 was selected with Mode C on; neither TCAS nor Mode S is fitted. His ac has a black colour-scheme and the white HISLs were on.

Approaching a position 2nm N of Ledbury, heading 260° at an altitude of 500ft RPS (1006mb), a white glider was spotted ½nm directly ahead at 500ft agl crossing from L - R. To avoid the glider a breaking turn to the L was initiated, the glider passing 200m away at the same altitude with a 'medium' Risk of collision.

LATCC (Mil) RADAR ANALYSIS CELL reports that a single primary radar contact, without any supporting SSR, 'pops up' on radar 2¼nm NW of Ledbury, in the vicinity of the reported Airprox location [2nm N of Ledbury] but the absence of a continuous radar contact has inhibited tracing action of the reported glider. Despite contacting all glider sites in the area surrounding the Airprox, the identity of the glider remains unknown.

UKAB Note (1): This Airprox is not illustrated clearly on the LATCC (Mil) Clee Hill Radar recording. The Hawk formation is shown approaching the reported Airprox location at 1231:13, the No2 - the most northerly of the pair squawking A7001 - descending through 1300ft unverified Mode C (1013mb) – equating to about 1090ft RPS (1006mb). The Hawk pair maintained a continuous descent on a W'y course in wide battle formation at a track displacement of about 2½nm. The reported glider is not evident at all until 1231:45, when a single primary contact that might or might not be the reported glider is shown for one sweep only in the No2's 1 o'clock at a range of 0.4nm, the latter indicating 800ft Mode C – about 590ft RPS. A climb is evident thereafter by the No2 that ascends to 1200ft Mode C, but the breaking L turn is not apparent. No further radar contacts which might be associated with the reported glider are evident at close quarters in this vicinity.

HQ AIR (TRG) comments that the No2 Hawk pilot took sensible avoiding action upon sighting a confliction in class G airspace. Whilst an earlier sighting, or a climb, might have produced a more comfortable miss distance, gliders are notoriously difficult to see at the best of times so this is a case where the see-and-avoid principle worked as well as could be expected. LFA 4 is a busy area which demands the greatest care and vigilance to navigate and this report serves as a reminder of the importance of a rigorous lookout procedure.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report solely from the No 2 Hawk pilot, radar video recordings and comment from the appropriate operating authority.

AIRPROX REPORT No 2010116

The Board was briefed that a Y Series (LFS) NOTAM had been issued for LFA 4 located some 5nm to the E, but this warning referred to a para-gliding activity. The BGA Member suggested that during August, in the middle of the day, it is highly possible the reported ac was a motor glider on a cross country or a glider from a gliding site some distance away elsewhere. Such flights can roam far afield; however, when encountered at 500ft agl, especially in this terrain, it could be that it was a motor glider, or glider, executing a landing away from base, but it was an unusual height to encounter an unpowered ac. More probably at 500ft agl, it was a motor-glider or a microlight operating independently from local sites the Member added. It was unfortunate that the reported ac could not be traced and without the other pilot's account the Board could only assess this Airprox, rather unsatisfactorily, on the basis of the No2 Hawk pilot's report.

Whatever the other ac was, the No2 Hawk pilot saw it first from a range of ½nm, directly ahead. Certainly any ac is more difficult to see when approaching almost head-on, but white gliders with a small frontal cross-sectional area, possibly against a cloudscape, without any other additional aids such as HISLs to their improve their conspicuity, can be more challenging to spot. Nevertheless, the see-and-avoid principle appears to have worked as well as could be expected in these circumstances and, although the sighting range was not ideal, the other ac was seen in sufficient time to enable the No2 Hawk pilot to take effective avoiding action. Based on his account, the Hawk pilot was able to remain 200m clear of the other ac; moreover, the radar recording also evinced a climb in the vicinity. The Board could only conclude therefore, on the basis of the limited information available, that this Airprox was the result of a conflict in Class G airspace resolved by the No2 Hawk pilot and that the avoiding action taken was effective in ameliorating the Risk of a collision.

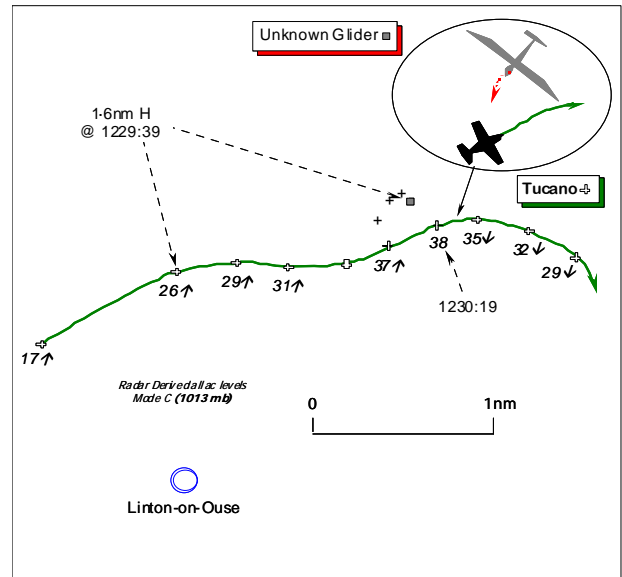
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace resolved by the No2 Hawk pilot.

Degree of Risk: C.

AIRPROX REPORT NO 2010117

Date/Time: 27 Aug 2010 1230Z
Position: 5405N 00111W (2nm NE
 Linton-on-Ouse - elev 53ft)
Airspace: Vale of York AIAA (Class: G)
Reporting Ac Reported Ac
Type: Tucano Untraced Glider
Operator: HQ Air (Trg) NR
Alt/FL: 3000ft ↑ NR
 QFE (1012mb)
Weather: VMC CLBC NK NK
Visibility: >10km NK
Reported Separation:
 400ft V/Nil H NK
Recorded Separation:
 Not recorded

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE TUCANO PILOT, a QFI, reports he was conducting an instructional sortie in the vicinity of Linton-on-Ouse. As the PF he was configuring his ac for a simulated stuck throttle exercise at a high power setting whilst in communication with Linton TOWER on 240.825MHz; he was not in receipt of an ATS. Wide downwind, climbing wings level through 3000ft QFE, heading E 3nm NE of the aerodrome, he became aware of a white glider orbiting near the cloudbase about 400ft above him. The glider was approaching from his 11 o'clock in a shallow L turn and to avoid it he bunted his ac to 'negate their closure' as the glider passed about 400ft above with a 'medium' Risk of collision. No discernible avoiding action was taken by the glider pilot. He stressed that he was working under a reasonably high workload at this point of the sortie as care was needed not to overspeed the landing gear and flaps, which were set to full.

His aeroplane has a black colour-scheme; the HISLs and taxiing lamp were on.

UKAB Note (1): The time of the Airprox was originally specified by the reporting pilot as 1420UTC. The Station and the Tucano pilot were aware of a gliding competition taking place and a competition was NOTAM'd from Pocklington on this day with 50 gliders participating. An Airprox report was also obtained from a Schleicher ASW 22 glider pilot who was identified in the vicinity at 1420UTC but had not seen the Tucano. However, examination of the radar recording for this time period subsequently revealed the reported Airprox timing was incorrect. The launch and recovery times for the subject Tucano were ascertained from Linton-on-Ouse as 1139UTC and 1239UTC respectively, the Schleicher ASW 22 glider discounted and no other identified, consequently, the reported glider pilot remains untraced.

At 1229:39, the Tucano is shown squawking A4501 passing 1.3nm N of the aerodrome whilst turning R downwind passing 2600ft Mode C (1013mb) in a steady climb. An unidentified primary contact, which might or might not be the reported glider, is shown manoeuvring in the Tucano's 12 o'clock at a range of 1.6nm. The Tucano steadies easterly at 1229:55, while climbing through 3100ft Mode C before the Mode C indication is lost for one sweep and the Tucano reverses L; at the same time the primary contact of the glider fades and is not evident at all thereafter. The Tucano ascends above the MATZ to a maximum indicated level of 3800ft Mode C – about 3710ft QFE (1010mb) – at 1230:19, in a position 2.1nm NE of the aerodrome which is perceived to be the point that the Airprox occurred in Class G airspace. On the next sweep the Tucano indicates a descent through 3500ft Mode C, which is perhaps indicative of the reported avoiding action 'bunt', before descending steadily through 3200ft whilst turning R.

HQ 1GP BM SM reports that for a variety of reasons, no reports or tape transcripts have been provided by the ATSU, which has impacted on the ability of this Command to investigate this Airprox. A recent interview with the

AIRPROX REPORT No 2010117

ADC about this Airprox has been unable to shed any light on the occurrence. The ADC is an experienced and reliable controller who states that no mention was made of the Airprox on the frequency, nor that there was anything untoward during the period.

It is possible that the reported glider did not appear on the Hi-Brite ATM, as there was another Airprox at Linton-on-Ouse 6 days later when the reported glider was not displayed on the ATM. Alternatively, with the glider operating at around 3400ft, it is more possible that the glider would have been lost in the radar overhead.

Whilst acknowledging that the Airprox occurred in Class G airspace, given the nature and volume of activity at Linton, planning to route over the MATZ in a non-transponding ac and without establishing RT contact with ATC peels away the barriers to an occurrence, leaving only 'see and avoid'.

HQ AIR (TRG) agrees with the observation of HQ 1GP BM SM on the actions, or rather the omissions of the glider in this case. The only additional mitigation for the Tucano pilot would have been to ask for a radar service outside of the MATZ but this would have been impractical for several reasons. Indeed, it is unlikely that this would have highlighted the presence of the glider in any case. This incident highlights again the hazards of non-transponding aircraft operating in the vicinity of known high concentrations of traffic without talking to appropriate agencies to warn of their presence. Despite the best efforts of the Board it has proved impossible to trace the glider operator to understand his side of the incident.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report solely from the Tucano pilot, radar video recordings, and reports from the appropriate ATC and operating authorities.

The investigation of this Airprox had proven somewhat problematic and the Board noted the unavailability of the ATC RT recording and controller's report, upon which HQ 1Gp BM SM had commented. Moreover, the absence of a report from the glider pilot, who remained untraced, naturally led to an incomplete analysis of the Airprox, which the Board could only assess on the basis of the Tucano pilot's report and the extremely limited recorded radar data.

The Station and the Tucano pilot were aware of a gliding competition taking place and Controller Members noted the comment by HQ 1 Gp BM SM about the lack of RT contact with gliders flying in the vicinity of military aerodromes. Good airmanship would suggest that it was desirable for glider pilots operating nearby to establish RT contact with an aerodrome's ATSU to notify them of their presence and to advise their intentions, which might thereby facilitate mutual warnings about military ac operating from the aerodrome and the glider itself. However, when competitions involving 40-60 gliders were involved controller Members were concerned at the potential to overload RT channels and the controller himself, who might have other higher priority tasks, so a balance had to be struck between information useful to controllers/other pilots and overloading ATC. Whilst acknowledging that any information was better than none, the Board recognised there was no compunction on glider pilots to call ATC when operating VFR under see and avoid and not all glider pilots have RT licences. In the absence of any recorded RT or input from Linton ATC, it was not evident if any glider pilots had called Linton APPROACH (APP). The Tucano pilot was not in receipt of a radar service whilst operating above the MATZ up to 3700ft aal more than 2nm away from the aerodrome, however, it was likely that TOWER would have liaised with APP beforehand. Thus if any glider pilots were in contact with APP on RT or evident on radar it could well have prompted a warning through TOWER to the Tucano pilot, but gliders are notoriously difficult to detect on primary radar and the lack of an SSR transponder makes them even less conspicuous to the controller.

A civilian controller Member emphasised, and the Board recognised, that both pilots were operating in Class G airspace above the Linton MATZ and embedded ATZ where see and avoid prevails and freedom of operation in accordance with the Rules of the Air is entirely axiomatic. Some suggested that this was a late sighting by the Tucano pilot, but then other Members contended that he had probably seen the glider as early as he could reasonably have been expected to do so. The HQ Air pilot Member concurred that the glider had been seen in sufficient time for the Tucano pilot to avoid the glider and, in his view, this was not a close encounter. The Tucano pilot reports he was able to clear 400ft below the glider after he had bunted his ac in avoidance. Moreover, the radar recording also confirmed the rapid descent in the vicinity of where the Airprox occurred. On the basis of the limited information available, the Board could only conclude that this Airprox was the result of a Sighting Report

by the Tucano pilot and that the prompt avoiding action taken was entirely effective in removing any Risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

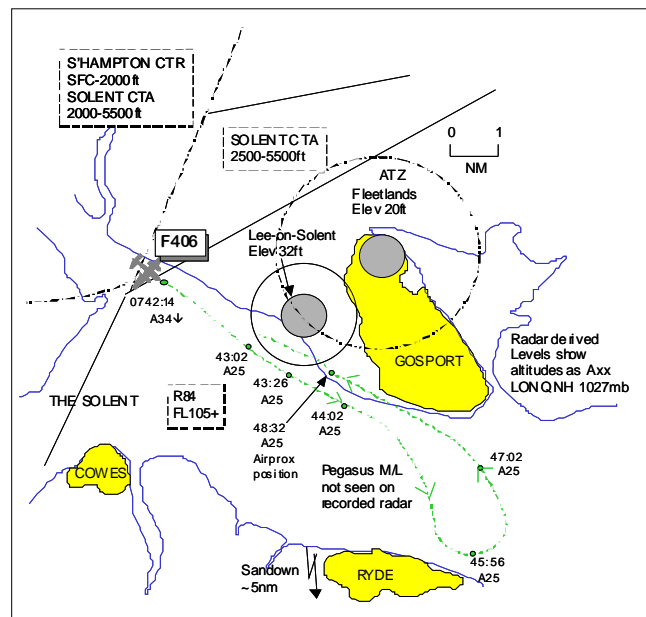
Cause: Sighting Report.

Degree of Risk: C.

AIRPROX REPORT No 2010118

AIRPROX REPORT NO 2010118

Date/Time: 31 Aug 2010 0749Z
Position: 5048N 00112W
(1nm SE Lee-on-Solent - elev 32ft)
Airspace: LFIR (Class: G)
Reporting Ac Reporting Ac
Type: F406 Pegasus
Flexwing M/L
Operator: Civ Comm Civ Pte
Alt/FL: 2400ft 2400ft
(QNH 1027mb) (QNH)
Weather: VMC CAVOK VMC HAZE
Visibility: 10km >10km
Reported Separation:
Nil V/100m H Nil V/100m H
Recorded Separation:
NR



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE F406 PILOT reports carrying out a photographic survey flight and in receipt of a limited TS from Solent Radar on 120.225MHz, squawking 3660 with Modes S and C. The visibility was 10km in CAVOK VMC and the ac was coloured purple/white with nav and strobe lights switched on. After completing runs at FL70 to the NW of Southampton, he descended to altitude 2400ft towards Gosport and flew the first line to the SE before carrying out a teardrop to re-establish on a NW'y line (300°). He heard a M/Light flight contact Solent Radar reporting airborne from Sandown, crossing the Solent N'bound at 2200ft, he thought. He looked for the M/Light, aware of the potential conflict, although the M/Light pilot had reported at 2200ft and he was flying level 200ft above. Heading 300° at 135kt and 2400ft QNH he continued the survey run whilst looking for the M/Light traffic. When close to Lee-on-Solent he caught sight of the M/Light in his 9 o'clock range 500m at the same level on a converging heading so he commenced a hard R turn for avoiding action, estimating he passed 100m in front of the M/Light. The M/Light did not appear to take any action, which led him to believe that its pilot was not visual with his ac. Once clear of conflict he reported the incident to Solent Radar requesting to file an Airprox. He assessed the risk as medium.

THE PEGASUS FLEXWING MICROLIGHT PILOT reports en-route from Sandown to Popham, VFR and in receipt of a BS from Solent Radar on 120.225MHz; no transponder was fitted. Close to Lee-on-Solent heading 036° at 43kt and 2400ft QNH a twin-engine ac suddenly appeared in his 2 o'clock range 100m banking R to avoid a collision before it passed 100m in front on a W'y course. The other ac's pilot and he both reported the incident to Solent Radar. He assessed the risk as high. At the time of the Airprox, the F406 approached from the E and there was glare from the sun, 30° to his R.

THE SOLENT RADAR CONTROLLER reports that the F406 flight, which was under a BS, advised that it wished to file an Airprox against a M/Light O/H Lee-On-Solent. The M/Light flight was under a BS and had reported over the mainland coast descending from 3000ft to 2200ft. The F406 pilot reported he was tracking 300° at 2400ft and the M/Light was crossing his track at 90°, estimating separation as 50m. The M/light pilot then reported passing 2300ft and seeing the F406 with separation of 100m.

ATSI reports that the Airprox occurred at 0748:31 within Class G airspace in the vicinity of Lee-on-Solent. Prior to the Airprox the F406 was conducting an approved flight survey, within the Solent Control Area (CTA), Class D controlled airspace (CAS). The Pegasus Microlight was on a VFR flight within Class G airspace, from Sandown

to Popham. The Solent Radar Controller was providing a BS to both flights. CAA ATSI had access to radar recordings from NATS Swanwick and written reports.

METAR EGGH 310720Z VRB01KT CAVOK 11/10 Q1026=

METAR EGGH 310750Z 0000KT CAVOK 12/11 Q1026=

At 0738:50 the Microlight flight contacted Solent Radar routeing from Sandown to Popham at 3000ft, QNH 1026mb. Solent Radar instructed the Microlight to report at the mainland coast and a BS was agreed. The radar recording shows the F406 within the Solent CTA, manoeuvring to the S of Southampton Airport at FL70. At 0739:00, the F406 commenced a descent to 2400ft, QNH 1026mb, in order to fly a SE'ly track towards Gosport [3nm SE Lee-on-Solent]. This routed the F406 outside CAS and the pilot's written report indicates that he intended to carry out a teardrop turn to establish on a NW'ly track of 300°, which would lead the F406 to re-enter CAS. The F406 pilot confirmed his intention to operate VFR. At 0742:14, radar recording shows the F406 leaving the Solent CTA descending through altitude 3400ft and just under 1min later Solent Radar agreed a BS. Shortly afterwards at 0743:24, in response to a request from Solent Radar, the Microlight pilot reported halfway across the Solent. At 0744:00, Solent Radar gave the F406 a clearance to enter CAS at 2400ft and to report any change in level. At this point radar recording shows the F406 continuing to track SE in Class G airspace.

At 0745:51, the Microlight pilot reported approaching the mainland coast at Lee-on-Solent, descending to 2200ft. Solent Radar instructed the pilot to report at New Alresford and to remain outside CAS. No primary contact was seen on the radar recording. However, the Southampton unit investigation report indicated that a primary contact was observed on the Southampton radar recording, approximately 3nm SE of Lee-on-Solent. At 0745:56 the radar recording shows the F406, 5-9nm SE of Lee-on-Solent at 2400ft commencing a L turn onto a NW'ly track.

At 0748:34 the radar recording shows the F406, 1-5nm SE of Lee-on-Solent but no primary contact is observed. The Southampton unit investigation report indicated that the Southampton radar recording showed the F406 merge with a primary contact.

At 0749:04 the F406 pilot asked Solent Radar if they were aware of a Microlight in the vicinity. Solent Radar reported the position of a Microlight, as N of Lee-on-Solent. The pilot of each ac then reported an Airprox.

The F406 pilot's written report indicates that he believed the Microlight to be crossing the Solent at 2200ft and considered it was 200ft below. However, the Microlight was at 3000ft and it was only when the Microlight crossed the coast at Lee-on-Solent, that the pilot had reported descending to 2200ft.

CAP493, Manual of Air Traffic Services, Part 1, Section 1, Chapter 11, Page 4, Paragraph 3.1.1 states:

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

Paragraph 3.5.1 states:

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

Both flights were in receipt of a BS from Solent Radar. CAA ATSI considered that although the provision of TI is not a requirement, the passing of a traffic warning would have aided the situational awareness of both pilots and would, in this case, have been appropriate.

AIRPROX REPORT No 2010118

UKAB Note (1): The radar recording shows the F406 approaching Lee-on-Solent from the SE tracking 300° level at altitude 2500ft LON QNH 1027mb before passing about 0.75nm SW abeam of Lee-on-Solent tracking towards the Solent CTA.

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.

An experienced pilot Member informed the Board that survey flight operations normally led to a busy cockpit environment, particularly when flown by a single pilot. Members wondered why the F406 pilot had not asked for a TS from Solent as the flight was leaving CAS to reduce his workload and supplement his lookout scan for other traffic. It was clear that the F406 pilot was under the misapprehension that the Microlight was at 2200ft, which had clouded his SA. The Pegasus pilot had reported his altitude as 3000ft and 2min before the Airprox had made a position report approaching the mainland and descending to 2200ft. Although both flights were on the same frequency for some time, the Pegasus pilot would have had great difficulty in assessing the F406's intended flightpath from the RT exchanges and so his SA was reduced. With both flights under a BS, both pilots were responsible for maintaining their own separation from other traffic through see and avoid. It was unfortunate that the Solent Radar controller had not issued a traffic warning to either flight as this might have taken the 'sting' out of the Airprox. As it was, the F406 pilot saw the Microlight late on his LHS and immediately made an abrupt R turn to avoid it, estimating 100m separation. The Pegasus pilot only saw the F406 as it crossed in front by 100m from R to L, as it was taking avoiding action, which Members agreed had been effectively a non-sighting. The visual acquisition by the F406 pilot and his prompt and robust actions were thought to have been just enough to remove the actual collision risk; however, the Board believed that the ac had passed with margins reduced such that safety was compromised during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively a non-sighting by the Pegasus Microlight pilot and a late sighting by the F406 pilot.

Degree of Risk: B.

AIRPROX REPORT NO 2010120Date/Time: 2 Sep 2010 0923ZPosition: 5309N 00219W (0.75nm N Arclid
M/Light site - elev 262ft)Airspace: LFIR (Class: G)Reporting Ac Reported AcType: Pegasus Quik MD900

GT450 Flexwing Explorer

Operator: Civ Trg Civ PteAlt/FL: 700ft 1300ft

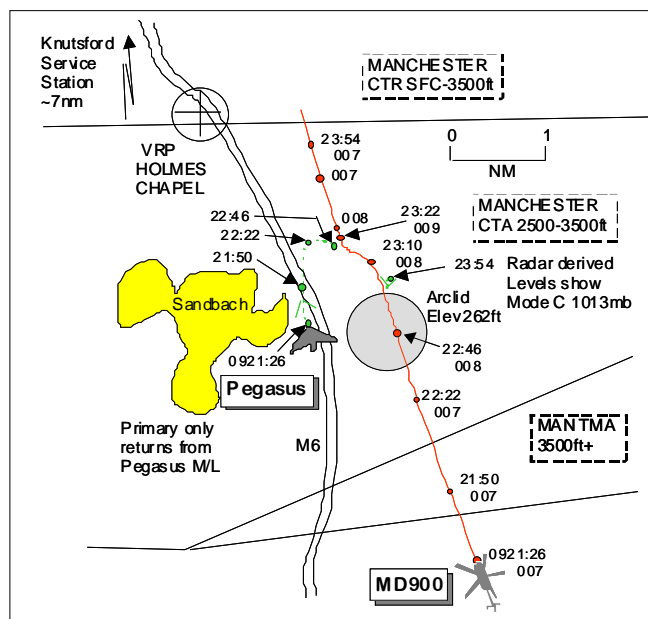
(QFE 1012mb) (QNH)

Weather: VMC NR VMC CLOCVisibility: >10km 20kmReported Separation:

Nil V/200m H 100ft V/1000m H

Recorded Separation:

NR

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE PEGASUS QUIK GT450 FLEXWING PILOT reports flying a dual training cct sortie from Arclid, VFR and monitoring the M/Light frequency 129.825MHz. The visibility was >10km in VMC and the ac's flexwing was coloured yellow/white. Whilst on R base leg RW20 at 700ft QFE heading 090° at 52kt, he was describing the next stage of flight to the student when he noticed movement in his R peripheral vision. On taking a closer look he saw a black or blue coloured medium sized helicopter, possibly a Eurocopter type, on a collision course heading 300° at the same height a few hundred metres away (0.25nm). He took control and descended to the L noting the helicopter also took avoiding action, he thought, by turning to its L; the helicopter then passed down his RHS by 200m. After landing he contacted Manchester Airport to report the Airprox. He believed there was a high risk of collision as the helicopter flew through the centre of an area of intense M/Light activity - the airfield is shown on charts - at cct height, with the ac involved being close enough such that the pilots felt the need to take avoiding action.

THE MD900 EXPLORER PILOT reports en-route to Barton, VFR and in communication with Manchester Approach, squawking an assigned code with Modes S and C. The visibility was 20km in VMC and the ac was coloured black with strobe lights on. Heading 350° at 1300ft QNH and 110kt they saw a powered delta-wing hang-glider about 1000m away as it was already passing down their LHS about 100ft above. In their opinion this was not an Airprox, there being no risk of collision and no avoiding action was taken by either ac.

UKAB Note (1): The UKAB Secretariat telephoned the Capt of the MD900 to discuss the disparate viewpoints of the incident. After informing the Capt of the geometry, he stated that the M/Light he had seen in the area had passed well clear to his L and above, not to his R and below as reported by the Pegasus pilot. Also, he had not made an avoiding action L turn near to Arclid but thought it might have been a track change to comply with the limit of the clearance issued by Manchester ATC to remain W of a VRP.

ATSI reports that the Airprox occurred at 0923, in the vicinity of Arclid airfield, situated in Class G airspace, 12.5nm to the SSW of Manchester Airport. Arclid is notified in AIP ENR 5-5-4-1 as a Microlight site (elevation 262ft). The Airprox was reported by the pilot of a Pegasus Quik GT450 M/Light, operating VFR in the cct for RW20 at Arclid airfield and not in receipt of an ATS. The Manchester METAR: EGCC 020920Z 0000KT 9999 NSC 18/11 Q1022 NOSIG=

At 0910:00 the MD900 pilot contacted Manchester Radar reporting on a VFR flight from a private site near Eastbourne en-route to Manchester Barton. The pilot reported at altitude 1400ft, QNH 1022, and requested a BS. Radar recording showed the helicopter's position as 25nm SSE of Arclid airfield tracking 350°. Manchester Radar

AIRPROX REPORT No 2010120

agreed a BS and allocated a squawk 7353. At 0911.20 the MD900 pilot reported 4nm SW of Stafford and the pilot was instructed to plan on a direct route to Barton but to remain outside CAS. At 0916:50 Manchester Radar identified the MD900 and confirmed a BS outside CAS however, there was no response from the pilot.

At 0918:00 Manchester Radar advised the MD900 pilot to route W of Knutsford Services [10nm NNW Arclid on the M6] to enter the CTR then direct to Barton not above 1250ft VFR. This was acknowledged correctly by the pilot. The radar recording showed the MD900 10nm SSE of Arclid and tracking 340° towards Arclid airfield.

[UKAB Note (2): By 0921:26 the MD900 is 4.2nm SSE of Arclid indicating FL007 (970ft QNH 1022mb) with an intermittent primary only return, believed to be the Pegasus M/Light, 0.75nm W of Arclid tracking 360° in the MD900's 1130 position range 3-25nm. The Pegasus M/Light continues on steady track until 0922:22 when it is seen to commence a R turn, rolling out on an E'y track base leg for RW20. The Pegasus M/Light fades after the sweep at 0922:46 when it is 1nm NW of Arclid at which time the MD900 is passing O/H Arclid indicating FL008 (1070ft QNH). As the MD900 reaches 0.8nm N of Arclid it turns L about 45° for a short period before resuming track. Just as the MD900 is about to enter the Manchester CTR at 0923:54, the Pegasus M/Light reappears on radar 0.4nm N of Arclid tracking 190° on final for RW20. The CPA is not captured as it occurs during the radar fade period of the Pegasus whilst on base leg.]

At 0926:14 the MD900 pilot reported abeam Knutsford, routing direct to Barton not above 1250ft VFR and 2min later at 0928:13 the flight was transferred to Manchester Barton retaining the squawk.

The Manchester Radar controller has no recollection of the MD900 pilot making any comment about the incident, whilst in receipt of a BS. MATS Pt1 Section 1, Chapter 11, Page 4, paragraph 3.1.1, states:

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

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.

Members agreed that this Airprox would not have occurred had the MD900 pilot taken due regard of the airspace in which he was flying. Arclid is marked on 1:250000 and 1:500000 charts and as such M/Lights should be expected in the cct area during daylight hours. All that was required was a small course deviation early on to route clear of the O/H and/or a cruising altitude that was well above the cct. In this case the MD900 pilot flew through the Arclid O/H at cct height and came into conflict with the Pegasus M/Light, which he did not see, and this had caused the Airprox.

The MD900's L turn, reported by the Pegasus pilot as avoiding action, was in fact a navigational turn, but it helped to increase the separation between the 2 ac as they passed. The Pegasus pilot did well to spot the approaching MD900, owing to its small head-on target aspect, about 0.25nm away and had turned L to avoid it, estimating separation as 200m. This prompt manoeuvre flown by the Pegasus pilot was enough to convince the Board that any risk of collision had been effectively removed.

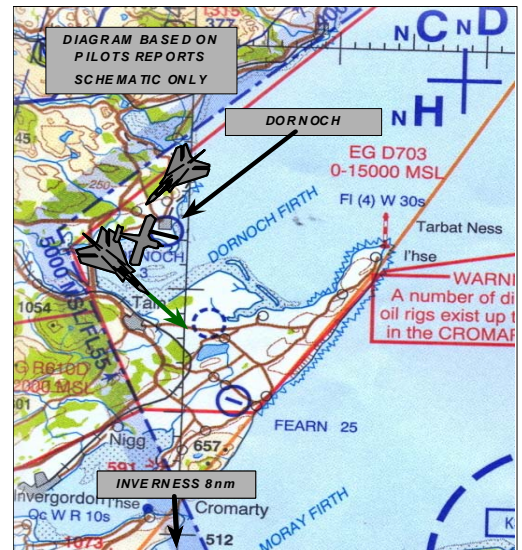
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The MD900 pilot flew through a promulgated and active M/Light site and into conflict with the Pegasus M/Light, which he did not see.

Degree of Risk: C.

AIRPROX REPORT NO 2010121

Date/Time: 31 Aug 2010 1734Z
Position: 5749N 00401W (Tain Range)
Airspace: EGD 703 (Class: G)
Reporting Ac Reported Ac
Type: Tornado GR4 PA28
Operator: HQ Air (Ops) Civ Pte
Alt/FL: 1000ft 150ft
(QFE 1023mb) (QNH 1023mb)
Weather: VMC CLOC VMC CLBC
Visibility: 10km 15nm
Reported Separation:
500ft V/500ft H 300ft V/1nm H
Recorded Separation:
NR

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE TORNADO GR4 PILOT reports leading a pair of ac conducting practice weaponry in Tain Air Weaponry Range (AWR) (EGD 703 See UKAB Note (1)) squawking 7002 with Mode C. Leader was heading 130° at 500kt, 3nm W of the Range Control Tower and about to commence a high energy 'pop' manoeuvre in order to attack a target from the West, when a light ac was seen 1000ft away in the Range Danger Area, at a height of about 1000ft agl just to the left of his nose but flying away from him. He immediately passed the 'stranger's' position to his No2 who was in 30sec trail behind him and then informed the Range Safety Officer (RSO) of the light ac and requested its heading and intentions. The RSO then identified the 'stranger' and informed them that the ac was seen to be exiting the Range to the NW.

When the 'stranger' was clear of the Range Danger Area the GR4 leader commenced an attack from the East and then exited the range to the S to RTB, while his No2 remained for a further pass. As Tornado 2 recovered from his attack he saw the ac again, appearing to have re-entered the Range from the NW, and he climbed above the ac in order to avoid a conflict. The RSO then informed him that the ac had re-entered the Range and was now exiting to the W.

They recovered to RAF Lossiemouth without further incident and assessed the risk as being Medium.

THE TORNADO STATION comments that they have highlighted the issue of penetrations of 'safe areas' in a recent Staneval newsletter.

THE PA28 PILOT reports that he took off from RW05 at Inverness on a private VFR flight to Dornoch Airstrip in a blue and white ac. He was initially flying at 75kt, in receipt of a BS from Inverness, squawking as directed with Mode C, with Tain Range frequency set as the standby. Shortly into the flight he was informed by Inverness he would be transferred to Safety Com, which he then set as the standby freq in place of the Tain frequency. While at about 2500ft over the Black Isle [outside EGD 703] he called APR and then switched to Safety Com as instructed.

On arriving at Dornoch he remained 1/3nm S of RW, checked the windsock and prepared to enter right base for landing on RW10; at that point his passenger, also a pilot, said he had seen another ac. This caused him concern and as a result he became high on the approach so he executed go-around. Shortly into the climb he saw a jet ac to the left of his nose over the water about 1nm ahead turning and possibly climbing from low level. He immediately made a 120° turn to right onto a heading of about 220° and climbed to 2500ft to depart the area without delay.

He assessed the risk as being low.

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After landing at Inverness he telephoned TWR and Tain Range to discuss this incident. The flight time from the freq change to Safety Com was very short (about 10 min) and indicated to him that the Range was inactive. At no time in this flight was he advised to contact Tain range.

He pointed out that on a previous flight to Dornoch at about the same time in the evening, he was also instructed by Inverness APR to use Safety Com and he landed at Dornoch without incident. Further, the only times Inverness APR had advised him to use Safety Com were on flights in the Dornoch area when Tain Range was not active. As a consequence he considered that the transfer to Safety Com by Inverness APR indicated the range was not active; on other flights in the area when the range was active he had contacted Tain on 122.75 as he would have done on this occasion had he not been advised to go to Safety Com.

THE TAIN RSO reported that 2 Tornado GR4 ac based at RAF Lossiemouth entered EGD 703 from the West to operate in the range. They reported seeing a light ac above the town of Dornoch, which is within the boundary of EGD 703, at about 1000ft. The light ac headed W and departed EGD 703, before turning N. The Tornados then set up for a run-in from Brora; both ac came through [the target] before leader departed the range and No2 set up for a run-in from the E.

He then saw the light ac again overhead Dornoch with Tornado 2 turning towards it so he informed the crew of the position of the ac and they replied that they were visual with it.

The light ac then turned W and, after passing Dornoch Bridge, it appeared to turn S towards Inverness so he called D&D to request that they identify the ac and put a call out on VHF guard to ask the ac's intentions. D&D spoke to Inverness ATC who said they believed the ac to be a PA28 Registration x-xxxx. He then called Inverness APR who said they had spoken to the pilot when the ac left their airspace and they had instructed him to go to the Safety Com Frequency.

At 1910 the pilot telephoned and said that he had been instructed by Inverness APR to transfer to Safety Com. The RSO informed the pilot that he would be submitting a report as the pilot had not requested permission to enter EGD 703 and had come close to a fast jet ac. Later he spoke to the Tornado Leader and the No2 navigator, who said the light ac was about 500 ft and 2/3nm away.

A transcript of the RT was provided.

INVERNESS ATC were not aware of the Airprox and did not provide a report.

HQ AIR BM SM commented that a Tornado GR4 pair was operating within an AWR (EGD 703) when an Airprox occurred with a PA28 that had infringed the range. Reports from the GR4 leader, the RSO, a radar replay and a RT tape transcript, were available to conduct this analysis; the radar replay, however, was inconclusive, therefore the investigation was conducted using information gained from the reports and RT transcripts.

The GR4 crews were conducting practice weaponry in the AWR and made initial contact with the RSO at 1731:33, when they received a range joining clearance. At that time the RSO was not aware of the presence of the PA28; therefore TI was not passed on initial contact. The first indication the RSO had of other traffic was when Tornado Leader reported an ac in their vicinity at 1734:44. This prompted the RSO to look in the reported position and where he saw a PA-28 (registration later identified). As the Tornados made a further run at 1739:44 the RSO again saw the PA28 overhead Dornoch Hotel, he estimated at 1000ft. He passed TI and Tornado leader reported visual and manoeuvred the formation to pass above the ac. The remainder of the sortie passed without incident and Tornado 2 reported leaving the range at 1742:00.

RSOs at AWRs generally operate without of surveillance equipment; consequently, their awareness of ac operating on the extremities of the AWR is dependent upon pilots operating in the area making information calls to them, under the auspices of the Danger Area Activity Information Service (DAAIS). Furthermore, the UK Mil and Civ AIP at ENR 5.1 states:

“aircraft wishing to use Dornoch or Easter aerodromes during range opening hours are to contact Tain Range on 122.75 prior to entering the range.”

This incident happened in a notified AWR and as such the ac operating within it are assumed to be protected from other airspace users in order to carry out weaponry sorties with tactical freedom. In this case the RSO carried out his duties effectively and, once aware of the proximity of the PA28, continued to scan in order to help provide early warning to the Tornados.

ATSI commented that the PA28 was on a VFR flight from Inverness Airport to Dornoch airfield.

Inverness was operating combined TWR and APR control positions but at the time of the incident neither ac was in receipt of a service from Inverness.

The Inverness weather was:

METAR EGPE 311720Z 05006KT CAVOK 16/08 Q1023=

At 1721 the PA28 departed from Inverness airport for Dornoch displaying the Inverness SSR conspicuity Code 6177. At 1723 the PA28 was asked to report when intending to change frequency for Safety-Com Dornoch.

At 1723 the Tornado formation called Inverness saying, '*north to routeing doors to the Beaully then north to Tain*'; at 1725:30 they reported clearing the gap and were instructed to report ready to leave the frequency for Tain. Inverness passed the formation TI on the PA28, positioned S abeam '*the Glory gap*', heading for Dornoch airfield. At 1726:44 the PA28 pilot was asked if he had copied the Tornados, shortly to pass N abeam en-route Tain and he confirmed that he had copied the TI.

At 1727 the Tornado formation reported abeam the '*Black Isle en-route Tain*'. At 1728:29 the PA28 was instructed to squawk 7000 and transferred to Safety Com frequency 135.475MHz, which the pilot acknowledged.

UKAB Note (1): EGD 703 is promulgated in the UKAIP (ENR 5-1-3-24) as a Danger Area from SFC to 15000ft, 0900-2200 Mon -Thu etc (the incident took place on a Tuesday) covered by [Statutory Instrument] SI 1940/644. That being the case, permission to enter from the DAAIS (Tain on 122.75) is required before entry. Further, as stated above, ac using Dornoch Aerodrome during the hours of operation of EGD 703 are required to contact Tain before entering the Danger Area.

UKAB Note (2): The incident occurred below the base of recorded radar cover.

HQ AIR (Ops) comments that this incident would be better classified as an infringement of an active danger area than an Airprox. The GR4s visually acquired the PA28 in good time to avoid it by an appropriate margin and did so. The reasons for the PA28 entering the range without the required permission is worthy of further investigation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board agreed that although this had been a serious airspace infringement, as reasoned below there had not at any time been a risk that the ac would have collided.

Tain is a busy Air Weapons Range with ac performing high-energy weaponry delivery profiles that sometimes preclude normal lookout since crewmembers need to concentrate on flying the weaponry pattern accurately, performing safety checks and acquiring the target. That being the case, such ranges are classified as danger areas for good reason and published procedures for landing at civil airfields such as Dornoch should be strictly adhered to. Further, Members noted that the PA28 pilot had incorrectly assumed that the Range was not active, despite that it was during the published activity hours, and he further incorrectly assumed that he could therefore enter the range without needing to get permission. Members agreed that these were key incorrect assumptions that had led to the confliction. The GA Member counselled that pilots should treat ranges with great respect, as they can be very dangerous places.

Controller Members agreed that, although the Inverness APR controller had complied with local orders, he could have been pro-active in helping the PA28 pilot. Although there is no landline communication between Inverness

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ATC and Tain Range, the controller was aware that the Tornados were heading there, that the Range was open and that it was within promulgated range opening hours. That being the case, and since he knew the PA28's destination, controller Members agreed that he should have prompted the PA28 pilot to call Tain as required by the UKAIP, rather than Safety Common.

When assessing the risk, Members considered the geometry of the incident and precisely when the respective pilots had seen the opposing ac. The lead Tornado pilot saw the PA28 after turning hard left onto 130° just before pulling-up for the weapon delivery profile. At that time the PA28 had already crossed the Tornado's intended flightpath well above and was probably over or very close to Dornoch airfield; that being the case, although neither pilot had seen the opposing ac until after they had crossed, the two ac had been separated by about a mile. The separation between the PA28 and the second Tornado was similar, although the geometry differed slightly. In addition, both Tornado pilots discontinued their weaponry pass to allow the PA28 to depart the range safely.

Members thought it inexplicable however, that the PA28 had then re-entered the range without calling them, in a second attempt to reach Dornoch. By then he knew positively that the range was active and he flew into conflict with the No2 Tornado for a second time; Members speculated that perhaps the PA28 pilot had incorrectly believed that, although they had no authority to do so, Inverness APR had somehow cleared him into the range. Fortunately the No2 Tornado crew saw the PA28 in good time to avoid it.

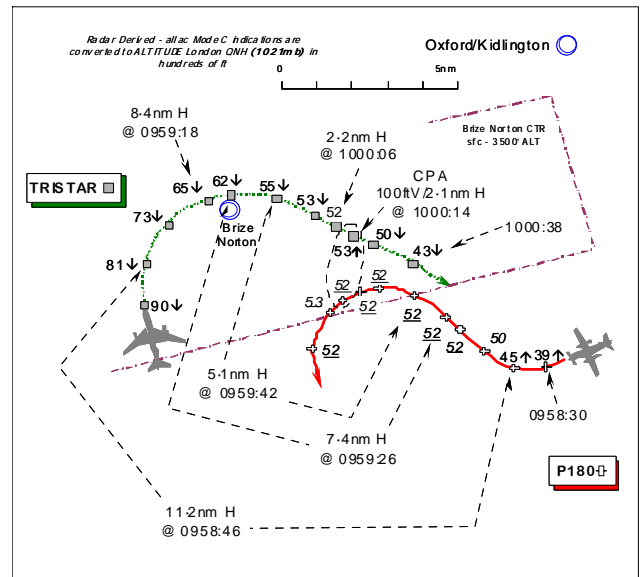
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA28 pilot entered an active Danger Area without permission and flew into conflict with the Tornado GR4s.

Degree of Risk: C.

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Date/Time: 5 Jul 2010 1000Z
Position: 5144N 00129W
 (4nm SSE of Brize Norton - elev:287ft)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Tristar KC1 P180 II Avanti
Operator: HQ Air (Ops) Civ Comm
Alt/FL: 5000ft ↓ 3000-5000ft
 QFE (1011mb) QNH (1020mb)
Weather: IMC VMC IICL
Visibility: 10km 10km+
Reported Separation:
 Nil V/<2nm H NK
Recorded Separation:
 100ft V/2.1nm H

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE LOCKHEED TRISTAR KC1 PILOT reports he was inbound to RW26 at Brize Norton from Akrotiri under IFR and in receipt of a TS from Brize DIRECTOR (DIR) on 133.75MHz. The assigned squawk was selected; Mode S and TCAS are fitted.

About 10nm S of the aerodrome in the descent from FL160 to FL80 at 270kt, DIR vectored them onto a radar heading of 340° straight towards the aerodrome and instructed them to descend to 4000ft Brize QFE (1011mb). Their proximity to the aerodrome and their height necessitated the use of full speed brakes. Passing about 9000ft they were given further descent to 2500ft and, once through the RW centreline, they were turned onto a heading of 100°, positioning them S of the aerodrome. Shortly afterwards, DIR gave a further R turn onto a heading of 120° towards traffic displayed on TCAS level at 5000ft. DIR then requested they expedite their descent. At about 6000ft QFE he elected to begin a level off, to avoid both the other ac's height and also to avoid entering cloud with tops at 5300ft QFE. This was followed very shortly afterwards by a TCAS RA, initially demanding a descent at over 2000ft/min, which the crew followed whilst informing ATC of the RA. Almost immediately thereafter they entered cloud and received a further RA, commanding a climb at 1500ft/min, which the crew initiated. During the period of the RA, DIR attempted to give avoiding action but once again he informed the controller of the TCAS RA. Shortly after receiving the 1500ft/min CLIMB RA, TCAS enunciated MAINTAIN VERTICAL SPEED indicating a 600ft/min climb, 5sec later CLEAR OF CONFLICT was enunciated. They then began descending to 2500ft in compliance with DIR's instruction and completed an approach and landing without further incident.

The other ac was not seen - it might have been in cloud - but he estimated minimum separation was within 2nm at the same height with a 'high' Risk of a collision. The Airprox occurred while the crew were under a high workload during their descent in the airfield overhead utilising speed brakes and about to enter cloud.

THE PIAGGIO P180 II AVANTI PILOT, the PF, reports that they were outbound from Oxford/Kidlington under IFR to join CAS at COMPTON (CPT), flying at 200-250kt. The assigned squawk was selected; enhanced Mode S and TCAS I is fitted.

After take-off from RW01 they climbed to 2500ft QNH (1021mb) making a R turn onto a downwind and quickly contacted Brize RADAR for a DS. Cloud was FEW at 3800ft and Brize RADAR gave them further clearance to climb but he was unsure to what altitude [FL50 - ALT52]. They were given several radar headings with large turns between them (i.e. 90° to L and R). Several contacts were seen on TCAS and he assumed this was the reason for the turns, but none of these triggered a 'warning' from their TCAS I whilst flying in 'intermittent VMC' in and out of cloud. After approximately 5min they were given a clearance to climb and proceeded enroute. The other ac was not seen.

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They were not aware that an incident had taken place and both he and his colleague were quite surprised to hear from the UKAB. Had they been aware at the time then an occurrence report would have been filed.

His ac has a white/orange livery and the HISLs were on.

BRIZE NORTON DIRECTOR (DIR) reports that he had a light workload and was working the Tristar inbound from airways on a radar-vectoring ILS approach under a TS. He had taken the Tristar through the centre-line, overhead the aerodrome, in a descent to 2500ft QFE (1011mb) on a heading of 120°. At this point the Tristar was descending through FL61 [ALT63] when he noticed that there was traffic – the P180 - working LARS heading NW at FL50 [ALT52]. He asked LARS where they were taking the ac and the ATS, which was a DS. Traffic information was given to the Tristar crew who were told to expedite their descent. Updated TI was given again at 4nm range and then the Tristar crew called a TCAS RA. The P180 turned southbound and the Tristar then continued inbound under his radar vectors.

THE BRIZE NORTON LARS CONTROLLER (LARS) reports she was mentor to a trainee controller on LARS when the P180 departed Oxford and requested a DS. The ac was immediately in conflict with numerous contacts around the CPT area so she took over from her trainee and issued an avoiding action turn. She did step in during the session as it was one of the first times the trainee had experienced providing a DS and the trainee's initial avoiding action was ineffective. There was not time to let him rectify this, or discuss it. Although the workload was high for the trainee, she did not feel like she as mentor was working to capacity; indeed, she felt in control of the situation with both the trainee and the traffic. At no time did the P180 crew report an Airprox or a TCAS RA.

The main problem for the P180 was conflicting traffic in the CPT area, which required some liaison with the civil sector to get a higher joining level. She initiated this liaison, which was completed by the Supervisor. It was stressed that she did not feel pressured or unduly busy and felt the situation was under control and safe.

HQ 1GP BM SM reports that the Tristar was being vectored for an ILS approach to RW26 at Brize Norton and in receipt of a TS from DIR. The P180 was outbound from Oxford/Kidlington to join airways at CPT, whilst in receipt of a DS from LARS, which was manned by a trainee and mentor.

When identified and instructed by LARS to climb to FL50, the P180 crew requested a DS at 0957:25. LARS did not place the flight under the requested ATS at that point, although it is clear from LARS' actions that they applied a DS. Immediately, at 0957:39, LARS offered an avoiding action turn onto W against another ac that is not within recorded radar coverage [not the Tristar], “[C/S] *avoiding action turn right immediately heading 2-7-0 degrees traffic was south 5 miles tracking west indicating 2 thousand feet below.*” At this point, about 12nm horizontal separation existed between the P180 and the Tristar, which was descending through FL114, S of Brize Norton. At 0958:33, LARS issued a further avoiding action R turn instruction onto a heading of 310°, against the other contact that was now manoeuvring 3nm to the south, but “*..indicating 3000 feet below*” with the P180 in the climb to FL50.

Meanwhile, after establishing from the crew that a TS was required when the Tristar exited CAS, at 0957:37 DIR instructed them to, “*..set Brize Q-F-E 1-0-1-1 descend...height 2 thousand 5 hundred feet*”, followed later by a turn onto 100°. DIR turned the Tristar R onto a heading of 120° at 0958:44, followed at 0959:22 by TI on the P180; “[C/S] *traffic south east 6 miles north west bound indicating flight level 5-0 expedite descent*”. Although DIR reports that he asked LARS ‘where they were taking the ac’ and ascertained that the P180 was under a DS, there is no evidence on the transcript of any liaison being conducted between DIR and LARS, nor does the LARS mentor mention it. It is possible that DIR's instruction to the Tristar crew to “*expedite descent*” was in order to assist LARS, conscious that the heavy ac would be unable to level off quickly as, at the time, it was passing FL63 Mode C [about 8.4nm NW of the P180].

[UKAB Note (1): At 0959:44, DIR updated the TI on the P180 to the Tristar crew, “*...that previously called contact 12 o'clock 3 miles now opposite direction indicating flight level 5-0*” [ALT52], which was not acknowledged by the crew. This was followed by an instruction to turn L 20° onto a heading of 100°. At 1000:03, the Tristar crew advised DIR “*..just got TCAS R-A*”, to which DIR replied, “*confirm what heading*”. The Tristar crew repeated 5sec later “[C/S] *is 5 thousand feet TCAS R-A*”, whereupon DIR responded, “*roger that's copied turn left heading 1-0-0 degrees descend height 2 thousand 2 thousand 5 hundred feet*”. This instruction was read-back by the crew “*left heading 1 hundred and descend 2 thousand 5 hundred feet [C/S] currently I-M-C*”, which was acknowledged by the controller. Following a further L turn instruction from DIR onto 080°, the crew advised at 1000:34 that they were “*..now clear of conflict*”.]

Although the Tristar pilot reports that at about 6000ft they 'elected to begin a level-off' to avoid the P180's level and also entering cloud, they did not mention the level-off on the RT. [UKAB Note (2): A reducing RoD is evident from the Tristar's recorded Mode S Downlinked Ac Parameters (DAPs) as the ac steadies outbound from the Brize overhead, after 0959:42, from about 2500ft/min to 1100ft/min at 0959:50. Mode S then shows an increasing ROC up to ~900ft/min through to the CPA. However, this ROC is hardly reflected at all in the ac's indicated Mode C, before the descent is resumed after 1000:14, increasing to over 3300ft/min.]

It is clear that LARS was aware of the P180's proximity to the Tristar at 0959:23, when an instruction to turn L onto 180° was issued; however, it is not until 0959:42 that the turn begins to become evident on the radar recording [about 2 sweeps later], when LARS amended the instruction into avoiding action, "[C/S] *avoiding action turn left immediately heading 1-7-0 degrees traffic was north east [sic] 4 miles tracking east indicated at flight level 5-0*". The transcript is not clear but the P180 crew may have become visual with the Tristar at this point stating, "*request traffic in sight and..turning left heading 1-7-0.*"

[UKAB Note (3): The P180 pilot reports the Tristar was not seen. When the avoiding action turn was transmitted the Tristar was actually 5.1nm NW of the P180, not NE as stated by LARS, indicating 5300ft (1013mb) and some 340ft above the P180 that was at 5200ft London QNH (1021mb) – (at the western edge of the displayed London QNH (1021mb) area). The CPA occurred at 1000:12 as the ac passed abeam, 2.1nm apart, with the Tristar indicating 100ft above the P180 on Mode C. A change of controller is noted on the transcript for the next transmission to the P180 crew at 1000:30, suggesting the mentor stepped-in at this point; "[C/S] *avoiding action turn right immediately heading 2-7-0 degrees traffic [not the Tristar] was south east 4 mile manoeuvring indicating 2 thousand 2 hundred feet below*". This was read back by the crew, "*..right heading 2-7-0 again*", before LARS [the mentor] added, "[C/S] *I am going to struggle to get you close to COMPTON under a De-confliction Service as there is a lot of conflicting traffic in that area [are you] happy to accept a downgrade to Traffic Service for your controlled airspace join?*" This was declined by the P180 crew, "*..roger we prefer a Deconfliction Service*". DIR then responded by modifying the previously transmitted avoiding action turn by 10° at 1000:56. A further avoiding action R turn was given onto E before the P180 crew was released own navigation for CPT, the CAS joining clearance issued and the flight switched to LACC.]

Although the Tristar crew state that, based on their interpretation of the TCAS display, DIR's turn onto 120° vectored them into confliction, this is not the case. At the point that the turn was issued to the Tristar crew [at 0958:44] the P180 was SE of Brize Norton and no factor. Furthermore, even after the P180 was turned onto 310° [at 0958:33], the Tristar's heading of 120° would still not be a conflicting heading within the terms of a TS, insofar as about 1nm of horizontal separation would have been achieved. Moreover, whilst the Tristar crew highlight that DIR passed them avoiding action after ATC were advised of the TCAS RA, this is technically incorrect in that it was a re-statement of the heading of 100° previously issued. Having acknowledged the TCAS RA, DIR then continued to vector the Tristar inbound. JSP 552 245.120.3 states that:

'controllers shall not attempt to modify the aircraft flight path until the pilot reports Clear of Conflict'.

Notwithstanding the potential cockpit workload during this phase of the flight, of further concern is the fact that the crew appeared to have decided to level-off without communicating this intention to DIR and that they did not advise DIR of the first TCAS RA.

From an ATC perspective, once LARS had given the P180 crew the avoiding action turn onto W against another ac at 0957:39, the trainee controller was faced with a challenging situation, given the airspace constrictions and his experience level. However, at no stage did LARS attempt to coordinate with the military ATSU that was working the traffic that caused them to take avoiding action. Nor did they reduce the ATS for the high traffic density, which may have afforded them greater flexibility to route towards CPT. Although the mentor took over from the trainee immediately after the avoiding action turn away from the Tristar, this Command contends that earlier intervention by the mentor could have prevented this Airprox. Notwithstanding DIR's actions after being advised of the TCAS RA, DIR had attempted to provide the best level of ATS to the Tristar by requesting the expedite descent and turning them away from the P180.

Normally in this situation, the SUPERVISOR (SUP) would be expected to maintain oversight and liaison between the controllers involved, a presence that could have affected the outcome of this Airprox; however, in this instance, the SUP had been busy in the VCR [although LARS says the airways join was finalised by the SUP after he returned to the ACR]. RAF Terminal ATSUs have for some time operated with only one Supervisor in ATC whose

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remit extends to both the VCR and ACR, yet a number of incidents have occurred where the lack of a supervisory input has been a contributory factor. As the RAF begins to concentrate ac types at a reduced number of MOBAs, it may be appropriate to re-consider the RN system of a dedicated VCR Supervisor – the Duty Air Traffic Control Officer (DATCO) – in addition to a Radar Supervisor in the ACR.

An aggravating factor in this occurrence was the slow response of the P180 to the avoiding action turns, possibly as a result of the crew's use of the A/P to initiate the turn, rather than flying the ac manually. If this is the case, this issue has been highlighted before in Airprox investigations and warrants further investigation.

Recommendations made by BM SM

HQ 1 Gp BM SM will shortly begin a regular newsletter to publicise the findings of occurrence investigations, which will cover the issues raised above.

RAF ATM FLC, in association with units, is requested to examine the utility and possibility of instituting dedicated ACR and VCR Supervisors.

The UKAB is requested to engage with the CAA about the use of A/P initiated avoiding action turns, rather than manual flying, when operating in un-controlled airspace.

HQ AIR (OPS) comments that the analysis by the HQ 1GP BM SM is supported and that HQ Air (Ops) has nothing further to add.

UKAB Note (4): Although not involved in this Airprox, NATS Ltd helpfully provided a TCAS review of this Airprox using the Eurocontrol Automatic Safety Monitoring Tool (ASMT) to analysis TCAS RA messages downlinked via Mode S (TAs are not downlinked) and the InCAS simulation tool. As TCAS interrogates once every second and the radar recordings used for the simulation give data updates rates of up to 8sec intervals, interpolation is necessary. Hence, there can be variations between the InCAS simulation and what actually occurred in the cockpit. The InCAS simulation here used interpolated single source radar data from the Heathrow 10cm (4sec data update rate), the Airprox diagram is based on the Clee Hill Radar recording (8sec data update rate). The main elements of this simulation are summarised herein.

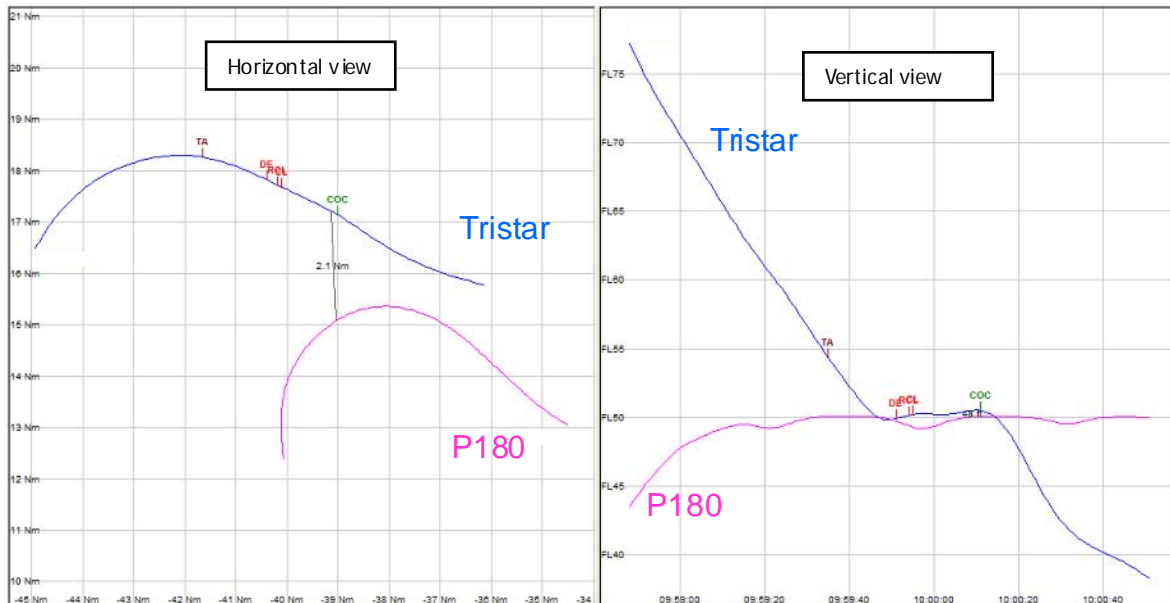
InCAS indicates that the Tristar crew first received a TA at FL54 at 0959:35, when the P180 was at a range of 5.88nm and 432ft below the Tristar. The ASMT recorded two TCAS RA messages downlinked via Mode S from the Tristar during this encounter. When the P180 had closed to a range of 3.57nm and 22ft below the Tristar, the latter's crew received a Descend RA within the 4 seconds prior to 0959:51. This RA changed to Maintain Vertical Speed within the 4 seconds prior to 0959:54. Analysis of the 'raw' downlinked messages indicates that this RA was specifically a Maintain Climb type of RA. (This RA is enunciated as "*Maintain Vertical Speed, Maintain*".) This would indicate that the sense of the RA must have reversed from a descending sense into a climb via an additional 'Reversal Climb' RA between the initial Descend RA message and the Maintain Climb RA message. The ASMT has not recorded this probable RA as no radars interrogated the ac during this brief period.

(Notably, the downlinked TCAS RA messages from the Tristar indicate that it treated the P180 as a Mode A/C aircraft and not as Mode S equipped. This is despite the ground radars identifying the aircraft as at least Mode S Elementary Surveillance capable.)

Thus the encounter geometry of the ac was such that the Tristar could have been in receipt of a Descend RA at 0959:51, followed within 4sec by a 'Reversal Climb' RA at 0959:54 as detailed above.

The simulation indicates that the Clear Of Conflict message would have been generated at 1000:11.

InCAS Simulation



Encounter Diagram Based on Heathrow 10 Single Source Radar Data

CODE	DESCRIPTION	CODE	DESCRIPTION
TA	Traffic Alert	DE	Descend
RA	Resolution Advisory	RCL	Reversal Climb
COC	Clear of Conflict	KVS	Maintain Vertical Speed

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 together with a TCAS analysis.

The Board noted the comments in the HQ 1GP BM SM report relating to the perceived slow response by the P180 crew to the avoiding action instructions issued by LARS, possibly as a result of the crew's use of the A/P rather than hand flying the ac. The Board was briefed that the recorded radar data (only updated every 8sec) suggested that the P180 was turning at a rate of about 3°/sec (rate 1) with a radius of turn of about 2nm. This seemed reasonable and a CAT pilot Member explained that his company's policy had changed recently from disengaging the A/P when given an avoiding action instruction to now applying the turn with the A/P still engaged. However, it was unclear how the P180 crew had executed the avoiding action turns in this instance. The Board had discussed on several occasions the advantages of the rapid response when flying manually against the disadvantages of disengaging the A/P and adding to the crew's workload in a potentially difficult and intense situation. A GA Member familiar with the P180 opined that it is fitted with a good, responsive A/P and the consensus here was that faced with multiple instructions to avoid other ac, including the Tristar, under the DS and their preparations to join CAS, the P180 crew was probably complying with LARS's instructions as best they could and their speed of response had little impact on the eventual outcome of this Airprox. Nevertheless, in view of the concern expressed by HQ 1GO BM SM, the CAA ATS Policy and Standards Advisor agreed to clarify, outwith the meeting, the current 'best practice' advice relating to the use of the A/P when complying with ATC avoiding action instructions.

Military controller Members noted that although the Tristar pilot was in receipt of radar vectors there was no necessity to achieve any stipulated separation minima under the TS requested by the pilot. A Member was concerned at the use of TS for directing IFR recoveries in IMC; some military controller Members suggested this was the only suitable radar service in Class G airspace, given the density of traffic commonly encountered in this locale. The military fast-jet pilot Member agreed that it was the Tristar pilot's choice; a balance had to be struck between an expeditious approach under a TS, where the pilot was content to maintain his own separation against

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traffic that he could see, versus the significant delays occasioned by following avoiding action vectors under a DS to achieve the stipulated deconfliction minima. A military controller Member opined that DIR would have been taking other traffic into account when issuing vectoring instructions in the pattern and agreed with the Command that the Tristar was not vectored into conflict by DIR. However, other pilot and controller Members had different views. This Airprox illustrated the importance of an early all round and frequent scan for other traffic by radar controllers, which might affect ac under service. DIR reports that he had not noticed the P180 until the Tristar was descending through FL61 and Members recognised this was moments before he transmitted the first TI about it to the Tristar crew as the latter passed abeam Brize Norton. DIR was not busy, but it seemed to civilian controller Members that the controller had spotted the P180 at a late stage; with vectors into a LHD pattern S of the RW centreline, combined with the decent to 2500ft QFE, it was always going to be difficult to get the Tristar safely below the P180 and a Member thought that DIR had subsequently vectored the Tristar unnecessarily close to the P180. Hence the request to the Tristar crew to expedite their descent below the P180's level. In the absence of verbal co-ordination, not knowing what LARS might do with the P180, a military controller Member thought it would have been better to have vectored the Tristar into a RHD pattern downwind N of the RW centreline, but by the time DIR had seen the P180 and appreciated the situation it was all too late. At these ranges the potential for triggering a TCAS RA by vectoring the Tristar so close ahead of another ac in level flight whilst descending through its level should have been readily apparent and ultimately resulted in the three RAs being generated in close succession. The TCAS analysis indicates that the Tristar crew received a TA and three RAs over the space of 20sec: a Descend RA, a reversal into a Climb RA followed by Maintain Vertical Speed, before Clear of Conflict was achieved. In considering the Tristar pilot's response to the TCAS instructions, the Board noted that he had advised DIR 12secs into the RA sequence, which the Board viewed as entirely reasonable in the circumstances given the requirement is to notify ATC as soon as possible, but with the caveat 'as permitted by flight deck workload'. CAT pilot Members rejected the Command's criticism of the Tristar crew for not communicating this and his intention to level out earlier. Moreover, pilot Members stressed that even if there is a conflict between an RA and an ATC instruction, pilots must comply with the TCAS RA that will, if followed promptly, ensure that they fly clear of the conflicting ac. Members agreed DIR should not have issued or reiterated any instructions to the Tristar crew once the RA had been declared. A civilian controller was concerned that this Airprox might illustrate a deficiency in military ATC training, but the HQ 1Gp BM SM Advisor reassured the Board, and the extract from JSP 552 confirmed, that the instructions for military controllers not to attempt to alter the ac's flightpath until advised that the ac was 'Clear of Conflict' were the same as that for their civilian colleagues.

Whilst endeavouring to descend the Tristar speedily below the P180 it seemed that DIR had attempted to liaise with LARS, but the Command had highlighted that no verbal co-ordination was evident from the transcripts. Irrespective of whether a TS or DS was being afforded, controller Members were adamant that co-ordination was warranted to ensure the safe deconfliction of these two ac. However, in the provision of a DS, controller Members opined that LARS had the primary responsibility to initiate verbal co-ordination to achieve the stipulated deconfliction minima. Neither controllers' workload was high, which should have allowed them to reach an accord that could have helped LARS significantly, prevented the eventual erosion of deconfliction minima and forestalled the TCAS RAs. The Board agreed that the lack of co-ordination between LARS and DIR was a Contributory Factor.

Especially in the early stages of training, Mentors must not allow the limited abilities of the trainees in their charge to adversely affect the ATS being provided. The LARS Mentor had reported her trainee's initial avoiding action was ineffective, but it seemed that she had not taken over control from the trainee until after the CPA had occurred. Judging exactly the most appropriate point to step-in and take-over is not always obvious or straightforward. Nevertheless, Members agreed that earlier intervention by the LARS mentor, who was entirely responsible for the actions of the controller under training, could have been beneficial here. Whether or not the CAS joining clearance affected LARS ability to co-ordinate or monitor the trainee, the Command's comment about the efficacy of retaining a Supervisor exclusively in the ACR had merit and might have led to earlier resolution of the developing conflict. When LARS elected to turn the P180 R onto 310° it might have taken the P180 away from the other ac, but it vectored the P180 closer towards the aerodrome radar pattern, which illustrated to some Members a lack of awareness of the overall traffic situation. This, coupled with the absence of any verbal co-ordination against an ac descending through the level of the P180 was indicative of a lack of team work within the ATSU, a civil controller Member opined. The HQ BM SM report shows that LARS did not attempt to resolve the conflict with the Tristar until the P180 was turned L onto 180°, when the Tristar was just over 7nm away and closing rapidly with horizontal deconfliction minima being eroded moments later. This signified that LARS was also caught unawares by the tanker descending into the ILS pattern, but which should have been readily apparent to them. After a wide ranging

debate, the Members concluded that this Airprox had resulted because LARS vectored the P180 into conflict with the Tristar.

Turning to the inherent Risk, the P180 pilot reported that he did not see the Tristar, although his RT response to the avoiding-action turn and TI about the Tristar might feasibly have confused the controller into thinking that he had. Nevertheless, whilst flying in between cloud layers the proximity of the Tristar should have been apparent to the P180 crew from their TCAS I display. Similarly, while the Tristar crew were aware of the P180 from their TCAS display and warnings, they did not see it visually. Although the rapidly changing TCAS RAs had only enabled the Tristar crew to gain 100ft separation above the 'non co-operative' TCAS I equipped P180 at the CPA, the analysis demonstrates that TCAS was resolving the conflict in the vertical plane. Furthermore, the avoiding action L turn instruction issued to the P180 crew did eventually ensure that their ac was flown clear to the S of the Tristar with 2.1nm horizontal separation as the ac passed. This convinced the Board that no Risk of a collision had existed in these circumstances.

The Board noted the first two internal Recommendations made within the HQ Air BM SM report and awaited further advice about the use of A/P initiated avoiding action turns, versus manual flying, when operating in un-controlled airspace.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause:LARS vectored the P180 into conflict with the Tristar.

Degree of Risk: C.

Contributory Factor: Lack of co-ordination between LARS and Director.

AIRPROX REPORT No 2010123

AIRPROX REPORT NO 2010123

Date/Time: 2 Sep 2010 0615Z

Position: 5503N 00502W (5nm SSW TUNSO)

Airspace: AWY P600 (Class: D)

Reporting Ac Reported Ac

Type: A319 ATR72

Operator: CAT CAT

Alt/FL: FL140 ↓FL150

Weather: VMC NR VMC NR

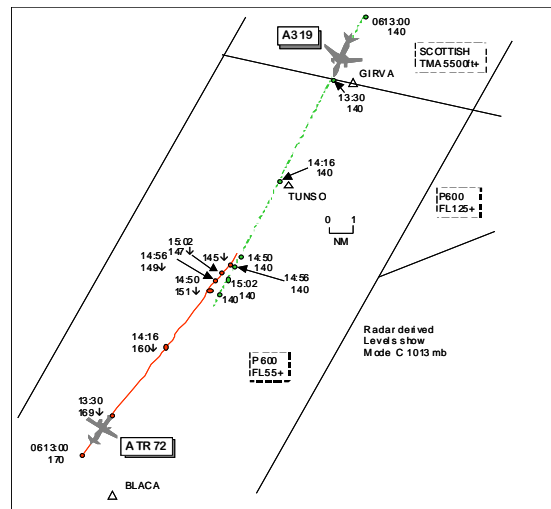
Visibility: NR NR

Reported Separation:

400ft V NR

Recorded Separation:

700ft V/0.3nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A319 PILOT reports cruising at FL140 en-route to Belfast IFR and in receipt of a RCS from ScACC on 123.775MHz, squawking with Modes S and C. ATC advised them of opposite direction traffic that had been cleared to descend to FL150; visual contact was made with an ATR 15nm ahead. A TCAS TA occurred as the ATR passed O/H as it had descended to +800ft of their level, before a TCAS RA 'monitor v/s' was received before 'clear of conflict' soon followed with no level deviation. Their TCAS showed the ATR to be behind them when it stopped its descent +400ft above their level. ATC checked with the ATR crew for their cleared level and told them of their 'level bust'. ATC was informed of their TCAS RA and they replied that a report had been filed. Visual contact was maintained continuously until the ATR passed O/H and he assessed the risk as high.

THE ATR72 PILOT reports en-route to Edinburgh, IFR and approaching TUNSO, having been cleared from FL170 to FL150 when ready, to be level by TUNSO. He, the Capt and PF, should have set the new cleared level on the altitude display unit (ADU) [MCP] straight away but instead he put FL150 into the GNSS [FMC] to work out the descent profile and missed the ADU. He thought a radio call to another ac just before their descent call distracted him, as he believed this other ac was also routeing towards TUNSO and was given the same level restriction they were expecting. They remained at FL170 for another few miles until he initiated descent by selecting VS mode and a ROD of 1200fpm, before increasing this to around 1800-2000fpm as they approached TUNSO. Whilst descending ATC told them to maintain FL150 on reaching as an A319 was cleared to 1000ft below their cleared level in the opposite direction. Both he and the FO looked out and watched the A319 pass by and then TCAS sounded "traffic traffic". He looked back in at the altimeter and noticed his error simultaneously as an RA 'adjust v/s' was received. He corrected their flightpath to regain their correct cleared level. They were able to make visual contact with the A319 as soon as the controller had told them to expect to see it and they remained in visual contact with the A319 throughout the whole incident. He opined that had they adhered better to their SOPs the 'level bust' could have been avoided. He believes that a significant factor was tiredness/fatigue as he had been on 4 very early starts in a row, before 0500, and had flown 80 odd sectors in the previous month; his FO had had a similar workload. He subsequently completed a level bust survey, which was included with his report.

THE ANTRIM SECTOR CONTROLLER (SC) reports the ATR72 flight was given descent to FL150 with TI on opposite direction A319 at FL140 whose crew was also given TI on the ATR. STCA activated when the ATR was descending through FL147 and, after the ac passed, he saw the ATR descend to FL144. No avoiding action was given as the ac were passing each other as STCA activated.

NATS PRESTWICK UNIT INVESTIGATIONS reports the Airprox occurred when the ATR72 flight, having been issued with descent clearance to FL150 and which was correctly read back, passed through its cleared level by 600ft.

The ATR72 flight first called the Antrim SC at 0553:15 climbing to FL150 and was advised of the landing RW at Edinburgh. The standard route is ROTEV – GOTNA – BLACA – TUNSO – TLA for a TWEED arrival. The Antrim Sector was then handed over and was then controlled by a single controller operating as the Tactical and Planner. At 0609:40 the ATR72 was issued with descent to meet the standing agreement between Antrim sector and the adjacent Galloway sector, *“ATR72 c/s when ready descend flight level one five zero level by TUNSO”* which was read back correctly. At 0611:15 the A319 flight called on its own navigation for BLACA as per the agreement with the Galloway Sector. About 2 min later at 0613:14 the Antrim SC passed TI to the ATR72 flight, *“ATR72 c/s maintain flight level one five zero on reaching there is opposite direction ‘A319 company’ one thousand feet beneath your cleared level”*. The ATR72 crew replied *“Okay we’ll maintain flight level one five zero on reaching ATR72 c/s”*. The SC then transmitted, *“A319 c/s when ready descend flight level one hundred”* which was read back correctly. Immediately after this the SC gave TI to the A319 flight, *“A319 c/s you might see opposite direction traffic on TCAS shortly he’s descending to one thousand feet above your current level”* to which the crew replied, *“Ah looking for traffic A319 c/s”*.

At 0614:59, as the ac were about to pass, Antrim SC transmitted, *“ATR72 c/s contact Scottish Control on one two one decimal three seven five”*, which was correctly read back. During this exchange at 0615:01 separation was lost as the ATR72 descended through FL148 before 2sec later at 0615:03 STCA activated as a low severity alert (white) with separation 700ft and 0.4nm [the ac have crossed]. Four seconds later at 0615:07 STCA changed to a high severity alert (red) with 500ft and 1.1nm separation, the SC then transmitted, *“ATR72 c/s just confirm your cleared level flight level one five zero”*. The ATR72 crew replied, *“We’re just ??????? (unclear but sounds like “maintaining”) flight level one five zero now ATR72 c/s”*. Meanwhile at 0615:11 STCA changed back to low severity alert (400ft/1.4nm) before ceasing at 0615:16. The ATR72’s Mode C shows FL142 at 0615:19 before indicating a climb; standard separation was regained at 0615:31. The A319 crew then transmitted, *“and A319 c/s we got an RA off that ATR72 company”*; the SC replied, *“A319 c/s roger I will have to file he did uh bust his level”*. The SC then called the ATR72, *“and ATR72 c/s you did uh break ah go through your level, flight level one four five at the minute”*. The ATR crew replied, *“That’s copied just correcting on a bit of a glitch in the system here”*.

[UKAB Note (1): The CPA occurs between radar sweeps. The radar recording at 0614:56 shows the ATR descending through FL149 in the A319’s 1 o’clock range 0.9nm whilst the next sweep 6sec later at 0615:02 shows the ac having passed starboard to starboard separated by 0.4nm, the ATR72 descending through FL147, 700ft above the A319 and in its 4 o’clock. The CPA is estimated to be 0.3nm and at least 700ft vertically.]

The Antrim SC was operating on his first morning shift of a 6-day cycle. The shift commenced at 0600 but he had plugged in on sector about 10min earlier. The Sector was described as moderately busy; a Planner was available but the radar controller did not feel it was necessary for the sector to be split. The controller stated that STCA triggered during the transfer of the ATR72 to the next sector. The data blocks were garbling and he was unable to read the levels. He then noticed the ATR72’s Mode C indicating FL148 and although this was not a level deviation he chose to question the crew immediately but chose not to offer avoiding action as the targets were already diverging. The radar recording shows that separation was lost for 30sec but for 28sec the tracks were diverging.

When the descent clearance was issued to the ATR72, the Mode S SFL did not change from the displayed FL170. The initial investigation revealed that where an ac is being flown manually it is unlikely that the SFL will change to reflect the cleared level. The SC did not notice the discrepancy between Mode S and the flight’s cleared level. His perception is that Mode S on certain ac types is unreliable and in some others it is missing completely. He thought that, in hindsight, the lack of Mode S information may have triggered something but in all likelihood he would have just considered the SFL readout to be unserviceable; the controller was aware of the phraseology relating to SFL. The SC had correctly issued the level change and monitored the read back, which was all that was required. The MATS Part 2 MOPS Section 4.3.1.6 Policy for the use of SFL states:

‘When available from suitably equipped aircraft, the SFL will be permanently displayed on the radar display.

Although the checking of SFL is not a mandatory task for controllers, it is encouraged for early identification of possible level busts.

The display of SFL is not a substitute for RT read back, which remains a mandatory controller task.

The SFL will be automatically removed from the Target Label on final approach.

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Phraseology when SFL is observed to be at variance with an ATC clearance states:

'Under these circumstances, controllers must not refer to the incorrect SFL observed on the radar display and must avoid debate over the RTF. Where controllers choose to query the discrepancy, the phraseology which should be used is:

"Callsign... check selected flight level. Cleared level is Flight Level/Altitude (number)"

During this event there were at least 2 other flights within the sector that had been given similar levels and routes to TUNSO but both flights were on a similar track to the ATR72 and ahead.

ATSI endorsed the findings of the Prestwick Unit Report (APX-64618). In addition to the allocation of safe clearances to both ac the Antrim controller also chose to give TI about the respective ac 1000ft above and below.

In addition, the non-standard behaviour of the Mode S Selected Flight Level (SFL) on the controller's situation display was highlighted to other unit controllers in the form of an Incident Brief, which was disseminated shortly after the incident. Standard phraseology is available for controllers to use when a challenge of Mode S information is appropriate (CAP493 Manual of Air Traffic Services Part 1, Appendix E (Attach) Page 14, 11 March 2010, refers).

The unit report also recommends the review of airspace 'hot spots', where similar occurrences might be likely. This has been accepted by unit management and the ATSD En-Route Inspectorate will monitor the progress of the recommendation as required.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Experienced CAT Members pointed out that the statement in the NATS Unit Investigations report regarding the SFL not reflecting the cleared level when an ac is being hand flown was incorrect. As shown in this case, the SFL displayed was not the ATR72's cleared level because the crew had not set FL150 in the MCP. The ATR72 was being flown using the v/s Mode of the AP but the functionality of SFL would have been no different if the ATR72 was being flown manually. It was clear to CAT Members that had SOPs been followed the AP would have captured the cleared level. Although the ATR72 Capt believed he had become distracted when the level change instruction was received, Members wondered why normal CRM cross-checking had not picked up this MCP/SFL anomaly. Furthermore, there should have been further cross checking as the flight descended with 1000ft to go checks as the ac approached its cleared level of FL150. It appeared the ATR72 crew were both looking out for the opposite direction A319, following good 'defensive' controlling by the Antrim SC when he passed TI to both flights, and they had watched the A319 pass below. In doing so the ATR72 crew descended below their cleared level and into conflict with the A319, which caused the Airprox. Separation was then lost as they crossed which then triggered the safety nets of STCA and TCAS. TCAS TAs and RAs were briefly generated which alerted the ATR72 crew to their error and caused the A319 crew some concern as they had watched the ATR pass 800ft above and then continue its descent before establishing into a climb back to FL150. With both crews' visual sightings and the ac rapidly diverging after they had crossed the Board agreed that any risk of collision risk had been effectively removed.

Members noted that the Antrim SC had not noticed the SFL/cleared level discrepancy but were surprised by his perception regarding the reliability and/or missing of SFL. A CAT Member informed the Board that whilst there is a known SFL transmission problem within a certain ac type in the UK leading to the SFL being missing, the problem is being addressed and there is no fundamental issue with the accuracy or reliability of Mode S equipment. Controller Members, familiar with LTC operations, informed the Board that checking of SFLs was 'modus operandi' since its introduction and querying of the SFL with crews, if it did not change when a flight was instructed to change level, was second nature.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The ATR72 crew descended below their cleared level and into conflict with the A319.

Degree of Risk: C.

AIRPROX REPORT No 2010124

AIRPROX REPORT NO 2010124

Date/Time: 3 Sep 2010 1228Z

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

Airspace: Lincolnshire AIAA (Class: G)

Reporting Ac Reported Ac

Type: Tristar TB20

Operator: HQ Air (Ops) Civ Pte

Alt/FL: FL66 ↓ FL61 ↓

Weather: VMC In rain VMC CLAC

Visibility: 5km >10km

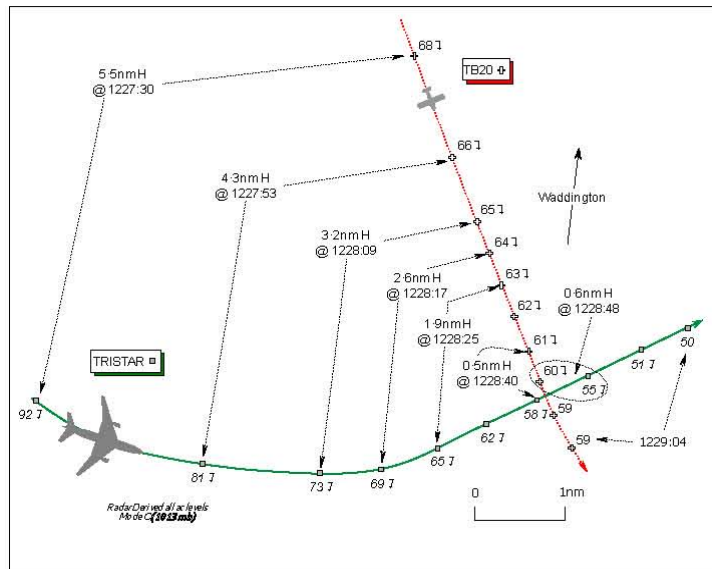
Reported Separation:

200ft V 300ft V

Recorded Separation:

Nil V @ 1.2nm H

0.5nm Min H @ 300ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

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

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

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

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

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

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

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

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

She then told ZONE the Tristar was stopping descent, whereupon the Tristar pilot advised that he was following a TCAS RA and descended through the level of the TB20 to FL50. The Tristar passed through the TB20's level in its 12 o'clock at 2nm, she thought.

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

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

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

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

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

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

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

APP's workload was high, providing a TS to the RAFAT operating within EGR313 on a dedicated VHF frequency, plus a TS to an E3D completing multiple circuits within the RTC on UHF and the Tristar on a third VHF frequency. The Tristar crew established first contact with APP at 1227:33; however, APP was receiving and then responding to a transmission from the E3D. The Tristar crew re-transmitted their initial call on VHF 'stepping on' the UHF transmission from the E3D. APP provided a vector to the E3D but the Tristar crew mistakenly believed that the transmission was for them asking, "*confirm that was for [Tristar C/S] to head 1-1-0°?*" APP replied at 1227:56, "*[Tristar C/S] negative, working 3 frequencies at once now identified descending Flight Level 5-0 traffic service.*" The ATS was not 'Reduced'. At this point, the Tristar is 4.3nm SW of the TB20, descending through FL81 Mode C, with the TB20 itself descending through FL66.

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

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

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

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

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

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

The LATCC (Mil) Member provided some added insight into the earlier stages of this occurrence when the Tristar crew was under the control of LJAO. Following a late hand-over from ScATCC (Mil), he confirmed the crew had been in receipt of a TS with LJAO NE and the ATS initially requested by them. It was also confirmed that the crew had contacted Waddington themselves and confirmed the availability of the PD at an earlier stage. Controller Members were somewhat surprised, therefore, that the Tristar had been accepted for the PD at Waddington when no controller was rostered for the DIR position; alternatively, having accepted the PD booking, that no controller was made available for the DIR position. Members noted that there was a missed opportunity at that stage for the SUP to cancel the PD if he believed that the unit was going to exceed its capacity to handle the Tristar without a rostered DIR. It was confirmed by the LATCC (Mil) Member that LJAO NE Tactical had turned the Tristar eastbound, as the controller perceived that the ac was progressing too far to the S away from Waddington during the extended handover whilst a VHF channel was obtained. This was not picked-up by the LJAO NE Planner controller during the hand-over to the SUP as the Planner was obtaining the VHF channel requested by the crew, which also delayed the transfer of control to APP. By turning the Tristar easterly, the LJAO NE Tactical controller perceived he was assisting APP, but the turn was not noticed nor notified by his colleague to the SUP in retrospect,

who accepted the hand-over on APP's behalf. This requirement for VHF communication with the aerodrome it seemed might not have been specified at the outset, which concerned the Board. This clearly placed an unexpected and additional load on the SUP and APP at a busy moment, but a military Member advised that not all of the Tristar fleet are fitted with UHF radios and ATSU's should be prepared for such requests. Conversely, military crews should be aware that the availability of dedicated VHF frequencies at UK military ATSU's is limited and many will only have recourse to NATO 'common' frequencies on 'standby' sets, as here. This could potentially result in poorer transmission/reception quality compared to a dedicated UHF as NATO 'common' frequencies are inherently more susceptible to interference from other ATSU's using them in the vicinity, especially in locations such as the Lincolnshire AIAA with many military aerodromes in close proximity.

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

The Board accepted that APP was busy and faced a complex situation that was complicated by working multiple frequencies. Members also noted that the Unit perceived this should not have been a problem for an experienced controller albeit that the Command considered that the taskload and complexity were significant. Whilst accepting that APP did not *knowingly* turn the Tristar into conflict, controller Members contended that between them, the SUP, APP and ZONE controllers should have been alert to a conflict between the Tristar and the TB20 and taken action earlier to forestall this close quarters situation; that they did not do so was indicative of a lack of teamwork within ATC. Whilst setting up the standby VHF box would undoubtedly have been a distraction, after accepting the hand-over the SUP should have recognised that the Tristar was turning L, that there was potential for a conflict and ensured that APP and ZONE did something about it.

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

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

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responsibility to 'see and avoid' other traffic was under a dangerous misconception. The Rules-of-the-Air still hold sway and here in Class G airspace separation is ultimately the pilot's responsibility under a TS.

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

Turning to the inherent Risk, it was clear that once APP had appreciated the confliction the controller had tried to stop-off the Tristar above the TB20, whilst also passing TI. At close quarters TI is essential and the Tristar pilot reports that he did see the TB20 in their 10 o'clock, he thought about $\frac{1}{4}$ nm away but actually $\frac{1}{2}$ nm at the closest point, some 200ft above their ac and realised it was also descending. However, this was after TCAS had demanded a descent, and then further descent at an increased rate, which the Tristar crew had complied with. Such crossing descent scenarios are not always straightforward, but it was plain that the Tristar crew was able to descend clear below the level of the descending TB20, such that 300ft of vertical separation was evident from the recorded radar data before the tracks crossed. By that point the TB20 pilot was also visual with the Tristar, but decided that no avoiding action was needed as vertical separation continued to increase, with 500ft evident on the next sweep. The Members agreed unanimously that all these factors combined had effectively removed the Risk of a collision.

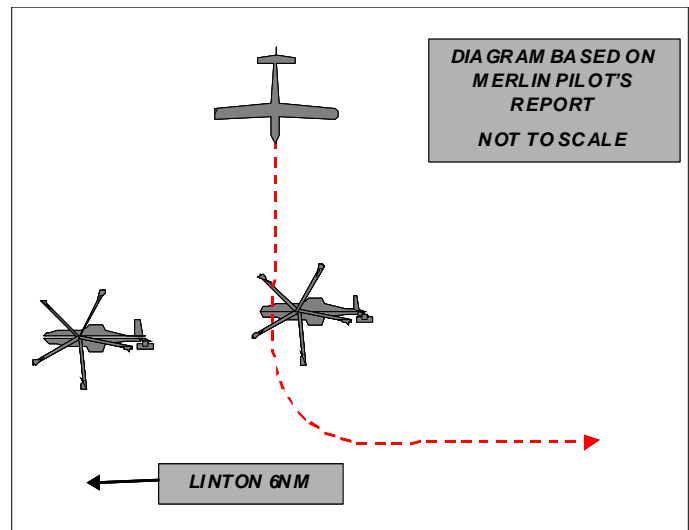
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT NO 2010125

Date/Time: 2 Sep 2010 1555Z
Position: 5404N 00102W
 (7nm E Linton on Ouse)
Airspace: Vale of York AIAA (Class: G)
Reporting Ac Reported Ac
Type: Merlin HC3 Glider
Operator: HQ JHC NK
Alt/FL: 2000ft NK
 (QNH 1020mb)
Weather: VMC CLBC NK
Visibility: 50km NK
Reported Separation:
 100ft V/150 m H NK
Recorded Separation:
 NK

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE MERLIN HC3 PILOT reports that he was flying as No2 in a pair of green helicopters on recovery to Linton on Ouse, squawking 7000 with Mode C but, although the ac was fully lit, TCAS was not fitted. They were listening out on Linton APP, heading 270° at 2000ft agl and flying at 120kt, when the crewman observed a glider 100m away, pass approximately 100 ft above their ac and 150m to their right. The glider was tracking from N to S and turned onto E just after the ac crossed. They were unable to take any avoiding action as the ac had crossed before there was time to react but reported the incident immediately to Linton APP and their ac was recovered with no further incident.

They assessed the risk as being high.

Despite extensive procedural tracing action, the glider could not be traced.

MIL ACC reports that during a visual recovery to RAF Linton on Ouse, a formation of Merlin HC3s, declared an Airprox against an unknown glider operating 6nm to the E of Linton. The APP Controller reported that the glider was not displayed on the Watchman Radar and therefore he was unable to provide any TI. Consequently, there is no ATM aspect to this incident.

This is a further example of an ac operating without a transponder in busy airspace, which has negated the available safety measures.

UKAB Note (1): The Merlins show clearly on the radar recordings but the glider does not show at any time.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the Merlin pilot, a radar recording, reports from the air traffic controller involved and reports from the appropriate ATC authorities.

Members noted that both ac had been operating legitimately in Class G airspace where see and avoid is the principal method of collision avoidance; they agreed however, that gliders can be very hard to detect visually, especially when head-on, at a similar altitude and not manoeuvring.

An experienced Gliding Member opined that the glider pilot would have both seen and heard the helicopters but, he believed one possible explanation for his not reporting the incident might be that the miss-distance had been

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slightly larger than estimated by the Merlin crew and therefore he had not considered it to be abnormal for glider operations.

This incident provided another example that if gliders are not fitted with SSR they usually do not paint on radar and therefore controllers are not able to warn or vector other ac round them.

Without in any way doubting the accuracy of the Merlin crewman's estimate of the separation, without a report from the glider pilot about what he saw or radar verification, Members agreed that they could not positively determine the degree of risk.

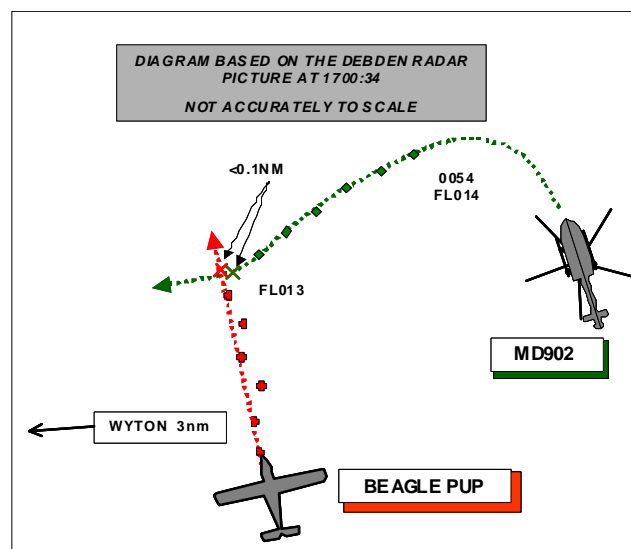
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively a non-sighting by the Merlin crew and a possible non-sighting by the glider pilot.

Degree of Risk: D.

AIRPROX REPORT NO 2010126

Date/Time: 1 Sep 2010 1701Z
Position: 5221N 00001W (3nm E Wyton)
Airspace: Lon FIR (Class: G)
Reporting Ac Reported Ac
Type: MD902 Beagle Pup
Operator: Civ Com Civ Pte
Alt/FL: 1300ft 1700ft
(QFE 1014mb) (QNH)
Weather: VMC CAVOK VMC CAVOK
Visibility: NR Good
Reported Separation:
300ft V 400-500ft V/O H
Recorded Separation:
NR V/ <0.1nm H

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE MD902 PILOT reports flying a blue and yellow helicopter with all lights switched on, on a training flight with the PF in the right seat conducting IF training and the captain in the left seat responsible for the lookout. They were squawking 0054 [county police] with Mode C, in receipt of a BS from Wyton APP and he had been head-in briefly to change frequency. They were heading 260° at 100kt, at about 1300ft QFE passing 3nm on the final descent of a GPS letdown into RAF Wyton when he saw a low-wing, dark-coloured, single-engine ac ½nm away and 300ft above crossing from left to right. He advised the PF who descended the helicopter rapidly to increase separation but they could not assess the separation or risk. TCAS was fitted but no alert was displayed.

THE BEAGLE PUP PILOT reports he is an experienced GA pilot and was informed of the incident 8 weeks after the event, but did not consider that there had been any danger and therefore did not report it; as a result his recollection of events is not clear.

He was flying alone in a black ac with nav-lights switched on in good weather and was not using GPS but was squawking 7000 with Mode C. He left Popham at 1650 en-route to Fenland via Booker, BNN, BPK, BKY and from there routed to a point just to the W of Fowlmere, which gave him a straight course to Fenland avoiding any controlled airspace, restricted areas or airfields. He thought that the incident had occurred at about 1700, just after passing abeam Cambridge, at 1700ft, heading 355° at 85kt and that the reporting MD902 had been flying at about 1700ft amsl. At that time he was listening out with London Info and there was little other aerial activity. He saw something to his right a few miles ahead and as he closed he recognised it as a black helicopter, he thought, circling. When the ac was in his 2 o'clock position it took up a South Westerly track towards him, passing he estimated 400-500ft below. Once it had passed he gave the matter no further thought until the chairman of his flying group contacted him well after the flight.

He kept the helicopter visual for the entire period ensuring that there was no risk/danger whatsoever and there had been no need for him to take avoiding action; he thought that the other pilot had also seen his ac.

At the time of the 'incident', the visibility to the E was good, to the N fair and to the W poor due to the setting sun.

UKAB Note (1): The incident shows on the recording of the Debden radar. The MD902 is squawking 0054 with Mode C and the Beagle 7000, but with no Mode C. At the start of the recording at 1658:40 both ac are tracking 355°, the MD902 indicating FL014, is in the Beagle's 0130 at 2nm. At 1659:30 the MD902, still at FL014, turns left onto a track of 260° to cross the Beagle's track, from L to R, as it intercepts the centreline of RW26 at about 5nm; it flies slightly through the centreline and closes it from the N as the Beagle continues on 355°. It continues to close with the Beagle and at 1700:38 passes less than 0.1nm behind it having descended by 100ft; the ac then diverge.

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PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that both ac were operating legitimately in Class G airspace where the pilots shared an equal responsibility to see and avoid other ac. Under the Rules of the Air the Beagle Pup should have given way to the MD902 since, at least initially, it was on his right but the (Beagle Pup) pilot considered that no avoidance was required due to the significant altitude difference between the two ac. Although Members accepted this, they observed that the MD902 crew had no way of knowing that the Pup pilot had seen their ac and was content with the vertical separation extant; the Board agreed that a wing waggle or ac manoeuvre by the Pup pilot would have reassured the helicopter crew that they had been seen. Members agreed that by maintaining visual contact with the helicopter throughout, the Beagle Pup pilot had ensured that there was no risk of collision.

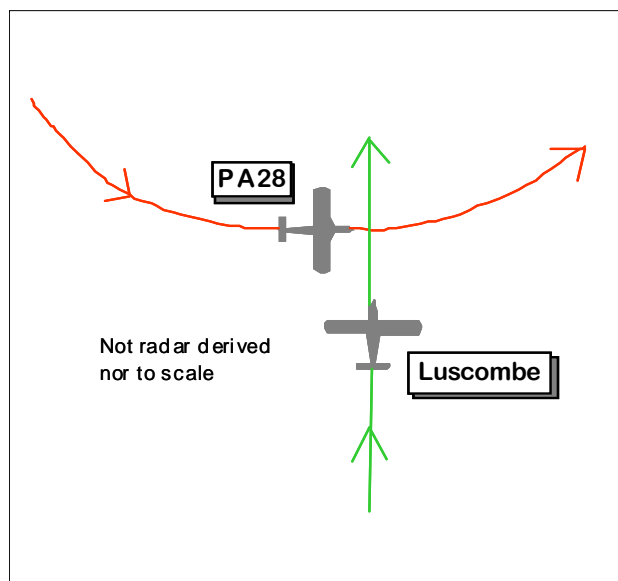
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Pilot perceived conflict.

Degree of Risk: C.

AIRPROX REPORT NO 2010127

Date/Time: 3 Sep 2010 1215Z
Position: 5053N 00205W
 (4nm NE Blandford Forum)
Airspace: LFIR (Class: G)
Reporting Ac Reported Ac
Type: Luscombe 8E PA28
Operator: Civ Pte Civ Club
Alt/FL: 2000ft 1950ft
 (QNH 1021mb) (QNH 1025mb)
Weather: VMC CLBC VMC HAZE
Visibility: 30km 6-8km
Reported Separation:
 20ft V/<100ft H 300ft V/400ft H
Recorded Separation:
 NR

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE LUSCOMBE PILOT reports flying a local sortie from a private site to the SW of Blandford Forum VFR and listening out with Bournemouth Approach on 119.475MHz, squawking 7000 with Mode C. The visibility was 30km flying 1500ft below cloud in VMC and the ac was coloured white/red with strobe and nav lights switched on. As he was approaching the 'Great Dorset Steam Fair' site, heading N at 2000ft QNH and 100kt, a yellow/ochre coloured PA28 appeared <100ft directly in front and 20ft above, its registration could be clearly seen, heading 070-080° flying straight and level. It was not seen earlier owing to the angle and point of approach, it being obscured by his ac's high wing. He assessed the risk as high. Later he spoke to the PA28 pilot who was apparently unaware an Airprox had occurred.

THE PA28 PILOT reports flying a local sortie from Compton Abbas VFR and in receipt of an A/G service from Compton Abbas on 122.7MHz, squawking 7000 with Mode C. The visibility was 8km in haze, reducing to 6km into sun, in VMC and the ac was coloured yellow/brown with anti-collision and strobe lights switched on. He was in a constant L turn at 1950ft QNH and 98kt around a large event on the ground and, as he was in a low-wing ac, he had positioned himself at the lowest permissible height above the event so he could focus his lookout above. Having turned around the event onto W he was surprised to see a white coloured high-wing ac, a Luscombe, 400ft on his L heading in the opposite direction about 300ft below and directly above the event. On sighting the ac he turned R onto a N'y heading to avoid. After landing he received a telephone call from the pilot of the Luscombe stating that whilst turning his PA28 gently L from S onto N passing E, the Luscombe had passed beneath his ac with <100ft separation. He had not seen the Luscombe at this time. He believed that at the time the Luscombe pilot reported approaching him from the S it would have been out of view under his R wing and coming out of sun, where there was poor visibility, making it very difficult for him to have spotted it. The Luscombe pilot said that after passing under his PA28 he positioned his Luscombe onto a reciprocal heading so that it would be visible to him.

UKAB Note (1): The RoA Regulations Rule 5 Low Flying Prohibitions Para (3) (e) Flying over open air assemblies states:

'Except with the written permission of the CAA, an aircraft shall not fly over an organised open-air assembly of more than 1,000 persons below the higher of the following heights:

1,000 feet; or

such height as would permit the aircraft to land clear of the assembly in event of a power unit failure.

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UKAB Note (2): Met Office provided a Bournemouth METAR and an assessment of the Wx conditions in the area. EGHH 031220Z 13009KT 9999 SCT030 21/12 Q1021=. In terms of the general situation, an area of high pressure centred just to the north of Shetland maintained a light SE'ly flow over southern England. An occluded front lay to the W of Ireland, but not affecting the Bournemouth area. The visibility in the area was generally good, in the range 20-25km. The cloud was SCT, locally BKN with a base of 2500ft to 3000ft (type shallow cumulus). No weather was reported in the Bournemouth area. The QNH in the area was 1021 hPa.

UKAB Note (3): The Airprox occurs outside of recorded radar coverage.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac.

Pilot Members agreed that there were 2 valuable lessons to be learnt from this incident. First, pilots should endeavour to be extra vigilant when planning to view a ground feature or event because of the potential to encounter other like-minded pilots. Second, with both pilots reporting that their view of the approaching ac had been obscured by known ac blind-spots, these known deficiencies should be mitigated by moving the ac (lifting/lowering a wing) and/or moving the pilot's head at regular intervals to ensure that the previously obscured airspace is clear of traffic. However, in this case the Luscombe passed unsighted to the PA28 pilot whilst Luscombe pilot only saw the PA28 as it appeared in front crossing from L to R, effectively a non-sighting.

Looking at risk, some Members thought that the ac had passed with more than a fair share of luck, and that there had been a definite risk of collision. Other members were more reticent, believing that when the Luscombe pilot saw the PA28, the ac were already passing each other, admittedly with separation margins reduced, but sufficiently distant that there was no instinctive reaction to take avoiding action. Without radar information to corroborate the actual geometry and separation distances that pertained, Members could only decide on the limited information available in the pilots' reports. In the end, the Chairman asked the Board to vote and, by a slim majority, it was decided that safety had not been assured during this encounter.

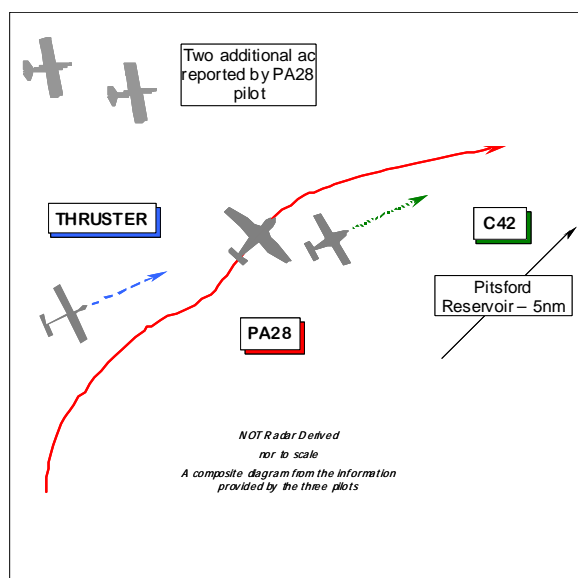
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the PA28 pilot and effectively a non-sighting by the Luscombe pilot.

Degree of Risk: B.

AIRPROX REPORT NO 2010128

Date/Time: 4 Sep 2010 1010Z (Saturday)
Position: 5116N 00057W
 (5nm SW of Pitsford Reservoir)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: C42 Microlight PA28-161
Operator: Civ Pte Civ Pte
Alt/FL: 1400ft 1800ft
 QFE (1007mb) QFE (1007mb)
Weather: VMC NR VMC CLBC
Visibility: 15nm 10km
Reported Separation:
 40ft V/10ft H 100-200ft V/100m H
Recorded Separation:
 Not recorded

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE C42 MICROLIGHT (ML) PILOT reports he was inbound VFR to Sywell for a light ac rally and listening out with Sywell INFORMATION on 122.700MHz [a modified BS was provided]. Following his white and dark blue C42 was a Thruster Sprint in his 7 o'clock position flown by a colleague.

Approaching a position 5nm SW of Pitsford Reservoir [the feature notified as the assembly area for the rally 4nm WNW of Sywell] heading 060°, in a level cruise at 1400ft QFE (1007mb), he was just entering Sywell's published arrival procedure for RW03 at 75kt when a PA28 passed 40ft above and 10ft to port of his ac as it overtook him. The blue and white PA28 – registration given – was flying an estimated 30-40kt faster and crossed L – R, within 5 to 10° of his heading. No avoiding action was taken, there was no time; by the time he saw it, the PA28 was above him and the separation was increasing during the overtake. Assessing the Risk as 'high', he added the airspace was busy with multiple ac inbound to the rally.

The PA28 overtook the Thruster Sprint to starboard and included within the C42 pilot's report was a written account from the Thruster pilot (summarised below). The C42 pilot did not report the Airprox on the RT but discussed the occurrence at Sywell after he had landed.

THE PA28-161 PILOT reports that he was inbound to the light ac rally at Sywell from Wycombe and was in receipt of a 'modified' BS from Sywell INFORMATION on 122.700MHz. A squawk of A7000 was selected with Mode C; Mode S is not fitted. His ac is coloured blue and white.

On arrival in the vicinity, to the W of Northampton, he was heading N at 100kt, level at 2200ft QNH (1022mb) and his intention was to follow the suggested VFR arrival route in the AIC issued for the rally – Yellow 062/2010.

At that point there were two ac in his 10-11 o'clock position: a small high-wing ac [the C42] leading another ac some distance behind [the Thruster], crossing L to R. Once the high-wing ac had passed in front, he then turned R to position behind it and slowed to 90kt.

Heading NE, he became visual with Pitsford Reservoir assembly area and tracked towards it whilst resetting his altimeter to the Sywell QFE (1007mb). The assembly area was to be flown not below 1500ft QFE and he also reduced speed to 80kt as he was aware he was still gaining on the ac in front. At this time he also noted two additional ac off his port wing-tip joining from the NW. The separation between the lead ac, which was now to the R of his track at a speed of about 70kt, and his PA28 was still reducing. He was reluctant to reduce speed any further, as this would not increase the separation and he felt it would be unsafe to do so in case he had to take any

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sudden action at the resulting low airspeed that could potentially put him in a stall/spin situation. His first option of a LH orbit was prevented by the other ac closing off his port wing-tip, which could have caused a head-on conflict with either of them. A RH orbit was also considered, but this would have taken him closer to the lead ac and they were to the N of Northampton by this time, over built-up areas of the City. Also, he was acutely aware that there was another ac behind him but he had no idea of its position or proximity so S turns to increase separation were therefore discounted. He felt he was becoming increasingly boxed-in but could see ahead that there were no ac at the Pitsford Assembly Area and decided his best option would be to pass the small high wing ac into clear airspace beyond. Both ac were on similar parallel tracks and he felt the risk was minimal. He positioned further to the L of the lead ac, mindful of the other two ac off his port wing tip, and accelerated to about 100kt. This also caused his ac to climb slightly, prior to re-trimming, and further increased the separation. The ac ahead and now to his R, which now appeared to be a small two seat high-wing very light ac type [the C42 ML], then passed down his RH side and under his starboard wing tip, 100-200ft below and about 100m away with a 'low' Risk.

Once he had passed the C42, he continued to Pitsford Reservoir Assembly Area. With no other ac now in the area, he began a descent and slowed to begin his approach to RW03 at Sywell. Late on base-leg flying at about 75-80kt he began catching-up two Piper Cub type ac, but he was able to turn finals for the hard RW03 whilst they extended their base leg before turning for the grass runway.

He added that multiple ac in close proximity flying on converging tracks at the time of the Airprox was a significant factor.

THE THRUSTER T600N SPRINT PILOT provided a supplementary account stating that he was also flying to the rally at Sywell and following his colleague, 500m astern of the C42 ML whilst listening out with Sywell INFORMATION on 122.700MHz. Flying a track of 060°, NW abeam Northampton approaching Pitsford Reservoir, he spotted a PA28 in his 4 o'clock - 300m away heading about 050° on a similar course. The PA28 was flying about 30-40kt faster and overtook from R to L in front of his ac, flying between his Thruster and the C42 at the same level. He did not feel there was any Risk at this point, even though the PA28 pilot did not give way to his ac, nor to his colleague's C42, by altering course to the R. It was not until the PA28, now to port of the C42, climbed slightly and unexpectedly turned R by 15-30° that there was a 'high' Risk of a collision with the C42 ahead. From his position 500m directly astern of the C42, the PA28 appeared to fly directly over the top of the C42 with very little vertical separation. The RT was very busy, so he was unable to make a radio call to warn the C42 pilot of the imminent danger posed by the proximity of the PA28.

UKAB Note (1): The AIC issued for the rally – Yellow 062/2010 dated 12 Aug 2010 - promulgated procedures for the event that had been devised to ensure the safety of participants and also create an orderly flow of traffic, including a Temporary Restricted Area in force within a 4nm radius of Sywell ARP (sfc - 3500ft agl).

A modified BS was available from Sywell INFORMATION during the period of the Airprox, and all radio equipped ac, including Microlights and Autogyros, were required to proceed to an Assembly Area at Pitsford Reservoir (4 nm WNW of Sywell) via suggested routes depending on the direction of arrival.

At Para 4.2.2, it was specified that:

'Prior to reaching Pitsford monitor 'Sywell INFORMATION' on 122.700MHz on which regular broadcasts will include the active runway and QFE. NO RADIO CALLS ARE NECESSARY FOR JOINING. Fly an anticlockwise holding pattern at Pitsford 020/200 degrees not below 1500 ft.....'

Hence, the modified BS.

UKAB Note (2): This Airprox is not apparent on the LATCC (Mil) radar recordings despite extensive analysis of the recorded data. A large number of ac are shown as intermittent primary contacts approaching Sywell via the notified Assembly Area at Pitsford Reservoir. Therefore, in the absence of Mode S data it is not possible to identify the C42 or Thruster Sprint from the myriad of other ac in the vicinity. Furthermore, no ac squawking A7000 with Mode C is shown approaching the Assembly Area in the manner described by the PA28 pilot. That is not to say that he did not comply with the promulgated procedures, just that it is not possible to identify his ac with certainty.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board was briefed that the Airprox was not evident on recorded radar data, but the radar recording did confirm that there was a large volume of traffic inbound to Sywell converging on the Assembly Area from all around. The GA Pilot Member has experience of various rallies, both in the UK and abroad; he explained that it is not an easy task to integrate into the inbound flow with so many disparate types of ac of greatly varying performance levels arriving from different directions. The smaller ac can be difficult to spot in the first instance and the widely differing speed ranges made it difficult to judge spacing in any inbound sequence. He emphasised that this rally is a very popular event attracting many ac from all over the Country and safe participation relies on good airmanship coupled with sound common sense. A number of Members, pilots and controllers alike, also have experience of such events and concurred that they could present a challenge for less experienced pilots. The GA pilot Member's view was that the procedures developed for the event had generally proved satisfactory provided pilots complied with them and exercised good overall airmanship.

The CAA ATS Policy and Standards Advisor commented on the use of a 'Modified' Basic Service and was concerned that this was not a term that he recognised within the range of ATSS promulgated for use within the UK outside CAS. Practically speaking, no form of ATS was afforded to rally traffic, especially within the ATZ, and this was effectively, a one-way 'listening watch'. Nevertheless, controller Members who had operated an aerodrome Flight Information Service during such events commented that these can be extremely busy scenarios, it was debatable, therefore, whether this volume of traffic could be operated under a more positive or more RT intensive form of ATS. The GA pilot Member said that in his experience, attempting to apply more positive control to such events limited the flow rate of inbound traffic to an unacceptable degree. However, another Member added that stipulated 'slot-times' could be helpful in smoothing out the peaks and troughs in the traffic flow. Nevertheless the Policy and Standards Advisor elected to review the use of this 'Modified' Basic Service in more detail outwith the meeting.

Notwithstanding the promulgated arrival routes, this Airprox occurred whilst ac were in transit to the Assembly Area, outside the ATZ, in the 'Open FIR' where see and avoid in accordance with the Rules of the Air applied. Broadly, the reports from the two pilots involved, together with that of the Thruster Sprint pilot, all agreed on the relative positions of ac during the encounter, except the crucial point of the minimum separation. It was clear to the Board that the PA28 pilot had spotted both the C42 and the Thruster and elected to follow the C42, not realising initially the significant speed differential before he found he had limited room for manoeuvre. A GA Member pointed out that pilots of slower microlight types must expect to be overtaken by other aeroplanes that are plainly not capable of being flown safely at such slow speeds. Thus, appreciation of differing ac performance needed to be taken into account by everyone involved. Members also noted the significance of the low-wing PA28 overtaking to port and above the high-wing C42; the C42 pilot would not have been able to see the PA28 until it started to draw alongside and flew into his field of view ahead. Plainly, it would have come as quite a surprise when the PA28 overtook his C42, from his perspective passing 40ft above and 10ft to port of his ac, contrary to the Rules of the Air, but the separation might have been difficult to gauge. It was evident that the PA28 pilot had the C42 in plain view for some time, whilst considering the apparently limited options available to him, having 'tucked-in' behind a slower ac. Notwithstanding the AIC's instruction that the Assembly Area he was approaching had to be flown at or above 1500ft QFE, the fast-jet pilot Member believed that the PA28 pilot was perhaps forgetting the vertical option, which was to overtake by passing well clear on the R after descending beneath the C42, resulting in a slightly increased speed, but allowing him to keep the C42 in sight throughout and also completing the manoeuvre more quickly, regaining height before reaching the assembly area. Nonetheless, it was the PA28 pilot that chose the separation during the overtake manoeuvre to port of the C42, which he estimated was about 100m away and 100-200ft below his starboard wing tip, but might not have been visible to him throughout in his low-wing aeroplane. The C42 pilot's colleague in the Thruster believed the PA28 passed directly over the top of the C42 with very little vertical separation, but from his perspective he would not have been able to judge the horizontal separation accurately at the point that the PA28 actually overtook the C42. In the absence of radar data the pilots' differing perceptions of the separation during this encounter could not be resolved independently, but it was clear to the Members that the C42 pilot had been justifiably concerned at being overtaken to port. The Board concluded that this Airprox had resulted because the PA28 pilot flew close enough to the C42 to cause its pilot concern. In the Board's view, however, there was no evidence of an actual Risk of collision in these circumstances.

AIRPROX REPORT No 2010128

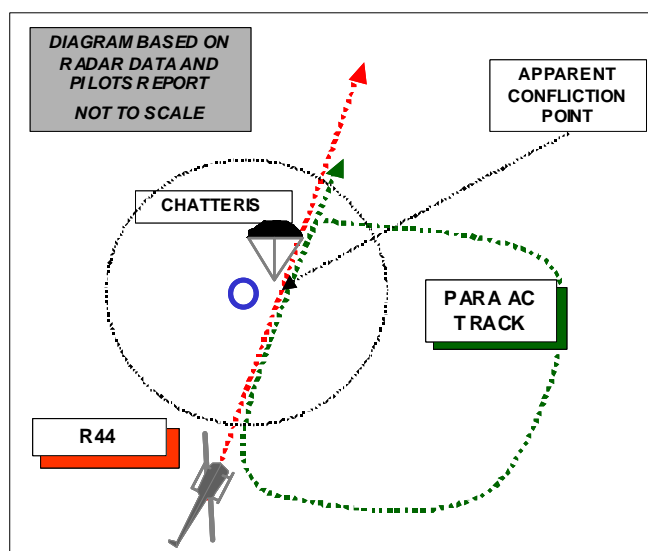
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA28 pilot flew close enough to the C42 to cause its pilot concern.

Degree of Risk: C.

AIRPROX REPORT NO 2010129

Date/Time: 2 Sep 2010 1518Z
Position: 5229N 00005E (Chatteris - elev 5ft)
Airspace: Lon FIR (Class: G)
Reporting Ac Reported Ac
Type: SKYDIVER R44
Operator: NK Civ Trg
Alt/FL: 2500ft 1500ft
 (agl) (NK)
Weather: VMC NK VMC NK
Visibility: unltd unltd
Reported Separation:
 NK NK
Recorded Separation:
 NK

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE SKYDIVER reports that he is the CFI of North London Skydiving Centre and jumped from their Twin Otter ac at 5000ft agl following an AFF (Accelerated Free-Fall) student who deployed his main canopy 7sec after exit. He then deployed his multi coloured canopy which opened at 3000ft and had a fully operational parachute at 2500ft when he 'released his brakes' and looked to his right, immediately seeing a helicopter coming straight towards him. His immediate reaction was to pull down on both brakes, which had the effect of slowing his descent rate and the black helicopter, which looked like an R44, passed directly below him. It was difficult to tell the helicopter's exact height but the parachutist could clearly see the single helicopter occupant wearing a pink shirt, with blue trousers and he had brown hair. As the helicopter went away from him he tried to see the registration, but due to the angle he was unable to see the markings. He landed as soon as possible and immediately spoke to the DZ controller who was in RT contact with their ac and was talking to RAF Lakenheath Radar who reported that they had tracked the helicopter.

He assessed the risk as being high.

THE R44 PILOT provided a very brief report stating that he was flying a black and white helicopter on a qualifying NAVEX from a private site near Salford. Although he was in the area at the time he saw nothing at the reported time of the incident.

UKAB Note (1): The recording of the Debden Radar shows the dropping ac and a contact squawking 7000 with Mode C, presumed to be the R44. At 1511:18 the Twin Otter first shows on radar 1nm NE of Chatteris tracking 110° and passing FL006 climbing; meanwhile the R44 is 8nm S of it tracking N at FL013. At 1513 the R44 turns right onto a track of 015° and the Twin Otter is 2nm SE of the airfield in a right hand climbing turn passing FL032. At 1514:54 the Twin Otter passes over the airfield on an N'y track at FL050, having completed one full orbit; at that time the R44 is 2nm due S of the airfield still tracking 015°. At 1518 the R44 passes 0.2nm to the E of the airfield centre (probable incident position) at FL014 (1710ft amsl) still tracking 015°; at that time the Twin Otter is 1.6nm to the NE still in a second RH orbit passing through E. The ac then pass 1.4nm apart on opposite headings. Although both ac show throughout, the precise geometry of the incident cannot be determined. It is assumed that the jump takes place as the Twin Otter passes just to the E of the airfield at FL050, tracking 015°, at 1515:43. The R44 passes through the precise position some 1min 15 sec later at 1517:58.

UKAB Note (2): Chatteris is a promulgated in the UKAIP ENR 5-5-3-1 as a Free-Fall Drop Zone of 1.5nm radius, up to FL150 and is active daylight hours Tue-Sun & PH. (Incident day Thursday). This is a warning not a prohibition.

AIRPROX REPORT No 2010129

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the skydiver, the R44 pilot and radar recordings.

The Board considered this a very straightforward example of inadequate flight planning by an inexperienced pilot. Chatteris DZ is promulgated and clearly marked on recognised VFR charts and electronic navigation systems; therefore the Board could not understand why the R44 pilot had not avoided it by a reasonable margin and, apparently, was not aware of its existence. While recognising that like many others, Chatteris Free-Fall DZ is not restricted airspace, Members agreed that, in order to ensure the safety of both skydivers and aircraft, pilots should avoid the site by a suitable margin during promulgated operating hours.

Bearing in mind the Skydiver's very limited ability to manoeuvre, that the R44 pilot did not see or avoid the former and that, although the actual separation could not be estimated, it was clearly very close, Members agreed unanimously that there had been a risk that the skydiver would have collided with the R44 most likely with fatal consequences.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The R44 pilot flew into a notified and active Free-Fall DZ and into conflict with a Skydiver.

Degree of Risk: A.

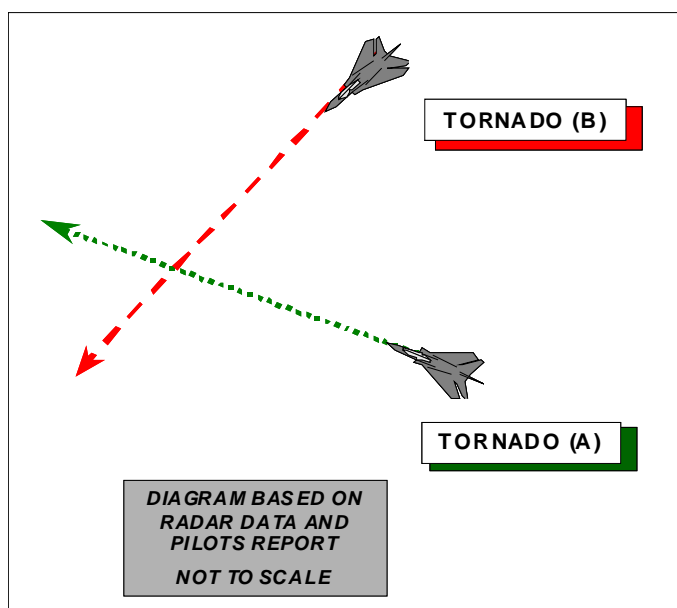
AIRPROX REPORT NO 2010130

Date/Time: 8 Sep 2010 (Wednesday) 2044Z
(Night)

Position: 5544N 00233W
(4nm SE Galashiels)

Airspace: UKNLFS (Class: G)

<u>Reporting Ac</u>	<u>Reported Ac</u>
<u>Type:</u> Tornado GR4	Tornado GR4
<u>Operator:</u> HQ Air (Ops)	HQ Air (Ops)
<u>Alt/FL:</u> 600ft (Rad Alt)	450ft (N/K)
<u>Weather:</u> VMC CLBC	VMC NK
<u>Visibility:</u> 10km	NR
<u>Reported Separation:</u> V 0ft/H NK	Not seen
<u>Recorded Separation:</u> Estimate from FLIR video 0 V/60m H	

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE TORNADO GR4 (A) PILOT reports flying a singleton night training flight with red strobes, obstruction lights and nav lights switched on. Initially they were conducting GH, from surface to 12000ft (QNH 1011mb), under a TS from ScACC (Mil) but were also booked traffic for Night Sector 2A between 1930 and 2045 as per the Lossiemouth Wing Night Deconfliction Plan.

On requesting descent, ScACC (Mil) advised them that terrain avoidance would be their own responsibility below the Safety Alt and they commenced a TFR descent from 12000ft to conduct a 'Show Of Force'. At 600ft agl and 450kt, on a track of 285° at position 5534N 00233W (in Night Sector 2A), an ac was encountered directly in the 12 o'clock crossing from right to left at very close range and at the same height. They immediately climbed out from Low Level, re-contacted ScACC (Mil) and asked if they were aware of any other ac descending into Night Area 2; ScACC (Mil) advised that they had previously been talking to another Tornado [C/S]. After landing the pilot of that ac was contacted by telephone and it was confirmed that he flew the ac involved in the Airprox, but he was unaware of the incident.

He assessed the risk as being very high.

THE TORNADO GR4 (B) PILOT reports that on return from a routine night training flight, he was informed of a close encounter with another Tornado GR4 in Night Sector 2A. Neither crewmember saw the other ac while airborne. At the reported time he thought that they were heading 220° at 450kt in the position reported.

UKAB Note (1): RAF Lossiemouth provided a copy of the Night Deconfliction Plan. This confirms that Area/Sectors 2A and 2B were allocated to Tornado (A)'s unit from 1930 to 2045. The sectors were allocated to Tornado B's unit from 2046-2200.

UKAB Note (2): The UK Low flying handbook at Sect 3 Para 18 states:

'Crossing Boundaries. Aircrew are to plan to cross boundaries in accordance with the following rules:

Night Sector Boundaries are to be crossed so as to ensure that ac are always operating within their allocated time slots

Ac may leave the UKNLFS by climbing above 2000ft AGL/ASL, direct to airfields or danger areas within the System (when cleared) or by crossing any seaward boundary at low level.

AIRPROX REPORT No 2010130

Para 19 states:

'**Joining the NLFS.** Ac may join the UKNLFS from above 2000ft AGL/ASL, direct from airfields or danger areas within the System or across a seaward boundary.

And Para 25 states:

'DECONFLICTION

FW/FW. Deconfliction of FW ac sorties is achieved by the allocation of sectors to units for fixed time periods for use by single, streams or formations of ac (formation sizes as per the regulations in Sect 1). Units are free to utilise the sectors as they wish, but are responsible for their own deconfliction within the sectors. Where ac from different operating bases require use of the same sectors simultaneously, a deconfliction fax (Annex C) is to be sent by the owning unit to LF Ops Sqn to confirm that coordination has been effected between the units concerned. Use of sectors is possible irrespective of whether the units' activity is associated or independent of the other user(s).'

UKAB Note (3): Although both ac show intermittently on the recording of the Prestwick radar, neither ac shows while at low level. Tornado (B) shows intermittently to the N of (A) but displays only one Mode (C) return, showing an alt of 1900ft amsl at 2043:41, but the contact disappears at 2043:56; Tornado (A) disappears at 2044:17 (entering low-level at approximately the time of the Airprox) and reappears at 2044:43 climbing out of low level in a NNE direction. Tornado (B) reappears at 2046:35, 15nm SW of the incident position, tracking SW, level at an alt of 4200ft amsl.

UKAB Note (4): A video of the Tornado (A) FLIR was provided. It showed Tornado (B) pass from right to left, almost at right angles (estimated to be 70° and confirmed by pilots' reports) to Tornado (A)'s track, directly ahead at a distance estimated to be 60m, but does not show the incident time. Tornado (A) is at 595ft agl and at 471kt G/S. Allowing for the crossing angle, at that rate of closure it takes about ¼sec to travel 60m.

HQ AIR (OPS) comments that this AIRPROX occurred as a result of Tornado B entering the night LFS outside its booked and deconflicted time; an investigation was conducted to ascertain the reasons for this. Lessons Identified by the investigation have been implemented to significantly reduce the likelihood of reoccurrence.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, radar photographs/video recordings, and reports from the Tornado operating authority.

UKAB Note (5): The results of a comprehensive RAF Flight Safety/Human Factors inquiry were made available to the UKAB but after the draft Part (A) had been distributed to Members for consideration. The full report of the RAF Inquiry was not distributed to the Board but the Board was briefed on its salient points.

The Board noted that this was a very serious occurrence where neither crew had seen the other ac at the time of the event. Tornado B crew were unaware that an incident had occurred until they were informed after landing, while the crew of Tornado (A) felt the wake turbulence of Tornado (B) but did not see the ac. Members were briefed on the (procedural) area/time deconfliction system used when operating in the UKNLFS and agreed that these measures, if adhered to, should prevent any confliction between Military users; they will not, however, prevent routine conflictions between Military ac and other legitimate VFR or IFR operations such as Police, Coastguard or other civilian ac operating legitimately, in Class G airspace under the provisions allowed by the ANO (and exemptions).

That being the case, the Board agreed unanimously that the UKNLFS [outside the Highlands Restricted Area] is Class G airspace where 'see and avoid' pertains. In this case, despite that the ac had been appropriately lit, the weather below cloud was good and terrain imagery showed that the ac had most likely not been obscured by the terrain, neither crew had seen the conflicting ac and this, Members agreed unanimously, had been the prime cause of the incident.

One Member observed that from the data available to the Board (not including the findings of the RAF Inquiry) it was not possible to determine the time of the incident or the time of entry into the LFS of either ac. At this stage, the Secretariat gave Members a short résumé of pertinent parts of the RAF Inquiry outlined below.

UKAB Note (6). Based on the data recorded on the respective ac Mission tapes, the RAF investigation established that Tornado (B) had entered Night Sector 2(A) at 2038:21, 7min39sec before its deconflicted (earliest) entry time of 2046:00 and that Tornado (A) was within its deconflicted time 'slot'. This was independently verified from the radar recording which shows Tornado (A) leaving the LFS in the climb (as permitted by LFHB procedures above) at about 2044:43, 17sec before the end of its 'slot'; Tornado (B) can be seen squawking 7001 in the area before the start of its slot (albeit from only one Mode C return). It also determined from the mission tapes that the CPA, where Tornado (B) crossed (A)'s nose, was at 2044:15.

In light of this information, Members agreed that the crew of Tornado B had not complied with the Deconfliction Plan and this was also part of the cause of the Airprox.

Notwithstanding this however, Tornado (A) crew had been in, or emerging from, a high-workload TFR-descent which requires both crewmembers to spend most of their time monitoring ac systems. For the descent they had terminated the radar service from ScACC (Mil), that apparently revealed no conflicts, had been within their deconflicted NLFS time 'slot' and had just passed through a cloud layer, so understandably they would not have expected to encounter any other ac and may have reduced the priority normally afforded to lookout.

The RAF Inquiry revealed that, although correctly qualified, the crew of Tornado (B) was relatively inexperienced and was on a Night EO (electro-optical) familiarisation flight. Although the EO equipment (both FLIR and NVGs) is capable of revealing other ac, the field of view of both is limited, the crew were not fully familiar with its use and their first priority would have been, again understandably, terrain avoidance at low level.

Members agreed however, that fully understanding and adhering strictly to a deconfliction plan is vital if night, low level, military operations are to be conducted safely; they were unable to determine why the crew of Tornado (B) had not afforded sufficient priority to the apparently sound and properly promulgated deconfliction plan.

When reviewing all the information available to them, Members agreed unanimously that, in this incident, there had been an actual risk that the ac would have collided.

The Board noted that the RAF Inquiry had produced a number of recommendations but agreed that consideration and implementation was a matter for the MoD.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: 1. Non-sightings by the crews of both aircraft.

2. The crew of Tornado (B) did not adhere to the deconfliction plan.

Degree of Risk: A.

AIRPROX REPORT No 2010131

AIRPROX REPORT NO 2010131

Date/Time: 9 Aug 2010 1627Z

Position: 5136N 00016E (5nm SE LAM)

Airspace: LFIR (Class: G)

Reporting Ac Reported Ac

Type: C150 PA32

Operator: Civ Trg Civ Pte

Alt/FL: 2000ft 2000ft

(QNH 1015mb) (QNH)

Weather: VMC CLNC VMC CLBC

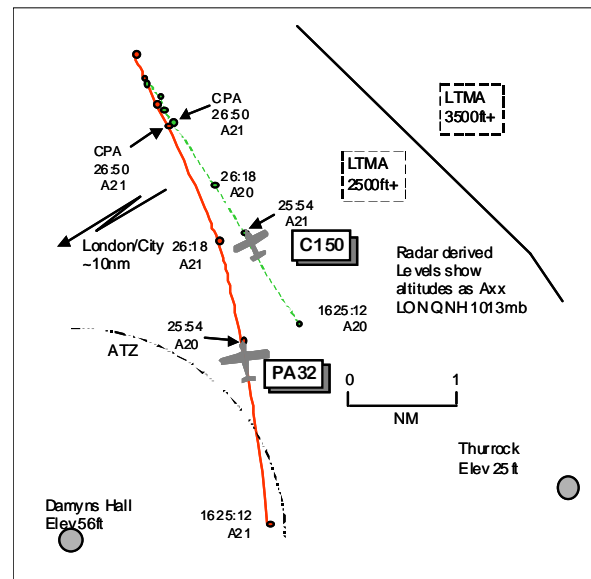
Visibility: >10km 7km

Reported Separation:

40ft V/20-30m H 100ft V/500m H

Recorded Separation:

Nil V/<0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C150 PILOT reports flying an instructional sortie inbound to Elstree VFR and in receipt of a BS from Farnborough N, squawking an assigned code with Mode C. The visibility was >10km in VMC and the ac was coloured red/white/blue with anti-collision light switched on. After hearing TI passed to another flight he realised that they were conflicting traffic to it and that it was catching them up. Owing to their high-wing configuration, he couldn't see the other ac, which was behind them and to their L (7 o'clock) and reported to be 100ft above. Heading 330° at 85kt and 2000ft QNH they wanted to climb to overfly the Stapleford ATZ so he asked Farnborough if it was clear for them to do so, thinking the other ac may not be a factor any longer. They were told that there was no reason why they couldn't climb and just as the student advanced the throttle the other ac, a PA32, was seen to pass about 40ft above and 20-30m clear to their L.

UKAB Note (1): The completed CA1094 was received at the UKAB on the 15th September by which time the Farnborough RT recording had been returned to service so was not available for transcription.

THE PA32 PILOT reports en-route to N Weald VFR and in receipt of a TS from Farnborough squawking an assigned code with Modes S and C. The visibility was 7km flying 100ft below cloud in VMC; no colour scheme or lighting was mentioned. When SE of LAM heading 330° at 2000ft and 145kt he saw an ac on his R about 3nm away on a W'y heading and on a converging flight path. As they closed he identified it as a C152 [actually a C150], and assessed that it was lower and that his ac was quite a lot faster. He did not consider the C150 to be a threat but wondered why Farnborough did not say anything about it. He was aware of how busy the airspace in that area can be, hence it was not unusual to be close to another ac. He estimated it passed 100ft below and 500m clear laterally and assessed the risk as none. The pilot also supplied a photo of the Cessna taken at the time.

ATSI reports that the Airprox occurred at 1626:54, 5.1nm to the SE of LAM, between a PA32 and C150. The Airprox report was received from the C150 pilot, 38 days after the incident and consequently RT recordings were no longer available for transcription. The controller was no longer at the unit and it was not possible to obtain a controller's written report. ATSI had access to radar recordings and the Farnborough fpss for the 2ac involved, together with the written reports from the 2 pilots.

The PA32 fps indicates that the flight called Farnborough at 1553, at an altitude of 1900ft, routeing from Bembridge to North Weald, in receipt of a TS and allocated squawk 5021. The C150 fps indicates that the ac was at an altitude of 2000ft, routeing from Rochester to Elstree, in receipt of a BS, and allocated squawk 5030. At 1625:09 the radar recording shows both ac on converging tracks towards LAM, with the PA32 aircraft, 8.7nm SE of LAM, indicating altitude 2100ft and the C150, 6.5nm SE of LAM, indicating altitude 2000ft. Radar recording shows that the tracks of the two aircraft cross at 1626:56.

METAR EGLL 091620Z 22011KT 190V250 CAVOK 24/11 Q1013 NOSIG=

The C150 pilot's report indicated an awareness that Farnborough had passed TI to the PA32, advising that the pilot of the PA32 was catching up the C150. The PA32 pilot's written report indicated that he had the C150 in sight and did not consider it a threat but wondered why Farnborough did not say anything. The PA32 was in receipt of a TS and according to the C150 pilot TI had been passed to the PA32. CAP493 Manual of Air Traffic Services Part 1 (01/07/10), Section 1, Chapter 11, Page 5, paragraph 4, states:

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

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

The pilot of the C150 reported an intention to climb in order to overfly the Stapleford ATZ and was also aware of the PA32 behind in his 7 o'clock. The pilot reports that ATC advised that there was no reason the C150 couldn't climb. It has not been possible to determine if the controller considered there to have been a risk of collision; however no warning was passed. The pilot of the C150 was in receipt of a BS CAP493 MATS Pt1 (01/07/10), Section 1, Chapter 11, page 4, paragraph 3, states:

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

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

Whether traffic information has been passed or not, a pilot is expected to discharge his collision avoidance responsibility without assistance from the controller.'

UKAB Note (1): The RoA Regulations 2007 Section 4 General Flight Rules Rule 8 Avoiding Aerial Collisions states: '(1) Notwithstanding that a flight is being made with air traffic control clearance it shall remain the duty of the commander of an aircraft to take all possible measures to ensure that his aircraft does not collide with any other aircraft. (2) An aircraft shall not be flown in such close proximity to other aircraft as to create a danger of collision. (4) An aircraft which is obliged by this Section to give way to another aircraft shall avoid passing over or under the other aircraft, or crossing ahead of it, unless passing well clear of it.' Rule 9 Converging states '(3) When two aircraft are converging in the air at approximately the same altitude, the aircraft which has the other on its right shall give way.' Rule 11 Overtaking states '(1) An aircraft which is being overtaken in the air shall the right-of-way and the overtaking aircraft, whether climbing, descending or in horizontal flight, shall keep out of the way of the other aircraft by altering course to the right. (2) An aircraft which is overtaking another aircraft shall keep out of the way of the other aircraft until that other aircraft has been passed and is clear, notwithstanding any change in the relative positions of the two aircraft.'

UKAB Note (2): The radar recording at 1625:12 shows the PA32 1.9nm E of Damyns Hall tracking 350°, G/S 145kt, indicating altitude 2100ft LON QNH 1013mb with the C150 in its 1 o'clock, range 2nm tracking 330°, G/S 85kt, indicating altitude 2000ft QNH. Both ac continue on steady tracks and by 1625:54 the C150, now showing altitude 2100ft, has moved into the PA32's 1230 position range 1nm, the PA32 now showing altitude 2000ft. The PA32 is seen to commence a slow L turn and by 1626:18 separation has reduced to 0.5nm, the C150 indicating

AIRPROX REPORT No 2010131

100ft below the PA32, before the PA32 passes the C150 on its LHS by <0.1nm at 1626:50, the CPA, both ac indicating altitude 2100ft QNH. The PA32 then pulls away from the C150 passing through its 12 o'clock with lateral separation increasing.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were disappointed that the late filing of the Airprox had resulted in a lack of an RT transcript and the lack of the LARS controller's input, which had hindered the ATSI investigation. Without a transcript Members were unable to resolve the contradictory information from both pilots. The PA32 pilot believed he was not told about the C150, but the C150 pilot thought he heard Farnborough pass TI on his ac to the PA32 flight. Furthermore, the RT exchange between LARS and the C150 flight, when its pilot asked if there was anything to affect a climb approaching Stapleford ATZ, could not be corroborated nor whether LARS had perceived a collision risk at the time.

It was clear that as this incident took place in Class G airspace below the LTMA, both pilots were responsible for maintaining their own separation from other ac through see and avoid. The PA32 pilot saw the C150 in good time and elected to overtake on its L which, although contrary to Rule 11 of the RoA Regulations, was thought not to have contributed to the Airprox. The radar recording shows the PA32 passing close to the C150 (<0.1nm or 185m) leaving Members wondering why the PA32 pilot had not altered his flightpath to give the C150 a wider margin; an early turn of 5-10° and/or a climb/descent would have sufficed. Therefore the Board concluded that the PA32 pilot's chosen separation distance was close enough to cause concern to the C150 pilot, which had led to the Airprox being filed.

Turning to risk, the C150 instructor and student were surprised as the PA32 appeared on their LHS, having approached from behind and above, as they were commencing a climb in the belief that the other ac was no longer a factor. However, the PA32 pilot's early sighting and continuous visual contact with the C150 was enough to persuade the Board that he was always in a position to manoeuvre his ac further, should it have been necessary, thereby removing the risk of collision.

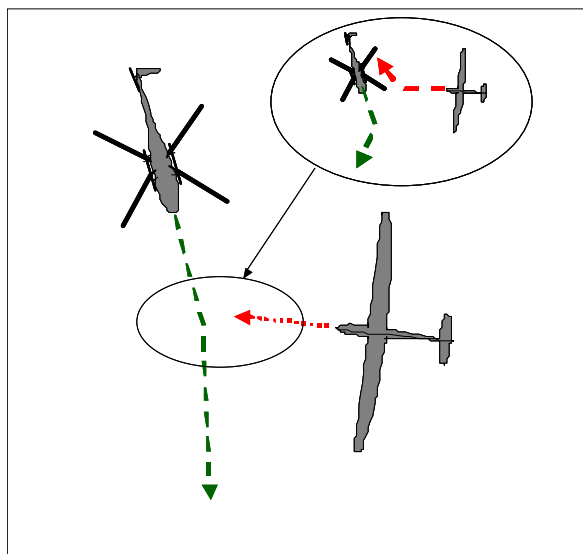
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA32 pilot flew close enough to the C150 to cause its pilot concern.

Degree of Risk: C.

AIRPROX REPORT NO 2010132

Date/Time: 5 Aug 2010 1147Z
Position: 5134N 00102W (5nm S Benson)
Airspace: Lon FIR (Class: G)
Reporting Ac Reported Ac
Type: Lynx GLIDER
Operator: HQ JHC NK
Alt/FL: 3000ft NK
 (QNH 1006mb)
Weather: VMC CLBC NK
Visibility: 40km NK
Reported Separation:
 0 V/ 80m H NK
Recorded Separation:
 NR

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE LYNX PILOT reports that he was flying an Instrument Flying exercise between RAF Benson and Middle Wallop with a PAR to 'Low Approach' at Odiham en-route. He was ac commander and handling pilot in the left seat with his No 2 pilot as safety pilot in the right seat; they were in receipt of a TS from Benson and were squawking as directed with Modes C and S. The Airprox occurred shortly after they departed from Benson while they were level at 3000ft (Benson QNH) and heading 170°. There were many TI reports from ATC of other [he thought] ac in the area and he was aware that a gliding competition was taking place at Bicester, so both his 2nd pilot and himself were exercising extra vigilance and he was carrying out a regular lookout even though he was under a helmet mounted IF hood. While beginning one such lookout scan he caught a glimpse of an object in his 10 o'clock, looked up and identified it as a modern, white, fiberglass glider 200m away, at the same level and heading directly towards them. He immediately banked the ac hard right and the glider simultaneously initiated a roll to the right for avoidance. He estimated the glider was within 100m of his ac when he lost sight of it behind his door frame. They continued on track towards Odiham, and did not see the glider again. An initial report of the event was made to Benson APP, followed by a full Airprox Report 3-5min later.

He assessed the risk as being high.

Despite extensive tracing action, the glider pilot could not be identified.

UKAB Note (1): The recording of the Heathrow 23cm radar shows the Lynx throughout, squawking 3615, tracking 175° at FL031. At 1145:21, an intermittent primary only contact, presumed to be the glider, pops up at 3nm in the Lynx's 11 o'clock. The Lynx continues to close with the primary contact which tracks 280° until 1146:46 when it disappears from radar when under ½nm away in the Lynx's 1030 position. The CPA is not recorded but the Lynx can be seen to turn right at 1146:55.

HQ AIR BM SM reports that the transcript time code appears to lag the radar replay by around 4sec; consequently, the transcript times have been amended to bring them into line with the radar replay.

At 1145:18 APP passed accurate TI to the Lynx on the glider describing the contact as "*left eleven o'clock, four miles, crossing left right, no height information.*" While CAP774 states that:

"controllers shall aim to pass information on relevant traffic before the conflicting aircraft is within 5 nm"

In this case, given the slow speeds of the ac, the TI was considered timely even though first passes when the ac were 4nm apart.

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APP updated the TI on the glider at 1146:44 saying, “*previously called traffic twelve o'clock, half a mile crossing left right, no height information;*” however, the glider’s primary contact had disappeared from the radar recording [not necessarily APP’s display] as it was being called. While the CPA is not captured on the replay, there is no reason to believe that the loss of data occurred on the Watchman display at the unit. It is possible to extrapolate from the replay that at the point that the TI was updated, the glider was actually in the 11 o'clock position at ½ nm, rather than 12 o'clock, with the glider moving towards the 10 o'clock position given the ac’s relative speeds, in keeping with the Lynx pilot’s description. The CPA probably occurred at around 1146:51 immediately prior to the Lynx pilot’s sighting report, with the Lynx’s avoiding action turn to the right becoming apparent on radar at the next sweep at 1146:56.

HQ JHC comments that with hindsight, the decision by the Lynx crew to stay ‘under the hood’ simulating IF was not sound. They appear to have been aware of the risk of flying in airspace that is likely to have been occupied by numerous gliders and were convinced that the extra vigilance they were using was appropriate in these circumstances. The crew stated that ATC was busy with traffic being called and it appears from their report and the HQ AIR BM SM report, that the glider was called appropriately. Arguably, having already made the decision to compromise the simulated IF scan with extra lookout from under the hood, it would have been better to come off instruments completely for a period of time until the airspace became less congested. If the glider had been fitted with SSR then the information passed could have been more detailed. The fact that the crew did not see the glider until the last minute suggests that the glider was difficult to see.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the Lynx pilot, transcripts of the relevant RT frequencies, radar recordings, reports from the air traffic controller involved and reports from the appropriate ATC and operating authorities.

Although the incident did not take place at low level, the Low Flying Ops Advisor informed the Board that on the day the incident took place there were a number of gliding competitions in the southern half of UK and they had sent representatives to several locations to ensure that timely, accurate and informative NOTAMS were issued. Members agreed that it is inadvisable to conduct simulated IF at the same altitudes as gliders operate, at times when there are notified competitions resulting in a high density of glider traffic. On such occasions, a military Member pointed out, at least one RAF Station had ceased all non-essential flying since there were too many gliders in the operating area. The Board agreed that it was unwise to programme this type of training sortie for a period when glider traffic was likely to be most intense.

Controller Members observed that Benson APP had on two occasions passed timely and accurate warnings of the primary contact (the glider involved), but the TI apparently had not been assimilated or reacted to by the Lynx crew, since the radar recording showed the ac continuing to track directly towards it. Controller Members agreed with HQ Air BM SM, that in these circumstances the TI had been passed at the appropriate time, even though later than the guidance in CAP774 (UK Flight Information Services).

Despite the factors described above, the incident took place in Class G airspace where the pilots of both ac shared a responsibility to see and avoid other ac. Since the Glider could not be traced, Members could not ascertain whether the pilot had seen (or heard) the Lynx or whether he had reacted to it. Under the Rules of the Air the Lynx should have given way to the glider and did so, albeit at a late stage when the ac were separated by only 200m. The Board considered that the lateness of the sighting and subsequent avoiding action had caused an erosion of normally accepted safety standards. Members agreed, even accepting that gliders are hard to see and that safety pilot was looking across the cockpit, the glider should have been visible to him, particularly assisted by timely warnings from Benson APP. If this lookout responsibility could not be complied with, and given the density of glider traffic encountered, pilot Members unanimously agreed with the HQ JHC comment that the IF exercise should have been terminated, despite the pressure to continue in order to complete the syllabus.

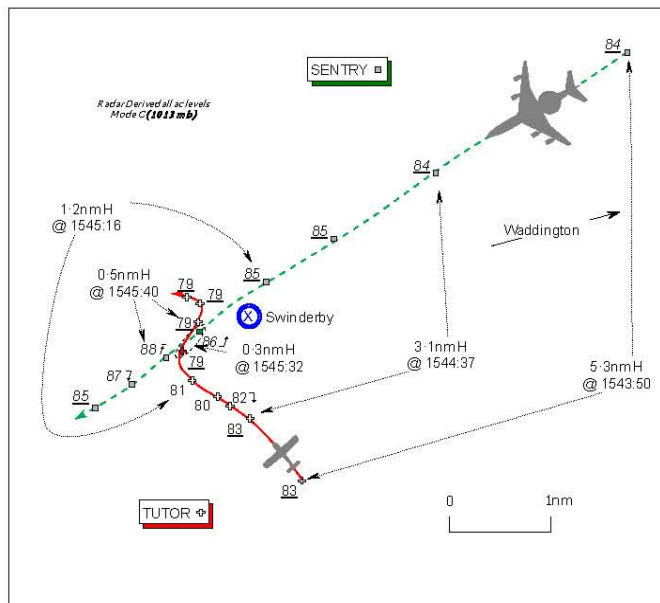
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sighting by the Lynx crew; the glider was untraced and it could not be determined whether or when its pilot saw the Lynx.

Degree of Risk: B.

AIRPROX REPORT NO 2010133

Date/Time: 14 Sep 2010 1545Z
Position: 5309N 00043W (6½nm S by W of Waddington A/D - elev 231ft)
Airspace: Lincolnshire AIAA (Class: G)
Reporting Ac Reported Ac
Type: Sentry Tutor
Operator: HQ Air (Ops) HQ Air (Trg)
Alt/FL: FL85 8000ft
 RPS
Weather: VMC CLOC VMC CLAC
Visibility: 30km 30km
Reported Separation:
 200ft V 500ft V/nil H
Recorded Separation:
 100ft Min V @ 3.1nm H
 0.3nm Min H @ 700ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

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

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

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

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

Due to particularly strong winds he was progressing slowly to the W (at a GS of about 40kt) and due to a poor horizon, had climbed to 8000ft. During the ascent he saw the Sentry as it passed from R – L in front of his aeroplane; he then saw it turn L and fly towards Waddington. As they continued W he saw it turn L and fly towards them again. Heading 300° at 75kt, at the point when it appeared to have zero angular velocity, he turned R and flew towards it to remain visual. The Sentry was higher than his aeroplane and he then decided not to continue but to reverse his turn so that he could stay visual with it. He flew directly underneath the Sentry at what he judged visually was about 500ft vertical separation with a 'low' Risk of collision. He added that his cockpit workload was 'low'.

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

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

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

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

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

Based upon APP's choice of phraseology at 1543:50, it is clear that TI about the Tutor had previously been passed by the controller to the Sentry crew before the RT transcript commences. However, at 1543:50 this TI was updated describing the Tutor as, "*Tutor now south west, 5 miles, manoeuvring 2 hundred feet below.*" APP was able to positively identify the Tutor type due to the SSR code in use, which is recognised throughout the Lincolnshire AIAA. At this point the Tutor, indicating FL83, was 5.3nm SW of the Sentry at FL84 Mode C.

Based upon the Tutor pilot's report and the radar replay, the Tutor first became visual with the Sentry in an earlier phase of its exercise at approximately 1541:26. Both the Sentry and the Tutor pilots report being visual with each other's ac. However, the Sentry pilot reports that they became visual after correlating TI from APP with their own TCAS information. This might suggest that first sighting occurred when APP provided a further update to the TI at 1544:33, describing the Tutor as, "*left 11 o'clock, now 2 miles (the radar replay shows 3.1nm separation at 1544:37) manoeuvring 3 hundred feet below appears to be descending.*" The Sentry responds, "*yeah on TCAS that confirms it thank you.*" It is equally possible to interpret the crew's response as having already correlated a visual target with the TCAS prior to the updated TI and then simply acknowledging the TI. At the point when the Sentry crew acknowledges this updated TI, both ac are closing on a constant relative bearing with the Tutor's Mode C indicating a slow descent.

The Sentry pilot reports that in order to ensure that they remained visual with the Tutor, he elected to remain within the COLBY hold, rather than to manoeuvre to avoid it. At 1545:15, the Sentry pilot reports manoeuvring in accordance with a TCAS RA against the Tutor, with the Tutor 1.2nm SW of the Sentry indicating FL81 Mode C. It is between 1545:32 and 1545:40 that the Tutor begins its reported turn towards the Sentry once the angular velocity between the 2 ac had reduced to zero. It is between these times that the CPA occurs, with the TCAS RA Climb shown on the radar recording at 1545:32, the Sentry indicating FL86 and the Tutor indicating FL79.

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

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

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

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

HQ AIR (OPS) comments that timely TI was passed to the Sentry which correlated with its TCAS, the crew then became visual and continued to the point of receiving a TCAS RA. Notwithstanding the Rules of the Air this

incident could have been avoided by the higher performance ac with the greater situational awareness taking early avoiding action.

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

The Rules of the Air required the Grob Tutor pilot to 'give way' in this situation as the Sentry turned and flew towards him. Whereas some Members thought it unwise for the Grob QFI to fly toward the Sentry, the Tutor pilot had kept it in sight throughout and elected to descend beneath it to remain clear. Pilot Members questioned the wisdom of descending directly below this large multi-engine jet ac in a small aeroplane as there was potential for wake vortex to affect the lighter more vulnerable Tutor. Furthermore, 'the Rules' discouraged pilots required to give-way from passing directly beneath another ac. The Tutor pilot had limited ability to put distance between himself and the faster ac but a hard turn to the right while it was at range would have allowed him to break the collision course and regain visual contact almost immediately. A turn combined with a descent would have maximised the separation and avoided generating a TCAS RA. That said, the Tutor pilot had ensured that over 500ft of vertical separation existed before he flew underneath and all this before the Sentry pilot reacted to his TCAS CLIMB RA and increased the separation even more to 700ft just before the tracks crossed. The Board noted the comments from the Command and perhaps the Sentry pilot, operating IFR in VMC, had more options open to him, but both crews still had a responsibility to 'see and avoid' in Class G airspace. The Board agreed that the Tutor pilot had fulfilled his responsibilities and avoided the larger ac by a suitable margin; it was just unfortunate that it was not quite enough to prevent a TCAS RA. The Board concluded, therefore, that this Airprox was the result of a sighting by the Sentry crew of traffic operating in the AIAA and that no Risk of a collision had existed in the circumstances.

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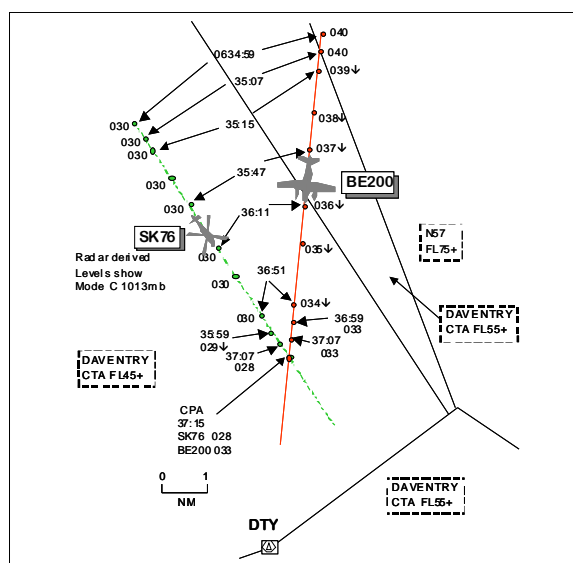
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting Report.

Degree of Risk: C.

AIRPROX REPORT NO 2010134

Date/Time: 14 Sep 2010 0637Z
Position: 5215N 00106W (4.5nm N DTY)
Airspace: LFIR (Class: G)
Reporting Ac Reported Ac
Type: SK76 BE200
Operator: Civ Pte Civ Exec
Alt/FL: 3000ft FL40 ↓
 (QNH)
Weather: IMC IICL VMC CLAC
Visibility: <1000m 8km
Reported Separation:
 300ft V/Nil H NR
Recorded Separation:
 500ft V/Nil H

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE SK76 PILOT reports en-route to Battersea, IFR and in receipt of a TS from Birmingham Approach on 118.05MHz, squawking 0403 with Modes S and C; TCAS 1 was fitted. The flight conditions at 3000ft QNH were IMC in and out of cloud with visibility <1000m. About 3nm NW of DTY VOR, heading 160° at 145kt, they noticed TCAS traffic >5nm away indicating 700ft above and descending on a converging course from the port side. Shortly after this Birmingham advised that there was a contact in their "10 o'clock at a similar altitude", he thought. After monitoring events for a short while they elected to take avoiding action and commenced a descent whilst trying to locate the threat ac. They also requested a "radar steer to avoid" from ATC who responded with an instruction to steer "radar heading 210°". They then observed a white coloured King Air fly O/H, wings level at a TCAS height of +300ft. Throughout their manoeuvre the conflicting ac appeared on TCAS to be maintaining a shallow descent. They declared an Airprox and asked Birmingham ATC to log the time and event. ATC advised that the conflicting ac was squawking 7000 and not working their frequency. He assessed the risk as high without avoiding action.

THE BE200 PILOT reports en-route to Oxford initially VFR squawking 7000 with Modes S and C; TCAS 1 was fitted. Prior to departure he had telephoned Oxford for their latest Wx and had then set course VFR via DTY. He initially received a BS from East Midlands, which was converted to a TS when he entered cloud and was cleared through East Midlands CAS IFR. N of DTY flying at FL40 between layers he terminated service with East Midlands and called Coventry for TI but received no reply. He listened to Oxford ATIS and prepared to contact them on 125.325MHz; a slow descent was initiated. Heading 190° at 200kt approaching DTY a TCAS TA was generated so he stopped his descent. Flying 200ft above cloud between layers in VMC with 8km visibility nothing was seen. He contacted Oxford and after landing was asked if he had seen a helicopter in the DTY area to which he replied, "only on TCAS".

THE BIRMINGHAM RADAR 1 CONTROLLER reports the SK76 was under a TS at 3000ft outside CAS. As the helicopter approached DTY he passed TI on unknown traffic squawking 7000 in the SK76's 10 o'clock range 2nm crossing from L to R indicating 3700ft. The SK76 crew asked about the traffic stating it was on TCAS in their 9 o'clock. At this stage the traffic appeared to be in the helicopter's 11 o'clock at <1nm and still in a descent, identifying the position accurately was difficult owing to the nature of primary contact. The SK76 crew reported that they were not visual and asked for a vector to keep clear. He again passed the position of the traffic and gave a R turn to avoid. At this point the SK76 crew reported visual with the traffic and stated they would be filing an Airprox report as they believed there to be <300ft separation.

ATSI reports that the Airprox occurred at 0637:12, in Class G airspace, 4.5nm N of DTY VOR, between a SK76 and a BE200.

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The SK76 was on flight from a private site near Uttoxeter to Battersea Heliport. The SK76 flight initially called East Midlands Radar and was transferred to Birmingham Radar prior to the Airprox where it was in receipt of a TS. The pilot's written report indicates that the SK76 was operating IFR.

The BE200 was on a flight from Gamston to Oxford. The BE200 flight initially called East Midlands Radar for transit through their zone and was then transferred to Oxford Approach. Oxford do not have surveillance equipment capability. The BE200 reported changing to IFR and was placed under a PS just prior to the Airprox.

The METAR observation for Oxford was not available. East Midlands and Birmingham are provided:

METAR EGNX 140620Z 22016KT 9999 -RA BKN009 SCT042 17/15 Q1013=

METAR EGBB 140620Z 22011KT 190V260 6000 -RA FEW009 BKN029 6/15 Q1014=

At 0620:10 the SK76 crew called East Midlands Radar routeing direct to BNN, climbing to 3000ft on QNH 1013 and squawking 7000. The SK76 flight was instructed to squawk 4550 and at 0620:49 the radar recording shows the SK76 change squawk 17.5nm to the WNW of East Midlands Airport and indicating FL030. A BS was agreed and at the request of the pilot this was later updated to a TS.

At 0620:50 the BE200 flight called East Midlands Radar, and reported VFR, en route from Gamston to Oxford, levelling at altitude 4000ft VMC, requesting a BS and transit through the East Midland Zone towards DTY. The BE200 crew was instructed to squawk 4551 with QNH 1013. At 0622:01 radar recording shows the BE200 23.4nm NNE of East Midlands Airport, indicating FL040. A BS was agreed and the BE200 crew was given clearance to transit the East Midlands Airspace at 4000ft on QNH1013. As the BE200 left East Midlands CAS, a TS was agreed.

At 1632:30, the SK76 flight was transferred to Birmingham and the radar service was terminated. At 1632:38 the radar recording showed the distance between the 2 ac was 9.8nm with tracks slowly converging. The SK76 indicated FL030 and the BE200 indicated FL040. Shortly afterwards the BE200 reported 16nm to run to DTY and requested a frequency change to Oxford. East Midlands Radar advised the BE200 to squawk 7000 and free call

The SK76 flight established contact with Birmingham at 0633:05 and reported on a squawk of 7000, due E of the Coventry NDB (CT) at 3100ft on QNH 1013. The flight rules under which the SK76 was operating were not established. The SK76 crew was instructed to squawk 0403 and at 0633:45, Birmingham Radar identified the SK76, 5nm E of the CT. A TS was agreed.

At 0634:55 the BE200 flight contacted Oxford Approach and reported inbound from Gamston, routeing towards DTY and requesting a straight in approach for the ILS RW19 with QNH 1016. Oxford acknowledged the call and agreed a BS passing a new QNH 1015.

At 0635:07, Oxford Approach instructed the BE200 crew to make a straight in approach RW19 ILS and to report LLZ established. The BE200 crew reported at altitude 3800ft descending to 3000ft and requested an upgrade from VFR to IFR. At 0635:46 Oxford agreed a PS and instructed the BE200 flight to descend not below 2300ft on QNH 1015.

At 0636:11 Birmingham Radar advised the SK76 flight of unknown traffic, *"and (SK76)c/s there's unknown traffic in your left ten o'clock range of two miles indicating three seven in the descent unverified."* Radar recording shows the BE200 to be in the SK76 helicopters half past nine position at a range of 2.2nm, with the SK76 indicating FL030 and the BE200 indicating FL037. The SK76 pilot replied, *"er (SK76)c/s er we've got TCAS in about our left er nine o'clock would that be the traffic."* Birmingham Radar responded, *"Yeah looks more like your eleven o'clock though."*

Shortly afterwards at 0636:51, the radar recording shows the 2 ac converging at a range of 0.8nm with 400ft vertical separation as the BE200 continued a slow descent. The SK76 pilot reported, *"er (SK76)c/s I'd er like some help with that separation please we don't have him visual."* Birmingham Radar advised, *"and (SK76)c/s looks like he's crossing you left to right so if you make a er right turn now a radar heading of er two one zero degrees."* At 0637:05 the SK76 pilot replied, *"Radar heading two one zero degrees and we're in the descent we got that aircraft"*

visual he's clearing us by about three hundred feet ?????." Birmingham Radar acknowledged, "(SK76)c/s that's understood if you're visual you can resume own navigation."

At 0637:15, the radar recording shows the 2 ac merging, with the SK76 now indicating FL028 and the BE200 indicating FL033. Shortly afterwards the SK76 pilot advised of the intention to file an Airprox and requested information on the other traffic.

The BE200 pilot was advised of the Airprox after landing and indicated that the other ac had not been sighted, but confirmed that it was monitored on TCAS 500ft below.

The SK76 pilot was in receipt of a TS from Birmingham Radar and was provided with TI to assist the pilot in avoiding the other traffic. At a late stage the SK76 pilot requested assistance with separation. The pilot did not request a change of service and there was insufficient time for the Birmingham Radar controller to upgrade the level of service. The Manual of Air Traffic Services Part 1, Section 1, Chapter 11, Page 5, Para 4.1.1 states:

'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 BE200 was provided with a PS just prior to the time of the Airprox. Oxford Approach, were not aware of the SK76 helicopter and were unable to provide TI. The Manual of Air Traffic Services Part 1, Section 1, Chapter 11, Page 10, Para 6.1.1 states:

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

A Procedural Service does not require information derived from an ATS surveillance system. Therefore, due to the ability for autonomous flight in Class F/G airspace, pilots in receipt of a Procedural Service should be aware of the high likelihood of encountering conflicting traffic without warnings being provided by ATC.'

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

With both flights operating within Class G airspace, both crews were responsible for maintaining their own separation from other traffic. Although both flights had previously been working East Midlands, they had then contacted different ATSUs. At the time of release, the ac were both tracking towards the DTY area but separated by 1000ft. Thereafter the SK76 flight had called Birmingham and received a TS whilst the BE200 flight had called Oxford, after unsuccessfully calling Coventry, and accepted a BS before upgrading to a PS as he descended. Pilot Members believed that as the Wx appeared to have been marginal for VFR flight, the BE200 pilot would have been better placed if, in his pre-flight planning, he had planned to use radar equipped ATSUs prior to Oxford – Coventry had no ATC available at the time of the Airprox. Both crews were aware of each other's presence from TCAS whilst the SK76 crew's SA was supplemented with TI from Birmingham. Members thought that the SK76 crew had been right to ask for an upgraded service but they had left it rather late in the evolution, leaving the Birmingham controller fewer options to resolve the conflict. The BE200 pilot had also upgraded to a PS from Oxford; however, Oxford APP, being a non-radar ATSU, was unaware of the SK76's presence. Both crews had seen the deteriorating situation and acted in the vertical plane to resolve it, the BE200 pilot arrested his descent while the SK76 crew commenced a descent and saw the BE200 as it crossed above. The Board unanimously agreed all parties had acted appropriately throughout and that this Airprox had been a conflict between IFR flights which had been resolved by the combined actions of both crews with the assistance of TCAS and ATC, thereby removing any risk of collision.

AIRPROX REPORT No 2010134

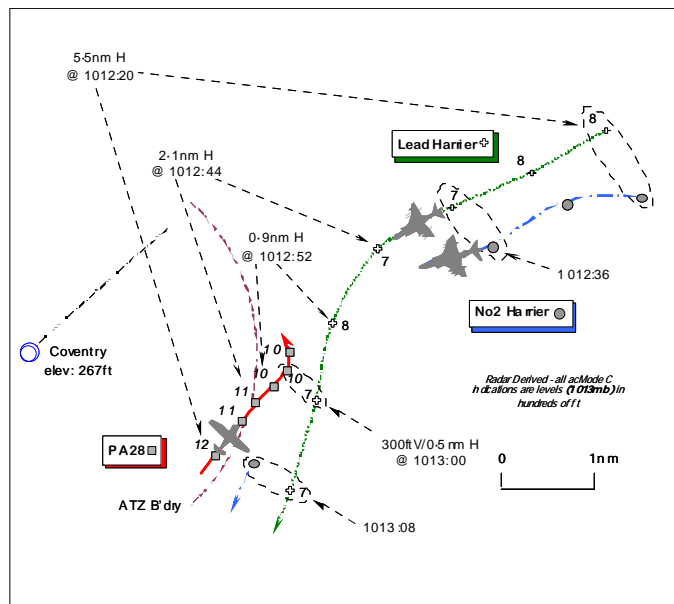
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict between IFR flights resolved by both crews with the assistance of TCAS and ATC.

Degree of Risk: C.

AIRPROX REPORT NO 2010135

Date/Time: 16 Sep 2010 1013Z
Position: 5221N 00124W
 (2.75nm E of Coventry - elev 267ft)
Airspace: UKDLFS/FIR (Class: G)
Reporting Ac Reported Ac
Type: Harrier x2 PA28-161
Operator: HQ Air (Ops) Civ Trg
Alt/FL: 700ft NR
 RPS
Weather: VMC NR NR
Visibility: 10km NR
Reported Separation:
 100ft V NR
Recorded Separation:
 PA28 v Lead Harrier 300ft V/0.5nm H
 PA28 v No2 Harrier not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HARRIER PILOT reports that he was leading a VFR low-level pairs sortie from Wittering, but because of two Royal Flights passing close to Wittering a different route to the normal VFR low-level routing was planned. This route passed 3nm from Coventry Airport and remained outside their ATZ.

At 1013:00Z, the westerly ac of the pair – the No2 - had an Airprox with a light civilian ac, with blue undersurfaces and white upperworks, operating from Coventry Airport [the PA28]. The light civilian ac was seen 0.2nm away at a very late stage whilst heading 240° at 420kt, no time was available for avoiding action to be taken. The PA28 passed just above the No2 Harrier on a reciprocal track with vertical separation of about 100ft.

During the RAIDS debrief the Harrier is shown passing outside the ATZ by 0.5nm. The HUD video shows that the Risk of collision was 'high' and that the reported separation is approximately correct.

The lesson from this Airprox is that although the Harrier's navigational equipment is now so accurate as to allow LFS avoidance areas to be 'just' missed, this level of navigational accuracy is not necessarily the same with other airspace users.

The Harriers have a grey colour-scheme and the HISLs were on. The lead ac was squawking A7001 with Mode C; the No2 was not squawking.

UKAB Note (1): The UK LFH at Part 1-2-4-3 highlights that the Coventry ATZ is in close proximity to the Birmingham Avoidance Area (AA). The UK LFC illustrates the Coventry ATZ boundary as lying at the extreme SE corner of the AA.

THE PIPER PA28-161 PILOT declined to provide an Airprox report.

ATSI reports that this Airprox occurred at 1013:00, in Class G airspace 2.9nm to the E of Coventry Airport just outside the ATZ. The 2.5nm radius Coventry ATZ is centred on the mid-point of RW05/23 and extends to 2000ft above the aerodrome elevation of 267ft.

The 0950UTC Coventry Weather was: sfc wind: 280/10kt, variable 260°-320°; visibility: >10km with showers in the vicinity; Cloud: FEW at 1000ft, BKN at 1800ft; QNH 1011mb.

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The PA28 pilot had rejoined the left hand visual cct for RW23 after returning from a local detail and was in receipt of an Aerodrome Control Service from Coventry TOWER, squawking A0260 with Mode C. The Coventry TOWER controller observed a contact on the Aerodrome Traffic Monitor (ATM), E of the Airport, squawking A7001 without Mode C. At 1012, although the Tower controller had not acquired visual contact with the unknown ac, a warning was passed to the PA28 pilot as the ac approached the midpoint of the downwind leg. Shortly afterwards TOWER advised the PA28 pilot that there might be two contacts in the PA28's 1 o'clock position. The PA28 pilot reported sighting the ac below and then, shortly afterwards, reported sighting both ac. At the same time the Tower controller acquired one of the Harriers visually as it turned onto a southerly heading.

At 1016, TOWER advised the PA28 crew that the pilot of the Harrier had called on the RT to apologise. Coventry ATC was not immediately aware that an Airprox would be filed and no written report was provided by either the Tower controller or the pilot of the PA28. The ATSU subsequently provided a summary of the controller's recollection of events.

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

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

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

TOWER passed an appropriate warning to the PA28 pilot regarding the close proximity of the unknown traffic. The Harrier pilot's written report indicates an intention to route close to the Coventry ATZ boundary, but no RT call was made to Coventry ATC until after the event.

[UKAB Note (2): The Clee Hill Radar recording shows the Harrier pair at 1012:20, approaching the Airprox location from the NE, heading SW, with the lead ac squawking A7001 and indicating 800ft unverified Mode C – about 740ft Coventry QNH (1011mb). The No2 Harrier is shown as a primary contact only in battle formation on the leader's port wing at a range of about 0.5nm. The PA28, which is 5.5nm away at this point is shown downwind for RW23 just inside the ATZ indicating 1200ft unverified Mode C. The lead Harrier and the PA28 both descend slightly by 100ft maintaining a steady course, to 700ft and 1100ft respectively. After 1012:36, primary contact on the No2 wingman fades. On the next sweep at 1012:44, the PA28 crossed the ATZ boundary downwind, indicating 1100ft Mode C (1013mb) – about 1040ft QNH - with the lead Harrier 2.1nm directly ahead commencing a L turn SSW'ly, vertical separation remaining constant at 400ft Mode C. Some 8sec later the lead Harrier has started to draw to starboard of the PA28's nose 0.9nm away, at the midpoint of the jet's turn, when vertical separation reduced to 200ft, the Lead Harrier climbing 100ft and the PA28 descending the same amount to an indicated 1000ft Mode C. The CPA between the PA28 and the lead Harrier occurs in between sweeps. The minimum recorded separation occurs at 1013:00, the lead Harrier now 3.12nm from the Airport - 0.62nm outside the ATZ - drawing R into the PA28's 3 o'clock, passing 0.5nm SE and 300ft below the latter, which itself is shown at a range of 2.75nm from the Airport and thus 0.25nm outside the ATZ. The No2 Harrier is still not evident. However, on the subsequent sweep at 1013:08, with the lead Harrier 1.5nm due S of the PA28, which itself is now turning L, the No2 is revealed 0.5nm off the leader's starboard wing thereby showing that the pair had conducted a cross-over turn on to SW. Interpolation of the No2's track history supports the lead pilot's report that the westerly ac of the pair - the wingman - passed directly beneath the PA28 at 1013:00, during or shortly after the No2's turn.]

HQ AIR (OPS) comments that whilst technically acceptable to fly this close to an ATZ without first contacting the controlling agency, it is not good airmanship. An early call to the airfield controller may well have improved the situational awareness of the Harrier flight and facilitated greater separation. It is disappointing that the PA28 pilot elected not to cooperate with the investigation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report solely from the lead Harrier pilot, radar video recordings, and reports from the appropriate ATC and operating authorities.

The Board agreed that it was most unfortunate that the PA28 pilot had elected not to contribute toward the investigation of this Airprox and pilot Members considered this to be a most unprofessional attitude from the PIC. The Board was denied his perspective on the encounter and the assessment of this Airprox was thus somewhat unbalanced. However, additional information was available from the ATSI report and radar recordings, which enabled the Board to complete its assessment. It was apparent that the Coventry TOWER controller had spotted one of the approaching Harrier's on the ATM and then astutely detected the other. The Board commended the controller for his alertness, swift appreciation of the situation and the prompt warnings passed to the PA28 pilot downwind for RW23. Why the PA28 pilot was flying such a wide cct downwind was unclear, but it was plainly wide enough to take the ac outside the relative sanctuary of the ATZ, which caused concern amongst the pilot Members. Without the PA28 pilot's account there was no apparent reason for this wide cct and the Harrier pilots might not have expected to encounter cct traffic here. Subsequent to TOWER's warning, however, it was plain from ATSI's RT recording that the PA28 pilot had spotted both jets. Whilst the PA28 is shown turning L on the radar recording at the point the Airprox occurred, whether its pilot was taking avoiding action himself, or this was just a base-leg turn was not evident.

The Harrier formation pilots clearly had a responsibility to remain clear of the Coventry ATZ at the extremity of the UKLFS Birmingham Avoidance Area, but Members noted that the lead pilot had reported that their route had been planned to pass 3nm from Coventry Airport and thus no more than ½nm outside the 2½nm radius ATZ boundary. Evidently, it is unwise to assume that aerodrome traffic will be contained within the ATZ boundaries. In the absence of RT contact with TOWER, who could have advised about the presence of any local traffic, pilot Members agreed with the Command's view that it was not good airmanship to plan to fly this close to an ATZ boundary. Moreover, despite the reported accuracy of the Harrier's navigational equipment, executing a cross-over turn at this point, thereby placing the No2 even closer to the ATZ also seemed unwise. Indeed the Chairman commented that there was little value in tactical formation flying in this area because of the profusion of LFS avoidances. The radar recording showed that the Harrier's cross-over turn was initiated just before they passed abeam the ATZ at the nearest point, as they also closed on the PA28 that was still unseen ahead. The Harrier pilot's laudably frank account states that the PA28 was not seen until a very late stage when it was a mere 0.2nm away – 400yd - with no time available for avoiding action as the PA28 passed about 100ft above the No2 Harrier. Therefore, the Board concluded that the Cause of this Airprox was effectively, a non-sighting by the Harrier pilots.

It was difficult for the Members to arrive at a more meaningful assessment of the inherent Risk without the PA28 pilot's account. However, on the information provided it was clear the Harrier pilots were unable to avoid the PA28 by any greater margin and the No2 would have been severely restricted in his ability to manoeuvre. Whether the PA28 pilot might have been able to alter his ac's flightpath significantly if he had seen the wingman in time was not known. Neither was it feasible to confirm the vertical separation that actually obtained without Mode C data from the wingman, but there was no reason to doubt the veracity of the leader's estimate of 100ft. The Board concluded that the safety of the ac involved had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

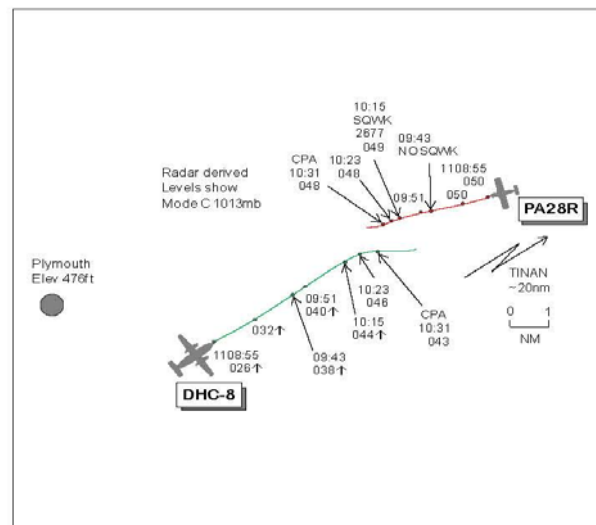
Cause: Effectively a non-sighting by the Harrier pilots.

Degree of Risk: B.

AIRPROX REPORT No 2010136

AIRPROX REPORT NO 2010136

Date/Time: 19 Sep 2010 1111Z (Sunday)
Position: 5028N 00354W
(8.5nm ENE Plymouth)
Airspace: LFIR (Class: G)
Reporting Ac Reported Ac
Type: DHC-8 PA28R
Operator: CAT Civ Pte
Alt/FL: FL45 ↑ FL50
Weather: IMC NR VMC CLAC
Visibility: NR 10km
Reported Separation:
200ft V/NR H Not seen
Recorded Separation:
500ft V/0.8nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DHC-8 PILOT reports departing Plymouth under IFR and in receipt of a PS from Plymouth Approach on 133.55MHz, squawking 1407 with Modes S and C. The Wx was layered cloud, SCT to BKN but improving towards the S Coast. Both RWs were in use and they elected to use RW13 for departure. On taxiing out they received the initial clearance to make a R turn out (through 300°), rather than a L turn that was expected before setting track to TINAN, owing to traffic passing through the climb out from W to E. However, the taxi phase took longer than expected resulting in the transit ac having passed well to the E, thus the R turn out was cancelled. They took off from RW13 and made a L turn towards TINAN onto heading 065° at 150kt. Approach asked for them to call passing 3000ft but as they did the frequency was busy with another flight transmitting. Passing FL45 heading 065° and 150kt an open cyan diamond (not depicted as proximate traffic) suddenly appeared on the TCAS screen in their 12 o'clock range 2-25nm and 1100ft above. It appeared so suddenly it was as if the ac's transponder had just been switched on. This coincided with another flight checking in on the frequency for the first time and being assigned a squawk of 2677. He pointed this out to the FO, PF, and within seconds it had changed to a 'descend' RA with a green arc demanding a ROD of 1000-1500fpm. The RA was followed with a R turn being initiated as it seemed as though the traffic was opposite direction. The other ac passed 200ft above and clear to their L. Normal flight was resumed following satisfactory resolution. He assessed the risk as high. He commented that the TCAS display went from clear of ac to 'other traffic' to full blown RA with exceptional speed, certainly not appearing to represent a closing speed of circa 300kt. After speaking to the ATCO, it appears that London Military saw the potential conflict either by PSR or SSR and had luckily taken the initiative to contact Plymouth Approach, asking if they were aware of the traffic. Plymouth ATC was not aware of this traffic and about this time the flight made its initial call. Plymouth immediately asked the flight to squawk conspicuity before informing the crew of the traffic to the E. It appeared to him that the ac's transponder was selected on at this stage but this was only his perception of events, and it was at this stage the RA occurred.

THE PA28R PILOT reports en-route to Newquay via St Austell VFR and had just established contact with Plymouth Approach on 133.55MHz and been issued a 2677 squawk; immediately prior to this he had been receiving a service from Exeter on an assigned squawk. The visibility was 10km flying 100ft above cloud in VMC and the ac was coloured blue/white with strobe lights and beacon switched on. The incident occurred about 8nm ENE of Plymouth when he was heading 255° at 120kt and FL50. He did not see the other traffic but was later told that it had been climbing through cloud from below on a reciprocal heading.

THE PLYMOUTH APPROACH/AERODROME CONTROLLER reports the DHC-8 had initially been issued with a CAS joining clearance from Swanwick Sector 6/9 and was also pre-noted to London Military who had agreed to provide a radar service outside CAS. The London Mil controller had been passed the airways joining clearance and had issued a radar clearance for the flight to route direct to TINAN climbing to FL120 together with a London Mil squawk. He had originally instructed the flight to make a R turn out after departure to ensure separation from

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

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

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

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

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

During weekday periods Monday to Friday, a LARS service is provided by Plymouth Military Radar. However, the Airprox occurred on a Sunday and London Mil had agreed to provide a radar service to the DHC-8, when above FL40. The standard practice requires that Plymouth Approach transfer such traffic to London Mil after passing an altitude of 3000ft.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

‘A Procedural Service is an ATS where, in addition to the provisions of a Basic Service the controller provides restrictions, instructions and approach clearances, which if complied with, shall achieve deconfliction minima

against other aircraft participating in the Procedural Service. Neither traffic information nor deconfliction advice can be passed with respect to unknown traffic.'

Paragraph 6.5, states:

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

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

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

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

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

The London Mil controller had done well by alerting the Plymouth controller to the approaching PA28R and, although this information was not passed on to the DHC-8 crew immediately, the Plymouth controller had discharged his responsibilities by issuing TI to both flights after the PA28R's details became known to him from its pilot's RT call. The DHC-8 crew was aware of the PA28R from TCAS and had correctly followed the RA guidance. It was noted, however that the crew manoeuvred their ac laterally as well, which is not recommended owing to the

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equipment's known inaccuracies in azimuth. Also, for whatever reason, the crew only reported a TCAS TA alert on the RT whereas the 'RA' and 'clear of conflict' should have been broadcast. Owing to the layer of cloud, neither crew was able to visually acquire the other ac, which led Members to classify this as a conflict in Class G airspace. However, the Board agreed unanimously that the actions taken by the DHC-8 crew and ATC were enough to remove any risk of collision.

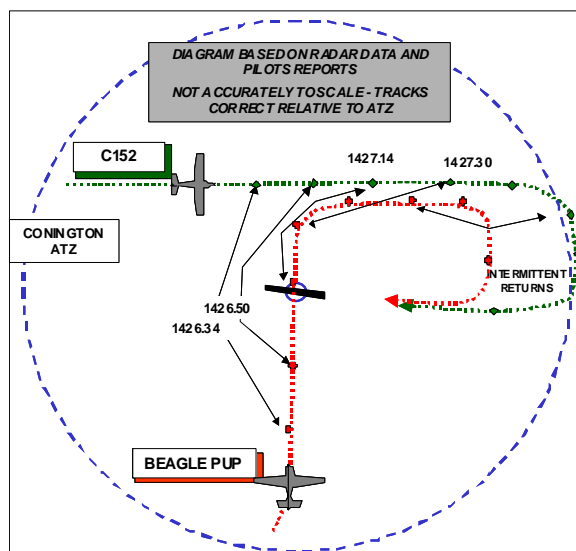
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT NO 2010137

Date/Time: 18 Sep 2010 (Saturday) 1429Z
Position: 5228N 00012W (Conington - elev 26ft)
Airspace: Conington ATZ (Class: G)
Reporting Ac Reporting Ac
Type: C152 Beagle Pup
Operator: Civ Trg Civ Pte
Alt/FL: 500ft 800ft
(QFE NR) (QFE 1019mb)
Weather: VMC CAVOK VMC NR
Visibility: >30km 30nm
Reported Separation:
V 30ft/H 30-50m V 30ft/H 0ft
Recorded Separation:
NR (See UKAB Note: (1))

**BOTH PILOTS FILED****PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE C152 PILOT reports that he was instructing a student pilot on cct procedures and was in a RH pattern for RW28 at Conington with the surface wind varying between W and NW averaging 10kt. His ac was blue and white but his SSR was unserviceable and he was in receipt of an A/G service from Conington Radio; TCAS was not fitted.

After take-off on RW28 he initiated a simulated engine failure from 700ft in order to demonstrate the relevant drills and recovery. As the subsequent recovery took their ac slightly outside the ATZ and he was aware that another ac had recently reported that it was descending deadside, prior to joining the downwind leg of the cct, he made a radio call "C/S rejoining downwind from the West". As they rejoined the downwind leg from the W, looking out of sun, he saw a Beagle Pup in their 2 o'clock on the deadside at the same level. Abeam the threshold of RW10, his student made a radio call "C/S downwind". He was still visual with the Beagle Pup, which was now in their 3 o'clock deadside, tracking North at the same level.

As they approached the end of the downwind leg he heard the Beagle Pup pilot call downwind. He looked behind to check the horizontal separation between them and was satisfied it was about 1nm and the ac was at a similar level. Having conducted a lookout check to the L&R, the student turned the ac onto base leg, configured it for landing (65kts, 20° flap) and, following a further lookout check L&R at about 800ft, turned the ac onto final approach. As they reached about 500ft at about 0.7nm on the approach, the student remarked that an ac (which it transpired was the same Beagle Pup) had just appeared from their right and beneath them. He (the instructor) then became visual with the ac and estimated that it was 30ft below them and taking up a position about 30-50m away in their 10 o'clock on final, on a track parallel to theirs. The instructor reported an Airprox on the frequency in use and instructed the student to manoeuvre their ac to the right so that they could maintain visual contact with the other ac. He made a radio call to establish what the other pilot's intentions were and was advised that he was landing. The other pilot went on to ask if they had joined on a left base but he informed him that they had been ahead and in the cct pattern. Given that the Beagle Pup pilot's intentions were now clear and it was the lower ac on the approach, he instructed the student to execute a go-around.

He assessed the risk as being high and the remainder of the cct detail was completed without further incident.

THE BEAGLE PUP PILOT reports that he was flying solo in a blue and white ac on a private VFR flight from Leicester to Conington, squawking with Mode C in communication with Conington radio. TCAS was not fitted. This was his 4th visit to Conington in 2010 and he descended dead-side at 80kt to the south of the field, obtained the airfield information from the 'TWR' which was reported as RW28 RH and he set the QFE of 1019mb. He heard

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another ac call that he was departing to the W and would join again downwind. As he went cross wind the radio was busy and it was not until he was opposite the RW28 threshold that he could call *'late downwind'*; although he had kept a very good lookout he saw no other ac either in the crosswind or downwind positions.

He does remember hearing another ac call *'final'* and on base leg looked carefully both at the whole length of the final approach both towards and away from the field and saw no other ac before he turned final. He assumed that the other ac had extended on final [downwind] and that that was why he could not see it. The visibility was very good and he did not think it necessary to ask the ac's range as he often did when in doubt.

The Airprox occurred just after he had turned and called final for RW28 when the other ac appeared on his left and passed 30ft above and flying at 60° to his track. The ac disappeared to his right very quickly and there was no need to take avoiding action but nonetheless he assessed the risk as being high.

He was unsure as to whether it is appropriate to give his opinion as to why this Airprox occurred, but in this case elected to do so. The only explanation that he could offer was that the other ac must have been in a blind spot, more probably above than below, as it appeared above him. Similarly he believes that his ac might also have been in the other one's blind spot below it as the other pilot described how he 'popped up' in front of them.

UKAB Note (1): Both ac show in the Conington cct on the recording of the Claxby radar. The Beagle Pup is squawking 7000 with Mode C but the C152 is a primary only contact. The geometry of the ccts flown is as depicted above with the Beagle Pup flying a tighter cct than the C152. The Beagle Pup passes over the RW at 1427:14 tracking N, while the C152 is in its 1 o'clock at about 1nm tracking E, before the former turns E onto downwind 0.1nm inside the C152'S track. At 1428:18 the Beagle Pup commences a R turn onto base leg (1.5nm from the RW threshold) while the C152, having already turned base but 1nm further out (2nm from the RW threshold), is in its 12 o'clock at 1.0nm. At 1428:55, just before the CPA, the C152 disappears from radar on the final turn while in the Beagle Pup's 9 o'clock at about 0.2nm and is not seen again. At the time the Beagle Pup is descending through FL007 (850ft aal) just about to turn final 300m inside the C152. By projection of the C152's position forward by 8 sec the ac get very close (say 50m) at about 1429:00.

UKAB Note (2): Peterborough Conington is a licensed aerodrome with a 2nm radius ATZ; the RW is 3283ft long.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that the radar recordings provided a useful picture of the tracks flown and relative positions of the two ac in the circuit area; unfortunately without a RT transcript, the sequence of transmissions or the ac positions when they were made could not be verified.

Both ac had been operating legitimately in the visual circuit at Conington. Although the C152 had departed from the recognised circuit pattern briefly to conduct a simulated engine failure drill, the pilot [reportedly] made his intentions known and correctly called rejoining downwind, thus establishing the circuit pattern. The radar recording showed that at the time the C152 was in the downwind position re-establishing the pattern, the Beagle Pup was approaching the overhead to join from the South, with the C152 1nm directly ahead of it crossing from L to R and apparently at the same altitude. The C152 was therefore, in a position where it should have been visible to the Beagle Pup pilot. Indeed at that point the C152 pilot was visual with the Beagle Pup in his 3 o'clock joining at the same level. That being the case, and since the C152 student had called downwind well before the Beagle Pup was in the downwind position, Members agreed that the onus had been on the Beagle Pup pilot to integrate safely behind the C152 and conform to the pattern formed by it. That the C152 [the radar showed] had extended downwind was not considered relevant and the Beagle Pup pilot should either have followed it or gone around if conforming made the circuit excessively long. Some Members doubted whether the Beagle Pup pilot had seen the C152 ahead and therefore he had not been able to integrate with it; a pilot Member pointed out that this is most inadvisable as safe separation in the visual circuit is dependent on pilots establishing and maintaining visual contact with other ac therein, both before joining and when in the pattern itself. [ANO, Rules of the Air, Rule 12 applies].

It appeared to Members that the Beagle Pup pilot had turned final inside the C152 ahead without visual contact with it and that on the final turn the former would have been obscured to the pilots of the high-winged C152; thus

for most of the final turn the respective pilots had not seen the opposing ac and separation was by happenstance. Further, both pilots agreed that the separation on final had been minimal. When considering these factors, a small majority of Members agreed that there had been a risk that the ac would have collided.

PART C: ASSESSMENT OF CAUSE AND RISK

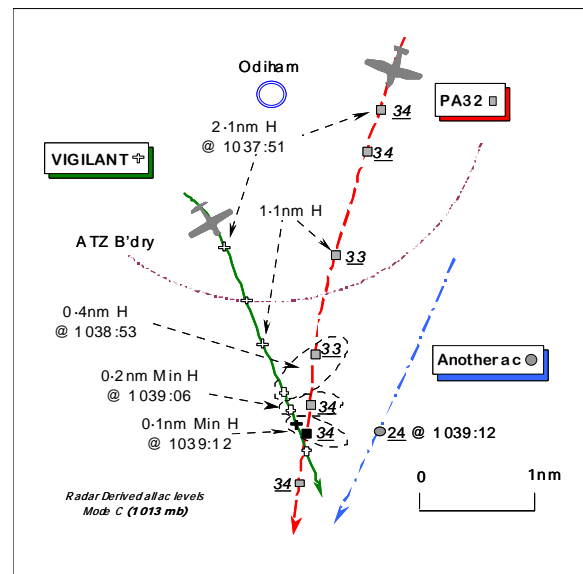
Cause: The Beagle Pup pilot did not establish visual contact with the C152 in order to integrate into the circuit.

Degree of Risk: A.

AIRPROX REPORT No 2010138

AIRPROX REPORT NO 2010138

Date/Time: 28 Aug 2010 1039Z (Saturday)
Position: 5111N 00056W
(3¼nm S of Odiham - elev 405ft)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Vigilant T1 MG PA32
Operator: HQ Air (Trg) Civ Pvt
Alt/FL: 2300ft 3400ft
QFE (1006mb) QNH (1021mb)
Weather: VMC NK
Visibility: 40km NK
Reported Separation:
150ft V/nil H NK
Recorded Separation:
0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VIGILANT T1 MOTOR GLIDER (MG) PILOT reports that he had departed from Odiham on a local training sortie whilst in communication with Odiham RADIO A/G station on 122.1MHz. A squawk of A3644 was selected; neither Mode C nor Mode S are fitted.

Whilst teaching the lookout scan procedure transiting out of the Odiham MATZ at 60kt, heading 170° in straight and level cruise at 2300ft QFE (1006mb), a low-wing single-engine light ac (LA) coloured dark blue with white decking overtook his glider on a heading of about 180° with minimal separation. The Airprox occurred about 5nm S of Odiham and he estimated the vertical separation was about 150ft as the LA overflew his glider. Due to the close proximity and speed of the LA it was not possible to read its registration but it passed sufficiently close for them to feel its wake.

He added that there was another aeroplane on the same heading which appeared to be about 500ft below the LA's height. This incident was reported to Odiham RADIO on 122.1MHz.

His MG is coloured white with DAY-GLO orange wing panels

THE RAC AT LATCC (MIL) reports that the reported time of the Airprox was given as 1000UTC, at a position 5nm S of Odiham. However, radar recordings did not show any events at this location/time despite the Airprox reportedly occurring in a position of good coverage from the Pease Pottage Radar. To allow for a possible time zone error, radar recordings for 0900Z and 1100Z were examined, but the event was still not seen. The possibility of a whole day error was considered; the radar recording for Sunday 29 Aug was examined for the foregoing timings, but again with no success. Contact was eventually achieved with the reporting pilot who reaffirmed his belief that the date, timings and location he reported for the Airprox were correct. Subsequently, the ATD of the Vigilant was ascertained from the VGS as 1030Z and the ac tracked after its departure from Odiham. This revealed that the Airprox occurred some 3¼nm S of Odiham at 1039Z with an ac squawking A0436, which eventually disappeared from radar in the vicinity of Cherbourg. This ac was subsequently identified as a PA32, which matched the colour-scheme given by the Vigilant pilot.

The PA32 is owned by a syndicate; the pilot flying the aeroplane on the day in question was eventually contacted on 10 Jan 2011, but alas could recall little detail of the flight on 28 Aug 2010 and was not aware of the Airprox. Cognisant that numerous gliders operate in this area, the PA32 pilot said that if he had encountered something unusual, he would have remembered it, having been involved in an Airprox many years ago that he still remembers quite vividly. Unfortunately, therefore, he was unable to provide any further detail.

UKAB Note (1): The UK AIP at ENR 2-2-2-4 promulgates the Odiham ATZ as a circle radius 2nm centred on the longest notified runway 10/28, extending from the surface to 2000ft above the aerodrome elevation of 405ft amsl and active continuously (H24).

UKAB Note (2): The UK AIP at ENR 5-5-1-4 promulgates Odiham Glider Launching Site as active from Sunrise to Sunset (HJ). Launching by Winch and Tug ac may be encountered up to 2500ft above the site elevation of 405ft [2905ft amsl].

UKAB Note (3): At the time of the Airprox, Odiham ATC was closed. Hence, the MATZ was not active. The radar recording shows the Vigilant squawking A3644 (no Mode C fitted) departing from Odiham on a steady SSE'ly course; the ac's reported height of 2300ft QFE (1006mb) equates to an altitude of broadly 2750ft amsl on the extant London QNH (1021mb) and therefore above the ATZ in Class G airspace. The PA32 is shown approaching from the NNE maintaining 3300-3400ft London QNH. The faster PA32 converges with the Vigilant off the latter's port quarter at 3400ft QNH and is shown 0.2nm abeam at 1039:06. The PA32 then starts to draw ahead of the Vigilant, which maintains its course throughout. The CPA of 0.1nm occurs at 1039:12. The third ac mentioned by the reporting pilot maintains 2400ft London QNH – 1000ft below the PA32 – on a steady SSW'ly course throughout.

HQ AIR (TRG) comments that the reported proximity does not correlate precisely with the radar recordings and the PA32 did not directly overfly the glider. However, the miss distance is still within normal minima. Moreover, it appears that the PA32 pilot did not see the glider at all. With the direction of approach of the PA32 being from the rear, the glider pilot had less of a chance of seeing the converging ac and appears not to have been visual until too late to take avoiding action. The Risk of collision must therefore be significant. The need to maintain a lookout scan all around, particularly for a slow ac, is paramount.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the Vigilant pilot, radar video recordings and comment from the appropriate operating authority.

Unfortunately, through no fault of the PA32 pilot, the protracted tracing action coupled with communication difficulties had denied the Board a timely input from the reported pilot. The Members understood entirely that the PA32 pilot would have been unable to recollect any specific details of his flight so long after the event. However, the recorded radar data shows his PA32 overtaking the Vigilant to port, with the latter reportedly 150ft below his low-wing aeroplane, so it might have been difficult for the PA32 pilot to spot the MG. The Vigilant pilot reported that the PA32 overtook his glider with minimal separation and that he felt its wake. It was not possible for the Board to determine whether the PA32 pilot saw the MG or not, but it seemed improbable that he would have flown this close if he had seen it. The Board could only conclude, therefore, that part of the Cause was an apparent non-sighting by the PA32 pilot. Similarly, the Vigilant pilot would have been unable to see the PA32 easily until it started to draw ahead off his port wing – the radar recording shows this occurred at a range of 0.2nm - and Members noted the Command's sage comments about maintaining an all-round lookout scan. Members agreed unanimously that the other part of the Cause was effectively, a non-sighting by the Vigilant pilot.

Whilst Members did not question the veracity of the Vigilant pilot's account, the radar recording, coupled with his own report, suggested that the vertical separation was somewhat greater than the Vigilant pilot's estimate. His reported transit height was 2300ft QFE (1006mb) and the equivalent altitude broadly 2750ft amsl on the extant London QNH (1021mb). Whilst the tolerance applicable to Mode C of +/-200ft might have placed the PA32 somewhat lower, its indicated altitude of 3400ft as it drew abeam suggests that vertical separation might have been in the order of 650ft. This was significantly at variance with the Vigilant pilot's minimum separation of 150ft. The Board noted that the other ac seen by the Vigilant pilot that was thought to have been 500ft below the PA32, whereas from that ac's Mode C indications it was actually 1000ft below the PA32. These inconsistencies could not be resolved with certainty because there was no Mode C data from the Vigilant. However, from the information available, the Board concluded that the vertical separation was greater than the reported estimate and that no Risk of a collision had existed.

AIRPROX REPORT No 2010138

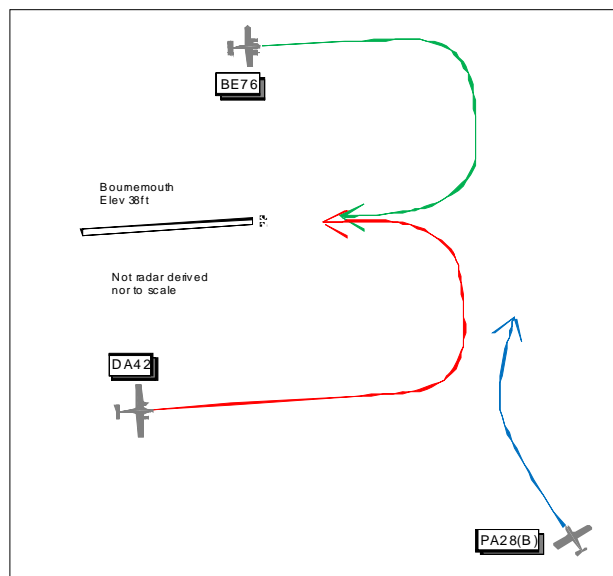
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: An apparent non-sighting by the PA32 pilot and effectively a non-sighting by the Vigilant pilot.

Degree of Risk: C.

AIRPROX REPORT NO 2010139

Date/Time: 7 Sep 2010 1301Z
Position: 5047N 00148W (1.5nm FIN APP
 RW26 Bournemouth - elev 38ft)
Airspace: ATZ (Class: D)
Reporting Ac Reported Ac
Type: BE76 Duchess DA42 Twin Star
Operator: Civ Trg Civ Trg
Alt/FL: 450ft ↓ NR ↓
 (aal) (QNH)
Weather: VMC CLBC VMC GOOD
Visibility: >10km Good
Reported Separation:
 20-50ft V Not seen
Recorded Separation:
 NR

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

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

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

THE BOURNEMOUTH ADC reports the BE76 was inbound from the NW on a standard rejoin clearance. The flight reported downwind and was told it was No2 in traffic, No1 being a PA28 on 0.25nm final. The PA28 landed and vacated the RW making the BE76 No1 for the approach. The DA42 was downwind LH in the visual cct at 1200ft and was passed TI on the position of the BE76, which was now turning R base, and was told it was No2 to the BE76. The DA42 pilot acknowledged the TI and reported he had the BE76 in sight. Immediately after this transmission Radar pre-noted a VFR inbound, a PA28 from the SE which had been issued a standard joining clearance to join L base. TI was passed to the DA42 pilot on the inbound PA28, informing him of its approximate position and the position this ac would be expected to join (L base). The DA42 pilot did not acknowledge his 1st transmission so he repeated the TI including a revised position of the PA28. The DA42 pilot acknowledged this call on the second attempt. Shortly afterwards the PA28 pilot called joining L base and the DA42 then appeared to make a tight L turn from L base and positioned onto 1nm final ahead and below of the BE76, which by this time

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had also positioned onto 1.5nm final. The BE76 pilot reported that he had contact with the DA42 ahead and below on final and that he was initiating a go-around. He told the BE76 flight to make a RH cct and instructed the DA42 to land and hold on the RW while the BE76 went around above. Once the BE76 had turned crosswind he cleared the DA42 for take-off back into the cct, the BE76 landed safely on its second approach.

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

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

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

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

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

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

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

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

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

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

At 1259:12, the Tower controller passed the DA42 TI regarding PA28(B), "*DA42 c/s traffic is a Cherokee inbound from Hengistbury Head about a mile north of Hengistbury Head this time joining left base.*" The unit radar replay showed the distance between the 2 ac as 3nm with the DA42 indicating an altitude of 1000ft and PA28(B) indicating an altitude of 900ft. There was no response from the pilot of the DA42 and the Tower called again to establish communication with the DA42. At 1259:30 the Tower repeated the message, "*Traffic is a Cherokee about a mile and a half north of Hengistbury Head joining left base shortly on your right hand side keep a good lookout.*" The DA42 pilot replied, "*er looking and er left downwind Touch and Go.*" The Tower advised the DA42 "*Roger – DA42 c/s you're number two number one is a Beech Duchess on a one mile right base.*" The DA42 pilot acknowledged, "*Number one A B-er number two and visual with number one DA42 c/s.*"

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

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

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

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

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

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

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

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

Page 12, Paragraph 15, states:

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

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

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

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: 1. Lack of positive control by ATC.

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

Degree of Risk: A.

AIRPROX REPORT NO 2010140

Date/Time: 21 Sep 2010 0848Z

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

Airspace: LFIR (Class: G)

Reporting Ac Reporting Ac

Type: DR400 BE200

Operator: Civ Pte HQ Air (Trg)

Alt/FL: FL75 FL85 ↓

Weather: VMC CLOC VMC CLOC

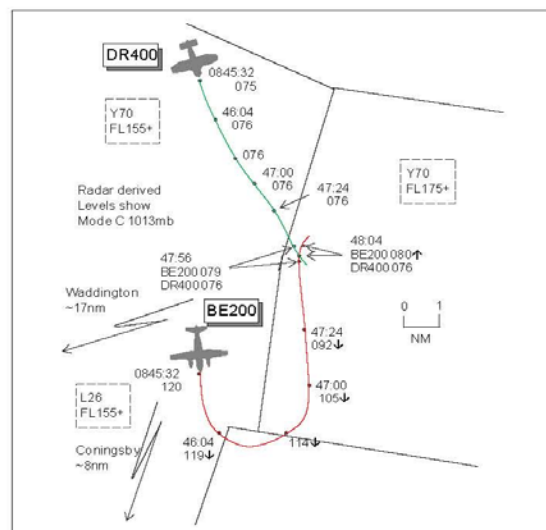
Visibility: >10km 15km

Reported Separation:

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

Recorded Separation:

300ft V/O·1nm H

**BOTH PILOTS FILED****PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

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

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

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

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

AIRPROX REPORT No 2010140

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

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

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

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

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

CAP 774 states that:

Under a TS, 'the controller shall pass traffic information on relevant traffic, and shall update the traffic information if it continues to constitute a definite hazard.'

Under a BS, 'if a controller considers that a definite risk of collision exists, a warning may be issued to the pilot.'

For both a TS and a DS, 'whether traffic information has been passed or not, a pilot is expected to discharge his collision avoidance responsibility without assistance from the controller.'

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

The crews of both ac were initially provided with accurate and timely TI on each other iaw CAP774. Typically, the BE200 will descend with a 10° nose down attitude which will have increased the visibility of the white upper body of the ac to the DR400 pilot. Furthermore, the paint scheme of the DR400 viewed from above appears predominantly white, albeit with a band of red on the leading edge. This, combined with the constant relative bearing between the ac and the possible presence of haze, will have made both of the ac difficult to spot. Moreover, whilst it is impossible to create a timeline of events within the BE200 cockpit, it is likely that the TCAS TA event will have interrupted the crew's workflow and, as the pilot's report states, directed their attention inside the cockpit. It is reasonable to argue that this will have affected the crew's visual scan and delayed their visual acquisition of the DR400, especially given the subsequent requirement to refocus outside the cockpit after viewing the TCAS display.

From an ATM perspective, given the closure speeds of the ac, the updates of TI provided by APP and ZON, whilst given, were too late to have enabled the pilots to take action to prevent the occurrence. APP's workload is unrecorded, but appears low based on the content of the transcript; however, APP was involved in a series of other tasks throughout the time that the BE200 was on frequency, which may have distracted them from passing an

earlier update. That notwithstanding, the BE200 was in receipt of a BS and had been provided with TI on the DR400. ZON's workload is unknown, but in the period between ZON passing TI to the DR400 at 0847:01 and the update at 0847:56, they were involved in a series of transmissions with 2 other ac operating around 15nm S of the CPA. Not only will the geographical split between these ac have served to divide ZON's attention, but the RT during that period is constant with no gaps until the TI is updated.

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

By the time the DR400 pilot saw the BE200 it was too late for him to take avoiding action, but he saw the BE200 manoeuvre away to his L and stop its descent 400ft above. Fortunately the BE200 crew had seen the DR400 slightly earlier, in enough time to take prompt and robust avoiding action as TCAS generated a mutual RA 'climb'. These actions were judged by the Board to have removed the actual risk of collision; however, safety had not been assured during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by the pilots of both ac.

Degree of Risk: B.

AIRPROX REPORT No 2010142

AIRPROX REPORT NO 2010142

Date/Time: 21 Sep 2010 1530Z

Position: 5106N 00038E (3nm S Headcorn)

Airspace: London FIR (Class: G)

Reporting Ac Reported Ac

Type: MD902 Untraced small

Unmanned ac

NO DIAGRAM POSSIBLE

Operator: Civ Comm NK

Alt/FL: 1200ft NK

(QNH 1019mb) (NK)

Weather: VMC CAVOK NK

Visibility: unltd NK

Reported Separation:

0ft V/ 35m H NK

Recorded Separation:

NK

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MD902 PILOT reports flying an a blue and white helicopter on a VFR non-emergency flight with all lights switched on squawking 0014 with Mode C and listening out with Headcorn Radio. He was in level flight over Biddenden [5km S of Headcorn airfield], heading 280° at 120kt and at 1200ft QNH [about 1000ft agl] when the pilot saw what he believed to be a sports glider in his 12 o'clock at some distance. Some 2 to 3sec later the 'glider' passed down the starboard side at the same level about 100ft away. It was not a full sized ac and he estimated its wingspan as being 10-12ft. He decided to follow the ac to investigate; initially it flew at the same height and then descended 200-300ft, before climbing away up to 1300ft. It was pure white in colour with turned-up wing tips at 45°, had a high tail and no other visible markings. Although, obviously powered, he could not see an engine and no operator was seen on the ground in the vicinity. He was later informed it could not be seen from the ground. They reported the incident at the time to Headcorn Radio and then returned to base.

He was initially shocked and due to the short timescale involved was unable to take any avoiding action so he assessed the risk as being high.

He provided a detailed diagram of the aircraft.

THE SMALL UNMANNED AC OPERATOR could not be traced. The MD902 pilot suggested that the ac had been a new type of sensor-equipped small Unmanned Aircraft System (UAS) designed to view and monitor agricultural crops. The owner of the land over which the incident took place was contacted and was most helpful but she does not use such ac nor does she permit models to fly over her land. The manufacturer of the type of UAS is based overseas and declined to provide any details of UK based users.

UKAB Note (1): The drawing and description provided were very detailed and were similar in all respects to the type of UAS manufactured by the company contacted above. The machine is controlled from a laptop computer, is hand launched, is 4ft long with a wingspan of 8ft and is electrically powered by a small propeller in the nose. It operates between 400 and 2200ft but its alt can be adjusted to comply with national regulations. It is manufactured in Canada and, although there is British TV news coverage showing its use in Sussex, there are no UK dealerships listed on the company's web site.

UKAB Note (2): CAP 722 covers civil UAV/S operation in the UK. Civil ac of under 20kg are classified as 'Small Unmanned Aircraft' and are covered by UK National regulation. The National Regulation is at CAP 722 Para 2.2. In essence this states that such ac must comply with the ANO (specifically Articles 166 and 167) or request exemptions from the CAA. Relevant sections of the ANO Articles are as follows:

'166(2) The person in charge of a small unmanned aircraft may only fly the aircraft if reasonably satisfied that the flight can safely be made.'

'166(3) The person in charge of a small unmanned aircraft must maintain direct, unaided visual contact with the aircraft sufficient to monitor its flight path in relation to other aircraft, persons, vehicles, vessels and structures for the purposes of avoiding collisions.'

'166(5) The person in charge of a small unmanned aircraft must not fly the aircraft for the purposes of aerial work except in accordance with a permission granted by the CAA'.

Article 167 confirms that small unmanned ac used for surveillance purposes are considered to be performing aerial work. It follows therefore that operators require permission to be granted by the CAA.

CAA Flight Operations Inspectorate (GA) has no record of any exemption for this type of ac.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the MD902 pilot and radar recordings.

While the Board normally discourages strongly pilots from following conflicting ac to determine their identity, in this case without the detailed description provided by the MD902 pilot, it is most unlikely that the UKAB would have been able to identify the type of UAS involved with any degree of certainty. Based on the detailed drawings the pilot provided, that match closely the photographs and description on the UAS manufacturer's website and a video of a TV news article, the Board was satisfied that the UAS involved was almost certainly of the type identified by the UKAB. It therefore, followed that the UAS was hand launched, its flight programmed from a Laptop Computer, and was capable of flying 'beyond visual range' and therefore out of sight of the operator. Further, based on website information, it would seem that the type of control from the Laptop is indirect and limited in its effect.

The Board was therefore most concerned that this was a conflict with a hitherto unseen type of commercially available UAS, apparently being flown in contravention of the provisions of Articles 166 and 167 of the ANO. Members agreed that flying at such altitudes, apparently out of line of sight of the operator and with very limited manoeuvrability, poses a significant risk to other legitimate lower airspace users. That being the case, the Director of the UKAB decided to take the unusual step of informing the CAA of his concern over this type of aviation activity.

Members understood the concern of the Helicopter pilot when the perceived distant 'glider' approached so quickly and that he was unable to manoeuvre until after it had passed. Since he then followed the UAS, determining accurately its actual rather than perceived size, Members agreed that, although it could not be verified by any other information, his estimate of the 35m miss-distance was most likely correct. They also agreed that in the case of the MD902, due to the short time between the pilot's first visual detection to the object to the ac passing and since apparently the (unseen) operator had no direct control of the UAS, neither ac had taken any action to resolve the conflict. That being the case, Members agreed unanimously that there had been a degradation of normally accepted aviation safety standards.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict with an untraced UAS.

Degree of Risk: B.

AIRPROX REPORT No 2010143

AIRPROX REPORT NO 2010143

Date/Time: 22 Sep 2010 1400Z

Position: 5322N 00016W
(5nm SSW of Binbrook)

Airspace: Lincolnshire AIAA (Class: G)

Reporting Ac Reported Ac

Type: Dominie T Mk1 DR 400

Operator: HQ Air (Trg) Civ Pte

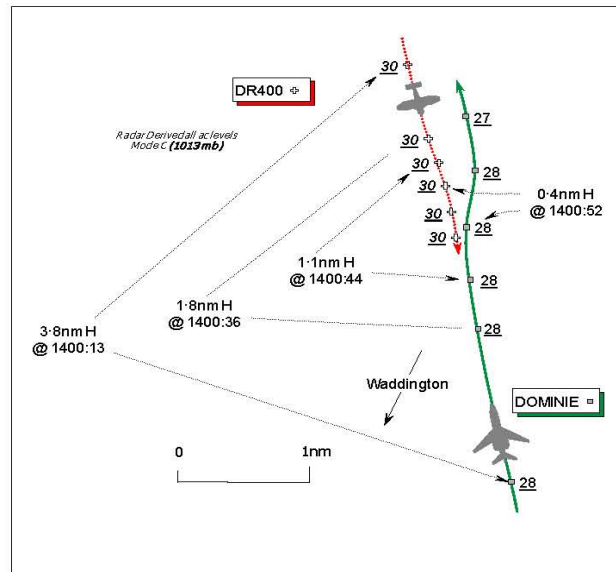
Alt/FL: 2500ft 3000ft
QFE (1004mb) QNH (1017mb)

Weather: VMC Haze VMC CLBC

Visibility: 12km 10km

Reported Separation:
50-100ft V/150m H 200ft V/200m H

Recorded Separation:
200ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HS DOMINIE T Mk1 PILOT reports he was inbound to Waddington for a practice PAR approach to RW20 as training for the pilot's assistant (PA). He was flying out of sun with a visibility of 12km in haze, in VMC and in receipt of a TS from DIR on 378-62MHz. A squawk of A3610 was selected with Mode C; Mode S was on but TCAS is not fitted.

Flying on base-leg at 170kt, level at 2500ft QFE (1004mb) DIR reported 'traffic, north, 4miles, 300ft above'. Shortly after looking into the area reported by the controller, the PA spotted an ac directly ahead at a range of less than 1nm. The conflicting traffic was a low wing piston-engined light ac – the DR400 - on a reciprocal heading about 50-100ft above them. About 3-7sec after the initial acquisition the DR400 had closed to within half a mile, so he elected to take control of his ac from the PA and carry out an emergency break to the R to avoid it. During the manoeuvre, he glimpsed the DR400 through the left Direct Vision (DV) window and estimated the distance to have reduced to about 150m horizontally and 50-100ft above his ac at the closest point as the ac passed to port with a 'high' Risk of collision. For the duration of the encounter, he thought the pilot of the DR400 made no change to his ac's flight path. He reported the Airprox to DIR immediately on the RT.

He added that the vision from the cockpit is poor and made worse by the windscreen heater membrane. Other light ac operating from Wickenby had been called by DIR but remained unseen.

The Dominie has a high-conspicuity black and white colour-scheme; the white HISLs, landing lights and nav lights were all on.

THE DR 400 PILOT reports he was PIC on a VFR flight from Sherburn-in-Elmet to Rochester, routing via the Humberside and Coningsby overheads. At Goole he called Humberside requesting a BS and transit through the overhead at an altitude of 2400ft. A BS was agreed, a squawk assigned and transit through the overhead confirmed. Subsequently a climb to 3000ft was requested and the transit through their overhead was made at that altitude.

Turning onto a direct track to Coningsby, heading 170° at 120kt, maintaining 3000ft ALT, in the area of Wickenby/Ludford Magna [3nm E of the Airprox location] he was released by Humberside without hand-over and advised his intention of calling Coningsby. (He mentioned here, that in the morning whilst flying a reciprocal route inbound to Brighton, he received an ATS from Coningsby, but when released he was advised to call Humberside and not Waddington as he had requested.) Contact was not made with Coningsby until approx 10-12nm from their overhead as they were very busy with other traffic on UHF. During the interval between Humberside terminating their ATS and calling Coningsby, both crew members observed a dark coloured Dominie ac on a N'y heading

about 1km away [0.54nm]. He turned R to avoid the Dominie, whose pilot also turned to the R in avoidance; the Dominie passed down their port side at an estimated range of 200m, about 200ft below his aeroplane with a 'low' Risk of collision.

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

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

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

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

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

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

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

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

CAP 774 states that:

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

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

AIRPROX REPORT No 2010143

JSP 552 201.200.3 states that:

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

CAP 774 states that:

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

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

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

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

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

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

Equally, the Dominie crew could have chosen to take their own avoiding action earlier, but might have expected DIR to provide this avoiding action turn instead. Potential for indecision exists when crews have to constantly switch between being directed to turn to follow the pattern (and avoid traffic in the case of the turn onto 350°) and having to initiate their own traffic avoidance turns. Opting for a Deconfliction Service in this situation might have provided clearer direction from DIR resulting in greater separation, but would still not have absolved the crew from

their collision avoidance responsibilities. Crews need to be prepared to take their own positive avoiding action earlier in such situations. Furthermore, more specific emphasis that traffic has been assessed as a direct confliction by the controller might alert crews earlier to the fact that a confliction exists, rather than them having to process the TI and come to that conclusion themselves.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

At the core of this Airprox was the issue of vectoring ac under a TS within the RTC, where Members recognised that the controller was also under remit when issuing vectoring instructions to take into account traffic in the immediate vicinity so that '...a risk of collision is not knowingly introduced'. Here the mentor and trainee manning DIR had elected to turn the Dominie onto 350° to keep clear of the ac conducting aerobatics. HQ 1Gp BM SM suggested that the controllers had not spotted the confliction with the DR400 before the turn instruction to 350° was issued because, with a high level of background traffic, they were operating under a medium to high workload and concentrating on the more imminent threat posed by the aerobatic ac at the time. Alternatively, it was contended that DIR had been aware of the DR400 and had planned to turn the Dominie on to a base leg before the ac closed, but this plan was thwarted by the E3-D calling on climb-out. Controller Members sagely argued that it was rarely wise to point one ac directly at another, and this Airprox illustrated just that. Although the recorded radar data did not replicate exactly the radar picture in use by DIR at the time, there was no reason to suppose that the DR400 was not displayed to DIR, which suggested to some Members that this was a late sighting by the controllers. After much discussion, the Board agreed that the Cause of the Airprox was that DIR had vectored the Dominie into conflict with the DR400; the Board accepted HQ 1Gp's view that in this complex scenario DIR had not been aware of the DR400 and therefore had not turned the Dominie into confliction 'knowingly'.

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

The CPA occurred in between radar sweeps, hence the horizontal separation could not be corroborated independently. Whilst the Dominie pilot had fulfilled his responsibilities to 'see and avoid' the other ac, he estimated the separation to have been about 150m horizontally and 50-100ft vertically with a 'high' Risk of

AIRPROX REPORT No 2010143

collision. This suggested to some Members that the safety of the ac had been compromised despite his avoiding action. Whilst this separation was less than that estimated by the DR400 pilot, it was of the same order of magnitude and the latter pilot's vertical estimate was spot-on from the ac's Mode C indications. The DR400 pilot reports he spotted the Dominie at a range of 1km – just 0.54nm; this was closer than the Dominie crew, who called visual at just over 1nm before they executed their R turn. Thus each pilot had seen the other ac in time to assess the situation and avoid each other's ac in-line with the Rules-of-the-Air, which convinced other Members that the pilots' combined avoiding action had effectively removed any Risk of a collision. Given the broadly equal division of the Members, the Board concluded by a majority vote that there was no Risk of collision.

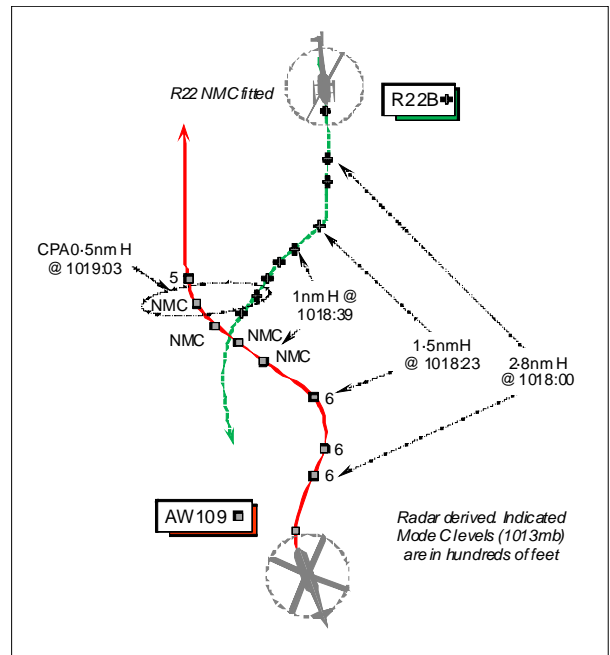
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

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Date/Time: 26 Sep 2010 1019Z (Sunday)
Position: 5252N 00005W
 (170° Coningsby 14nm)
Airspace: London FIR (Class: G)
Reporter: Waddington ATC
1st Ac 2nd Ac
Type: AW109 R22B
Operator: HQ Air (Ops) Civ Pte
Alt/FL: 500ft 550ft
 RPS (1008mb) agl
Weather: NR VMC
Visibility: 5km 1500m
Reported Separation:
 NR Not seen
Recorded Separation:
 0.5nm Min H



CONTROLLER REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE WADDINGTON ZONE CONTROLLER (ZONE) and the ATCO I/C reports that the R22B was under a BS routing to Humberside, but due to poor weather conditions the transit was aborted and the helicopter diverted to Fenland. As the R22B turned southbound a northbound ac was seen S of the R22B displaying a Coningsby squawk. Coningsby APP telephoned requesting TI and was told the R22B was at 700ft routing to Fenland. Coningsby APP stated that their ac – the AW109 - was at 500ft. ZONE passed TI on the AW109 to the R22B pilot twice and on the second transmission the pilot advised he was unlikely to see the other ac and was turning R to avoid it, so she believed the confliction would be resolved. At this point Coningsby APP turned the AW109 to the L into direct confliction with the R22B. The two ac returns were seen to merge. Coningsby APP advised that the AW109 pilot saw the R22B pass down his right hand side, but the R22B pilot did not see the AW109. She stated that with deteriorating weather conditions she was reluctant to give an avoiding action vector to an ac that was flying well below the Sector Safe Height. The Risk was assessed as 'high (A)'.

THE AGUSTA 109 (AW109) HELICOPTER PILOT submitted his report about 8 weeks after the Airprox and so his recollection of the incident was 'a little hazy'. Flying VFR from Northolt to Coningsby, he was in receipt of a TS from Coningsby APP. The assigned squawk [A1740] was selected with Modes C and S on; TCAS I is fitted.

To the S of Coningsby the weather deteriorated due to drizzle and low cloud, but they were able to remain VFR easily at between 500-1000ft msd. About 10-15nm S of Coningsby heading 350° at about 1000ft RPS [BARNSELY 1008mb] a contact was displayed on his TCAS I equipment, but he could not recall if the other ac's altitude was shown. However, he does recall turning away from the contact to increase the distance just in case, as the other ac was not in RT contact with Coningsby APP. At no time did he see the R22B, he thought, so he was unable to estimate the minimum separation but he did not consider there had been a Risk of a collision.

UKAB Note (1): APP advised the AW109 pilot at 1018:42, *".. he's just turned right against you as well he's just right 3 o'clock half a mile crossing right left"*, which was acknowledged *"roger that [AW109 C/S]"*. Eleven secs later the AW109 pilot reported *"..we're visual with that"*.

UKAB Note (2): The Coningsby weather was transmitted by APP to the AW109 pilot at 1014:55 as CC GREEN with 3700m NSW, BKN at 800ft.

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THE R22B HELICOPTER PILOT reports he had planned to fly solo under VFR from Cambridge to Humberside and the weather conditions on the day were forecast as:

Waddington TAF: 2606/2624 35015KT 9999 SCT045 PROB40 TEMPO 2606/2610 SHRA SCT020 BECMG 2610/2613 RA BKN020 TEMPO 2613/2624 7000 RA BKN012

Northbound passing Fenland on a direct track the weather started to reduce from a cloud base of 1000ft and slant visibility estimated to be 5km in haze and fine drizzle. On leaving Fenlands frequency, he established RT contact with Waddington ZONE on 127.35MHz and requested a BS; a squawk of A3601 was assigned, but Mode C is not fitted. Radio reception was poor, readability '3', he believes because of the low transit height. About 10nm S of Coningsby, he requested the local weather at Waddington. At a position 8nm S of Coningsby, he informed ZONE that the visibility had reduced to limits and he had elected to divert to a small helipad, 6nm NE of Boston at his home address. Within a very short space of time he decided the visibility was no better heading E and he informed the controller that he would be diverting to Fenland Aerodrome, which he had over-flown earlier and where he knew the weather was above minima. His workload was high due to the extremely poor visibility, checking the map for obstacles and power-lines on the reverse track and setting the Fenland frequency as the next frequency on the comms box, with the additional factor of poor reception with Waddington. Heading 170°, about 15nm S of Coningsby flying at 550ft agl and 90kt, ZONE then informed him of a helicopter 'on an intercept course', indicating the same level. He advised ZONE that he did not have visual contact with the other helicopter and was unlikely to do so because of the poor weather conditions. He asked for 'avoiding action instructions', but cannot remember the exact reply from Waddington. However, he does remember sensing the urgency in the tone of the controller's voice and understood that there was a real collision risk, but part of the message from ZONE was unreadable. Advising the controller that he was making an immediate turn to the R, he banked the helicopter to the R by about 20° into an avoiding action turn and rolled out on a heading of about SW. Shortly afterwards, ZONE asked if he had seen the other helicopter to which he replied 'negative'. He estimated his ac's height at the time of the incident as between 500-600ft agl. The Risk was not assessed.

THE CONINGSBY APPROACH (APP) CONTROLLER provided a comprehensive account stating that he was 1 of 2 controllers on duty during a weekend day shift tasked with providing a radar service in the event of a priority move. The Watchman primary ASR was out of service with ongoing serviceability issues so he was operating with SSR only.

During his shift, as part of a Station event, an AW109 from Northolt was inbound to Coningsby. The AW109 pilot free-called APP to the S of Coningsby heading N at 1000ft, but he could not recall the ATS provided. [UKAB Note (3): It was a TS with reduced TI SSR only.] The AW109 was identified, passed the Coningsby A/D information and asked to report visual with the aerodrome. He observed an ac contact – the R22B - displaying a Waddington squawk to the R of the AW109's 12 o'clock flying slowly southbound, so he asked Waddington ZONE for TI and ascertained that the traffic would pass close to the AW109. He passed TI to the AW109 pilot on the R22B contact more than once as the ac were closing. The conflicting traffic was still to the R of the AW109's nose so he suggested a turn to the NW [L] to avoid the contacts merging. Avoiding action was not given; however, the AW109 pilot took his suggested turn, but by that stage the AW109 pilot had already commenced a turn to the R, which had taken him through the R22B's 12 o'clock. Unfortunately, operating SSR only, the associated data update rate was slow. As the AW109 turned back onto a NW'ly heading the R22B commenced a turn to the R and the contacts merged. He continued to call the conflicting traffic throughout and the AW109 pilot reported visual with a helicopter, he thought passing about 200ft above his ac with no horizontal separation. Waddington ZONE called on the landline asking if the AW109 pilot had seen the R22B and why the AW109 had turned L when the 'Rules of the Air' require ac approaching head-on, or nearly so, to turn to the R to avoid each other. The landline was poor quality and he did not wish to dwell so took no further action.

HQ 1GP BM SM reports that the AW109 crew was in receipt of a TS from Coningsby APP and the R22B pilot in receipt of a BS from Waddington ZONE; Waddington ATC was unable to provide an RT tape transcript for the ZONE frequency.

The Coningsby SSR update rate is 8rpm, which equates to one sweep every 7½sec. The Waddington ASR update rate is 15rpm, which equates to one sweep every 4sec.

This Airprox occurred at a weekend when the respective ATSU's were operating at reduced manning. This is not considered a contributing factor to the Airprox as both controllers reported having a low workload and neither mention a lack of ability to control the situation due to workplace stresses.

ZONE reports passing TI to the R22B, although the flight was under a BS. This is a clear indication of a controller passing information under the duty of care principle. That TI was passed is corroborated by the R22B pilot and he acted on it by taking a turn to the R in accordance with the Rules of the Air.

APP had correctly identified the AW109 and placed the flight under a TS; although the original service request was unreadable, the pilot accepted the ATS offered by the controller, who correctly reduced the TS whilst operating SSR only with the Watchman ASR out of service. APP correctly applied the TS and advised the AW109 pilot that they were operating below the terrain sector safe height.

At 1016:54 Coningsby APP passed TI to the AW109 pilot about the R22B stating, "*traffic just right of your 12 o'clock, 5 miles, opposite direction, last known at 7 hundred feet.*" APP liaised with Waddington ZONE at 1017:15, "*Coningsby request traffic information please, er Fosdyke Bridge southbound 3-6-0-1*"; ZONE replied, "*700 feet on the BARNSELEY*" and it was ascertained that ZONE's traffic was a helicopter. APP advised "*well I've got a helicopter just right of his 12 o'clock*" and ZONE responded at 1017:26, "*yeah I'm just about to call it*". After APP added that the R22 was at 500ft, the call was terminated without any further course of action reached or implied. TI was passed to the R22B pilot about the AW109; APP updated the TI to the AW109 pilot at 1017:31, "*...previously reported traffic's now just right of your 12 o'clock, 4 miles, opposite direction 7 hundred feet a helicopter*". From the Coningsby APP transcript it is clear that the pilot of the AW109 was concerned about the presence of the R22B and stated at 1017:44 – the start of the diagram - his intentions, "*roger we're ??? [inaudible word] we're just ??? [inaudible word] our conflicting track at the moment, we are going to turn right 20 degrees ?? [inaudible word]*". At this point, the R22B is slightly right of the 12 o'clock of the AW109 at a range of 3-7nm. At 1017:51 APP advised the AW109 pilot, "*suggest a left turn onto about 320 degrees*" which is co-incident with the AW109's right turn appearing on radar. The turn back to 320° becomes evident after 1018:00. At this point the R22B is 2.8nm N of the AW109. Given the information presented to APP, with the associated slower update rate of the SSR compared to the Watchman ASR and the geometry between the ac at the time that the L turn was suggested, this was a reasonable solution to the problem. However, by offering a turn to the L the controller had not followed the Rules of the Air nor assimilated the possibility that the R22B pilot would turn R.

At 1018:23, the R turn by the R22B is evident on the radar recording with 1.5nm lateral separation. Shortly afterwards, ZONE contacted APP, who answered the landline call at 1018:28. ZONE asked "*can you turn..can you insist that yours turns right?*"; APP replied "*he's already on it isn't he, look*". At this point (1018:37) lateral separation of about 1nm exists, with the R22B NNE of the AW109 tracking SW. At 1018:42, APP advised the AW109 pilot, "*I've just been speaking to Waddington and they've turned right against you as well and er, he's just in your 3 o'clock, half a mile, crossing right left.*" Given the distance between the R22B and AW109 at this point, there is little that could have been achieved from this liaison call. Although the AW109 pilot's written report states that he did not see the R22B, he reported to APP on the RT at 1018:53, "*..we're visual with that*".

In considering the respective update rates of the radars involved, it is clear that the faster update rate of the Waddington primary ASR will have provided ZONE with better SA. Unfortunately, due to the absence of an RT transcript for Waddington ZONE, it is impossible to establish ZONE's response to the R22B pilot when he asked for deconfliction advice. The pilot states that he sensed the urgency in ZONE's voice "*and understood that there was a real collision risk*" although they could not remember what ZONE said and that part of the message was unreadable. However, this had prompted the R22B pilot to turn to the R, probably based on the last TI, which may have been passed before the AW109's L turn was evident. What is clear is that there was a significant difference in the data update rates of the radars available to the controllers involved and that the Coningsby controller considered it to be a factor.

The weather which both flights were subject to, and the pilots' interpretation of flight rules, enabled a situation where neither pilot was able to effect appropriate avoiding action in accordance with their obligations under the respective ATSS provided. Unfortunately, whilst done with the best of intentions based upon the radar information available to the controller at the time, in trying to provide a pragmatic resolution to the conflict, the APP controller's advice compromised the Rules of the Air, which served to decrease the separation when combined with the R22B's un-anticipated R turn.

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This Airprox highlights that pilots should ask for an ATS appropriate to the prevailing met conditions and fully understand the limitations of the service being provided.

HQ AIR (OPS) comments that this incident highlights some good awareness of collision risks from all those involved and the issue described by HQ 1 Gp BM SM above unfortunately led to the miss distance being considerably less than it would otherwise been. The R22B pilot's use of the TI he received was entirely correct. Had the AW109 pilot continued his initial avoiding turn the issue would have been resolved. Whilst in this case the APP controller's advice reduced the miss distance, it was given with the best of intent and was followed by the AW109 pilot. He would have assumed it was based on better situational awareness than he had at the time and may have agreed with a TCAS I contact (acknowledging the azimuth accuracy limitations of TCAS). Furthermore, whilst it is possible to question the application of the Rules of the Air in this case, the controller was actually presented with a visual picture where a left turn should have generated maximum separation and avoided a turn through the other ac's extended flightpath. The Rules of the Air are simplistic and they do not define 'head-to-head' or provide such an additional stipulation. It is noted that the collision avoidance rules for Air Combat Training do provide this clarification. Even with the coincident turn by the R22B, the collision course had been broken and the subsequent TI provided by APP allowed the AW109 pilot to sight the R22B.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

In Class G airspace 'see and avoid' prevails, but it can only cater for situations where the other ac is seen in time to take appropriate action. It was evident that this Airprox had resulted from an unfortunate chain of circumstances where the weather had played a significant part and was somewhat worse than that forecast. The AW109 pilot had wisely obtained a 'reduced' TS from Coningsby APP and the controller had provided a good level of TI about the approaching R22 from a range of 5nm. Importantly the controller had also liaised with Waddington ZONE whom he had identified as providing a service to the R22B pilot. With the benefit of the information from ZONE, APP then provided an update about the R22B, which he perceived to be to the right of the AW109's 12 o'clock and the pilot responded that he was going to turn 20° to the R. It was after the R turn had been initiated that APP then advised "*suggest a left turn..*" onto 320°, but this was without any prior notification to ZONE. Controller Members recognised the limitations of operating with SSR only and the slower data update had undoubtedly hampered the controller's appreciation of the situation and might have delayed detection of the R22B's R turn. Members agreed with the Command's view that with the benefit of TCAS 1 the AW109 pilot had the better SA; it was unfortunate, but understandable, that he chose to accept the controller's suggestion and turn L, probably in the belief that the controller had a better view of the geometry of the situation. The conflict would have been resolved if he had continued to the R. Members agreed that the controller had proffered this advice with the best of intentions albeit that it was not in accord with the Rules of the Air and, all things being equal, compliance with 'the Rules' when offering avoiding action advice is plainly preferable. Nevertheless, there are situations where the opposite will apply and it was unfortunate that the controller's suggestion was based on limited data that was perhaps not giving him the true perspective.

Whilst diverting to Fenland, although only operating under a BS from ZONE, the R22B pilot benefited from a warning about the AW109 from the controller, but without an RT transcript it was not feasible to examine exactly what information was provided by ZONE. The R22B pilot reports that he had asked for 'avoiding actions instructions'; whilst a warning and advice on a suggested course of action might be proffered, at these heights, below the sector safe height and at the limits of radar coverage where only limited data might be available, controllers were unlikely to proffer an instruction.

The Board debated whether these ac could have been seen any earlier, as the pilots' recollections of the prevailing visibility varied somewhat. The R22B pilot had subsequently turned R in compliance with 'the Rules', based on the warning provided, although he had not sighted the AW109 at all. Despite his memory lapse, it was plain that the AW109 pilot had seen the small R22B, which are notoriously difficult to spot even in ideal conditions. However, the R22B was passing abeam about 0.5nm away to starboard when the AW109 pilot saw it, which the Board concluded was not unreasonable in the prevailing circumstances. Therefore, the Members agreed unanimously that the Cause of this Airprox was a conflict in Class G airspace. However, there was sufficient horizontal separation evinced by the radar recording to convince the Board that no Risk of a collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

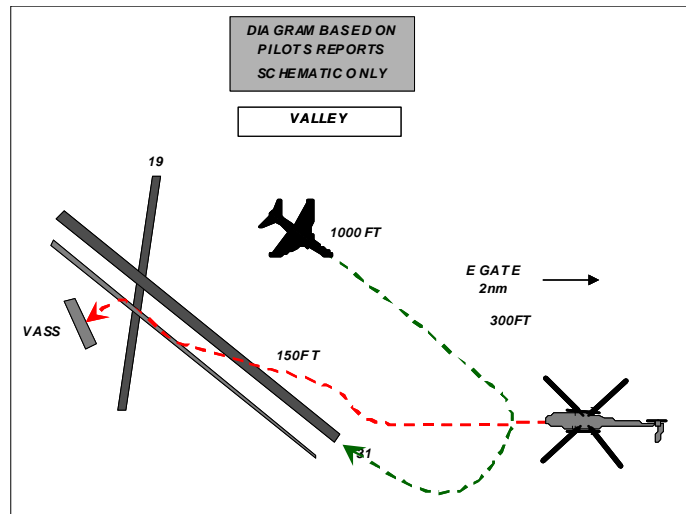
Cause: A conflict in Class G airspace.

Degree of Risk: C.

AIRPROX REPORT No 2010145

AIRPROX REPORT NO 2010145

Date/Time: 16 Sep 2010 2255Z (night)
Position: 5314N 00430W
(Final RW31 Valley - elev 36ft)
Airspace: Valley ATZ (Class: G)
Reporting Ac Reported Ac
Type: Hawk Lynx
Operator: HQ AIR (Trg) HQ JHC
Alt/FL: 500ft NK
(QFE) (QFE)
Weather: VMC CLBC VMC CLBC
Visibility: 10km 10nm
Reported Separation:
100-200ft V/NR H 500ft V/0m H
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK PILOT reports that he was in the [night] cct for RW31 (RH) with his (red) strobe and nav lights switched on and was in receipt of a BS on UHF, from the Valley ADC on his first night solo on Hawks; TCAS was not fitted. While descending and turning through about 500ft QFE on the final turn at 140kt, while looking into the turn towards the threshold, he saw the red strobe of an ac passing below them. He rolled wings level to line up with the RW and then saw the red strobe level with his ac, on the horizon in his 4 o'clock; at that time he was at 300ft QFE. He called TWR to confirm whether or not there was any traffic on short final and was informed that a Lynx helicopter holding short of RW31. The angle-rate geometry of his observation of the strobe enabled him to accurately assess that the separation between the helicopter and his ac to have been between 100 and 200ft.

He reported the incident to ATC and assessed the risk of collision to be high.

THE LYNX PILOT reports that Valley Ops informed them of the incident one month after the event. They were flying an Exercise sortie and conducting a planned NVG assisted recovery to RAF Valley, in receipt of a BS from TWR on VHF and with standard night lighting displayed. On approaching the airfield, initially at 100kt, they were instructed to continue to 'East Gate' [2.0nm E of the threshold of RW31 – See UKAB Note (1)] at which point they were informed of circuit traffic using RW31 RH. They were initially instructed to hold at the Gate, not above 500ft QFE and at this stage he became visual with the Hawk (due to its lighting). The Hawk was on the downwind leg for RW31 and at that point they were cleared to the airfield remaining NE of RW31 (the area referred to as the 'Golf Course') so they proceeded as instructed, descending as they did so. The pilot watched the Hawk closely and was content with the separation. On the transit to the 'Golf Course' at 300ft agl, the Hawk was on the downwind leg and passed over them about 400-500ft above. They were then given clearance to cross the RW and land at VAS. Once clear of RW31 at 150ft agl they made their final approach to the parallel taxiway [SE of the RW] at the intersection point of RW19/01 and they then air taxied to VAS and landed.

The pilot was not made aware either by radio or telephone that an Airprox had been declared (iaw JSP 551 Vol 1) nor did he consider that any risk had existed as he had the benefit of NVG. The Lynx remained at RAF Valley for about an hour before returning to RAF Leeming during which time the pilot heard nothing.

These details as much as the crew can remember given the significant passage of time between the date of the event and notification of the Airprox report by telephone from the RAC towards the end of October.

UKAB Note (1): The UK Mil AIP – EGOV 1-16, Special Procedures (2) Copter Note (3) states:

'SE Route via EAST GATE.

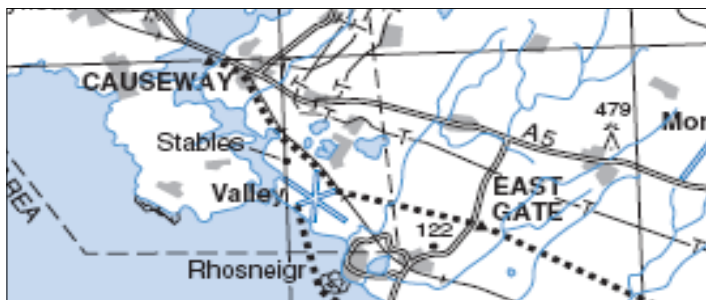
For landing at Visiting Aircraft Dispersal, SARTU or 22 Sqn.

B. Flight between Menai Straight & PONT MARQUIS (SH 434698) max 500ft QFE (200ft msd). Flight between PONT MARQUIS and EAST GATE (SH355744) max 500ft QFE (200ft msd). Flight between EAST GATE and RW19 or 31 THR max 250ft QFE. Report over EAST GATE inbound and outbound.'

HQ 1GP BM SM reports that SATCO RAF Valley confirmed that the Lynx pilot had previously been briefed by the units ATC staff and was being treated as a locally based ac. No radar replay was available to conduct the investigation; hence it is based on the reports of the pilots, the ADC and the tape transcript. However, there is an inconsistency with the tape transcript, highlighted below, which has been impossible to resolve as the original tape was inadvertently returned to service.

During the occurrence, the Lynx was operating on VHF and the Hawk UHF. At 2255:31 the transcript recorded that 2 different transmissions were made simultaneously, one on UHF and the other VHF with the Hawk being cleared to touch and go and the Lynx being cleared to cross the active RW. Clearly, the timing of the transmission is impossible and the clearance to the Lynx makes no sense in the context of the situation and the subsequent RT exchanges. At 2256:31 however, the transcript has a further transmission to the Lynx clearing them to cross. Given this, HQ Air BM SM contends that the 2255:31 transmission to the Lynx is a transcription error and did not actually take place and the investigation has been conducted on that basis.

As stated at UKAB Note (1), the Mil AIP states that for ac inbound 'Flight between East Gate and Rwy 19 or 31 THR max 250ft QFE. [Pilots are to] report over East Gate inbound and outbound.' The following diagrams show East Gate and the railway line in relation to the airfield, and the area known as the 'Golf Course' which is bounded by the NE fence of the railway line, then the two fence lines running E-W and N-S forming the other 2 sides of the green triangle marked on the photograph.



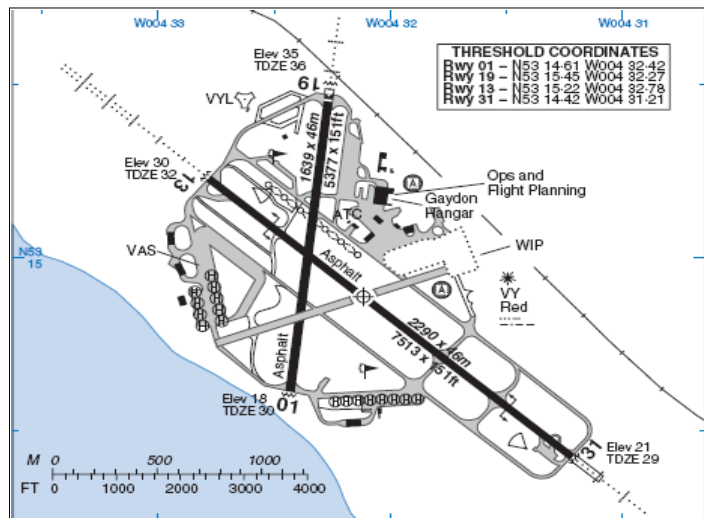
At the point that the Lynx called requesting a visual join at 2254:04, the Hawk was completing its first cct having rejoined through initials. The Lynx pilot reported that they were visual with the Hawk prior to calling for join and that they remained visual throughout. At 2255:03 the Lynx reports that they were approaching the airfield boundary; TWR acknowledged and instructed them to "hold short RW 31"; the controller reported that he saw the Lynx holding abeam RW31 threshold in the vicinity of the railway track. The Lynx pilot reported that as the

they transited to the Golf Course from East Gate at 300ft agl (QFE), the Hawk was downwind and passed about 400-500ft above them but the Hawk pilot reported that as they descended through about 500ft in the final turn, he saw "a red strobe pass underneath the aircraft."

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Without a radar replay it is not possible to be certain, but from the descriptions given it is probable that the Lynx was routing through the South-Eastern corner of the Golf Course, which is roughly the same position as late-downwind or early finals for the Hawk.

Although the ADC did not reiterate the height at which that the Lynx was required to operate, given that the Lynx crew had received an ATC brief and that they were considered to be familiar with the airfield, the ADC reasonably assumed that the crew would fly in accordance with the locally published procedures. Although it is impossible to be certain, it is possible that the Lynx was flying higher than stated in the published procedure.



The ADC reported that he did not inform the Hawk pilot about the helicopter as it was below 250ft QFE (in accordance with the FOB), however, the unit FOB actually states that “when Rwy 31/13 is in use, Tower is to inform any ac flying a low level circuit of any rotary traffic on the golf course; all such rotary traffic is to remain below 250ft QFE.” Given that frequency separation existed between the Hawk and the Lynx, the provision of TI to the Hawk on the Lynx would have improved the pilot’s situational awareness. That said, from an ATM perspective, the ADC fulfilled his obligations to sequence the visual circuit traffic correctly and he was at all times aware of the location of both ac.

It appears that the height of the Lynx and its proximity to the RW31 threshold caused concern to the Hawk pilot and moreover, if the heights reported by the respective pilots are accurate, then only about 200ft vertical separation might have existed, supporting the Hawk pilot’s assessment of the separation. However, the Lynx crew was visual with the Hawk from early in their recovery, they remained so throughout and were content that adequate separation existed at all times.

UKAB Note (2): The transcript (see HQ 1GP BM SM report) shows that the Lynx reported “approaching airfield boundary” at 2255:03 and was instructed to “hold short of RW31” and he acknowledged he was holding short 2 sec later; the Hawk called finals at 2255:28 and was cleared for a touch and go; at 2256:40 the Lynx was cleared “cross runway 31 with one climbing out”. The Lynx is recorded as landing at 2259.

HQ AIR (Trg) comments that this incident was undoubtedly alarming for the student pilot and notes that the incident report is welcomed. Whilst it is disappointing that the Airprox report was not made immediately a significant amount of detail has been gathered. However, timely follow-up on landing might have allayed the pilot’s concerns and enabled the Airprox report to have been withdrawn. Busy, mixed circuits such as that at RAF Valley rely significantly on robust procedural deconfliction. However, these apparent conflicts can always occur. In this case it appears that the Lynx pilot flew slightly above the required height, producing a closer pass than necessary. Despite the Hawk pilot’s estimation of the vertical separation, the exact vertical separation it is not clear. Indeed, the Lynx would have needed to be considerably south of the routing from East Gate to have been under the Hawk at its 500ft point (this would be in the second half of the final turn for a correctly flown normal circuit). From the Hawk pilot’s comment that the Lynx was in his 4 o’clock on rollout, and the fact that the Lynx was holding at this point, geometry places the Lynx more in the first half of the finals turn. The Hawk’s height here would have been 700 – 800ft which, coincidentally, equates to the 400 – 500ft separation noted by the Lynx pilot. This, and the fact that the Lynx crew reports being visual throughout reduces the level of concern over this incident, but the fact remains that the Lynx reduced the separation unnecessarily. HQ Air is content that the RAF Valley procedures are robust.

HQ JHC did not provide a comment.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted the two different impressions of the incident by the respective pilots; the inexperienced Hawk pilot was concerned by the proximity of the Lynx whose experienced crew were unconcerned by the flightpath of the Hawk. Although there was no confirmatory information to supplement the pilots' reported separation, Members agreed that the Lynx had under-flown the Hawk but could only deduce from the estimates and relative ac positions that the vertical separation had been of the order of 300ft. (The HQ Air Ops Member informed the Board that on a normal circuit the Hawk would have been at 650-700ft half way round the final turn). While the separation was perhaps less than ideal, Members agreed that there had been no risk of collision as the Lynx crew had been visual (on NVGs) with the Hawk throughout.

There was concern however, that the ADC had not provided the level of service that Controller Members would have expected. While supporting the Hawk pilot's decision to report the incident, Members suggested that, had the ADC provided TI to the Hawk pilot regarding the Lynx, the incident would probably not have been reported as an Airprox. Further, they considered that the ADC's instruction to the Lynx pilot to "*hold short of RW31*" was open to interpretation and, since the Lynx crew was familiar with Valley, a more precise instruction or a direction to hold/orbit at a specific point should have ensured better separation. Additionally the route stipulated in the FOB from East Gate to the threshold of RW31 takes ac very close to the final approach track.

The HQ JHC Member, who was familiar with both the incident and the type of Lynx involved, informed Members that the Lynx involved was UHF-equipped and there were no obvious factors precluding it operating on a UHF frequency in the cct. Members agreed that had this been the case, the Hawk pilot would have not only been aware of the Lynx but also its position and the pilot's intentions thus probably alleviating his concern that prompted him (the Hawk pilot) to ask if the ADC was aware of any other ac in the cct area. Members did not agree with HQ Air Trg's view that the RAF Valley procedures were sound and recommended that they be reviewed particularly regarding the co-ordination of helicopter movements and the passing of TI. Members also directed that a recommendation be made regarding ac operating in the visual circuit on different frequencies.

UKAB Post Meeting Note: After the meeting it was noted that the following recommendation was made in Mar 2010 with respect to Airprox 2009117:

'The MoD is recommended to direct that, whenever possible to do so, aircraft in the visual circuit operate on the same frequency'.

The recommendation was agreed by MoD and ATSU's were advised accordingly; the recommendation was then considered closed.

That being the case, RAF Valley ATC should have been complying with this directive unless there were other factors that prevented them from doing so.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Lack of TI led the Hawk pilot to believe there was a conflict with the Lynx

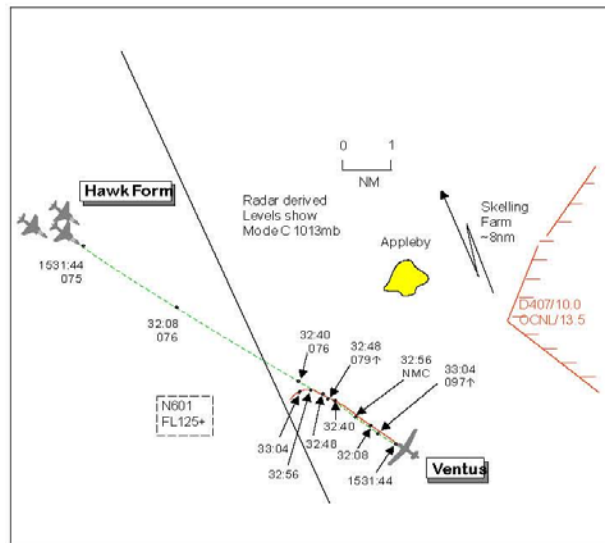
Degree of Risk: C.

Recommendation: 1. It is recommended that RAF Valley reviews its procedures for
co-ordinating helicopter movements under fixed-wing circuit traffic.

AIRPROX REPORT No 2010146

AIRPROX REPORT NO 2010146

Date/Time: 24 Sep 2010 1533Z
Position: 5432N 00231W (3nm SW Appleby)
Airspace: LFIR (Class: G)
Reporting Ac Reporting Ac
Type: 3x Hawk Ventus B Turbo
Operator: HQ Air (Ops) Civ Club
Alt/FL: FL75 8095ft
(QFE)
Weather: VMC CLAC VMC CLAC
Visibility: 20km 50km
Reported Separation:
>50ft 50-100ft
Recorded Separation:
Nil H



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK LEAD PILOT reports the formation pulled up from low-level through a gap in the cloud in the Penrith area post a low-level 2v1 evasion sortie. A recovery to Leeming was initiated and the formation changed frequency to Leeming Approach 386-575MHz to acquire a radar service, squawking 7000 with Modes S and C. The cloud tops were 5000ft and FL75 was selected for transit owing to fuel considerations whilst remaining below CAS in good VMC at the correct quadrantal. The visibility was 20km and the ac were coloured black with landing-lights and HISLs switched on. The formation was established in the cruise heading 130° at 300kt in loose arrow, heavy side R with No2 swept slightly low and 50m L of the lead. The WSO of the lead ac was still attempting to get the formation identified when the lead pilot saw a glider about 0.5nm away head-on slightly low and just L of the nose. Concerned about the collision risk for his No2 the lead pilot immediately commanded the formation to “pull-up, pull-up” on the VHF formation chat frequency. All ac pulled up to avoid the glider. The incident occurred too quickly to assess if the glider pilot had taken any avoiding action. The pilots of No2 and No3 ac both saw the glider during the avoidance; No2 assessed that his original flightpath would have taken him to within 50ft of it. He assessed the risk as high commenting that the white glider against the white background nose-on presented a very thin cross-section that contributed to a late spot.

THE VENTUS B TURBO PILOT reports flying solo on a local sortie from Skelling Farm heading 315° at 60kt and 8000ft and listening out on Glider Common on 129-975MHz. The visibility was good, 50km, in clear air flying in wave lift about 4000ft above lenticular wave clouds but he could see the ground with clear skies above. When S of Appleby, all of a sudden 3 Hawks in formation appeared about 300m straight ahead at the same level. Within a second they had split in front of him, the centre jet flew straight up and over between 50 and 100ft above, close enough to see joins in the riveted panels where the wings are attached to the fuselage, whilst the other 2 jets broke diagonally up and outwards passing each side. He was not alarmed by this; seeing each other head-on is very difficult and he thought the Hawk pilots did well to see his ac and take avoiding action. He had no time to take avoiding action and he assessed the risk as high.

HQ 1GP BM SM reports that this Airprox involved a formation of 3 Hawks in the process of pulling-up from low-level and recovering to their base, and a glider. Due to a problem with the PC controlling the unit's RT and landline recording, there was a discrepancy between the timing of the radar replay and tape transcript.

At 1532:26 (transcript timings) Leeming Approach (APP) states that the formation is identified and it is reasonable to argue that this will have occurred no more than 5sec after the SSR Mode 3A code was displayed on the Watchman radar display. On the radar replay, the Hawk formation's SSR Mode 3A assigned code appears at 1533:50, which allows us to approximate APP's identification of them as being at 1533:55 (replay timings). This

provides a difference between the transcript and replay timings of 1min 29sec, which means that the formation's initial call to APP occurred at approximately 1533:04.

On the radar replay, the reported ac is clearly visible, with the CPA occurring at 1532:47. Although there is a little leeway in the calculated timings, it is clear that the Hawk formation had probably not yet initiated comms with APP, or, if they had, it may have been during the initial call. Consequently, there is no BM SM input required.

HQ AIR (OPS) comments that that this is another example that highlights the limitations of the see and avoid principle as the sole means of deconfliction. If both ac had been IFF and TCAS equipped a greater separation distance may have been achieved. It was a good spot by the Hawk leader who calmly and swiftly directed effective avoiding action.

UKAB Note (1): The radar recording clearly captures the incident. At 1531:44 the Hawk Formation is seen 6.5nm W of Appleby tracking 125° squawking 7001 and indicating FL075 with a primary only contact, believed to be the Ventus glider, 3.5nm S of Appleby in its 12 o'clock range 7.5nm. The subject ac continue on opposite direction head-on tracks, the Hawk Formation showing level at FL076, when just under 1min later at 1532:40 the ac are head-on with 0.8nm separation. The next sweep 8sec later at 1532:48 shows the ac having just passed, the Ventus now in the Hawk Formation's 6 o'clock range 0.2nm, with the Hawk's Mode C indicating FL079 and climbing. It is estimated that at the CPA the ac passed with no lateral displacement. The ac now rapidly diverge and on the next sweep the Hawk Formation shows NMC before reappearing on the next sweep at 1533:04 indicating FL097 climbing. By now the Ventus is seen to be turning L 1.9nm to the NW of the Hawk Formation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

An experienced glider pilot Member stated that this was a known wave area situated over the Pennine chain where gliders could be operating, in the right conditions (particularly in W'ly and E'ly winds), up to FL195. Within this Class G airspace all crews were responsible for maintaining their own separation from other ac through 'see and avoid'. Members agreed with the HQ 1Gp Advisor's comment that the Hawk leader had done well to spot the white glider against a white background in a head-on encounter, seeing it probably as soon as was reasonably possible given the circumstances. The Ventus pilot saw the Hawk formation later but he too had been faced with sighting 3 ac, with known small target aspect qualities, head-on, albeit the Hawks nose light frequently facilitates earlier sightings. After sighting the glider 0.5nm ahead the Hawk Leader was able to warn his colleagues on the VHF 'chat' frequency and the formation pulled-up to avoid, the Ventus pilot estimating the closest Hawk passed 50-100ft above. Bearing all of these elements in mind, the Board believed that this Airprox had been a conflict in Class G airspace where the Hawk formation leader had done enough to remove the actual risk of collision but safety had not been assured during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

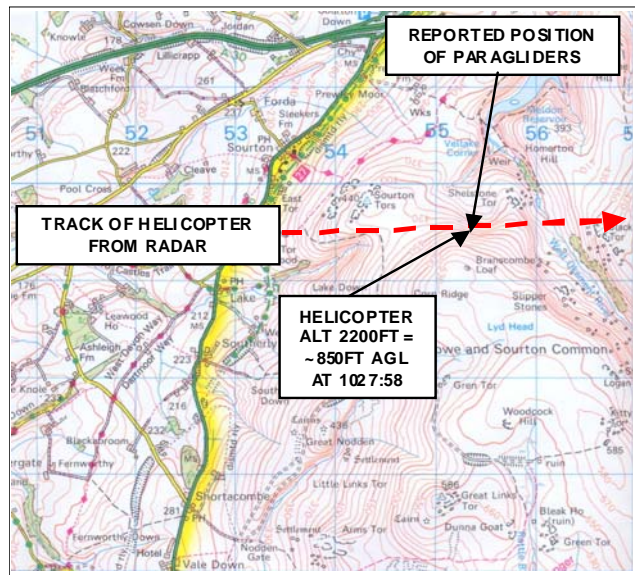
Cause: A conflict in Class G airspace resolved by the Hawk formation leader.

Degree of Risk: B.

AIRPROX REPORT No 2010147

AIRPROX REPORT NO 2010147

Date/Time: 26 Sep 2010 (Sunday) 1028Z
Position: 5041N 00403W
(Corn Ridge Near Oakhampton)
Airspace: Lon FIR (Class: G)
Reporting Ac Reported Ac
Type: Paragliders x 3 EC145
Operator: Civ Pte Civ Pol
Alt/FL: 500ft agl 1500ft
(RPS/QNH & RA)
Weather: VMC NR VMC NR
Visibility: NR >10km
Reported Separation:
200ft V/0 H 500ft V/1nm H
Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PARAGLIDER PILOT reported (2 reports were received but 3 paragliders were involved) that he was flying a multi-coloured paraglider at a local flying site with 2 other paraglider pilots. One had climbed to around 500ft above the hill [ground] and 200ft out from the ridge, another was around 100ft behind at a similar height and the third was 300ft to the W also at a similar height; all were ridge soaring at about 12kt. The first and second pilots both saw a blue and yellow police helicopter about 1nm away to the SW at about 700ft agl (i.e. 200ft above them) coming towards them. The helicopter continued on a straight and level course directly towards them and passed directly over them about 200ft above. The first pilot made large hand gestures to the helicopter pilot while the second made large turns, to show their position, but the helicopter took no evasive action or make any attempt to give them wider separation. The helicopter continued on his track towards Exeter without changing heading.

He pointed out that their ac are very delicate and do not react well to turbulent air and they consider themselves lucky to not have been affected by the downdraft. The first pilot assessed the risk of collision as being high and the second as low.

It was not possible for them to move quickly out of the way as, due to the wind speed on the day (12-18mph), they had very little ground speed and conducting emergency descents would have been dangerous at their low altitude.

THE EC145 PILOT reports recovering from the Padstow area to Exeter in a blue and yellow police helicopter, with all lights on, squawking 0032 with Mode C. At the time they were transferring from a BS with Newquay to Exeter, in the cruise heading 090° at 120kt, following a routine police task, in good VFR, when both he and the crew saw paragliders about 3km away on the windward slopes of Dartmoor near to Okehampton.

He conducted a gentle turn away and maintained 500ft vertical separation, thus ensuring that there was no risk of collision.

The paragliding was not NOTAMed on the day in that area, despite there being intense activity.

UKAB Note (1): The EC135 shows on the recording of the Burrington radar, squawking 0032 and tracking 085 at FL022 (QNH 1013mb - 2200ft amsl). The terrain in the area varies from ~500ft to the W rising to 2038ft just to the SE of the incident position; although the ground height varies considerably, the height in the area reported was 420m – 1380ft. The paragliders do not show at any time.

UKAB Note (2): The reported time of the incident was 1hr in error resulting in some confusion and a delay in obtaining the EC135 pilot's report.

THE BHPA comments that all the ac were being operated normally in Class G airspace. There is no requirement for this sort of paragliding activity to be NOTAMed, nor any method by which it could practically be NOTAMed. [See Part B]

With the helicopter pilot having the paragliders in sight the BHPA believes that there was no risk of collision, however, there was a risk from the helicopter-generated turbulence.

The BHPA understands that UKAB is charged with assessing only the risk of a collision between ac and not the risk associated with the effect of the helicopter's downwash on the paragliders.

Over the years there have been a number of helicopter/paraglider incidents the common feature of which has been the helicopter pilot's insistence that their downwash could not affect the paraglider. It seems that many pilots of powered ac are unaware that what they feel as a mild bump when crossing the wake of another ac (something most pilots have probably experienced) is sufficient to cause the total collapse of a paraglider - at 500ft agl this could well be fatal since there is insufficient time to recover or deploy a reserve parachute.

Over the years the BHPA has requested that the CAA consider research into the actual extent and possible effects of helicopter generated turbulence upon lightweight ac. These requests have been turned down. The BHPA believes that with the increase in both light-weight ac and helicopter activity over the last ten years it is unfortunately only a matter of time before there is a fatality, or serious accident, effectively caused by a helicopter pilot's lack of knowledge, knowledge which is currently not available.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, radar recordings and a report from the BHPA.

Board Members were not able to reconcile the significant differences in the separation reported by the respective pilots. The Secretariat informed the board that the position of the incident reported by the Paraglider(s) was an accurate Latitude and Longitude, indicating that it had probably been GPS-derived and therefore, in their view, unlikely to be significantly in error. One Member however, pointed out that the pilot might have noted this position some time after the actual event. Although the radar-derived track of the helicopter was also accurate (within the limits of radar accuracy and plotting - say 200m) when the track and position were plotted the separation appeared to be closer to the distance estimated by the helicopter pilot than the paragliders. The reports provided by 2 of the paragliders indicated that there were at least 3 of them in the area but did not state the actual number in the area and Members agreed that there had most likely been more. The reports also stated that the paragliders were spread over an area of some hundred metres and that the pilots had made hand gestures at the Helicopter; Members reasoned that they would have been unlikely to have made hand gestures at the helicopter if it had been 1nm away, as reported by the helicopter pilot. As is usual in such cases of conflicting information Members placed equal weight on both reports but, since they were significantly differing, they sought a plausible explanation. A Member suggested that the helicopter pilot might have seen (and reported) other paragliders and estimated the separation from them; Members agreed that although this would provide a plausible explanation, it would not be possible to substantiate the theory. They also agreed that an experienced professional helicopter pilot would not have deliberately flown 200ft directly over (or just upwind of) a paraglider, as he would almost certainly be aware of the hazard that would result from his flightpath. That being the case, Members agreed that the helicopter pilot had most likely not seen the reporting paragliders.

The DAP Advisor informed the Board that, contrary to the BHPA comment, it is straightforward to report such activity to AUS, for instance by mobile telephone, and for them to issue a NOTAM; he agreed however, that on some occasions, such NOTAMS might be promulgated too late for them to be effective.

The Board agreed that, since the helicopter pilot had not seen the Paragliders in his forward field of view above the ridge and there had been 200ft [reported by the paragliders] vertical separation, there had been no risk of collision.

AIRPROX REPORT No 2010147

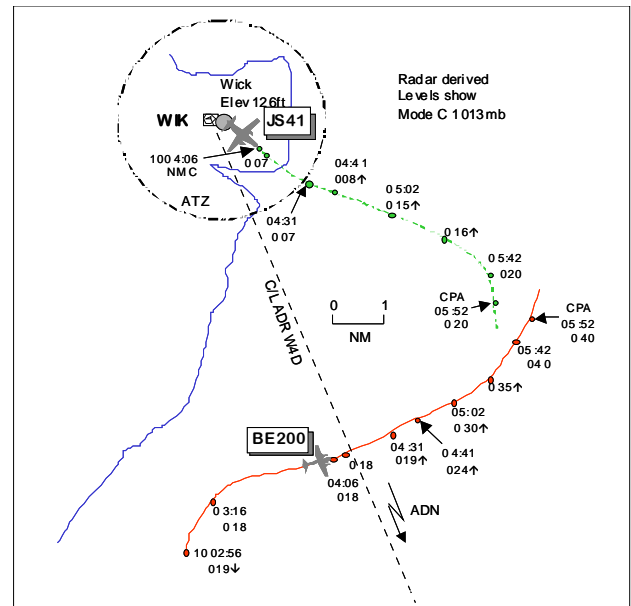
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The EC145 pilot flew close enough to cause concern to a group of paragliders, some of which he may not have seen.

Degree of Risk: C.

AIRPROX REPORT NO 2010148

Date/Time: 29 Sep 2010 1006Z
Position: 5824N 00255W
 (7nm SE Wick - elev 126ft)
Airspace: SFIR (Class: G)
Reporting Ac Reported Ac
Type: JS41 BE200
Operator: CAT Civ Comm
Alt/FL: ↑3000ft 1800ft
 (QNH 1012mb) (QNH 1012mb)
Weather: IMC KLWD IMC KLWD
Visibility: 4000m NR
Reported Separation:
 1200ft V/5nm H 1800ft V/5nm H
Recorded Separation:
 2000ft V/0.7nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JS41 PILOT reports outbound from WICK IFR and in receipt of a PS from Wick squawking an assigned code with Modes S and C. On line-up RW13 they were given a local restriction on departure to climb and maintain altitude 3000ft owing to a BE200 inbound from the SE, which they believed had been cleared for the RW13 procedure maintaining 4000ft. On rotation he, the Capt PNF, noticed a TCAS contact 6-7nm ahead 1700ft above their ac. He confirmed this geometry with the PF and agreed to dial 1000ft into the ALT SEL window whilst the PF flew manually at 160kt and reduced the ROC until they had 'cleaned up' the ac. He requested ATC to confirm the level of the inbound ac to which they replied altitude 4000ft. He advised the controller that this did not agree with their TCAS display so ATC interrogated the BE200 crew and found that the flight was at 1800ft. The controller then instructed the BE200 pilot to climb immediately to 4000ft before they were instructed to climb and maintain altitude 2000ft. It appears that the BE200 crew was under the impression that they were cleared to descend with the RW13 arrival as 1800ft is the platform altitude. He assessed the risk as low.

THE BE200 PILOT reports inbound to Wick IFR at 180kt and in receipt of a PS from Wick squawking with Modes S and C. ScACC had cleared them down to 4000ft and handed them over to Wick and they were then told that they were cleared for the procedure RW13 under a PS. The start of this procedure involves a turning onto a 5DME arc at 1800ft. They reported turning onto the arc and when established another ac's crew, a JS41 flight on departure, asked for their position and altitude. They stated 1800ft, 5DME and the radial following which ATC told them to climb immediately to altitude 4000ft and report beacon outbound. He disconnected the A/P and initiated a climb; the procedure was completed and the ac landed safely. After landing they visited ATC and discussed the incident. The controller stated that they had been cleared for the procedure maintaining 4000ft; however, they had not read back 'maintaining 4000ft' nor had ATC repeated the 'maintain 4000ft altitude' restriction. Neither he nor the FO had heard the call from ATC.

THE WICK APP reports mentoring a trainee under OJTI supervision. The BE200 was inbound on the WIK 195R at altitude 4000ft under a PS, ETA WIK 1004. The BE200 crew was asked to maintain altitude 4000ft until advised and was cleared for the VOR/DME Direct Arrival RW13 and to report beacon outbound. The JS41 departed RW13 at 1003 under a PS routeing W4D to Aberdeen climbing to maintain altitude 3000ft. As the JS41 commenced its climb-out the crew queried the level of the BE200 whose pilot reported maintaining altitude 1800ft. He took control and told the BE200 pilot to climb to altitude 4000ft to achieve standard vertical separation.

ATSI reports that the Airprox occurred outside the Wick ATZ (radius 2nm) situated in Class G airspace. Advisory Route W4D, Class F airspace, commences at WIK on magnetic track 163°. The base of the ADR is FL35 in the vicinity of WIK. Wick ATC is not equipped with surveillance equipment.

AIRPROX REPORT No 2010148

Wick Aerodrome/Approach position, which always operates combined, was being operated by a mentor and trainee. The mentor reported that the trainee was making all the RT transmissions until the time of the Airprox, albeit he was having to prompt him on occasions. The mentor reported that the workload was light, the subject ac being the only flights on the frequency.

The Wick 0950 METAR: 14022KT 6000 RADZ SCT004 BKN006 12/12 Q1012=.

The VOR direct arrival to RW13 at WICK from the S (UK AIP Page AD 2-EGPC-8-3) states:

'At MSA or above, at 7 DME WIK turn right to intercept the 5 DME arc WIK (CAT A,B), or at 9 DME WIK turn right to intercept the 7 DME arc (CAT C,D). Once established on the 5 or 7 DME arc descend **not below 1800** (1686). At lead radial R127 WIK turn left to intercept the R111 inbound to WIK VOR, **not below 1800**(1686). Continue to overhead WIK VOR then follow Basic Procedure'.

On this occasion, the BE200, on a CAT A flight, was routing from the S direct to WIK, to establish on the procedure as stated above.

At 0956, the JS41 flight was cleared to taxi to holding point 'C', initially, for a departure from RW13. Subsequently, it was instructed to backtrack the RW. At this time, the BE200 established communication with Wick. The controller updated the Wx information (moderate rain and drizzle) and reported he was providing the flight with a PS. At the controller's request for his range and bearing from WIK, the pilot reported, "*Roger we are on a bearing of er One Nine Seven degrees and the range is twenty six nautical miles and expecting runway One Three confirm*". This was confirmed and, at 0959:10, the BE200 flight was instructed to, "*...descend to altitude four thousand feet on the Wick QNH One Zero One Two*". The pilot read back, "*Descend altitude four thousand feet one zero one two BE200 c/s*". Shortly afterwards, the controller transmitted, "*BE200 c/s clear altitude four thousand feet to advise you are clear the VOR/DME direct arrival runway One Three next report Beacon Outbound*". The pilot acknowledged the transmission just using his c/s. Consequently, the trainee, prompted by the mentor, requested a read back of the clearance. The pilot stated, "*BE200 c/s er roger the direct arrival for runway One Three and confirm that that's round the arc 'cause we're that's what we're intending to do round the five DME arc coming in and then outbound Three Hundred*". The controller confirmed, "*...affirm that's the procedure*". (The procedure is stated previously in paragraph above). Albeit that the pilot did not read back the ATC service being provided and this was not challenged by the trainee (a MATS Part 1 requirement), it is not considered to be a causal factor to the Airprox. The mentor commented later that he was aware that his trainee's plan was to issue descent to 4000ft to the BE200 flight and to allocate 3000ft to the outbound the JS41 flight. Consequently, he expected his trainee to instruct the BE200 crew to continue for the procedure but to maintain 4000ft until advised. The mentor agreed, with hindsight, that this instruction was not issued and he had missed this omission when the trainee passed the BE200 flight clearance for the procedure. Additionally, he had not registered that the pilot had not stated any altitude restriction during his read back. Therefore, the mentor believed that an altitude restriction of 4000ft had been placed on the BE200 until further advised. He commented that he had, previously, experienced problems with his trainee not obtaining read backs. Consequently, he agreed that he should have monitored his trainee's actions closer to ensure that the correct instruction was issued and read back correctly.

Nearing the end of its backtrack, the JS41 flight was issued with its departure clearance, "*...expect a local restriction after departure clear to Aberdeen via Whiskey Four Delta climb to maintain level Niner Five squawk is Six Zero Two Four and a Procedural Service*". The pilot read back the clearance and the type of service correctly. Approximately one minute later, the local restriction was passed to the JS41 crew, "*...local restriction climb and maintain three thousand feet*". This restriction was read back correctly. The controller now believed that procedural separation of 1000ft was established between the subject ac; however, no TI was passed regarding the reason for the local restriction that would have aided the pilot's situational awareness. At 1002:56, the JS41 flight was cleared for take off, with a R turn from RW13. However, the radar recording shows that, at the time, the BE200, 8.8nm S of WIK, was passing 1900ft and its Mode S Selected Flight Level (SFL) was 1800ft.

Shortly afterwards, at 1003:15, the BE200 crew reported "*...is turning right on the Arc*". The controller requested the pilot to, "*...report turning left inbound on the One One One Radial*", which he acknowledged. No mention was made about BE200's altitude, which was now 1800ft.

When airborne, the pilot of the JS41 requested at 1003:50, “confirm level of the er outbound traffic”. This message referred to the BE200. The controller, still believing that the BE200 was only descending to 4000ft replied, “...the inbound traffic’s now descending to the altitude Four Thousand feet”. The pilot responded 1004:00 “Roger our TCAS could be ?????(possibly lower)”. As a result of this call, the pilot of the BE200 stated, “Er BE200 c/s just to confirm we’re at One Thousand Eight Hundred feet on the QNH One Zero One Two”. Up until this point, the ATC transmissions had been made by the trainee. However, the mentor, realising that separation was not ensured, now took over (1004:10) and instructed the BE200 to, “...climb to altitude Four Thousand feet expedite climb”. This instruction was read back correctly. His next transmission was to the JS41, “...stop climb altitude Two Thousand feet BE200 c/s is climbing to altitude Four Thousand feet”. The JS41 crew replied, “That’s all copied we’re maintaining one thousand feet on reaching JS41 c/s.”

[UKAB Note (1): The JS41 first appears on the radar recording at 1004:06 0.8nm SE of Wick tracking 130° indicating NMC with the BE200 in its 0130 position range 6.3nm level at 1800ft; the next sweep shows the JS41 level at 700ft.]

The following transmissions were then made to and from the BE200:

BE200 1004:30 “????? BE200 c/s we are now climbing through Two Thousand Two Hundred feet can you confirm we were cleared in the procedure which involves One Thousand Eight Hundred feet at this point”

ATC “BE200 c/s you were clear you were asked to maintain altitude Four Thousand feet until advised and cleared for the VOR DME direct procedure to runway One Three.”

BE200 “Roger don’t remember the first bit but anyway er BE200 c/s’s passing Two Thousand Eight Hundred.”

ATC “BE200 c/s er roger report passing altitude Three Thousand feet.”

BE200 1005:00 “BE200 c/s is now passing Three Thousand feet BE200 c/s.”

Thereafter, vertical separation existed and the JS41 flight was again instructed to climb altitude 2000ft.

The radar recordings of the event reveal that, at the lowest vertical separation of 1100ft, the aircraft were 5nm or more apart. Thereafter, vertical separation generally increased as the horizontal distance decreased. By the time the 2 ac were at their CPA (0.7nm) at 1005:52, vertical separation was 2000ft.

A Safety Directive was issued by Highlands and Islands Airports Ltd (HIAL) Head Office in August 2009 (04/09), concerning Instrument Approach Procedure (IAP) phraseology:

‘The following phraseology should be used for all aircraft carrying out IAPs:

When an aircraft has been cleared for an IAP and has reported “commencing the procedure” there is **NO** need to add “descend / further descent with the Procedure”. The onus is on the pilot to descend as having already been cleared for the IAP, further descent has been authorised. If there is a need to restrict descent this should be stated **BEFORE** issuing a clearance for the IAP e.g “Not below Alt3600 until advised, Cleared IAP Rw, report xxx” and stated **AGAIN** once the pilot has reported “commencing the procedure” “Not below Alt3600, Report xxx” (if required). **PLEASE ENSURE THAT THE CORRECT READ-BACK IS RECEIVED AT ALL TIMES’.**

The MATS Part 1, Section 1, Paragraph 6, defines a Procedural Service:

‘A Procedural Service is an ATS where, in addition to the provisions of a Basic Service, the controller provides vertical, lateral, longitudinal and time instructions, which if complied with, shall achieve deconfliction minima against other aircraft participating in the Procedural Service. A controller shall provide deconfliction instructions by allocating levels, radials, tracks, and time restrictions, or use pilot position reports, aimed at achieving a planned deconfliction minima from other aircraft to which the controller is providing a Procedural Service in Class F/G airspace’. On this occasion, the controller was intending to use the vertical minima, 1000ft.

The mentor believed that his trainee had instructed the BE200 to maintain 4000ft until advised whilst positioning for the direct VOR arrival to RW13. This would have ensured that the requisite 1000ft vertical separation, when

AIRPROX REPORT No 2010148

both flights were receiving a PS, would have been provided between the subject flights. However, this instruction was not passed. The pilot was cleared for the VOR DME procedure with no restriction. This meant that the BE200 could descend on the procedure to 1800ft towards WIK and, thereby, into conflict with the JS41. Although the trainee was making the transmissions up to that point, it is assessed that the mentor must bear responsibility for the Airprox, for not ensuring that the correct instruction was issued by his trainee.

Apart from receiving an altitude report from the pilot of the BE200, after he had descended to 1800ft, ATC had no means of realising the situation between the 2 ac. It would appear that the potential conflict between the two flights was resolved following the TCAS observations received by the JS41.

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.

Controller Members agreed that the phraseology used by the Wick APP trainee, which went unchallenged by his mentor, had not restricted the BE200 to maintain 4000ft as intended. The instruction passed by APP had in fact cleared the BE200 to 4000ft and then continue with the direct arrival procedure which placed the BE200 into conflict with the departing JS41 causing the Airprox. Furthermore, the trainee/mentor team did not challenge the BE200 pilot's read back, which did not include any mention of the altitude restriction. Thereafter the APP team were unaware that the BE200 was descending to 1800ft until the JS41 crew challenged the BE200's level from the information displayed on TCAS. This had elicited the BE200's actual level from its pilot, which triggered the APP mentor to take control and instruct the flight to climb expeditiously, and then to restrict the JS41's climb and pass TI. CAT Members commended the good SA and actions taken by the JS41 crew. After informing ATC of the deteriorating situation and then levelling off at 1000ft whilst monitoring the BE200's flightpath as it commenced a climb out of conflict, the Board were in no doubt the JS41 crew had quickly and effectively removed any risk of collision.

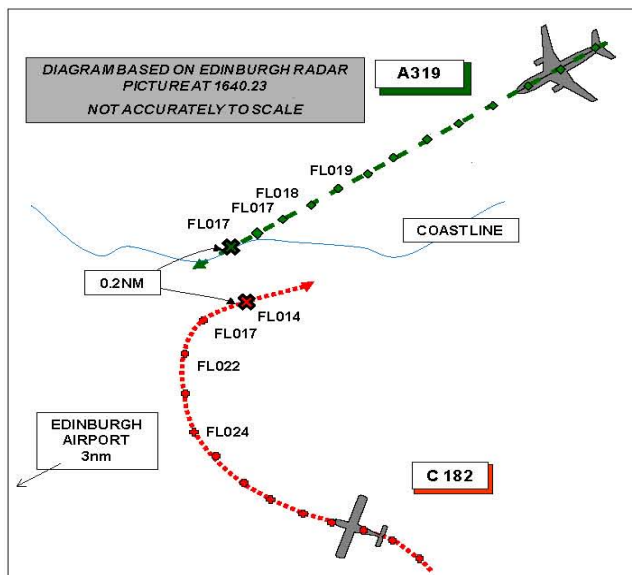
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: APP cleared the BE200 into conflict with the JS41.

Degree of Risk: C.

AIRPROX REPORT NO 2010149

Date/Time: 4 Oct 2010 1640Z
Position: 5559N 00315W (4nm Final RW24
 Edinburgh - elev 136ft)
Airspace: Edinburgh CTZ (Class: D)
Reporting Ac Reported Ac
Type: A319 C182
Operator: CAT Civ Pte
Alt/FL: 1200ft 1800ft
 (QNH 990mb) (QNH NR)
Weather: VMC NR VMC CLBC
Visibility: 50km >20km
Reported Separation:
 300ft V/900m H NR V/1km H
Recorded Separation:
 ~300ft V/0.2nm H

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE A319 PILOT reports flying a CAT flight into Edinburgh under IFR and in receipt of an Approach Control Service (ACS) from them. While descending on an ILS approach to RW24, passing about 1200ft, with the ac fully configured and stable on a heading of 235° at 140kt, ATC informed him that they might see traffic ahead on TCAS, to the S of the approach path. The other ac was identified on TCAS as proximate traffic, 100ft above at a range of about 3nm, and the captain identified it visually as a C182 that was apparently orbiting in a holding pattern waiting for them to pass. However, without notice the C182 suddenly performed an extremely rapid descending RH turn and started heading straight towards them. TCAS then enunciated the C182 as 'traffic', followed straight away by an RA 'monitor vertical speed'. The FO [handling pilot] disconnected the autopilot in accordance with company SOPs and followed the TCAS RA command.

The Captain continued to monitor the C182 visually as it flew past and below them on the LH side at close range. After the TCAS 'clear of conflict' they continued their approach and landing. He assessed the risk as being very high.

THE C182 PILOT reports that he was flying a VFR private flight inbound to Edinburgh at 100kt, in receipt of an ACS from them, squawking with Modes C and S and his ac was fitted with an ACAS [TCAS 1 equivalent]. He requested and was given clearance to enter zone VFR to Arthur's Seat [a VRP in the SE of the city] below 2000ft QNH so he continued into the zone in good VFR with a brisk SW'ly wind and as he approached Arthur's Seat at about 1800ft he was experiencing considerable turbulence. He reported at Arthur's Seat and was instructed to continue on course but he became very concerned by flying over the City at relatively low level, which he was told in training was a 'no no'. The RT was busy with other ac and he was then instructed to hold to the S of the approach paths so he then entered a LH orbit over the centre of the city. The orbit reinforced that he was over the city so he decided that his next orbit would be to the right placing him within gliding range of the shoreline on the S of the river Forth to the E of the airport.

As he entered the right turn he briefly saw an airliner about 1km away in his 11 o'clock, slightly higher than him, so he immediately took avoiding action by steepening the right turn and descending out of its flight path; a TA was activated after he turned away. There were various comments on the RT and he was subsequently cleared to land.

With hindsight he thought that his turn to the right coupled with the strong southerly wind might have caused his ac drift towards the approach path. However, he believes that his action to continue the right turn away from the airliner prevented a conflict and therefore there was no risk of collision.

AIRPROX REPORT No 2010149

THE AIR CONTROLLER reported that RAD informed him of a C182 inbound to land from Musselburgh [a VRP 11nm E of Edinburgh Airport] and said to “*watch him*” as the pilot seemed unsure on RT. The pilot checked in and on reaching and reporting at the Braid Hills [Arthur’s Seat] he instructed the pilot to route to the Southern airfield boundary and to remain S of RW24. This was not read back correctly so he repeated the instruction to hold S of RW24 and this was acknowledged.

He had traffic to depart and could see on the ATM that two IFR ac were inbound to the airfield. Given the prior warning from RAD and his initial exchanges with the C182 pilot, he decided to sequence the IFR inbounds to land before bringing in the C182. He could see that the C182 was approaching the airfield, so he again instructed the pilot to remain to the S of RW24; this was acknowledged and the ac commenced a LH orbit.

The A319 was by then on final for RW24, the C182 was established in the orbit and at that point he had the C182 visual and on the ATM continuing the LH orbit away from the approach. It was his intention to tell the A319 pilot about the VFR traffic holding to the S when he checked in and he also intended to land another IFR inbound before the C182 and had organised a suitable gap in the IFR traffic with RAD to facilitate this. He did not pass TI to the C182 as it was still in the LH orbit, away from the approach, and was not going to be fitted into the landing pattern until after the subsequent IFR inbound had landed.

The A319 was approaching 4nm final when the C182 inexplicably turned right towards it and the A319 pilot checked in with him. He knew the C182 was above the A319 which left no option to send the A319 around. He asked the C182 pilot if he was visual with the A319 but the A319 pilot responded that he was visual with the RW24 traffic; he instructed the A319 to continue and passed essential TI as he believed that the C182 would pass just in front but above it. When the A319 pilot reported that the C182 was behind them, he cleared him to land. The A319 pilot informed him that it had been really close and that he would be filing an Airprox.

NATS Ltd provided a timely and comprehensive investigation report. The investigation is largely the same as that in the ATSI report below and, for brevity, has not been included. The report also made 4 internal recommendations, which have been implemented, and identified 3 ATC lessons, namely:

1. The benefit of keeping unfamiliar GA pilots in a standard visual circuit pattern.
2. The use of an intermediate VRP to hold off until a suitable gap in the inbound IFR traffic allows the GA traffic to make an approach to land.
3. The suitability of the existing VRPs for the operation at Edinburgh Airport.

ATSI reports that when conducting the investigation they had access to radar recordings provided by NATS Prestwick Centre and Edinburgh Airport, together with RTF recordings and controllers’ reports.

The Airprox occurred 3.5nm to NE of Edinburgh Airport on final approach to RW24 at an alt of 1100ft, outside the ATZ but within the Edinburgh CTR, which is CAS extending from the surface to 6000ft amsl.

Edinburgh TWR was operating with split positions. The ADC (AIR) was an experienced controller who had been in the operational position for 1hr 10min prior to the incident and he reported that workload as light; RW24 was the runway in use.

The A319 was on an IFR flight inbound to Edinburgh and was being vectored left hand for the ILS RW24 while the C182 was operating on a VFR flight also inbound to Edinburgh and was approaching from the E.

The AIP entry for Edinburgh Airport AD 2-EGPH-1-11 24 Sept 09, VFR flights, paragraph 8, states:

‘ a) VFR flight in the Control Zone will be given routeing instructions and/or altitude restrictions in order to integrate VFR flights with other traffic.

b) Pilots should anticipate routeing via the Visual Reference Points detailed in paragraph 10 or the routes detailed in paragraph 11.

c) Pilots of VFR flights are reminded of the requirement to remain VMC at all times and to comply with the relevant parts of the Low Flying Rules, and must advise ATC if at any time they are unable to comply with the instructions issued.'

Musselburgh and Arthur's Seat are published VRPs and lie 11NM and 7.5NM respectively to the E of Edinburgh Airport.

The METAR was: 041620Z 19015KT 9999 SCT035 16/08 Q0991=.

Edinburgh RAD gave the C182 pilot clearance to enter the CTR, VFR, and join for RW24 routeing via Musselburgh and Arthur's Seat, not above 2000ft QNH; RAD suggested AIR to monitor the pilot, as he seemed unsure on the RT.

At 1633:39 the C182 pilot called TWR, *"This is (C182)c/s at Musselburgh I'm heading towards Arthur's Seat"* and the AIR replied, *"(C182)c/s Edinburgh Tower Good Afternoon report at Arthur's Seat please"*.

AIR reported that he was monitoring the A319 on the ATM, and planned either to make the C182 No1, or alternatively to hold it to the S, depending on the range that the A319 turned onto the ILS.

At 1635:20 the C182 reported at Arthur's Seat and AIR instructed the pilot, *"(C182)c/s thank you report approaching the southern airfield boundary remain south of Runway 24 please"* and the pilot replied, *"Report southern area of L- boundary erm (C182)c/s say again er erm positioning for runway two four (C182)c/s"*. AIR reported that the pilot seemed unsure and gave an incomplete readback so he decided to emphasise the clearance and instructed the C182 pilot, *"Yes remain south of Runway two four please"*; the pilot responded, *"Remain south of Runway two four (C182)c/s"*.

The controller was asked if he considered that TI to the C182 would have been appropriate; he stated that there was no cct traffic at that time to affect the C182 and the A319 was still some distance away.

As the A319 closed on final approach, AIR informed RAD that the C182 would hold to the S; at 1637:33 AIR instructed the C182 pilot, *"(C182)c/s if you hold to the south of Runway two four please"* and the pilot replied, *"Holding to the south of Runway two four (C182)c/s"*. The radar recordings show the C182 position to be 3nm E, tracking towards the airfield at an alt of 1600ft, with the A319 on left base 10nm ENE of the airfield.

AIR noted both visually and on the ATM, that the C182 entered a left hand orbit. At 1638:43, the radar recording showed the C182 in a left hand orbit 2.75nm E of the airfield, indicating an alt of 1800ft and the A319 established on final approach at 7nm; RAD had informed the A319 crew about the C182 holding to the S. At 1639:28 the radar recording showed the C182 taking up a N'ly track indicating an alt of 1900ft. AIR reported that he saw this, but shortly afterwards he was reassured when he saw the C182 commence a left turn, still at 1800ft, as though it was continuing in the left- hand orbit. At the same time, 1639:37, the A319 pilot contacted AIR, *"Tower (A319)c/s with you descending on the ILS"*; immediately after this call AIR reported that he saw the C182 make a sharp right turn towards the final approach. The radar recording shows the C182 turn right at 1639:57 indicating an alt of 1700ft.

The controller reported that he immediately recognised that the ac were in conflict and at 1639:58 transmitted to the C182 pilot, *"(C182)c/s just confirm you're visual with the er traffic on two four"*, but at 1640:05, the A319 pilot reported, *"(A319)c/s is visual with the er traffic on two four"*. The radar recording shows the A319 at 3.5nm on the final approach, indicating an alt of 1200ft, with the C182 in its 11 o'clock position at 1.2nm crossing from left to right, indicating 1700ft. AIR responded to the A319's call, *"(A319)c/s roger there is VFR traffic I believe just about to cross you left to right are you visual with that"*. At 1640:14 the radar recording showed the C182 descending and passing 1600ft, in a right turn towards the A319, indicating 1100ft. At 1640:19, the A319 pilot replied, *"Er Yeah it's erm a bit close"*.

At that point radar the recording shows both ac indicating an alt of 1100ft, 0.5nm apart with the C182 then continuing its right turn and descending to 700ft. AIR reported seeing the C182 make a rapid descent and right turn and pass down the left hand side of the A319 and was concerned regarding the safety of the C182.

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The A319 was instructed to continue its approach and the pilot commented that the C182 had approached them very quickly. The C182 made an apology and repositioned onto final approach. Both ac landed without further incident.

The controller was asked to consider anything that might prevent a future occurrence; he indicated that once he had decided to hold the C182, TI to the pilot would have been appropriate regarding the IFR ac inbound with the reason for the delay. He also added that, if the C182 pilot was unable to comply with an instruction to remain S of RW24, he should have advised ATC.

The controller also reported that the airport was well served with VRP's except to the S, where a suitable VRP would enhance the arrival and holding of VFR traffic.

Following the Airprox the ATSU has recommended a review of current procedures for inbound VFR flights and a review of VRPs. The ATSU reported that a suitable VRP had been identified and an appropriate application, for the approval of the VRP was being processed with DAP.

The C182 pilot did not comply with the AIR controller's instruction to report approaching the Southern airfield boundary and to remain S of RW24. The AIR controller, aware of the requirement to monitor the C182 pilot, decided after the incomplete read back, to emphasise the requirement to remain S of RW24 on two further occasions. The C182 pilot subsequently turned towards final approach without advising the controller.

When the AIR controller decided to hold the C182 because of the A319 on final approach, the controller did not provide the C182 pilot with appropriate TI, which would have aided the pilot's situational awareness regarding the A319. Therefore, the absence of appropriate TI is considered to be a contributory factor. The Manual of Air Traffic Services (MATS) Part1, Section 2, Chapter 1, Page 1, Paragraph 2.1, states:

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

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

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.

The Board was briefed regarding the wind conditions and a pilot Member familiar with operating from Edinburgh informed the Board that significant turbulence downwind of the Pentland Hills and over the city was not an uncommon feature and would have been uncomfortable for the C182 pilot.

Although Members generally considered the Controller's sequencing plan sound in the circumstances, some familiar with Edinburgh procedures opined that instructing the C182 to join downwind or base for RW24 would have been more expeditious and might have allowed the ac to join and land, without the need to hold, before the instrument traffic (which had priority); that, however, was a matter of judgement and they agreed that the controller was better placed than them to make the decision.

Both pilot and controller Members observed that, although the controller believed his instructions to be clear and unambiguous, the C182 pilot had not understood or implemented them as intended. The controller noted the pilot's unclear and incorrect readback and reiterated the instruction, but he did not repeat the instruction to track to the Southern Aerodrome boundary. The Board noted the potential for misunderstandings in an instruction to remain south of a runway that was not oriented east-west; several controller and pilot Members said they would interpret the instruction to remain "*south of runway 24 please*" as an instruction to remain S of the RW24 approach path, particularly when approaching the airfield from the E. Therefore the Board considered it to be an imprecise instruction that could be understood either way and Members agreed that an instruction to proceed to/hold at a precise location, direction and alt would have been clearer and less open to interpretation. It was also observed that in such circumstances in Class D airspace ATC is required by MATS Pt 1 (Sect 3.2) to provide TI to the VFR

ac on the IFR ac; it is considered good practice to inform the pilot of his number in the landing sequence. The first indication to the C182 pilot that there was another aircraft approaching would have been when the A319 pilot called on TWR frequency at 1639:37, just as the C182 pilot was changing the direction of his orbit; even then, the A319 pilot called, "*Tower (A319) c/s with you descending on the ILS*", which would not have indicated the precise position of the A319 to the C182 pilot. Shortly after this TWR observed the C182 tightening its turn as the pilot most likely first saw the airliner. Members could not determine, however, why the C182 descended through the airliner's alt rather than remaining level above it.

In the event the C182 pilot did not comply strictly with the controller's instructions and Members agreed that he had not understood them fully. Further, the pilot was uncomfortable with holding over the city at an alt where he considered that he would not have been able to glide clear of the built-up area in the event of an engine failure. Up to the time the pilot decided to reverse the direction of his holding turn Members agreed that, although not strictly in accordance with his instructions, and despite the lack of an explicit instruction to maintain the left hand orbit, it was reasonable for the Controller to assume the C182 would continue its left hand orbit and that this would result in safe separation clear to the S of the approach path. Only when the C182 pilot, for understandable reasons changed to a right-hand orbit, without calling it and in the absence of any prior warning about the A319, did the separation erode. The controller noted this quickly, and attempted to ensure that the C182 was taking visual separation; however at that stage the A319 reported visual with the C182. The C182 pilot saw the A319 in his 11 o'clock and increased his rate of turn and descent ensuring that there was no risk of collision.

Although Members noted and welcomed the NATS review of VRPs, it was pointed out that the prime purpose of VRPs is for routing instructions to VFR Zone traffic and their suitability for holding VFR inbounds could not be ensured as they are frequently too far away from the airfield.

Pilot Members discussed the soundness of disconnecting the Autopilot in the event of a 'passive' TCAS RA; it emerged that different airlines have different SOPs. The CAA FOI Advisor advised that the CAA directs that operators should have a SOP, not what the SOP should be; the CAA requires operators to give the issue due consideration and write their SOPs accordingly.

Post Meeting Note: The airline concerned informed the UKAB that their TCAS procedures are in line with those recommended by the ac manufacturer. As the Board agreed at the Meeting, the pilot's actions were, as far as could be determined, totally in accord with the airline's SOPs.

PART C: ASSESSMENT OF CAUSE AND RISK

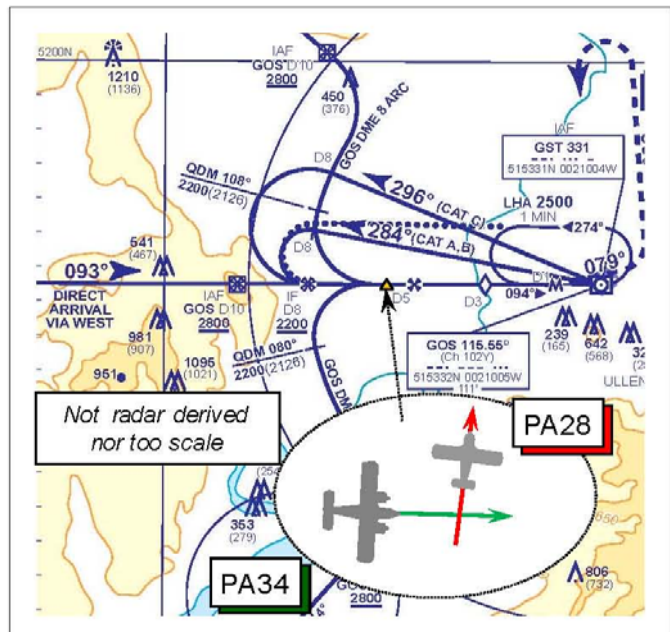
Cause: In the absence of TI, the C182 pilot flew close enough to cause the A319 crew concern.

Degree of Risk: C.

AIRPROX REPORT No 2010150

AIRPROX REPORT NO 2010150

Date/Time: 7 Oct 2010 0956Z
Position: 5153N 00220W
(6nm W of Gloucester - elev 101ft)
Airspace: London FIR (Class: G)
Reporter: Gloucester ATC
1st Ac 2nd Ac
Type: PA34 PA28
Operator: Civ Trg Civ Pte
Alt/FL: 2000ft 2000ft
QNH (1018mb) QNH (1018mb)
Weather: IMC In Cloud VMC CLBC
Visibility: Nil 10nm
Reported Separation:
2-500ft V $\frac{1}{2}$ -1 H Not seen
Recorded Separation:
Not recorded



CONTROLLER REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GLOUCESTERSHIRE AIRPORT APPROACH CONTROLLER (APP) reports that at 0950 the PA34 crew reported outbound for an NDB/DME approach to RW09. The PA28 pilot reported on frequency 10nm SW of the Airport, routing northbound, level at 1900ft QNH at 0954. As the PA28 approached the FAT to RW09 he passed TI to the pilots of both ac about each other. The PA34 was completing the base turn and reported IMC. However, he believed from radar returns at 0956 that the 2 ac were converging. When asked, the PA34 pilot reported he was still flying in IMC and asked for the range of the PA28. APP reported that the PA28 was believed to be 12 o'clock at 1nm, but below the PA34's level, flying VFR in VMC. A later conversation with the PA34 pilot revealed the PA28 was at a similar level.

The 0950UTC METAR: 16007KT 9999 FEW012 15/11 Q1018=

THE PIPER PA34-200-T (PA34) PILOT, a flying instructor, reports he was conducting a dual IFR training flight at Gloucestershire Airport under a PS from GLOSTER APP on 128.55MHz. A squawk of A7000 was selected with Mode C; neither Mode S nor TCAS are fitted.

Whilst executing an NDB approach to RW09, he was advised by APP of VFR traffic crossing their inbound track from S to N at a similar altitude. He advised ATC twice that they were still in cloud, and requested the position of the traffic - a PA28. IMC in cloud, descending through 2000ft QNH (1018mb) at 100kt, heading 093° approaching 6nm DME on a bearing of 273° from Gloucestershire Airport during final descent, they 'popped' out of cloud into a gap and saw the PA28 passing from R – L about $\frac{1}{2}$ - 1nm away at 10 o'clock, slightly high, flying away from them after it had crossed ahead with a 'high' Risk of collision. He telephoned ATC on landing back at base to discuss how similar events could be avoided in future. He thought it advisable to give avoiding action advice to VFR traffic to keep them clear of the NDB approach lane.

His ac has a white and blue livery; the white HISL and tail-fin anti-collision beacon were on.

THE PIPER CHEROKEE WARRIOR II (PA28) PILOT reports he had departed from Compton Abbas under VFR for Manchester/Barton, routing via Bath, Cosford and Ashcroft at 100kt. A BS was provided by Bristol and Filton ATC and approaching a position 10nm SW of Gloucestershire Airport he requested a BS from GLOSTER APP on 128.55MHz, which was agreed. He informed GLOSTER APP of his route on a heading of 007° and was asked to

report abeam Worcester - he was not asked to select a squawk. The flight proceeded uneventfully in a level cruise at 2000ft QNH (1018mb) some 300ft below cloud with an in-flight visibility of 10nm until approaching Worcester, when cloud 'limited VMC' so he elected to divert back to Gloucestershire Airport to review weather conditions before attempting to continue onward to his destination. He informed the controller of his intentions, retraced his outbound track and was told to expect a straight in approach for RW18 at Gloucestershire, which he completed to an uneventful landing.

The PA34 was not seen nor was he aware of any separation issues until he was contacted by Compton Abbas Ops. His aeroplane has a cream colour-scheme and the HISLs were on.

UKAB Note (1): This Cleve Hill Radar was out of service on this day; consequently, this Airprox occurred outwith the available recorded radar coverage.

ATSI reports that the Airprox occurred at 0956:50 UTC, in Class G airspace, 6nm to the W of Gloucestershire Airport. The PA34 was an IFR training flight, from Filton inbound to Gloucestershire Airport for the procedural NDB/DME approach to RW09, which requires a letdown to the W of Gloucestershire Airport.

Gloucestershire ATC is equipped with a primary radar system (MARIS 900), without SSR. The radar is utilised to expedite the procedural environment, without surveillance capability and the provision of a radar service is subject to manning levels and the availability of appropriately qualified staff. The UK AIP entry for Gloucestershire at AD 2-EGBJ-1-6 (8 Apr 10), Paragraph 2.18, states:

'Radar services (Primary only) within 25 NM below FL80, availability subject to manning. Use of 'Radar' suffix denotes availability only. Provision of a specific radar service is not implied.'

The GLOSTER APP controller was qualified to operate radar, but at the time of the Airprox, the controller was providing an Approach Control Procedural service.

The PA34 crew first called Gloster APP at 0934:33, inbound IFR at FL50 and a PS was agreed. The PA34 crew was cleared to the GST NDB with no delay for the NDB/DME approach to RW09 with information 'Golf'. The PA34 crew requested one hold before commencing the NDB procedure.

At 0945:02, the PA34 crew reported outbound in the hold at FL50 and APP responded, "[PA34 C/S] roger cleared NDB DME approach runway 0-9 QNH 1-0-1-8 report beacon outbound." The pilot gave a correct readback.

At 0949:32 the PA34 pilot reported beacon outbound and APP instructed the pilot, "....report base turn complete." The UK AIP at AD 2-EGBJ-8-3, states for the extended holding pattern:

'Extend the outbound leg [274°] of NDB(L) GST holding pattern descending to 2200. At GOS DME 8 turn left to intercept FAT..'

At 0951:38 the limited radar data available shows the PA34, 3nm NW of Gloucestershire Airport outbound on the procedure, displaying a squawk of A7000 and indicating FL41 Mode C. The ac's radar return then fades from coverage.

At 0953:32, the PA28 pilot established communication with Gloster APP and reported, "..[PA28 C/S] is a PA28 from..Compton Abbas..to Manchester Barton routeing via Cosford..our..present position is..to the..southwest of Gloucester..and our heading is to the west of..your zone..so we are at present..1 thousand 9 hundred feet 1-0-1-7..Basic Service if possible please." APP agreed a BS on the QNH (1018mb) and instructed the PA28 pilot to report at Worcester, which was acknowledged correctly. At 0954:49, APP passed TI to the PA28 pilot, "[PA28 C/S] traffic similar..level will be a PA 34 making a..approach to runway 0-9 that traffic not yet established inbound on the final approach track." The PA28 pilot responded, "..[PA28 C/S] is looking for traffic."

Then at 0955:12, APP passed TI to the PA34 pilot, "..traffic..south of the extended centreline routeing northbound is a Cherokee will be similar level on your er base turn complete." The PA34 pilot replied, "..roger [PA34 C/S]..is India Mike Charlie this time", which APP acknowledged, "roger." At 0955:33 the PA34 pilot requested, "..the range of the traffic." APP replied, "[PA34 C/S] procedural traffic [sic] I believe the traffic's northbound just passing through the extended centreline", which the PA34 pilot acknowledged, "roger." The PA34 pilot reported base turn complete

AIRPROX REPORT No 2010150

at 0956:05 and the controller believed from displayed radar returns that the two ac were converging. APP asked the PA34 pilot, "Are you still IMC" and at the request of the pilot, APP repeated the message. The PA34 pilot replied, "...affirm and I just needed a range from..from Golf Sierra Tango for the traffic would appreciate it."

The controller, using radar information, responded, "Roger I believe the traffic's..1 mile in your 12 o'clock but if you're I-M-C he's VFR below." At 0956:49 the PA34 pilot reported, "[PA34 C/S]..we've just passed him..less than half a mile." The PA34 then continued the approach without further incident.

The PA34 crew was in receipt of a PS and was passed TI regarding the PA28 operating VFR. The Manual of Air Traffic Services (MATS) Part 1, Section 1, Chapter 11, Page 10, states:

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

A Procedural Service does not require information derived from an ATS surveillance system. Therefore, due to the ability for autonomous flight in Class F/G airspace, pilots in receipt of a Procedural Service should be aware of the high likelihood of encountering conflicting traffic without warnings being provided by ATC.'

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

The controller believed, from the radar information available, that the two ac were converging and having confirmed that the PA34 was IMC, then passed a warning regarding the believed position of the PA28, again using radar derived information.

The PA28 was in receipt of a BS and had been passed TI on the PA34. The MATS Part 1, Section 1, Chapter 11, Page 4, Paragraph 3.1.1, states:

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Only rudimentary radar equipment is available to Gloucestershire controllers, but the controller had used it to provide TI to the PA34 crew. Whilst noting that the installed primary radar is not ideal compared to more sophisticated equipments, controller Members were surprised that the controller had not made more use of it, which the ATSI report had explained was used merely to expedite the procedural environment and was without a true surveillance capability. Basically, the radar was used here to enhance the controller's situational awareness whilst providing a PS rather than being able to offer a full surveillance based DS.

Evidently the PA34 crew was operating IFR, in cloud, whilst turning inbound on the procedure until they flew into a gap and saw the PA28. APP was only required to ensure deconfliction minima against other IFR flights participating in the PS and in this case the PA28 pilot was operating VFR under a BS. However, APP had perceived the potential for a conflict with the PA28 and wisely passed TI to the PA28 pilot whose pilot was operating in VMC clear beneath cloud. Some controller Members thought that an opportunity was lost here and the controller could have done more by asking the PA28 pilot to route clear of the FAT. The CAA ATS Policy Advisor commented that this situation was covered in the MATS Pt 1, which at Part 1, Section 1, Chapter 11, Page 12, states:

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

Notwithstanding the facility to do so, there was no compunction on the controller to restrict the PA28 pilot's flight profile as he was reasonably expecting him to fulfil his responsibilities whilst operating VFR to 'see and avoid' other ac. Members pointed out that pilots executing IFR approach procedures in Class G airspace under a PS must remain alert to the potential of encountering and avoiding in accordance with the rules of the air conflicting ac about which neither TI nor deconfliction advice has been provided because the controller did not know about the other ac. In this occurrence, with the PA28 approaching from beneath cloud on the PA34 pilot's starboard side, it was the latter who was nominally required to 'give way'. However, the Rules can only work if pilots can spot the other ac in time to take action and with the PA34 legitimately descending in cloud in accordance with the procedure this was unlikely. One controller Member wondered why the PA34 pilot continued to descend and suggested the pilot might not have understood the limitations of the PS with regard to separation from other VFR traffic. However, it was plain from the PA34 instructor's remarks that he was well aware not only of his responsibilities but what the controller might potentially do in this situation.

The IFR approach 'feather' is clearly marked on NATS/CAA VFR charts and experienced pilot Members thought it unwise to plan a route through an IFR approach at an altitude where a conflict was likely to occur with ac flying IFR procedures in cloud. That said, this was Class G airspace and the PA28 pilot was legitimately entitled to fly where he did maintaining VMC; moreover, he had sensibly called APP and obtained a BS.

The available radar recording had not shown this Airprox and without radar, with Mode C data to judge the relative altitudes, it was not feasible to examine the exact geometry of this occurrence. Nevertheless, Members recognised that when descending through 2000ft QNH the PA34 pilot saw the PA28 after it had crossed through his 12 o'clock and that there was no need to take any avoiding action.

The controller who initiated the Airprox report did not provide an estimate of the separation from his radar display. Flying VFR, some 300ft below cloud with 10nm in-flight visibility, the PA28 pilot had received TI about the PA34 and was looking out for it. However, he did not see it and would have been unable to do so whilst the twin was in cloud. The only measure available to the Members, therefore, was that reported by the PA34 pilot, who estimated that the PA28 had passed about ½ - 1nm away, 200-500ft above his ac. In the Board's view this was not close enough to the PA34 to cause concern. The PA28 was flying clear of cloud and each pilot was proceeding with due regard for one another. Members concluded, therefore, that this was a controller perceived conflict and agreed unanimously that in the circumstances reported here there was no Risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A controller perceived conflict.

Degree of Risk: C.

AIRPROX REPORT No 2010151

AIRPROX REPORT NO 2010151

Date/Time: 5 Oct 2010 2004Z

Position: 5421N 00218W (13nm E Kendal)

Airspace: UKNLFS (Class: G)

Reporting Ac Reported Ac

Type: Harrier T8 MC130H

Operator: HQ AIR (Ops) HQ 3 AF

Alt/FL: 250ft agl NK
(RPS 991mb) (NK)

Weather: VMC CLBC NK

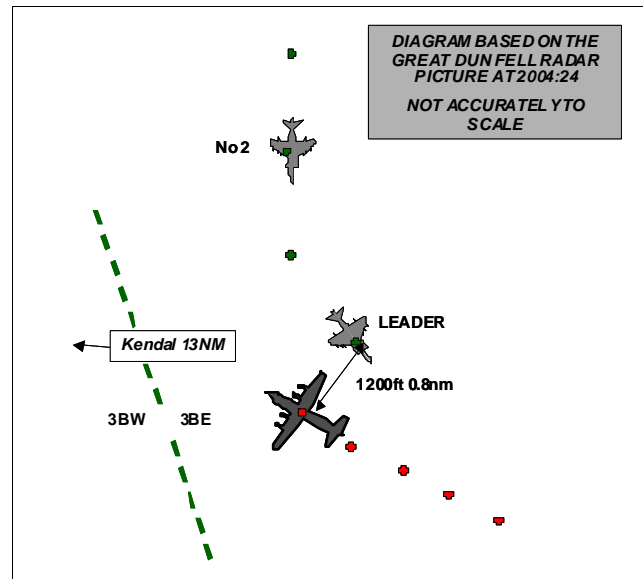
Visibility: 10km NK

Reported Separation:

500ft V / 0.5nm H
NR

Recorded Separation:

1200ft V / 0.8nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HARRIER PILOT reports that he was flying dual as leader of a 2 ship of Harriers conducting a VFR night low level training sortie, booked into Night Low Flying Areas (NLFA) 3BE and 3BW. They were flying in 1.5nm trail heading 170° at 420kt and 250ft agl [using Night Vision Devices] when he saw a large multi-engine ac 2nm away at about 800ft agl, tracking N (the opposite direction) down the right hand side of their formation, about 0.5nm to the W of them. He made an information call to his wingman while breaking left to avoid the other ac; his wingman was also visual with the ac and turned left to avoid it. The ac was displaying standard strobe and nav lights.

While the risk of collision was not considered significant due to the lateral displacement and the difference in altitude, they were concerned to see another ac at low level in the same low flying area. The multi-engine aircraft was perceived visually to be at approximately 800ft agl.

THE MC130H PILOT did not provide a report. When followed up by HQ 3AF the crew had been posted to another theatre.

UKAB Note (1): Initially, the incident was thought to have taken place at 2004BST and this was passed to the MC130H Sqn. It was later discovered that the incident took place at 2004Z. The corrected incident time was then passed to MC130H Sqn but the error resulted in the Sqn initially identifying the wrong ac. Although the MC130H was displaying intermittent Mode S data, it was not displaying the correct callsign, but this was not revealed until NATS did a complete radar trace of the ac involved, from takeoff to landing. It is thought that this might have been as a result of a late airframe change for the flight.

THE MC130H UNIT stated that they have no reason to doubt the validity of the radar recording that indicates that a MC-130H was flying in airspace into which it was not allocated/booked. They had never previously encountered a crew/unit making such an error. All bookings are made in GMT, and the unit always operates in Zulu, regardless of whether or not BST is in effect. Although they consider it almost impossible that this could occur, the information available appears conclusive.

The only possible explanation would be that the crew applied a BST correction to the booking sheet and entered into the low-level structure at 2030L (1930Z).

UKAB Note (2): The incident took place in NLFA 3BE at 2004Z. The C130 was tracking from 3BE to 3BW. Both 3BE and 3BW were allocated to RAF Cottesmore (the Harriers' Stn) from 1930-2030Z. The actual Low Level Booking showed the areas being used by the Harrier formation from 1930-2008Z. The Areas were allocated to the MC130H base from 1730-1930Z and again from 2030-2200Z.

UKAB Note (3): The incident shows clearly on the recording of the Great Dun Fell radar. The Harriers are squawking 7001 with Mode C, tracking 170° towards the CPA; the C130 is also squawking 7001 with Mode C and very intermittent Mode S and tracks about 300° towards the CPA. The CPA is at 2004:25 when the C130 (at FL032) passes 0.8nm to the SW of Harrier leader who is indicating FL020 in a level break to the left.

UKAB Note (4): The nearest Met reporting station to the incident position is Blackpool; the 1950 METAR was:

METAR EGNH 051950Z 16009KT 9999 FEW029 13/09 Q0999

HQ AIR (Ops) comments that the Harriers were visual in good time and avoided the MC130 by a safe margin. However, it is disappointing that the MC130 was operating within the NLFS outwith its booked time; equally disappointing is the lack of response to requests for information following the event.

HQ 3 AF comments that the absence of a report from the aircraft commander is regretted. That said, the evidence indicates that either there was a misunderstanding over which area was booked and when, or that an error was made BST vs Zulu.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the lead Harrier pilot, radar recordings and reports from the ac operating authorities.

The Secretariat briefed the Board on the difficulties that led to the delay in identifying the MC130H involved in the incident. The HQ 3 AF Advisor informed the Board that he had spoken to the officer who was Sqn Cdr at the time of the incident and due to the time period that had elapsed since the incident and that the crew involved had been posted to another theatre so he was unable to provide any further information. He did however, believe that the flight might have been delayed or otherwise changed and that the crew had made a human error regarding their low flying allocation and booking. He was confident that the crew had been fully conversant with UK Night Low Flying regulations. The MoD Low Flying Advisor stated that an incorrect or conflicting booking would normally be picked up by his staff, but in this case, possibly due to the callsign confusion, they had no information whatsoever on the flight and had most likely assumed that it had not been flown; they had no record of a low flying booking being made for NLFA 3 for either correct or incorrect MC130H callsigns.

Members noted, however, deconfliction between users of the NLFS is purely procedural (time) and this is totally dependent on ac complying with the allocation and booking system in the UK Low Flying Handbook. Despite the procedures in place the UK NLFs lies in Class G Airspace where the 'see and avoid' principle applies; in this incident the Harrier Lead crew saw the MC130H with the aid of NVGs, early enough to determine that only modest avoidance was required, but it could not be determined if the MC130H cockpit crew, who were also using NVGs, had seen the Harriers.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause:1. Conflict in the UKNLFS resolved by the lead Harrier pilot.

2. The MC130H was low flying in an area not allocated to it.

Degree of Risk: C.

AIRPROX REPORT No 2010152

AIRPROX REPORT NO 2010152

Date/Time: 6 Oct 2010 1129Z

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

Airspace: ATZ (Class: G)

Reporting Ac Reported Ac

Type: Tutor BE200

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

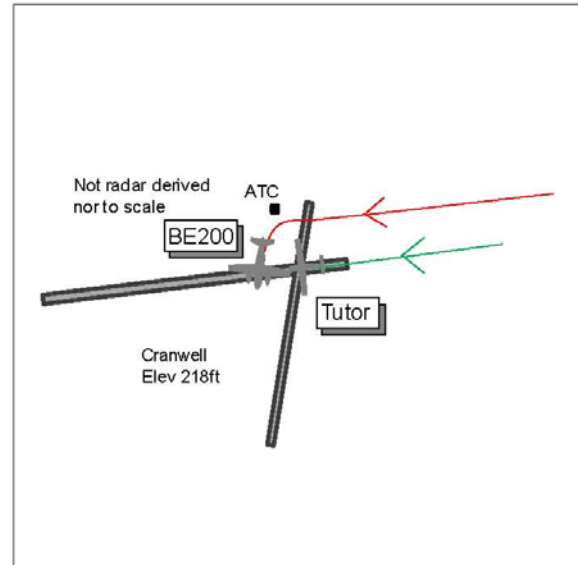
Alt/FL: 300ft ↑ 500ft
(QFE 996mb) (QFE)

Weather: VMC CLNC VMC NR

Visibility: 20km

Reported Separation:
200ft V/100ft H Not seen

Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

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

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

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

THE CRANWELL SUPERVISOR reports he was in the VCR owing to the cct being full. The BE200 had 'gone around' being unable to continue his approach and the Tutor had commenced a 'touch and go'. As the Tutor climbed away the BE200 was deadside O/H the VCR and its pilot called "breaking early low-level" as the BE200

crossed RW26 above the Tutor. He saw the Tutor initiate an immediate descent and once the BE200 had passed the Tutor recommenced a climb and its pilot called Airprox.

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

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

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

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

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

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members wondered why the BE200 crew appeared to have disregarded Tutor(A) as a factor when, having last seen it rolling on the RW ahead, they then positioned deadside at 500ft before turning crosswind early into the cct. The crew’s SA had clearly broken down or they would have ensured they were visual and had adequate separation from the Tutor before turning L. The BE200 crew’s attention appeared to have been focussed on completing the

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low-level cct and trying to establish the position and visually acquiring Tutor(B) joining the cct downwind. Tutor(A) was there to be seen, as it climbed away from its touch and go, and should have been detected and taken into account when the BE200 crew was clearing the flightpath into which they were intending to turn. This manoeuvre caused the Airprox. The ADC could not have known that the BE200 pilot had lost sight of Tutor(A) as the BE200 passed above the VCR on the deadside immediately prior to the CPA. Fortunately Tutor(A) pilot had seen the BE200 approaching from behind and above and took prompt action by levelling-off as it turned to pass just in front and 200ft above. Although Tutor(A) passed unsighted to the BE200 crew, the prompt action taken by Tutor(A) pilot was enough to persuade the Board that any risk of collision had been quickly and effectively removed.

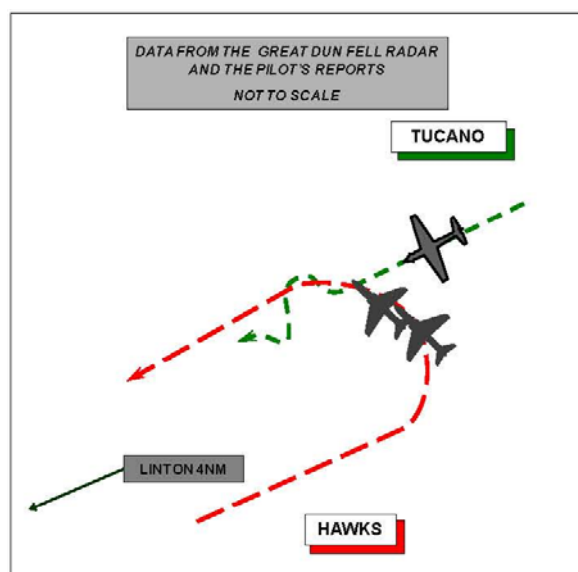
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The BE200 crew elected to turn downwind early and flew into conflict with Tutor(A), of which they had lost sight.

Degree of Risk: C.

AIRPROX REPORT NO 2010153

Date/Time: 7 Oct 2010 1545Z
Position: 5407N 00109W
 (4nm NE Linton-On-Ouse - elev 53ft)
Airspace: Linton MATZ (Class: G)
Reporting Ac Reported Ac
Type: Tucano Hawk x 2
Operator: HQ Air (Trg) HQ Navy Cmd
Alt/FL: 2000ft 1500ft
 (QFE 1016mb) (QFE 1016mb)
Weather: VMC CLBC VMC CLBC
Visibility: 7km 45km
Reported Separation:
 0 V/70m H Not Seen
Recorded Separation:
 NR (See UKAB Note: (5))

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

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

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

THE HAWK PILOT reports that he was leading a pair of black Hawk ac, on recovery to Linton on Ouse having been handed over to Linton DIR on leaving CAS over Leeds Bradford. They were squawking as directed and had all lights switched on and on initial contact with DIR he requested a 'radar to initials' recovery. Although they were visual with the airfield from about 20nm they remained in contact with DIR so that they could receive TI. When they were descending through about 5000ft QFE about 5nm S of the airfield he asked if there was any other joining traffic to affect their approach and, since none was reported, he stated his intent to contact TWR. On contacting TWR he requested a visual join which was approved as they were approaching initials in a left-hand banked turn in a slow descent. He called "Initials" as they turned onto a heading of 210° at 300kt and TI was passed regarding a Grob ac in the circuit; he could not see the Grob so he requested further information to aid his visual acquisition. He then saw the Grob ac which was crossing the upwind end of the RW and climbing through 800ft. Once clear of all known traffic, they carried out a break to land. Neither he nor his No2 crew saw the Tucano at any time so they were unable to take any avoiding action but he assessed the risk as being Medium.

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

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

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

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

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

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

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

The SUP left the ACR, en-route to the VCR, at about 1544:46 (following the transmission of a Practice PAN on the APP freq) as a result of the increasing workload in TWR caused by the Hawks joining the already busy circuit.

Given the size of the ATC building it takes about 45sec to reach the VCR, from the ACR.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Note: CAP 774 states that under a BS:

If a controller considers that a definite risk of collision exists, a warning may be issued to the pilot.

Whether traffic information has been passed or not, a pilot is expected to discharge his collision avoidance responsibility without assistance from the controller.

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

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

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

Thirdly, and in a similar vein, DIR's response of "*no radar traffic to affect*", while technically accurate, would have lulled the Hawk pilots into a false sense of security. Having asked whether there was "*any traffic to affect*" he would have been conditioned to accept the response as being to the question he had asked. Re-asking the question may have elicited information about the other joining traffic. Absence of information on the Hawks to the Tucano by APP also contributed by not enabling the Tucano pilot to refocus his lookout scan. It is unfortunate that this information was not passed but it is noted that the Tucano was under a BS. Upgrading to a TS in light of the reported visibility could have been a consideration.

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

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

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

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

PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: A.

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

AIRPROX REPORT No 2010154

AIRPROX REPORT NO 2010154

Date/Time: 5 Oct 2010 1141Z

Position: 5422N 00320W
(21nm S of DEAN CROSS VOR)

Airspace: UAR (Class: C)

Reporter: LAC Sector 4

1st Ac 2nd Ac

Type: Airbus A320 Hawk T1

Operator: CAT HQ Air (Trg)

Alt/FL: FL370 ↑FL350

Weather: NR NR

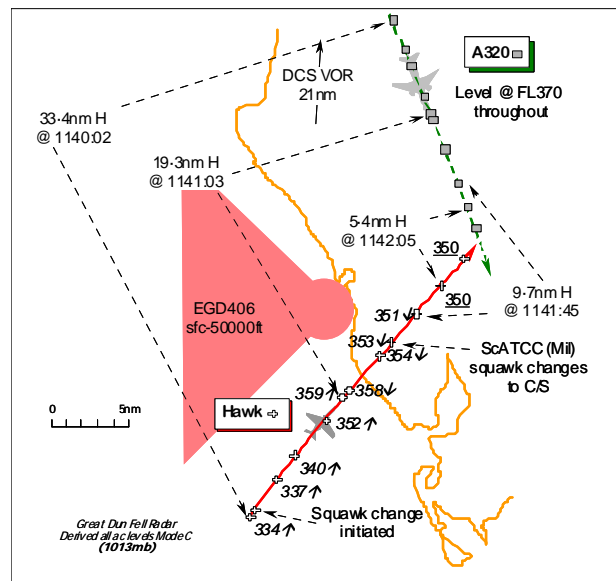
Visibility: NK NR

Reported Separation:

NR NR

Recorded Separation:

1100ft min V @ 19.3nm H



CONTROLLER REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LACC SECTOR 4 TACTICAL CONTROLLER (S4 TAC) reports that they had received the A320 from DEAN CROSS (DCS) Sector outbound from Edinburgh and climbed it to FL370 under a RCS. The Hawk had been co-ordinated by LJAO with his PLANNER (S4 PLAN) to climb beneath the A320 to FL350 as it was non-RVSM compliant [Reduced Vertical Separation Minima could not be applied thereby requiring 2000ft vertical separation against GAT]. S4 PLAN noticed the Hawk had climbed through FL350. The Hawk was seen to climb to FL358 so he gave TI to the A320 crew, selected the climb rate button whilst talking and saw that the Hawk was now descending. He explained to the A320 crew that the other ac was a military jet and that it was now descending, but was non-RVSM compliant. No avoiding action was issued. The geometry was such that the A320 would have had to be turned R into an active Danger Area – EGD406 – to avoid the Hawk if the climb button had revealed the Hawk was level or climbing. Prescribed separation was not eroded.

THE LACC S4 PLANNER CONTROLLER (S4 PLAN) reports that LJAO NW rang to co-ordinate the Hawk, non-RVSM, against two ac on their frequency. The LJAO controller accepted FL350 for the Hawk, 2000ft underneath the A320 cruising at FL370. The Hawk was then observed climbing through FL355 with the STCA flashing. She immediately shouted across to LJAO NW to ask what they were doing and was told that they had transferred the Hawk to ScATCC (Mil). She asked LJAO NW to ring ScATCC (Mil) but at the same time could see the Hawk's Mode C was indicating it was now descending.

UKAB Note (1): Despite repeated attempts by the UKAB to establish contact with the company and obtain a report from the A320 pilot, no contact has been achieved, therefore no report is available.

THE HAWK T1 PILOT reports that whilst in transit to Dunbar on a solo navigational training sortie he was handed over to LONDON MILITARY and during a stepped climb was given clearance to climb to FL350. At some point between FL300 - FL330 he was issued with a new squawk and a frequency change to ScATCC (Mil). Whilst doing this, his height checks 'dropped out of the scan' due to a high workload within the cockpit: i.e. the frequency change, squawk change, navigating to an intersection and working out timeline changes etc. He had already switched from LONDON MILITARY's [LJAO NW TAC] frequency at the point that he climbed through FL350 and he started the bunt at FL356; the highest level he saw at any time was FL357. As he had no two-way RT comms with anyone at that point, his next action was to get in contact with SCOTTISH MILITARY. When he established communication with the controller they confirmed the level he was cleared to and he descended back down to FL350. Minutes later, an airliner that had been coordinated 2000ft above him at FL370 flew directly overhead. However, by then, he had descended and had been maintaining FL350 for about 2min before it overflew his ac.

He thought, incorrectly, that he might have set off their TCAS and the Airprox had been filed as a result; the Risk was assessed as 'low'.

THE LJAO NORTHWEST TACTICAL CONTROLLER (NW TAC) reports the Hawk pilot was flying a LAKEY to SHAPP profile from Valley looking to descend to low-level in the Dunbar area. The Hawk pilot had been instructed to climb to FL350. A Cleared Flight Path (CFP) [a co-ordinated cleared level on a specified track] was requested from S4 PLAN for the Hawk at FL350, maintaining the current heading - non-RVSM, which was approved. Furthermore, S4 PLAN was advised that an electronic CFP would be sent and that the Hawk would be changing to a squawk of A4627 for ScATCC (Mil). The handover, with co-ordination, was conducted in accordance with JSP552 and the receiving ScATCC (Mil) controller read back the instruction 'traffic you're handing me not above FL350 negative RVSM.' The Hawk pilot was instructed to contact SCOTTISH MIL on the frequency given and at this point the ac was passing about FL338 Mode C. Although he had seen the A320 he had not called the co-ordinated traffic to the Hawk pilot on RT, as at this stage it was still about 20nm to the NE. The Hawk was then observed to carry on climbing through its assigned level of FL350 Mode C. At this point he was on the landline to ScATCC (Mil) receiving a prenote when S4 PLAN asked, across the room, what the Hawk was doing. He asked the ScATCC (Mil) controller to transfer him to the controller working the Hawk having advised S4 PLAN that the Hawk was no longer under his control. The Hawk was observed to climb to FL358 Mode C before descending again to FL350 –he thought the A320 was about 12nm away from the Hawk at this point. The ScATCC (Mil) controller informed him that the Hawk pilot had continued its climb before contacting ScATCC (Mil) – as soon as the Hawk pilot had called on the RT the controller had instructed him to descend to FL350.

ATSI reports that the Airprox occurred in Class C airspace S of Dean Cross (DCS). The A320 was in contact with S4 on 132-860 MHz under a RCS. S4 was being operated by a Tactical controller - S4 TAC - and Planner controller - S4 PLAN.

At 1134:10, the A320 crew called S4 TAC maintaining FL350. The pilot requested FL370 for the cruise. S4 TAC instructed the A320 to climb to FL370 and route direct to Goodwood. The LJAO NW controller called S4 PLAN at 1137:45 and requested co-ordination on the Hawk. The Hawk was 60nm SW of DCS passing FL270 in the climb and displaying a SSR code-converted to callsign. S4 PLAN identified the Hawk and LJAO requested, "*looking for flight level 3-5-0 negative R V S M*". In accordance with CAP493 (MATS Part 1) Section 1 Chapter 3 paragraph 5.1.1, the required vertical separation standard for non-RVSM aircraft above FL290 is 2000ft. S4 PLAN pointed out an MD11 maintaining FL370 and the A320, which was climbing to FL370. A B777 at POL at FL360 was also pointed out by S4 PLAN and both parties agreed that the Hawk would pass ahead of this ac. At 1138:15, S4 PLAN stated, "*... yeah okay yeah so 3-5-0 underneath [the MD11] and the [A320] then*". LJAO replied, "*...thanks I'll send you the electronics*" and, "*it's [Hawk C/S] changing to 4-6-4-1 going to Scottish now.*" At 1140:25, the SSR code-converted callsign of the Hawk changed to a squawk of A4641, a code allocated to ScATCC (Mil). The Hawk was 36nm SSW of DCS, passing FL337, having reduced its ROC from approximately 4500ft/min to 1500ft/min.

The Hawk passed FL351 Mode C at 1140:56; subsequent Mode C level reports indicated that the ac was still climbing. The LAC Multi Radar Tracking recording shows that at 1141:07, the Hawk reached a maximum level of FL359 before starting to descend. Between 1141:17 and 1141:29 the Hawk's Mode C indicated FL355 for three consecutive updates. CAP493 Section 1 Chapter 5 paragraph 10.3.1 d) states: 'An aircraft may be considered to have reached an assigned level when three successive Mode C readouts indicate 200 feet or less from that level'.

At 1141:30, S4 TAC passed TI to the A320 crew, "*...3 o'clock range of about er 15 miles you'll see military crossing traffic 2 thousand feet below your level*". At 1141:40 the A320 pilot reported having acquired the traffic on TCAS but not visually. Both S4 TAC and S4 PLAN reported activation of the STCA on their situation displays; S4 TAC reported feeling unable to give avoiding action because, '*...the angle was such that the [A320] would have had to have been turned right into an active mil danger area...*'. EG D406 was active to the W of the A320. The S4 PLAN reported shouting across to LJAO NW and asking them what they were doing, only to be told that LJAO NW had transferred the Hawk to ScATCC (Mil). By 1141:54 the Hawk was indicating FL350 Mode C 8-3nm SSW of the A320. The tracks crossed at 1142:29, 21nm S of DCS, the A320 was level at FL370 Mode C and the Hawk indicated FL350. At 1152:00, the A320 was transferred to the next en-route sector.

Co-ordination of the Hawk's transit of S4 airspace was made in accordance with the required vertical separation standard for non-RVSM aircraft above FL290. At the end of the co-ordination process LJAO NW informed S4 PLAN that the Hawk was about to change its squawk and be transferred to ScATCC (Mil). The SSR code of the Hawk was observed to change shortly thereafter as the aircraft was passing FL337. At the time of the SSR code

AIRPROX REPORT No 2010154

change at 1140:25, the Hawk pilot had reduced his ROC but the ac was still climbing with 1300ft to go to the assigned level of FL350. The Hawk passed FL351 26sec later at 1140:56. The S4 controllers were alerted to a potential loss of separation as the Hawk's Mode C indicated it was continuing its climb above FL350. STCA acted to amplify the controllers' belief that a potential loss of separation was about to occur. Whilst descending back to FL350 the Hawk's Mode C remained level at FL355 for 3 updates of the display. This would further reinforce the S4 controlling team's belief that separation was about to be lost between the Hawk and A320. Appropriate TI was passed to the A320 crew by S4 TAC. S4 PLAN's ability to contact the Hawk's controller was limited as it was no longer in communication with LJAO NW controllers proximately located to S4. Separation was not lost as the Hawk established level at FL350, 8.3nm before the tracks of the two ac crossed.

It is concluded that:

The Hawk pilot received his cleared level, an SSR code change and frequency change over a short period of time causing the pilot to omit monitoring his ac's level.

The S4 controlling team received various indications that there was potential for a loss of separation to occur: Mode C of the Hawk climbing, STCA activation, inability to communicate with the Hawk's controlling authority, Mode C of the Hawk remaining constant at FL355 for 3 data updates.

The required vertical separation of 2000ft was achieved before the ac were less than 5nm apart laterally.

UKAB Note (2): The Great Dun Fell Radar (GDF) single source recording was used by UKAB as the basis of the diagram above and as such exhibits minor variations in time, range and level when compared to the LAC Multi-Radar Tracking recording available to ATSI. The GDF shows the maximum indicated level of the Hawk was FL359 at 1141:03, at a range of 19.3nm from the A320. The Hawk achieved level flight at FL350 on the GDF recording at 1142:05, at a range of 5.4nm from the A320.

HQ 1GP BM SM reports that the Hawk crew was routeing LAKEY-SHAPP under IFR, climbing to FL350 and in receipt of a RCS from the LJAO NW TAC controller, with the intention of descending to low-level in the vicinity of Dunbar.

LJAO completed a thorough investigation of this occurrence, confirming that the Hawk pilot was instructed to climb to FL350 and co-ordinated against the A320 at FL370. The controller was cognisant that the point of confliction was shortly after the point where they would be required to transfer the Hawk to the next ATCRU - ScATCC (Mil); therefore, NW TAC passed the SSR code issued by ScATCC (Mil) to LACC S4 in order that the S4 controllers could retain track identity and maintain their SA.

NW TAC handed over the Hawk to ScATCC (Mil), including the co-ordination with S4, in accordance with SOPs. NW TAC noted that the Hawk's SSR Mode C was indicating a climb through FL338, as they instructed the Hawk crew to contact ScATCC (Mil).

The Hawk pilot states that the excursion above his assigned level occurred after they had switched from NW TAC's frequency, but before he had established RT contact with ScATCC (Mil). The highest level indicated by the Hawk was FL359 Mode C at 1141:03, when the A320 was level at FL370, with horizontal separation of 19.3nm. The Hawk levelled at FL351 some 35sec later, with approximately 9.7nm horizontal separation extant, the A320 remaining level at FL370. At no stage does the A320 appear to take any avoiding action, either as a result of a TCAS RA or instruction from S4 TAC.

The Hawk pilot states that due to high cockpit workload, his height checks had dropped out of his scan and consequently the level-bust occurred. Given the timing of this, with the pilot switching between ATCRUs, it was not possible for either LJAO NW TAC or ScATCC (Mil) to take any corrective action earlier than they did.

HQ AIR (TRG) comments that it was unfortunate that the pilot was given a frequency change so close to his level-off altitude. It appears that this contributed to his distraction from the priority task of levelling at the assigned level. The Hawk T1 is a rudimentary ac with no autopilot or altitude warning system and so maintenance of cleared levels requires a high degree of concentration and task prioritisation. This event appears to be more of a level bust than an Airprox.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the Hawk pilot, transcripts of the relevant LAC and LATCC (Mil) RT frequencies, radar video recordings, reports from the controllers involved and reports from the appropriate ATC and ac operating authorities.

The Board noted the absence of a report from the A320 pilot, which did not show the company in a good light and denied the Board the A320 pilot's perspective. However, Members accepted that the A320 crew had virtually no impact whatsoever on the outcome of this incident and in the Board's view, their assessment was no less valid without it.

The reports from ATSI and HQ 1GP BM SM confirm that co-ordination had been agreed between LJAO NW and LAC S4 to ensure that the stipulated vertical separation of 2000ft would be maintained between the Hawk climbing to FL350 and the A320 maintaining a level cruise at FL370. Having been instructed to climb to this co-ordinated level and switch to ScATCC (Mil), the Hawk pilot reports candidly that he then became distracted by a number of in-cockpit tasks and did not monitor his level effectively. This resulted in the Hawk pilot climbing above his assigned level of FL350 to a maximum of FL359 Mode C, the GDF radar recording revealed. Members commended the Hawk pilot for his frank account and accepted that his altimeter had indicated that his ac had only ascended to FL357, which was within the allowable tolerance for verified Mode C of +/-200ft. When he realised what had occurred, the Hawk pilot reaffirmed his cleared level with ScATCC (Mil) and descended to FL350, which Members recognised was achieved well before the stipulated horizontal separation of 5nm against the A320 could have been breached. It was clear that the S4 controllers had spotted the Hawk's excursion above FL350 in good time and were also alerted by the activation of STCA. Unfortunately, this occurred whilst the Hawk pilot was switching between the LJAO NW and ScATCC (Mil) frequencies, therefore it was not until the Hawk pilot established contact that the ScATCC (Mil) controller could interject; by that stage, however, the Hawk pilot had already realised the situation. This switch between controllers also impinged on S4's ability to check what was happening. For their part S4 TAC had wisely passed TI to the A320 crew beforehand, who had acquired the Hawk on their TCAS display. Thus despite S4 being justifiably concerned about what the Hawk pilot was doing, the situation was quickly resolved before any erosion of separation occurred. The Board agreed unanimously that this Airprox had resulted because the Hawk pilot climbed above his co-ordinated level giving the LAC S4 controllers cause for concern. However, as vertical separation was not less than 1100ft based on the ac's Mode C indications and potentially slightly more, which increased as the extant horizontal separation decreased, the Members agreed unanimously that no Risk of a collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Hawk pilot climbed above his co-ordinated level giving the LAC S4 controllers cause for concern.

Degree of Risk: C.

AIRPROX REPORT No 2010155

AIRPROX REPORT NO 2010155

Date/Time: 6 Oct 2010 1501Z

Position: 5641N 00230W (3nm SW Montrose)

Airspace: SFIR (Class: G)

Reporting Ac Reported Ac

Type: PA28 GR4

Operator: Civ Trg HQ AIR (OPS)

Alt/FL: 2000ft NR

(QNH) (RPS)

Weather: VMC CLBC VMC NR

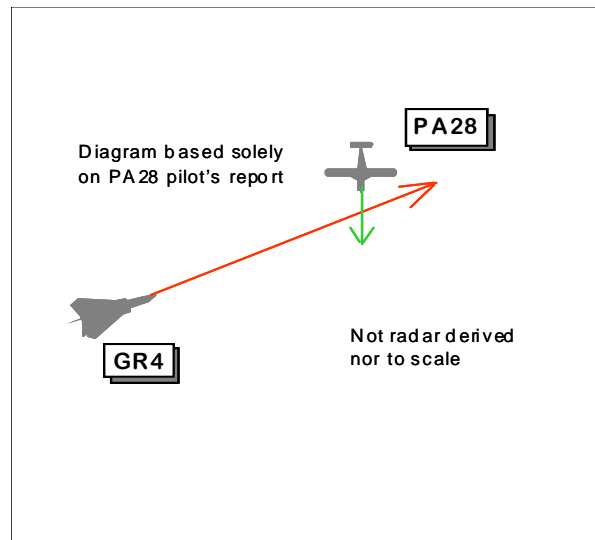
Visibility: >10km NR

Reported Separation:

150ft V Not seen

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA28 PILOT reports flying a dual training sortie from Dundee, VFR and in receipt of a BS from Dundee on 122.9MHz, squawking 7000 with Mode C. The visibility was >10km flying 1000ft below cloud in VMC and the ac was coloured white with black/red/blue stripes; nav, landing and strobe lights were all switched on. Whilst in the area close to Kinnell [disused aerodrome 7nm SW of Montrose] at 2000ft QNH he rolled out from a L turn onto heading 180° at 100kt and saw a Tornado GR4 at the same level in his 2 o'clock range 1-1.5nm closing quickly on a crossing track. He took control and initiated an avoiding action descent, levelling at 1400ft after the traffic had passed about 100-150ft above. The GR4 was remaining constant in the window initially until the avoiding action was taken. He assessed the risk as high.

THE GR4 PILOT reports being made aware of the Airprox 6 weeks post incident. At the time he was leading a formation of 2 ac on a pairs low-level conversion sortie. None of the formation members reported seeing any light ac in the vicinity of Montrose where the Airprox occurred. The formation did route through the area autonomously, operating at 250ft MSD although they routinely climb to 1000ft agl when crossing coasts.

UKAB Note (1): The GR4 was traced by the RAC but the pilot involved was away on exercise, which led to the delay in completing a report.

ATSI reports that the Airprox was reported by the pilot of a PA28 and occurred at 1500 UTC, in Class G airspace, at a position reported as 6nm to the SSE of Montrose.

The pilot of the PA28 reported being in receipt of a BS from Dundee Tower. Dundee ATC were operating combined Tower and Approach control positions without the aid of surveillance equipment.

METAR EGPN 061450Z 23018KT 9999 -SHRA FEW030 SCT045 13/09 Q0997=

The PA28 was operating from Dundee airport on a local VFR flight to the E of the airfield and before departure was passed QNH & QFE 997 and advised that Danger Area D604 was active up to 2000ft. The PA28 departed from Dundee RW27 at 1431 and was in receipt of a BS. The Manual of Air Traffic Services Part 1, Section 1, Chapter 11, Page 4, Paragraph 3.1.1, states:

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

The ATSU were not immediately aware that an Airprox had occurred and no RT reports were made by the pilot of the PA28. At 1520:25 the PA28 pilot called Dundee Tower and requested rejoin. The PA28 landed on RW27 at 1531.

HQ AIR (OPS) comments that without comprehensive radar coverage and any knowledge of the incident by the GR4 the actual separation is hard to assess. There are known limitations with see and avoid operations in Class G airspace and this may well be another example where 2 ac came quite close without both being visual. As the PA28 was squawking the fitment of a CWS to the GR4 could have improved situational awareness and separation.

UKAB Note (2): The radar recording for the period does not capture the Airprox owing to poor radar coverage. From 1450-1458 a 7000 squawk is seen manoeuvring between Kinnell disused aerodrome, the coast to the E and Montrose to the N. This is believed to be the PA28, its Mode C indicating a maximum of FL037 (approximately 3200ft QNH 997mb) and a minimum of FL024 (1900ft QNH). During the same period a 7001 squawk, the GR4 Lead ac, and an intermittent primary only return are seen manoeuvring off-shore, well to the SE of the PA28, the 7001 squawk showing a similar height band. Then between 1458 and 1501 the PA28 manoeuvres between FL026 and FL024, turning on a S'ly track before fading from radar. Meanwhile the GR4 lead ac tracks NWly before fading as it coasts in, Mode C showing FL019 (1400ft QNH) on track to pass about 4nm S of the PA28. A primary only return pops up 6nm astern of the GR4 Lead ac also tracking NW but fades 40sec later 3nm before the coast. Just over 1min later the PA28 reappears level at FL025 (2000ft QNH) manoeuvring to the E of Kinnell disused aerodrome before fading again 1min later tracking NW. Twenty seconds later the GR4 Lead ac reappears, 2nm NW of the position where the PA28 faded, tracking SE climbing through FL022 (1700ft QNH) before coasting out and turning NW'ly and changing to a Scottish Mil assigned code at FL50.

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.

Members could add little to this incident. The radar recording shows the 2 GR4s operating off-shore before turning towards the Kinnell area and descending; however, neither of the subject ac show at the same time to capture the incident. As the Airprox occurred in Class G airspace, both crews were responsible for maintaining their own separation from other ac through 'see and avoid'. The PA28 instructor had seen a single GR4 approaching 1-1.5nm and taken action; however, the GR4 crew did not recall seeing a light ac in the area and Members agreed that it was this non-sighting that had caused the Airprox.

Turning to risk, the PA28 instructor had limited options open to him to avoid the GR4, owing to the limited performance compared with the fast moving jet. He had elected to descend, estimating the GR4 passed 100-150ft above, and his presence had gone unnoticed by its crew. Taking these elements into account, the Board concluded that safety had been compromised during this incident.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the GR4 crew.

Degree of Risk: B.

AIRPROX REPORT No 2010156

AIRPROX REPORT NO 2010156

Date/Time: 12 Oct 2010 1254Z

Position: 5154N 00016E
(1.75nm NE Stansted - elev 348ft)

Airspace: ATZ (Class: D)

Reporting Ac Reported Ac

Type: A319 C152

Operator: CAT Civ Club

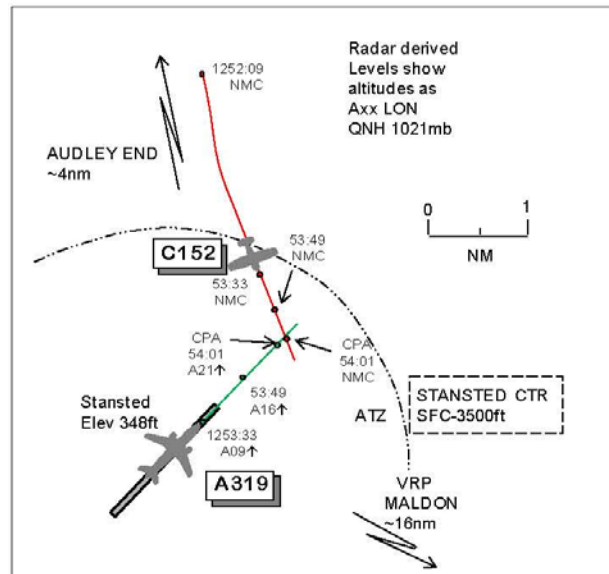
Alt/FL: 1500ft ↑ 1300ft
(QNH 1021mb) (QNH 1022mb)

Weather: VMC CLBC VMC CLBC

Visibility: >10km 10km

Reported Separation:
700ft V/Nil H NR

Recorded Separation:
<0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A319 PILOT reports outbound from Stansted, IFR and in receipt of an Aerodrome Control Service from Stansted Tower on 123.8MHz, squawking 7707 with Modes S and C. Upon lining up on RW04 they were advised of light ac traffic (the subject C152) transiting the CTR not above 1500ft with a clearance to remain N of the RW and cross the RW04 threshold; however, it did not comply with this clearance. They had TCAS contact with the C152 whilst on the ground and were cleared for take-off. The C152 ac was Mode A transponder equipped so was not giving altitude readings. Heading 040° at 140kt they visually acquired the C152 shortly after take-off and it became apparent that the flight was not conforming to its clearance as it was tracking to cross the climb-out path at a distance of 1.5nm to the NE of RW22 threshold, level at 1500ft QNH. They received a TCAS TA which he was certain would have been an RA had the C152 been squawking Mode C. As they climbed through 1500ft he estimated lateral separation was 1nm. The C152 proceeded on its track below them and seconds later they passed O/H it with lateral separation of virtually zero and vertical separation of about 700-800ft. ATC's only intervention was to ask the C152 pilot if she preferred RW22 threshold for transit. Since he was able to maintain visual contact and considered collision unlikely they remained on the SID; no avoiding action was taken but safety was compromised. This separation was by luck, not design, so if the flight had been heavier or had used an intersection departure, separation would have been significantly less and it could have been very dangerous.

THE C152 PILOT reports en-route from Duxford to Henlow, VFR and in communication with Stansted Tower on 123.8MHz, squawking an assigned code with NMC. The visibility was 10km flying 1000ft below cloud in VMC and the ac was coloured white/purple; no lighting was mentioned. Routeing from Duxford via VRP Audley End [7nm N Stansted] and then VRP Maldon [19nm SE Stansted] she had been cleared to transit N of RW04 threshold at Stansted not above 1500ft on 1022mb. She accidentally approached the wrong end of the RW (22 threshold) at 1300ft and when she realised it was too late to change course. An A319 was on the RW as she approached and it began to take-off so she remained on heading 130° at 90kt and 1300ft and the A319 climbed well above. There was little noise and she felt no wake turbulence. She stated that she was a low-hours PPL pilot and this was her first zone transit. She apologised for this mistake and has taken action to address it with the Flying Club CFI.

THE C152 FLYING CLUB CFI reports that following this incident the pilot immediately notified him and the event was gone through to ensure she recognised and understood her mistake. Following on from this he has made several dual instructional training flights with the pilot including a VFR zone transit O/H an international airport to ensure she is fully aware of her mistake and to reinforce the correct procedures. Also included was more RT instruction for transit clearances and emphasis on understanding and querying if necessary.

THE STANSTED AIR CONTROLLER reports accepting the subject C152 VFR not above altitude 1500ft from Audley End and intending to route it via the RW04 threshold and then to the SE. The flight was transferred to the

AIR frequency when the ac was 2nm S of Audley End and she instructed it to route towards the 04 threshold and to remain N of the RW. In the same transmission she gave TI on the A319 which was about to take-off, but had not yet been given take-off clearance, on a CPT 2S departure. She then passed TI on the C152 to the A319 flight, which was acknowledged, and she then issued take-off clearance. She was not visual with the C152 owing to reflections of the sun but from the ATM she could see the ac routeing towards the RW22 threshold. At this point she asked the C152 pilot if she was visual with the A319 and if she would prefer to route via the RW22 threshold. AIR became visual with the C152 just as it was routeing beneath the A319 and crossing the RW22 threshold. The A319 crew reported that it was close to confliction.

ATSI reports that the Airprox occurred at 1254:01, 1.8nm to the NE of Stansted Airport, within the Stansted Aerodrome Traffic Zone (ATZ), Class D airspace, which has a radius 2.5nm and extends from the surface to 2000ft above aerodrome level.

VFR ac inbound or intending to transit the Stansted CTR or CTA are required to contact LTC Essex Radar 5min before the CTR/CTA boundary.

The A319 was an IFR flight departing from Stansted following a CPT 2S SID to Alicante and the C152 was a VFR flight from Henlow to Duxford. The radar recording shows the C152 displaying an SSR code without Mode C reporting.

The initial part of the CPT 2S SID is promulgated as 'Climb straight ahead. At I-SED D2 (BKY VOR R119) turn left onto BKY VOR R102 by BKY D7 to BKY VOR. Crossing BKY VOR R102 D5 at 3000 or above.'

The Stansted Air controller (Tower) reported being well rested prior to the start of shift at 1230. The controller had been on duty for 20min before the incident, reporting workload as light, in good Wx with very sunny conditions. All equipment was reported as serviceable and RW04 was the notified RW in use.

Audley End is situated 7nm N of Stansted Airport and Maldon VRP is situated 18nm to the SE of Stansted Airport and are shown on the UK AIP Stansted CTR and CTA chart, AD 2-EGSS-4-1 (22 Oct 09).

METAR EGSS 121250Z 01009KT 9999 SCT023 14/09 Q1021=

At 1247:50 the C152 flight contacted Radar, requesting a zone transit, "*(C152)c/s a Cessna one five two from Duxford to Henlow via V R P Maldon at two thousand feet over Audley End request zone transit.*" Radar issued a squawk 0201 and asked the pilot to confirm the requested routeing was via VRP Maldon. The C152 pilot confirmed this routeing and Radar then identified the C152 at Audley End, passing the QNH 1021mb. The C152 pilot requested a BS and Radar responded, "*Roger Basic Service you have report when you have Stansted Airfield in sight do you er do you wish to transit via the zero four threshold confirm.*" The pilot replied, "*Affirm (C152)c/s.*"

At 1249:55 Radar passed the C152 flight a clearance to transit the Stansted CTR, "*(C152)c/s roger you are clear to transit the Stansted Control Zone not above altitude one thousand five hundred feet V F R initially to remain one mile to the north of Stansted Airfield report visual with Stansted.*" The C152 pilot responded, "*Not above one thousand five hundred feet er at Stansted er one nautical mile and (C152)c/s.*" It was not clear if the C152 pilot fully understood the clearance to remain 1nm N of Stansted airfield and Radar did not challenge the incomplete read back.

At 1250:00 Radar advised Tower about the C152 at Audley End, squawking 0201, requesting a transit of the ATZ via the 04 threshold. Tower acknowledged the details and agreed for the transfer of control once the C152 pilot reported visual with the airport.

At 1250:42, Essex Radar advised the C152 flight, "*(C152)c/s now inside controlled airspace radar control service Q N H one zero two one.*" The pilot replied "*Affirm radar one zero two one (C152)c/s.*" Radar then passed full details of the C152 to the Tower giving c/s, not above 1500ft, VFR outbound from Duxford and routeing to the SE of Stansted. Radar did not advise the Tower controller that the C152 flight had been instructed to remain 1nm N of Stansted airfield. The C152 pilot reported visual with Stansted and was then transferred to the Tower (1251:20).

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Meanwhile at 1251:00, Tower instructed the A319 flight to line up, *“(A319)c/s Stansted Tower via hotel one line up runway zero four”* and the A319 crew responded: *“Via hotel one line up and wait runway zero four (A319)c/s.”* Radar recording showed the C152 position to be 6.2nm N of the airfield.

At 1251:42, the C152 flight called Tower, *“Stansted tower good afternoon (C152)c/s is with you from Essex Radar.”* Tower replied, *“(C152)c/s Stansted Tower good afternoon you can route towards the zero four threshold remaining to the north of the runway traffic about to depart is a (A319 operator) three one nine will be routeing to the west.”* The C152 pilot replied, *“Zero four stay north of the runway er copy traffic (C152)c/s.”* No RW in use had been stated and it was not clear if the C152 pilot fully understood the TI regarding the A319 departing to the W. Immediately after this at 1252:10, the Tower controller passed TI to the A319 crew, *“(A319)c/s traffic is a Cessna one five two currently two miles to the east of climb-out it will be routeing towards the zero four threshold it's not above altitude one thousand five hundred feet VFR.”* The A319 crew replied, *“Copy the traffic (A319)c/s.”* Later, when discussed, the Tower controller accepted that the TI passed was incorrect and should have been passed as N of the climb-out. The controller had not acquired the C152 visually but the ac was displayed on the ATM. The radar recording showed the C152 was 4nm NNE of the airfield. The Tower controller had an expectation that the C152 would remain N of the airfield routeing to the 04 threshold. At 1252:25, the A319 flight was cleared for take-off RW04 with the surface wind 030/10 knots, which was read back correctly.

At 1253:01 as the A319 was rolling, a vehicle, c/s Ranger 1, requested permission to enter the RW to check on a surface repair. At 1253:15 the Tower gave the vehicle a conditional clearance: *“Ranger one roger after the departing (A319 operator) enter runway zero four at Papa Romeo.”* This was acknowledged correctly by Ranger 1. Radar recording showed the C152 was 2.5nm NNE of the airfield. At 1253:27, as the A319 became airborne, the radar recording showed the C152 tracking 170° without Mode C, 1.4nm N of the RW extended centreline and 2nm NNE of the airfield. The controller continued to believe that the C152 would turn and route N abeam the airfield. Tower asked the C152 flight, *“(C152)c/s confirm you're visual with the departing traffic.”* The pilot responded: *“Affirm visual (C152)c/s.”*

The Tower controller reported that it had been difficult to obtain an early visual sighting of the C152, which was being monitored on the ATM. The controller believed that the C152 would turn downwind N of the airfield and indicated that locally based helicopter pilots, familiar with procedures, often route downwind, quite close to the airfield. However, fixed-wing ac transiting the ATZ are less frequent and the controller felt this may have been an important factor that influenced the expectation, even at a late stage, that the C152 would remain N.

At 1253:33, the radar recording showed the A319 appear at the end of RW04, passing altitude 900ft, with the C152 in the A319's 11 o'clock position at 1.6nm, crossing L to R. The Tower controller then acquired visual contact with the C152 and considered that the C152 might be able to route behind the A319. Consequently at 1253:48 the Tower controller transmitted, *“And (C152)c/s er would you prefer to cross at the two two threshold or the zero four.”* The C152 pilot replied, *“Two two (C152)c/s.”*

At 1254:01, the A319 crew reported: *“Yeah that was a bit late he er I think he'd already chosen the two two and was er almost a confliction on our departure there actually (A319)c/s.”* This was acknowledged by the Tower controller and the A319 was transferred to Stansted Director.

[UKAB Note (1): The CPA occurs at 1254:01; the C152 is now in the A319's 1230 position range 0.1nm, the A319 now climbing through altitude 2100ft.]

The controller, asked to consider any action that could in future prevent such an incident, believed that instructing the C152 flight to carry out an orbit would have prevented the incident. It was only after the incident that it became apparent that the C152 pilot was mistakenly routeing to the wrong threshold. In addition the controller felt that the establishment of intermediate VRPs for fixed wing ac routeing N and S of the airfield, would enhance procedures, but accepted that this might be difficult to achieve, owing to the lack of geographical features.

As a result of the Airprox the ATSU have recommended that difficult VFR/IFR scenarios be introduced into the annual Training in Unusual Circumstances and Emergency (TRUCE).

The ATSU have recommended that CAA review MATS Part1 guidance with a view to ensuring that the relevant Section 3 (Approach Services), Chapter 4 (Integration of VFR/IFR flights in Class D airspace) entry is re-iterated

in Sections 1 (Air Traffic Services) or Section 2 (Aerodrome Services) as required, particularly for the benefit of single-rated controllers.

As a result of the Airprox NATS Swanwick LTC, have reviewed procedures for the integration of VFR/IFR, resulting in the issue of a MATS Part 2, Supplementary Instruction SI133/10 LTC, effective from 02/12/10. This outlines the procedures that should be employed for the coordination of low-level flights into or through the London City, Stansted, Luton and Gatwick CTR/CTAs.

Both the Radar and Tower controllers had instructed the C152 pilot to remain N of the airfield and route towards RW04 threshold. The pilot was inexperienced and had accidentally routed to cross RW22 threshold. This was considered to be the primary causal factor which, in the absence of any corrective action, allowed the C152 pilot to continue into conflict with the departing A319. A number of breached safety barriers allowed the pilot's mistaken assumption and misunderstanding to continue unchecked; these are listed below.

The coordination between Radar and Tower regarding the clearance to transit was not clear. The pilot's incomplete read backs went unchallenged. AT SIN 183 (05 May 10) refers to 'effective monitoring of pilot read backs and RT discipline' and paragraph 1.1 states:

'There have been several serious incidents recently to which a major contributory factor was the controller not identifying and correcting mistakes made by pilots during read backs of an ATC clearance or instruction.'

More accurate TI would have aided the situational awareness of both the C152 and A319 pilots. MATS Pt1, Appendix E, Page 2, paragraph 1.1, states:

'...the information and instructions transmitted are of vital importance in assisting in the safe and expeditious operation of aircraft. However, the use of non-standard procedures and phraseology can cause misunderstanding.....'

The C152 reached a point when the possibility of a conflict would have been apparent to the Tower controller. CAA ATSI considered that at this point, the Tower controller did not provide appropriate instructions to assist the pilots in avoiding the conflict and this was considered to be a contributory factor; therefore the controller must bear partial responsibility for the Airprox occurring. MATS Part1, Section 2, Chapter 1, Page 1, Paragraph 2.1, states:

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

aircraft flying in, and in the vicinity of, the ATZ;

aircraft taking-off and landing."

The opportunity to issue appropriate instructions and resolve the situation was missed. Once the A319 became airborne it was too late.

CAA ATSI recommends that the CAA should consider a review of the MATS Part 1, Section 3, Chapter 4, guidance (Integration of IFR/VFR traffic in Class D airspace), with a view to re-iterating guidance within sections 1 or 2 as required, particularly for the benefit of single-rated ATCOs. MATS Part 1, Forward, Page 1, paragraph 1.1, states:

'Operational controllers are expected to have a detailed knowledge of Sections 1 and 5, together with the same degree of knowledge of those Sections appropriate to their licence....'

CAA ATSI recommends that Stansted ATSU review coordination procedures and the phraseology used for zone transit clearances, with a view to ensuring that, when required, they reflect any appropriate clearance limit imposed.

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.

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Members agreed with the ATSI viewpoint that the root cause of this Airprox was that the C152 pilot did not comply with the ATC instruction to route via the RW04 threshold and flew into conflict with the A319. The initial plan instigated by Essex and subsequently transferred to Tower had been good; however, it was poorly executed. Although Essex Radar did not tell Tower that the C152 flight had been instructed to remain 1nm N of Stansted, the subsequent instruction issued by Tower to route towards the RW04 threshold remaining N of the RW, after the pilot's initial call on frequency, superseded the previous Essex clearance. Members believed that the timeline of events showed that when the A319 flight was cleared for take-off, the situation was safe. Although the TI given to the A319 flight had been erroneous with respect to the C152's position relative to the climb-out, the crew had seen the C152 on TCAS and were aware of its intended flightpath. Tower did not advise the C152 pilot which RW was in use and the information that the A319 was departing to the west could have contributed to the pilot becoming confused; however, the C152 pilot subsequently saw the A319 on the RW before it took off, thereby removing any ambiguity. There appeared to be no reason for Tower to doubt that the C152 pilot would not comply with the clearance; the controller was anticipating the ac to turn downwind when close to the aerodrome. However, Members expressed concern because Tower was attempting to provide reduced separation in the vicinity of the aerodrome, which was dependant on the controller seeing both ac visually and continuously. Although the C152 could not be seen visually from the VCR, the ac's track was there to be 'seen' from the ATM and the information displayed should have alerted the controller to the fact that the C152 was routeing to pass to the E of RW22 threshold. This was an opportunity to challenge the intentions of the C152 pilot; however, Tower only asked the C152 pilot for confirmation that she was visual with the A319 and received a reply of "affirm...". By now the C152 was entering the ATZ NNE of Stansted but still tracking SSE'ly towards the climbout. Members believed that Tower could and should have clarified the situation to ensure that the C152 pilot was going to act in accordance with her 'mental model' by asking the pilot if she was going to turn downwind and/or by issuing a positive instruction to alleviate the situation. As it was, after Tower visually acquired the C152, she believed that the C152 would be able to pass behind the A319, which was already above the C152's altitude and climbing, and offered the C152 pilot routeing via the RW22 threshold. . Members agreed that Tower could have done better but her actions had not been a causal factor in the incident.

Turning to risk, the C152 pilot had, for whatever reason, not assimilated the ATC clearances issued and, after sighting the departing A319, elected to continue on track in the belief that it was too late to take action. Fortunately the A319 crew had good SA and had located the C152 on TCAS prior to departure. Immediately after take-off the crew visually acquired the C152 and quickly realised that it was in potential conflict, reinforced by a TCAS TA. They monitored the C152's flightpath and continued on the SID after assessing that collision was unlikely. Members agreed with the A319 crew's assessment that this had had the potential for being a much more serious incident. Nevertheless, the visual sightings by both crews and actions taken by the A319 crew combined with the geometry that pertained were enough to persuade the Board that any risk of collision had been quickly and effectively removed.

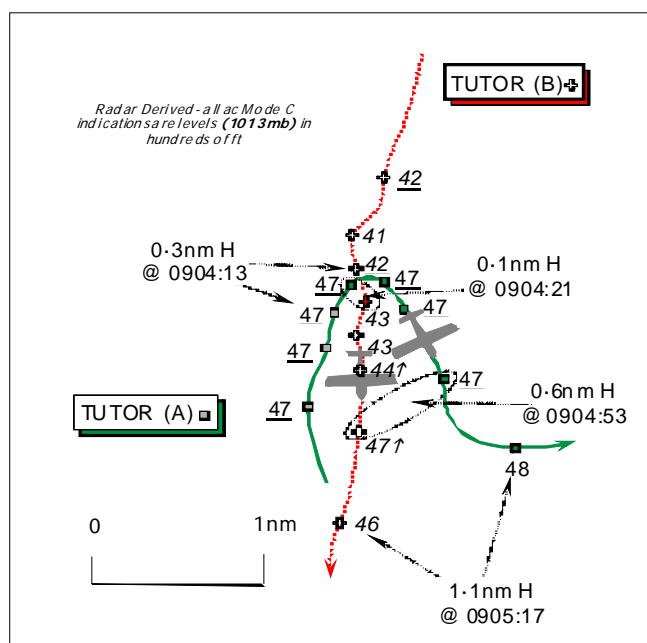
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The C152 pilot did not comply with the ATC instruction to route via the RW04 threshold and flew into conflict with the A319.

Degree of Risk: C.

AIRPROX REPORT NO 2010158

Date/Time: 12 Oct 2010 0904Z
Position: 5252N 00024W
 (8nm SE of Barkston Heath - elev 367ft)
Airspace: Lincolnshire AIAA (Class: G)
Reporting Ac Reported Ac
Type: Grob Tutor T Mk1 Grob Tutor T Mk1
Operator: HQ Air (Trg) HQ Air (Trg)
Alt/FL: 5000ft 5000ft
 RPS RPS
Weather: VMC CLBL VMC CLAC
Visibility: 10km 40km
Reported Separation:
 200ft V/nil H 300ft V
Recorded Separation:
 Nil V @ 0.6nm H
 400ft V @ 0.1nm Min H

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

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

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

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

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

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

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

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

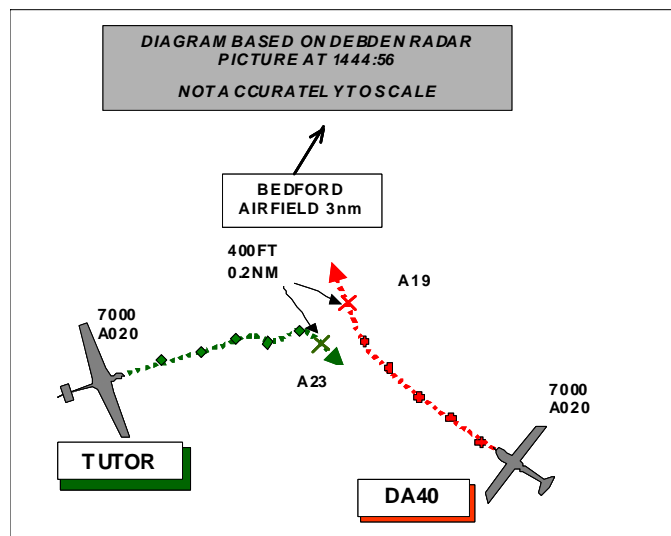
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT NO 2010159

Date/Time: 12 Oct 2010 1445Z
Position: 5205N 00026W
 (3nm SSW Bedford Airfield)
Airspace: Lon FIR (Class: G)
Reporting Ac Reported Ac
Type: Grob Tutor DA40
Operator: HQ Air (Trg) Civ Pte
Alt/FL: 1800ft 2500ft
 (RPS 1014mb) (NK)
Weather: VMC HZBC VMC CAVOK
Visibility: 20km >10km
Reported Separation:
 50ft V / 200m H 0 V/400m H
Recorded Separation:
 400ft V / 0.2nm (370m) H (See UKAB Note (1))

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE GROB TUTOR PILOT reports flying a dual navigation training flight in receipt of a BS from Cottesmore, squawking 7000 with Modes C and S; TCAS was not fitted. They were heading 100°, out of sun, at 120kt and at 1800ft on the RPS conducting a teaching exercise when the captain saw a white, low-winged, single-engined ac, with a T tail, 300m away in their 12 o'clock position, crossing from R to L at a similar level. He immediately initiated a climbing break to the right to pass behind the ac, which was not seen to manoeuvre.

He assessed the risk as being Medium and reported the incident to Cottesmore Zone.

THE DA40 PILOT reports flying solo on the return leg of a private, VFR flight from North Weald to Sywell, in receipt of a BS from Farnborough North and squawking as directed with Modes C&S; PCAS was carried. Approaching Bedford, Farnborough terminated the radar service due to his approaching the edge of their radar cover and instructed him to change squawk from 5036 to 7000. He was heading 305° at 118kt and no immediate traffic had been advised but almost immediately on changing to 122.7 (Sywell) and squawking 7000, he saw a low-wing single-engine ac, 400m away in shallow climb (nose high) in his 10 o'clock. No PCAS warning or alert was given but he disconnected the autopilot and initiated a descending R turn; after a few seconds other ac made a hard R turn and passed behind him. He estimated that the ac passed about 400-500 metres away. He thought that had both ac not reacted there could have been a collision but due to the reaction the risk was low.

ATSI reported that the DA40 had left the Farnborough frequency at the time of the incident.

HQ 1GP BM SM reports that the Tutor was in receipt of a BS from Cottesmore Zone at 1800ft, around 3nm SSW of Bedford airfield and the Airprox was declared on their frequency. The Cottesmore investigation showed that although both the reported and reporting ac might have been operating on Zone frequency both ac were operating below the base of Cottesmore radar coverage; consequently, Zone were unable to provide TI.

UKAB Note (1): The recording of the Debden radar shows the incident as depicted above. Both ac are squawking 7000 with Mode C, both are showing an alt of 2000ft in the lead up to the CPA and the ac are on a collision course. The Tutor's right, upwards break and the DA40's descending right turn are both evident on the radar recording and generated a miss-distance of 0.2nm and 400ft.

UKAB Note (2): Since the Grob was squawking with Mode C throughout, it cannot be explained why no PCAS warning was enunciated.

AIRPROX REPORT No 2010159

HQ AIR (Trg) comments that this was a conflict in Class G resolved by both pilots but contributed to by late sightings. It is noted that the DA40 pilot appears to have expected that his BS would have provided him with TI on the Tutor. As such, he may have had a false expectation that there was no traffic to affect and not prioritised lookout so highly as a result; this may have applied equally to the Tutor crew who were also under a BS from another unit. It is disappointing that the Tutor crew only spotted the conflict when it was in their 12 o'clock, probably after the conflict had been resolved by the DA40.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that both pilots were operating legitimately in Class G airspace where the 'see and avoid' principle applies; the Tutor was in receipt of a BS from Cottesmore and, until no longer practicable, the DA40 had been in receipt of a BS from Farnborough. The Airprox occurred shortly after the DA40 left the Farnborough frequency and, in the absence of a RT transcript, the Board could not know what, if anything, had been said by the controller about traffic to affect when he cleared the DA40 en-route. It was unclear whether the Farnborough controller could see the Tutor on radar; although the Tutor's squawk is visible on the recorded radar, it did not generate a warning on the DA40's PCAS. If there was a reference to traffic, Members thought that the DA40 pilot might have misconstrued the departing call from Farnborough to mean that there was no traffic in the vicinity rather than no traffic showing on the radar in his location, as intended. A pilot Member considered that the DA40 pilot's report could be interpreted to mean that he had an expectation of TI under a BS, but the CAA SRG ATS Standards advisor disagreed. However, in the event both pilots saw the conflicting traffic, although later than optimum, in time to take effective avoiding action thus ensuring that there was no risk of collision. The Board was evenly split regarding the cause, half considering that it was late sightings and the other half a conflict in Class G airspace; the Chairman opted for the latter since the pilots' sightings were such that the resulting avoiding action they took was in time to be effective.

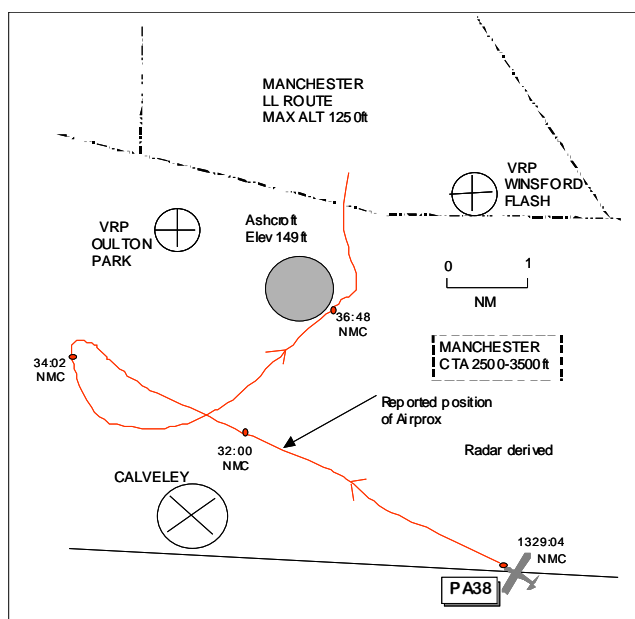
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class G Airspace resolved by both pilots.

Degree of Risk: C.

AIRPROX REPORT NO 2010160

Date/Time: 20 Oct 2010 1332Z
Position: 5308N 00235W
 (2nm S Ashcroft - elev 149ft)
Airspace: LFIR (Class: G)
Reporting Ac Reported Ac
Type: Mainair Blade PA38
 Flexwing M/L
Operator: Civ Pte Civ Trg
Alt/FL: 1200ft ↓1500ft
 (QNH 1021mb) (QNH 1021mb)
Weather: VMC CLNC VMC CLBC
Visibility: 30km >10km
Reported Separation:
 Nil V/200m H Not seen
Recorded Separation:
 NR

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE MAINAIR BLADE FLEXWING M/L PILOT reports flying a 'Permit to Fly' check flight from Ashcroft, VFR and listening out on Ashcroft frequency 122.52MHz. The visibility was 30km in VMC and the flexwing was coloured white. After climbing out from RW31 he turned onto heading 180° and levelled at 1200ft, Manchester QNH, at 60kt. About 2nm S of Ashcroft flying into very bright sunlight he first saw a PA38 in his 11 o'clock range 200m heading NW at the same altitude. He immediately commenced a tight L turn to avoid a certain collision, the PA38 passing 200m clear on his R without taking avoiding action. He assessed the risk as high.

THE PA38 PILOT reports flying solo on a qualifying cross-country between Halfpenny Green and Blackpool, VFR and in receipt of a BS, he thought, from Manchester on 118.875MHz, squawking 7366 [Conspicuity code for ac operating within 5nm of Manchester CTR maintaining a listening watch on Approach frequency] with NMC. The visibility was >10km in VMC and the ac was coloured blue/white with anti-collision light switched on. On the leg between Hixon and Winsford he was R of track at the halfway point so he altered course to the L by 16° as a correction. Past Crewe heading 305° at 2000ft QNH 1021mb and 90kt tracking to Calverley he recognised Oulton Park to the N and altered course towards it, remaining outside CAS. He commenced 2 orbits to the S of Oulton Park at 2000ft to orientate himself, identifying Winsford and Ashcroft Farm, and then he descended to 1500ft on track to Winsford to enter the LL Route at 1250ft. As he passed abeam Ashcroft he saw a M/Light on his R, which was not close, and he did not consider there to be any risk of collision.

UKAB Note (1): The PA38 was traced by RAC Mil and the pilot was contacted in early November. However the completed CA1094 was not received by UKAB until the 20th December. By then the Manchester RT recording media had been returned into service so no transcript was available; therefore ATSI did not provide a report.

UKAB Note (2): The radar recording does not capture the CPA as the Mainair Blade M/Light does not show at all. The PA38 is seen clearly throughout, tracking 290° and passing 2.2nm S of Ashcroft at 1332, the approximate position of the reported Airprox. Four minutes later at 1334:02 the PA38 is seen to have commenced a L turn 2.5nm S of Oulton Park (3nm SW of Ashcroft) and after a 270° turn the PA38 rolls out on a NE'ly heading before passing 0.5nm SE of Ashcroft at 1336:48. Thereafter the PA38 turns onto a track of 360° and passes W abeam of Winsford Flash VRP and into the Manchester LL Route.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

AIRPROX REPORT No 2010160

Although the Airprox was not captured on recorded radar, owing to the Flexwing not showing, the PA38's track is clearly seen, which broadly verifies the reported pilot's recollection of his flightpath. The PA38 student pilot had initially passed just over 2nm S of Ashcroft tracking 290°, the reported Airprox location. However, he had not seen the Mainair Flexwing at this time, only later seeing a M/Light as he passed Ashcroft after he had set course towards Winsford. Members sympathised with the student pilot, who was concentrating on his navigation by identifying ground features, which almost certainly was to the detriment of maintaining a good lookout for other traffic. Fortunately the Flexwing pilot, who was looking into sun, saw the PA38 as it approached on a NW'ly track, albeit late, and took prompt and robust avoiding action to the L, estimating separation as 200m. This action was enough to persuade the Board that any risk of collision had been quickly and effectively removed.

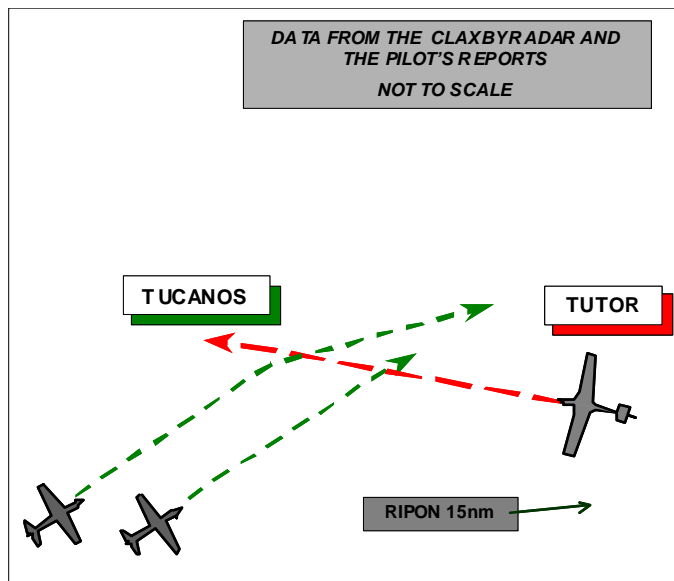
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the PA38 pilot and a late sighting by the Mainair Flexwing pilot.

Degree of Risk: C.

AIRPROX REPORT NO 2010161

Date/Time: 20 Oct 2010 1333Z
Position: 5406N 00157W
 (near Grimwith Reservoir)
Airspace: LFA 17 (Class: G)
Reporting Ac Reported Ac
Type: Tucano x 2 Grob Tutor
Operator: HQ Alir(Trg) HQ Air (Trg)
Alt/FL: 250 agl 500ft
 (RPS 1014mb) (RPS)
Weather: VMC CAVOK VMC NK
Visibility: 40km 5km
Reported Separation:
 100ft V/100ft H 250ft V/200m H
Recorded Separation:
 NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TUCANO PILOT reports that he was leading a pair of black Tucano ac with all lights switched on, on a low level formation training flight; he was squawking 7001 with Mode C and TCAS 1 was fitted. The formation was heading 050° at 240kt, authorised to 250ft msd, and flying as a ‘fighting wing pair’, when both crewmembers noted a TCAS contact indicating +500ft and about 2nm away; it quickly disappeared from the screen [no TA was reported]. Both crews attempted to acquire the contact visually and the leader, assessing that the unknown ac was likely to be descending into low level at Grimwith Reservoir, manoeuvred his ac to the NE. His wingman adjusted his formation position (150m swept on the left and slightly higher) while simultaneously trying to acquire the ‘stranger’ visually. The leader then saw a military Grob Tutor, about 700m away in his 2 o'clock and assessed that maintaining his current flight path was the best option to avoid a collision. He did not have time to warn his wingman. The No 2 pilot then saw the Tutor in his 12 o'clock at about 400m and, assessing that there was a collision risk, turned right and descended with the Tutor passing slightly left and above him at an estimated range of 100ft.

He assessed the risk as being high and reported the incident to Linton on Ouse.

THE GROB TUTOR PILOT reports that he was instructing a UAS student on a low level training sortie from RAF Leeming flying at 500ft msd, squawking 7001 with Mode C and S. While heading 290° at 120kt he saw a pair of black Tucanos with strobes 1000m away approaching from low in his 9 o'clock position.

His sighting was fairly late as there was a slight haze and the Tucanos were coming from an out-of-sun direction. With minimal manoeuvre capability available to his ac and in association with the late pick-up, the best avoidance was to continue straight ahead, as the Tucanos appeared to be at 250ft and he judged that they would pass below. The Tucanos (flying in trail formation at the time) had obviously seen his ac and manoeuvred to pass behind, so he assessed the risk as being Medium.

UKAB Note (1): The Leeming METAR was:

METAR EGXE 201250Z 31012KT 9999 FEW030 08/M04 Q1019 BLU NOSIG

UKAB Note (2): Although the Tutor shows on the radar recordings, the Tucanos do not show until after the CPA. The recording verifies however, that the geometry of the incident however, is as shown on the diagram above.

HQ AIR (Trg) comments that this was a late sighting in class G airspace. The Tucano crew made good use of their TCAS SA to initiate their concentrated scan for the Tutor. The lack of fidelity of the TCAS in azimuth and its

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imperfect operation in the low-level environment means that the crew were unable to take any more effective avoiding action. The wingman's position change was a sensible move but had the unfortunate side effect of reducing the CPA with the Tutor. The different heights flown by the two parties reduced the risk of collision significantly although the resultant separation was less than the accepted safe minima. The Tutor is a difficult aircraft to see, however all parties saw each other with sufficient time to avoid a collision and the Tutor would have also had the option to climb away from the traffic; this would have been his only effective means of avoidance. He also appeared content that the Tucanos had taken avoiding action from 1000m away so no actual risk of collision existed; however, whilst a turn to the right would have increased the lateral separation it was clear to the leader that he was going to avoid the Tutor in height. The benefit of TCAS, albeit limited, is noted.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board discussed the apparently conflicting and incomplete reports of the geometry of the incident and agreed that it had most likely been as displayed on the diagram above with the No2 Tucano moving from the left to the right side of his leader. An HQ Air Member observed that he was aware of the difficulty of assessing incidents when reports are brief; HQ Air was taking action to encourage pilots to submit comprehensive and accurate reports thus allowing thorough investigation.

Both the Tucano formation and the Tutor had been operation legitimately in the LFS at differing heights, the former at 250 ft and the latter at 500ft. That being the case, and since it was flying relatively slowly, Members agreed that the Tutor should have been visible to the Tucanos for some time (the same time as the TCAS warning). The rolling terrain however had most likely caused the ac (and therefore the warning) to disappear for a short time; when it had ceased to be obscured all pilots involved had seen the opposing ac as early as could reasonably be expected. Having reported that he saw the Tutor 700m away in his 2 o'clock, Members could not easily explain why the lead Tucano pilot reported that he did not have time to warn this No2 in formation on his right (probably), of its presence; one explanation might be that the Tutor had been significantly closer and therefore the ac crossing had happened in a short time period. Members agreed that the Tucano the Tutor pilot reported as turning to go behind him, was the No2 as this correlated with the Tucano pilot's report; that being the case Members assessed that the leader had passed ahead of and about 250ft below the Tutor.

When assessing the cause of the incident Members agreed that the pilots had discharged their responsibility to see and avoid their respective ac and the incident had therefore been a resolved conflict in the LFS and that TCAS had played a significant part in the Tucano crews acquiring the Tutor.

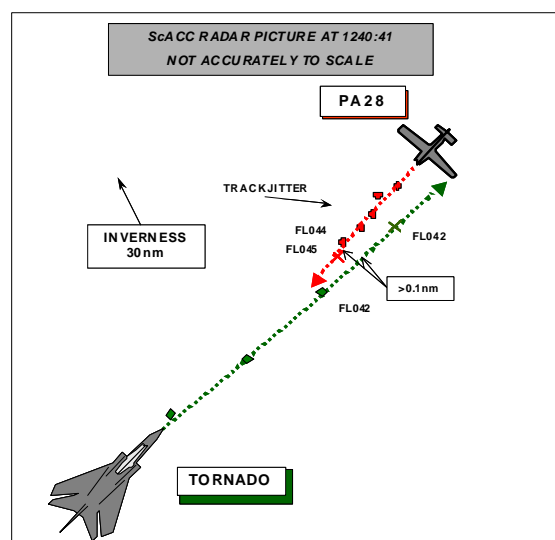
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in the UKDLFS resolved by the Tucano pilots, with the assistance of TCAS.

Degree of Risk: C.

AIRPROX REPORT NO 2010162

Date/Time: 25 Oct 2010 1241Z
Position: 5706N 00340W (Cairngorm Mountains)
Airspace: LFA14/Scot FIR (Class: G)
Reporting Ac Reported Ac
Type: Tornado GR4 PA28
Operator: HQ Air (Ops) Civ Pte
Alt/FL: 500ft agl 5500ft amsl
(RPS 1014mb) (QNH)
Weather: VMC CAVOK VMC CAVOK
Visibility: 40km >10km
Reported Separation:
100ft V/500ft H 0ft V/600m H
Recorded Separation:
200 V/ >0.1nm H (See UKAB Note (1))

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE TORNADO PILOT reports flying a low level training flight in a grey ac with HISLs and nav lights switched on, squawking 7001 with Mode C but TCAS was not fitted. While heading 040° (out of sun) at 420kt over a flat section of the Cairngorm Mountain range and in a 10° right turn, the pilot saw a blue and white, low-winged, single-engine light aircraft, 1000yd away in their 11 o'clock, flying straight and level and coming towards them. The ac was slightly high and to the left of their flight path so he rolled wings level just before the light ac passed down the LH side and no further avoiding action was taken as he assessed that it was clear that the ac would not collide.

He considered that a factor in his late acquisition of the light ac had been that the front cockpit windscreen was dirty. The option of cleaning the windscreen in flight has been removed due to the windscreen wash bottles no longer being replenished. Although the cockpit workload was low, both crewmembers attention had initially been focused into the turn to the RH side of the ac, but due to previous training and experience the pilot then chose to look to the outside of the ac turn.

He assessed the risk as being Medium and reported the incident to Lossiemouth APP on first contact.

THE PA28 PILOT reports that he was flying a green and white ac on a private flight with a passenger on a local sortie from Inverness in receipt of a BS from them. His strobes and nav lights were switched on, he was squawking 6177 with Mode C, but TCAS was not fitted. While flying straight and level, heading 280° at 100kt, he saw a fast moving green military aircraft 800m away in his 11 o'clock, he thought in a near vertical climb, so he broke right to avoid it. He reported the incident by telephone to Inverness ATC after landing and assessed the risk as being high.

UKAB Note (1): Although the Tornado does not show on the lead-up to the CPA, for 4 sweeps including the CPA, both ac show clearly, as shown on the diagram above. The CPA however, takes place between sweeps and the horizontal separation was derived by projecting the ac positions.

HQ AIR (Ops) comments that this was another incident in Class G airspace where the fitment of TCAS to either ac would have increased the pilots situational awareness and may have allowed a greater separation distance to be achieved. It is disappointing that, having identified that he had a dirty windscreen, the GR4 pilot considered it appropriate to continue with the low flying exercise.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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Members agreed with HQ Air that, had the Tornado windscreen become so dirty during the flight that forward vision was reduced, then the ac should have been climbed out from low level and returned to base under IFR.

The Board was informed by the Secretariat that the terrain in the area of the incident is about 4000ft amsl; therefore the altitudes reported by the respective pilots are consistent. Further, it was thought most unlikely that a Tornado would have been in a 'near vertical climb' as reported by the PA28 pilot at such a low alt.

Both ac had been operating legitimately in Class G airspace where the pilots had an equal and shared responsibility to see and avoid other ac; Members assessed how the respective pilots/crew had acquitted this responsibility.

Members noted that the PA28 had been in receipt of a BS from Inverness and therefore would not routinely have been passed information on other traffic; even had he asked for a TS or DS, the Board agreed that, due to the ac location, Inverness would have been unlikely to be able to provide a radar based service. Also, Inverness is not a LARS unit. With no outside warning of its presence, the PA28 pilot saw the Tornado 800m away, effectively head on. Members considered that, although the Tornado was below the horizon from the PA28 pilot's point of view, it had not been obscured by terrain (the highest terrain in immediate area is 4085ft and the PA28 reported that he was at 5500ft i.e. well above it); Members therefore agreed that the PA28 pilot could have seen the Tornado, and initiated avoiding action, earlier.

Flying at a lower altitude, the converse applied to the Tornado i.e. the PA28 was above the skyline and also not obscured by terrain. Therefore, Members agreed that it could have been seen and avoided before it had closed to 1000yd.

Although the sightings were somewhat late, both pilots had seen the opposing ac and both had taken effective avoiding action thus ensuring that there was no risk of collision.

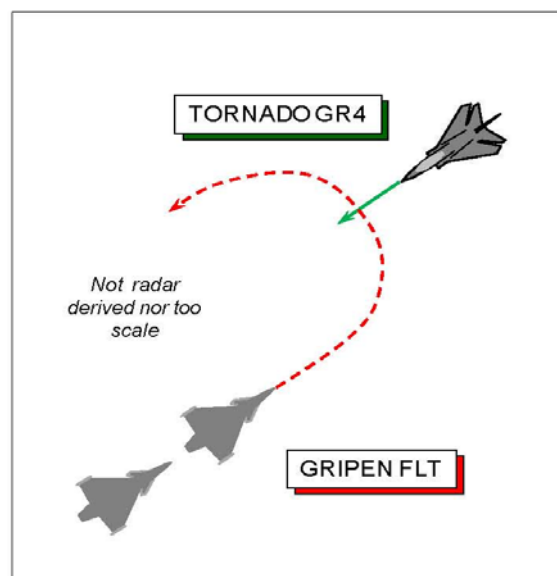
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by the Tornado crew and the PA28 pilot.

Degree of Risk: C.

AIRPROX REPORT NO 2010163

Date/Time: 13 Oct 2010 1036Z
Position: 5750N 00313W (3nm Final Approach RW23 at Lossiemouth - elev 41ft)
Airspace: MATZ (Class: G)
Reporting Ac Reported Ac
Type: Tornado GR4 SAAB Gripen x2
Operator: HQ Air (Ops) Foreign Mil
Alt/FL: 900ft 800ft
 QFE (1022mb) QFE (1022mb)
Weather: IMC IBCL VMC In rain
Visibility: 8km >10km
Reported Separation:
 Nil V/200m H Not seen
Recorded Separation:
 Not recorded

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE TORNADO GR4 PILOT reports flying an SRA at Lossiemouth having declared Fuel Priority (FP) and, he thought, under a 'radar control' service from Lossiemouth TALKDOWN under IFR. Although the recovery state was Radar to Visual, the weather conditions at base were poor with a cloud base of about 800ft.

Heading 224° at 200kt, they were descending wings level on the procedure through 900ft QFE (1000mb), in IMC, when they entered a break in the clouds about 4nm from the threshold of RW23. Simultaneously, both crew members saw a grey Gripen ac pass from L to R across their nose about 200m ahead at the same height in a banked turn away from them. As they descended below the cloud base the Gripen was seen on their starboard side maintaining height, in formation with a second Gripen that had not previously been seen by either crew member. Minimum horizontal separation was 200m, but as their Tornado descended the Gripen remained level, thereby resolving the conflict before avoiding action could be taken. They reported the close proximity of the Gripen ac to TALKDOWN and continued with the SRA, landing without further incident. At no stage were the positions of the Gripen ac passed to them by ATC. Their Ground Mapping Radar was being used to locate the RW threshold, so the Gripen was not detected before being sighted. He assessed the Risk as 'high'.

Their ac has a grey colour-scheme; the HISLs, anti collision beacons and landing lights were all on. The assigned squawk was selected with Mode C; TCAS is not fitted.

THE SAAB JAS39 GRIPEN PILOT, the wingman of the flight of two Gripen ac, reports they were on recovery to Lossiemouth after a local sortie and received the Weather State information as Colour Code WHITE [Vis >5km; Cloud SCT > 1500ft QFE] and that the recovery state was Radar to Visual.

When descending inbound they were visual with the water beneath at 1000ft QFE and were 'cleared' lower to get visual with the aerodrome. As they reached a height of about 800ft they called visual with the aerodrome and joined the cct at 200kt behind a 4-ship Gripen formation ahead. Whilst turning onto Final for RW23, under a BS, TOWER instructed the flight to 'go-around and climb to 1000ft'. The flight leader acknowledged the go-around, climbed and joined the new cct at 1000ft, where they were flying in and out of cloud that made ac separation within the flight difficult so they joined a new cct at 800ft QFE in VMC for landing. They did not have enough fuel for an ILS/TALKDOWN after their go-around and therefore stayed visual with the aerodrome.

From their point of view, ATC should have known that a go-around and climb to cct height of 1000ft meant flying in IMC. It also appears that there was not enough spacing between the traffic inbound with TALKDOWN and the Gripen flight, as there were a total of 6 ac in the circuit. They did not see the Tornado GR4 flown by the reporting pilot.

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His ac has a grey colour-scheme but the HISL was on. The assigned squawk was selected with Mode C 'on'.

THE LOSSIEMOUTH SRA CONTROLLER (TALKDOWN) was called to the ACR to carry out a SRA for the GR4 when traffic levels were quite high with a flurry of recoveries, mainly Radar to Visual from the N. Although the GR4 was FP and the crew's intentions were to land, the 2 formations of Gripens were vectored in to join the visual cct ahead of the GR4 as they were faster. The subject Gripen flight seemed to struggle to become visual with the aerodrome and he remembered looking at the Met cloud-base, which was given as SCT at 1200ft. He carried out the SRA for the GR4 and at the 4nm point was given a 'call by 2'. There were 2 primary contacts (SSR was selected off for the SRA) that looked like visual cct traffic, but as he was not given any TI on them he presumed they would not be a factor - either going around above the GR4, or extending behind it. At 3½nm from touchdown he realised the primary contacts were now crossing L - R against his GR4 SRA traffic. He called the contacts to the GR4 crew as, 'traffic was crossing now on the right possible visual circuit traffic', or words to that effect. The GR4 crew called visual so he continued the approach, obtaining and passing the final clearance - 'cleared to land, 4 on, 2 in' - at 2½nm from touchdown.

THE LOSSIEMOUTH AERODROME CONTROLLER (ADC) reports that a formation of 4 Gripens joined the visual cct at 1500ft QFE 1nm from the aerodrome due to cloud. Upon asking for descent to cct height they were instructed to do so, they then asked for 500ft. After it was established that this was necessary due to low cloud, further descent was approved on the Break. The subject flight of two Gripens then called to join and he gained visual contact as they were commencing their Break. At this time an 8 mile call was received from TALKDOWN for the GR4 to land - FP. The formation of four called Final gear-down individually and were given clearance to land with 'one on' and subsequently 'in turn'. The subject Gripen flight was instructed to go-around at cct height because radar traffic - the GR4 - was approaching 6miles, and given the position of the radar traffic. He thought, it was the flight leader [but actually the wingman] that then made a comment about climbing to 1500ft and it was eventually ascertained that the ac would be climbing to 1500ft and the wingman remaining at 1000ft as they had lost visual contact with each other [this is not reflected on the RT transcript]. The weather had deteriorated significantly at this stage, taking all of them by surprise. A 4 mile call was received for the GR4 to land and a 'call by 2' was issued. The formation of four landed and the GR4 was cleared to land '4 on - 2 in'. When visual contact was regained with the Gripen flight [after the Airprox] the GR4 was just overflying the RW23 ring road on short Final and the 2 Gripens appeared overhead. The Gripen flight then broke Downwind and upon receiving the Final gear down call was cleared to Land with one on and land in turn respectively. Once all ac were on the ground the SUPERVISOR (SUP) was informed that the visual cct had become unfit, the Duty Aircrew Officer (DAO) agreed and the visual cct was closed.

The Weather was reported to be 200/08kt; 15km in light drizzle; OVC cloud at 2200ft.

THE LOSSIEMOUTH ATC SUPERVISOR (SUP) reports that the Lossiemouth Weather State Colour Code was WHITE and on consultation with the DAO the recovery state was promulgated as Radar to Visual. There were multiple recoveries into both Lossiemouth & Kinloss with all control positions working extremely hard. The Gripen ac were on frequency, N of Lossiemouth, requesting a Radar to Visual approach. As with all foreign aircrew the APP controller was at maximum capacity ascertaining their exact requirements as well as vectoring the GR4 for an SRA - FP - to land. APP managed to vector the 6 Gripen ac so that they were visual with the aerodrome and switched them to TOWER. He then received a call from the ADC to say that the Gripens had lost visual contact with the aerodrome and were carrying out a low-level cct to land. He told the ADC to inform the DAO that he was changing the recovery state to Mandatory GCA and that the visual cct was closed. The Gripen formation landed, but the flight of 2 was sent around to allow the FP GR4 to land.

HQ 1GP BM SM reports with RT transcripts that this Airprox occurred between a Tornado GR4 recovering to Lossiemouth via an SRA that had declared a fuel priority to land and a flight of 2 Gripen jets. The declared recovery state at the time was Radar to Visual. The Airprox occurred beneath recorded radar coverage.

At 1031:25, the ADC and APP were conversing on landline about a formation of 4 Gripen ac that was positioning for a Visual join ahead of the subject Gripen flight; APP advised, "*I'm going to keep these..Gripens coming*", the ADC replying that the runway lights were required because, "*it's getting a bit scooshy out there.*" This is believed to mean that the visibility [and/or cloudbase] was considered to be dropping.

At 1032:28 the first Gripen formation of four ac joined the visual cct at 1000ft. At 1032:53 they were still the only ac in the visual cct and reported they were unable to maintain 1000ft due to cloud, which they assessed as having

a base of 600ft. On the tape transcript there is a live mic input when the ADC states, “*not fit they're looking for 500ft*”; however, it is not possible to determine who the ADC is speaking to [but possibly the DAO].

At 1033:18, the subject Gripen flight requested a join from the ADC, which was granted, with correct cct information being passed on the four Gripen ac downwind in the cct. At 1033:36, the subject Gripen flight reported on the Break for RW23 [LHC]. It is clear from the ADC's live mic retort “*where the...oh there they are*” that the Gripen flight could not initially be seen from the Control Tower and another indication of the degradation of conditions in the visual cct. At 1034:07, the first formation of four Gripen ac was given clearance to land ‘in turn’.

At 1034:34, TALKDOWN made an on channel intercom broadcast to alert TOWER to the GR4 passing 8nm from touchdown that was to land “*fuel priority*”. The ADC said to an unknown individual on a live mic at 1034:50, “*not just now...give it 10 minutes Tornado is not gonna get in fuel priority with 6 aircraft landing.*” Given that the GR4 crew had declared fuel priority, the ADC correctly accorded them priority ahead of the subject Gripen flight, instructing the Gripen flight leader at 1035:15 to, “*..go around circuit height 1 thousand feet*” that was followed by the same instruction to his wingman both of which were read back. At 1035:23, a transmission was made by the ADC to the Gripen flight leader and wingman that radar traffic, the GR4, was now passing 6nm. At 1035:29, another comment from the ADC on the open mic was captured that highlights the pressure that the controller was under, saying, “*right how many we got on the ground? Is that the third or fourth aircraft?*” This is believed to be the ADC trying to ascertain how many of the first Gripen formation had now touched down. The intercom broadcast from TALKDOWN to the ADC “*4 miles 1 thousand feet [C/S] land fuel priority*” was made at 1035:55, seeking the GR4's clearance to land. However, due to the uncertainty of the traffic situation the ADC responded, “*..call by two*”, delaying the decision on the final clearance.

At 1036:05, the transcript reveals the ADC asked, “*where's [Gripen flight lead C/S]*”. At this point the weather conditions meant that the ADC was unable to see where the cct traffic was. However, he should have still been able to utilise the Highbrite ATM to facilitate the integration of the Gripen flight and the inbound IFR GR4. Indeed, the fact that the ADC updated the position of the GR4 at 6nm to the Gripen flight indicates that he was utilising the ATM, but this Command has been unable to establish whether the ADC was able to see the Gripen flight on the Highbrite display. At this point (1036:20) the Gripen flight wingman reported “*I-M-C climbing to 1 thousand 5 hundred feet*”. However, the ADC responded to the Gripen flight giving both ac permission to descend, “*roger you may descend to 5 hundred feet for cloud*”, as the first Gripen formation had previously done so, to maintain VMC. This transmission was not acknowledged by either pilot, nor was the formation's intentions questioned by the ADC. Whilst it is impossible to determine whether the Gripen wingman climbed to 1500ft QFE, what is clear is that both ac of the flight turned across the approach lane and at least one of them was at or about 1000ft QFE.

[UKAB Note (2): The TALKDOWN transcript reflects that at 1036:13 the GR4 is “*on centreline 3 miles 7 hundred and 50 feet approaching minimum descent point*”. (The RW23 SRA Missed Approach Point is at 1nm and the MDH 500ft.) The next transmission was at 1036:23, “*on centreline contact...on your right hand side ??? [inaudible word] traffic...2 and a half miles*”.]

Based upon the reported events, the CPA occurred when the GR4 was approaching 3nm from touchdown, with the GR4 crew gaining visual contact with both Gripens at about 2½nm from touchdown as they broke through the cloud-base.

It was a reasonable assumption for the TALKDOWN controller to report that the two primary radar contacts that had been seen were visual cct traffic. However, when he perceived that the Gripen flight posed a threat to the GR4, the TI passed to the crew was not in a useable format for them to assimilate. This would explain the GR4 pilot's statement that ‘at no stage were the positions of the Gripen aircraft passed’. Furthermore, the console layout in the ACR meant that the SRA controller was on the far RHD side of the room, but unable to improve his SA by viewing the PAR or DIR's display and would have been reliant on the Supervisor [or ADC] for information on the Gripen flight.

At 1036:29, a 2½nm call was made by TALKDOWN and a clearance followed from the ADC immediately, “*clear to land four on, two in*”. The associated broadcast on the TOWER frequency was made by the ADC to visual cct traffic at 1036:36, “*Tornado 4 miles [sic] 2 miles land*” that was followed by an inaudible transmission. It is possible that the ADC was uncomfortable with the situation as at 1036:43, he immediately instructed the Gripen flight leader to “*report finals, gear down radar traffic now at 2 miles to land*” with a further warning about the GR4. At 1036:48, the Gripen flight leader stated that they were “*over threshold, 1 thousand feet VMC, now will..go around for another*”.

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approach.” However, based upon the GR4 pilot’s report, it appears that this was after the CPA with the Gripen flight almost certainly when they were Deadside and tallies with the point where the GR4 gained visual contact.

It appears that the ADC was unable to assimilate the impact of the deteriorating weather on the Gripen flight’s ability to execute the Go-around safely, believing that the instruction to Go-around ‘made’ the situation safe. Furthermore, this last transmission by the Gripen pilot indicates that they had again crossed through the approach lane for the airfield without communicating their intention to do so.

This Airprox is the epitome of a Swiss cheese barrier erosion. Supervision of the situation by both the SUP and the DAO was not robust enough to take into account the decreasing weather conditions. This meant that ac in the visual cct were unable to gain visual contact with the GR4 on instrument approach. Furthermore, the unsuitable weather conditions made it impossible for the ADC to manage the cct by visual scan alone and provide relevant information in order for the cct traffic to take appropriate action to sequence themselves against IFR traffic. That said, whilst there is evidence that information was derived from the Highbrite ATM display, its full potential was not exploited to aid integration calling into question whether the Gripens ‘painted’ on the Highbrite. Finally, the Gripen pilots although aware of the inbound radar traffic, appear to have turned across the approach lane without first ensuring that they were visual with the radar traffic, thereby removing the final barrier to the occurrence.

When the ADC stated “*it’s not fit*” after the four-ship Gripen formation leader reported needing to get below the cloud at 600ft, the ADC had an opportunity to send the subject Gripen flight back to radar. However, it is not clear whether the ADC considered this or whether it had been discounted. The SUP was in a position to realise the potential for difficulties and insist that the Gripen flight was instructed to depart the cct and return to APP. The SUP was aware that the GR4 was fuel priority and that this would shape the way that the ADC planned the integration of the visual cct with instrument traffic. Nevertheless, it is clear from the reports and RT tape transcripts that the ATC team were under considerable pressure to attempt to recover all of the ac as expeditiously as possible, in rapidly deteriorating weather conditions.

HQ 1Gp BM SM Spt recommends that the Unit review:

The safety implications of vis cct conditions and procedures for dispersing the visual cct if weather conditions are not deemed suitable.

The briefing of visiting aircrew.

UKAB Note (4): The UK MIL AIP at AD2 EGQS AD2.21 Noise Abatement procedures notes:

1. a. RW23. Visual circuit is flown outside Lossiemouth town. If it is necessary for the aircraft to go around this should be done from the end of the downwind leg provided that visual contact has been established with any aircraft carrying out instrument approaches.

UKAB Note (5): Met office archive data gives the Lossiemouth METARS as:

0950Z 25008KT 9999 FEW015 OVC022 10/08 Q1022 WHT NOSIG

1050Z 30010KT 9999-DZ SCT010 OVC022 10/09 Q1023 GRN TEMPO FEW010 BKN020 WHT

Another source gives the following special:

1016Z 28008KT 9999-DZ SCT012 OVC022 10/08 Q1023 GRN TEMPO FEW012 BKN022 WHT=

HQ AIR (OPS) concurs with HQ 1 Gp BM SM in that supervision of the situation by both the SUP and the DAO was not robust enough to take into account the decreasing weather conditions. It is disappointing that the information regarding the actual cloud base (<1000ft) was available to the ADC at 1032 that he then, at 1035, directed a formation to go around at 1000ft thereby guaranteeing that they would be unable to visually separate from the fuel priority radar traffic. Additionally, if recovering flights are caught out by unexpected deteriorations in weather and do not have the endurance to reposition for an instrument approach they should be directed to divert.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

HQ 1Gp BM SM had likened the circumstances surrounding this Airprox to one of a 'Swiss cheese barrier erosion', where all the holes had aligned thereby allowing the Airprox to develop unchecked. Although the outcome was not engineered, fortuitously the end result was not catastrophic. There were many facets to this Airprox, which the Board debated extensively. However, the absence of a radar recording illustrating the geometry and the timings of what actually occurred had hampered full understanding of all that transpired. The key factors considered by the Board were as follows:

ATC were working hard to facilitate Radar-Visual recoveries in marginal weather. The ADC was extremely busy after the Gripen flight arrived in the visual cct area, with 6 ac either in or joining the cct, all having difficulty maintaining VMC and being forced below normal cct height, with the added complication of the GR4's IFR arrival.

This rapid and unexpected deterioration in the weather, not apparently forecast, could have been acted upon earlier by any one of the supervisory team in the tower to forestall the outcome. About 2 min before the flight called to join, the ADC and APP had realised the visibility was dropping. This was an opportunity to discuss the situation with the SUP and DAO, either of whom could have initiated IFR recoveries. It seems likely that such a change would have resulted in some of the ac having to divert, and it is possible that this consequence was a factor in the controllers' and supervisors' minds. In the event, it appeared that the ADC did not appreciate just how poor the conditions had become until the 4-ship of Gripens requested to fly at 500ft in the cct to remain visual. Having realised that the cct was "unfit", there was an opportunity to initiate IFR recoveries, and to divert the subject Gripen flight at that point if they had declared that they had insufficient fuel for a PAR recovery at Lossiemouth. However, with just 30 secs between the ADC's agreement to 500ft ccts for the 4-ship and the pair's break into the cct, it was a fleeting opportunity.

The RN Member voiced concern at the absence of any dedicated ATC supervisor in the VCR. Recognising that the radar supervisor's rightful place was overseeing the watch within the ACR, at RN Air Stations a Duty Air Traffic Control Officer is established to supervise the control of aerodrome traffic, monitor the weather and manage the operation of the aerodrome in close consultation with the officer-in-charge of flying and the ATC Supervisor.

When the Gripen flight joined, the ADC was having difficulty keeping track of them visually. Subsequently, when TALKDOWN advised of the FP GR4 at 8nm to Land, the ADC elected to initiate the go-around, crucially instructing the Gripen flight to fly at the nominal cct height of 1000ft thereby instructing them to fly in cloud. Given the difficulties experienced in the cct by the 4-ship formation earlier, the ADC should have realised that this was unwise; this was the precursor to the flight split and the wingman climbing to 1500ft.

The HQ Air Ops fast-jet Member noted that other crews might have refused, or at least queried this instruction, and elected to cct at a lower height.

From the pilots' reports and METARs the in-flight visibility beneath cloud remained entirely satisfactory; it would have been preferable to have held the Gripen flight 'VMC below' on a low-level cct, making greater use of the Highbrite ATM and passing copious TI, until they had either sighted the GR4 after it broke cloud or it had been seen to pass abeam, sending them back to radar on a long downwind to do so if necessary.

ADC advised the Gripen flight that the GR4 was at 6nm, before they crossed through the approach ahead of it, but it seems the Gripen flight pilots either did not assimilate the information, were concentrating on maintaining their separation from each other while IMC, or perceived that the height specified of 1000ft would facilitate separation against the GR4 when they crossed the RW centreline into the deadside.

As it was, the No2 Gripen pilot did well to find his leader once more after his ascent to 1500ft, but this seemed to happen as the GR4 broke through cloud just as the Airprox occurred.

The GR4 pilot had little impact on the outcome; when advised of the traffic by TALKDOWN he could do no more than search for it visually and remain predictable by maintaining his course and ROD.

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TALKDOWN, who was providing a TS, was denied accurate height information from the Gripen's Mode C by operating with SSR suppressed, hence he was unable to include that crucial element within his TI, which was not transmitted clearly. It was unfortunate that the SRA console was displaced away from the PAR which would also have provided accurate height information on the Gripen flight.

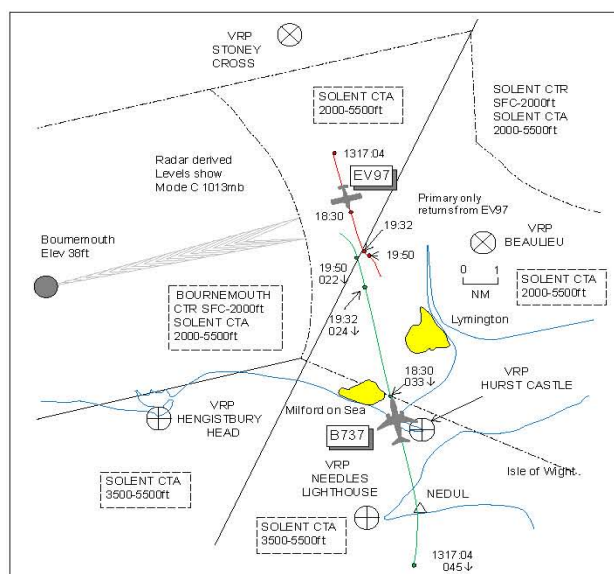
None of this was visible to the ADC from the Control Tower except on the ATM. The GR4 was not seen by the Gripen pilots before one of them crossed ahead belly up to the GR4, 200m ahead at the closest point the GR4 pilot reports. Considering all of the factors, the Board concluded unanimously that earlier intervention could have forestalled the Airprox and that the root Cause was that visual circuits were permitted in unsuitable weather conditions.

What separation that existed was purely fortuitous; the Members agreed unanimously that an actual Risk of collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Visual circuits were permitted in unsuitable weather conditions.

Degree of Risk: A.

AIRPROX REPORT NO 2010164Date/Time: 21 Oct 2010 1320ZPosition: 5048N 00136W
(9nm E Bournemouth - elev 38ft)Airspace: Solent CTA/LFIR (Class: D/G)Reporting Ac Reported AcType: B737-500 EV97 EurostarOperator: CAT Civ ClubAlt/FL: 2500ft ↓ 1500ft
(QNH) (QNH)Weather: VMC CLOC VMC CAVOKVisibility: 5nm 20nmReported Separation:
Nil V/3nm H 500ft V/1-2nm HRecorded Separation:
0.4nm**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

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

THE EV97 EUROSTAR PILOT reports en-route from Popham to Bembridge VFR and listening out on Bournemouth frequency 119.475MHz; no transponder was fitted. The visibility was 20nm in CAVOK and the ac was coloured silver; no lighting fitted. He had routed via Alderbury VFR and then turned onto heading 170° at 85mph and descended from 2000ft to 1500ft QNH to be level at Stoney Cross VFR, remaining clear of CAS. He heard ATC clearing a flight inbound over the Needles from the S descending to 2500ft or 2000ft, he was unsure. As he heard this clearance he was descending to 1500ft and once over Stoney Cross he turned slightly to pass W of Lymington and E of Milford-on-Sea (both of which he could see clearly) aiming then to turn direct for the Needles, which he could also see. Near to Stoney Cross he saw a large airliner on what looked to be a reciprocal heading in his 1230 to 1 o'clock position above the horizon at a distance of approximately 10-12nm. Although not on its projected flightpath when initially seen, or anytime subsequently, and by virtue of hearing the RT exchanges and anticipating the ac would turn W towards Bournemouth, he nevertheless turned to port (probably about 45°) to put additional lateral distance between them as a simple response to seeing another ac. The airliner continued to descend, presumably to its cleared height of 2000 or 2500ft QNH, but when he judged himself to be safely clear, he turned back onto a S'y heading, watching the airliner pass 1-2nm clear down his starboard side and about 500ft above. He did not believe he was close enough to be a cause for concern. He accepted that he knew about and had seen the other ac for some time and recognised that it's a little different if you only see something as it's passing you; also, being a Microlight, his ac was probably not very easy to spot. He did not hear ATC offer avoiding action and/or any information on his presence. Whether or not ATC were aware of his presence, he felt there was no cause for concern and he assessed the risk of collision as none.

THE BOURNEMOUTH APR reports carrying out OJTI duties and neither he nor his trainee was aware of the incident at the time. The B737 pilot did not report anything on frequency and waited until he contacted GMC. The pilot remarked about seeing an ac at a similar level as he was instructed to turn onto a closing heading for the ILS; at this stage of the approach the ac was at 2500ft and about 9nm from touchdown. Concerned that he had missed something, he contacted Solent Radar to see if they had any knowledge of an ac in that area but they did not.

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Later he viewed a radar replay and whilst the B737 was on base leg, no other ac was showing but when the B737 flight was told to turn. A non-squawking contact paints just to its E and then continues to track intermittently to the SE. He opined that had anything been seen on radar before this time he would have deemed the ac to be below the base of CAS (2000ft). It is common for light ac to transit in that area between Southampton and Bournemouth CTRs.

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

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

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

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

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

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

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

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

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

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

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

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

PART C: ASSESSMENT OF CAUSE AND RISK

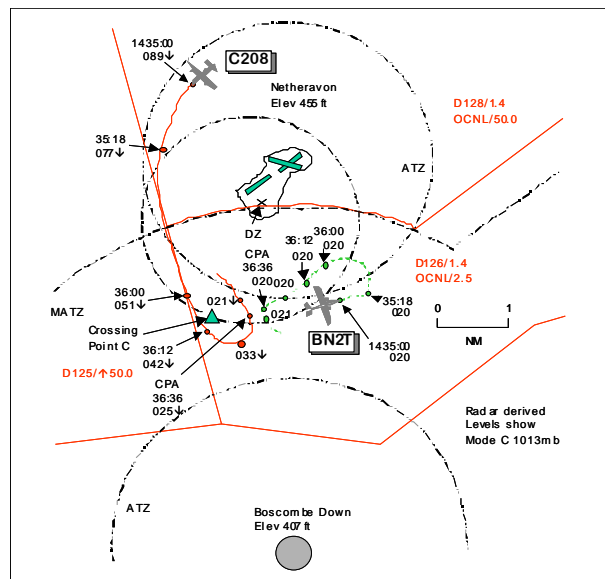
Cause: Perceived loss of separation.

Degree of Risk: C.

AIRPROX REPORT No 2010165

AIRPROX REPORT NO 2010165

Date/Time: 16 Oct 2010 1437Z (Saturday)
Position: 5113N 00146W
(2.25nm S Netheravon - elev 455ft)
Airspace: D126/Para DZ (Class: G)
Reporting Ac Reported Ac
Type: BN2T C208
Operator: Civ Comm Civ Club
Alt/FL: 2000ft ↓cct
(RPS)
Weather: VMC CLBC VMC CLOC
Visibility: >10km 10km
Reported Separation:
Nil V/200m H Not seen
Recorded Separation:
500ft V/0.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BN2T PILOT reports flying a sortie in support of an Army training exercise in Salisbury Plain DA complex squawking 7002 with Modes S and C. The visibility was >10km flying 500ft below cloud in VMC and the ac was coloured white/blue with anti-collision, nav and strobe lights all switched on. They had been cleared into the areas by Salisbury Ops on the previous day and D126 and D128 were active from the surface to 6000ft on the Portland RPS for their operations. The adjacent D125 was their Western limit as live firing was taking place. They had also been briefed by Salisbury Ops that parachuting would be going on at Netheravon and gliding at Upavon. Prior to departure he confirmed this information by listening to the Salisbury Ops recorded activity bulletin by telephone, as Salisbury Ops was not usually manned at weekends, as was the case on the day of the incident. The task was to monitor a proposed surface convoy route from the E of D126 to the W along the Southern transit route up to crossing point C [3000m/1.5nm SW of DZ centre]. In order to achieve this they were flying below cloud cover to maintain good camera contact with the proposed targets. On entering the range he established communications with Netheravon both to establish their movements and inform them of theirs. Netheravon stated that it was quiet and that only 1 ac was in use. He asked Netheravon to inform them prior to each drop, which they did as part of their 'clear to drop' procedure. Most of the time the BN2T was sufficiently S of Netheravon not to need to take evasive action. Twice the Army asked for them to look at areas closer to the airfield but before proceeding closer he confirmed with Netheravon that he was clear to do so. On one occasion when they were tasked to look at a crossing N of crossing point C, they had to make a number of moves S to avoid the paradrops as and when required. The paradrop ac [the C208] took-off in an E'ly direction and was never a threat, climbing out of sight to the E. On returning from the drop the ac would descend rapidly to the E and its pilot announced when it was passing 4000ft, at which point they would all start looking for the drop ac as its route was a wide downwind leg to R base for RW06. This route brought the drop ac close to their operational area but on most occasions the paradrop pilot would announce that he was visual with their ac first and then they would reciprocate when visual. The paradrop ac did not stay confined to the ATZ and would roam freely through the active Danger Area. He heard some chat on the radio between Netheravon and the drop ac pilot about, "its XXXX's turn now, you can change over soon". Shortly afterwards whilst heading 270° close to crossing point C at 90kt and 2000ft RPS they were looking for the paradrop ac after a drop as a call was made by its pilot at 4000ft seconds before the C208 appeared 800m away, high and to their L heading straight at them; the ac had descended to the W and was making a straight-in approach. He immediately turned L to avoid it; the C208 then passed to their R by 200m as it descended through their level. He asked the C208 pilot if he was visual with his ac at the time and its pilot replied, "who are you?" He stated his c/s and informed the C208 pilot that he had just missed his BN2T. The C208 pilot then said that the BN2T should not have been there as it was an active Danger Area. He informed the C208 pilot that it was active for his ac working with the Army and that he had been in contact with Netheravon and the drop ac all morning. The C208 pilot apologised and landed thereafter. They finished their tasking about 10min later and departed for their final destination. He assessed the risk as low.

THE C208 PILOT reports flying for parachuting duties during the afternoon on the day of the incident and in communication with DZ Control on 128.3MHz, squawking 0033 with Mode C. The visibility was 10km in VMC and the ac was coloured white/blue/red with nav and strobe lights switched on. Before commencing his duty he went to the Drop Zone (DZ) control bus as normal and spoke with the DZ controllers but they did not mention that there was or would be any other traffic operating in the vicinity of the DZ to affect. He took over from the morning pilot who briefed him on the run-in to use and suggested RW in use. He listened to the ATIS where he heard that there may be activity in D126 during his shift and was aware that there may be traffic S and W of the DZ up to 6000ft. With this in mind the final part of his descent at 150kt was on the delineation line between D126 and D128, making his base leg turn N up the Pewsey Valley along the boundary of D125 for a R turn onto RW06. He was unsure how many sorties he had completed on the day before the BN2T pilot spoke to him on the radio but on timings it must have been either his first or second sortie. At the time he was positioned RH downwind, he thought, and was asked whether he had seen the BN2T to which he replied he hadn't. There was also a short conversation where he mentioned his surprise that the BN2T was operating so close to the Netheravon DZ and thereafter he agreed to give position reports to keep adequate separation on future sorties during the rest of the day. He had not seen the BN2T and its pilot did not seem concerned at the time so he was surprised to hear the next day that an Airprox had been filed. Also, he learned that there had been an agreement for the BN2T flight to operate in conjunction with the parachute operation which was agreed on the previous evening but which he was not privy to.

UKAB Note (1): The MIL AIP at AD 2-EGDN-1-6 Para 2.17 promulgates Netheravon ATZ as a circle 2nm radius centred on N511449.66 W0014515.33 from SFC to 2000ft aal; elevation 455ft. The aerodrome is active 0800-1700 Mon-Fri, other times available to meet operational requirements. AFIS or A/G service is available to meet operational requirements. Intensive parachuting takes place seven days a week during daylight hours. RW06/24 is an unlicensed grass strip on the western side which may be used by parachuting and Netheravon Flying Club ac only when there is no FISO service and is entirely at pilot's discretion.

UKAB Note (2): The UK AIP at ENR 5-5-3-3 promulgates Netheravon as a Free-fall Drop Zone circle 1.5nm radius centred on 5111423N 0014615W from FL150 active normally during daylight hours. Activity notified on the day to Salisbury Operations or alternatively on 128.3MHz.

UKAB Note (3): The DZ is approximately 1200m SSW of the Netheravon ARP. The unlicensed RW06/24 is 300m N of the DZ Reference Point.

UKAB Note (4): The SPTA Airspace Allocation for the weekend 16/17th October promulgates the BN2T activity in SPTA areas 17/18/19 between 1230-1530; no operating height was shown. Areas 17/19 are within D126 either side of a N/S dividing line through the Netheravon E airfield boundary. D125 was active with live firing 0830-0030; D126 and D128 were not firing. Netheravon JSPC/APA was promulgated active during daylight hours. The Airspace Allocation sheet and an Information and NOTAM sheet for SPTA and Netheravon is created by Netheravon Stanops on the Friday at 1200Z prior to the weekend activity and is faxed to various units including the JSPC/APA. These 2 sheets are also attached to the OPS room window for viewing by airfield users.

UKAB Note (5): Boscombe Down was active 0730-1500Z. The Boscombe METAR was 1450Z AUTO 02015KT 9999 FEW029 13/06 Q1021=

UKAB Note (6): AIS provided a copy of the Pre-Flight Information Bulletin (PIB) for the 16th October which included a NOTAM for the BN2T activity within D128: -

EGTT/QRDCA/IV/BO/W/000/060/5116N00144W005

DANGER AREA EG D128 EVERLEIGH ACTIVATED ABOVE NORMAL LVL. FIXED WING

ACTIVITY

LOWER: SFC

UPPER: 6000FT AMSL

FROM: 16 OCT 2010 06:00 **TO:** 16 OCT 2010 16:00 F3351/10

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UKAB Note (7): The Pease Pottage radar recording clearly captures the incident. At 1435:00 the BN2T is seen 2.25nm S of Netheravon tracking 080° following a LH racetrack pattern, squawking 7002 [Danger Areas General] and indicating FL020 (2240ft QNH 1021mb) with a G/S 80kt. At the same time the C208 is seen 1.7nm NW of Netheravon in a slow L turn passing through heading 210° squawking 0033 [Aircraft Paradropping] indicating FL089 descending, ROD 4000fpm and G/S 190kt. Eighteen seconds later at 1435:18 the BN2T commences a L turn whilst the C208 is turning through heading 190° 1.8nm W of Netheravon, descending through FL077. The BN2T rolls out on a SW'ly track at 1436:00 level at FL020 whilst the C208 is steady on a track of 170° on the E boundary of D125 passing FL051 in the descent, 2nm to its W. The C208 commences a L turn towards Netheravon at 1436:12 descending through FL042, in the BN2T's 12 o'clock range 1.5nm. Twenty four seconds later the CPA occurs; the C208 is now steady on a NW'ly track descending through FL025 passing through the BN2T's 12 o'clock from L to R range 0.2nm, which is 500ft below at FL020. The next sweep shows the BN2T having turned L, which accords with the BN2T pilot's reported avoiding action, onto a S'ly heading at FL021 with the C208 diverging to the NW descending through FL020.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It appeared to Members that the C208 pilot had noted, from the ATIS, the BN2T's activity to the S and W but its proximity to the DZ, known to the previous BN2T pilot, had not been assimilated. That said, the C208 pilot's chosen flightpath, post paradrup, had taken his ac into the BN2T's notified activity area so, with the Airprox occurring in Class G airspace, there was equal responsibility on both pilots to maintain their own separation from other traffic through 'see and avoid'. However, for whatever reason, he had not seen the BN2T, which was in the airspace into which he was turning, and this was a part cause of the Airprox. The BN2T pilot had established an accord with the previous C208 pilot but had been surprised when he saw the C208 approaching from a different direction, late, as it descended towards Netheravon; this was the other part cause of the Airprox. Members agreed that better communication between the pilots concerned of their relative positions during each paradrup evolution would have improved their SA immensely.

Looking at the risk element, although the C208 pilot did not see the BN2T, the BN2T pilot saw the C208, 800m away above and descending, and took prompt and robust avoiding action to the S; the radar recording showing 500ft and 0.3nm at the CPA. This was enough to persuade the Board that any risk of collision had been quickly and effectively removed.

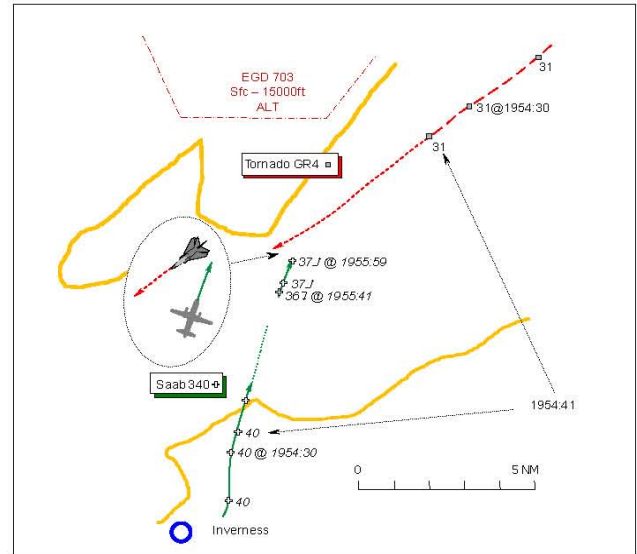
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the C208 pilot and a late sighting by the BN2T pilot.

Degree of Risk: C.

AIRPROX REPORT NO 2010166

Date/Time: 1 Nov 2010 1955Z NIGHT
Position: 5741N 00357W
 (8nm NNE of Inverness - elev 31ft)
Airspace: Scottish FIR (Class: G)
Reporting Ac Reporting Ac
Type: SAAB SF34 Tornado GR4
Operator: CAT HQ Air (Ops)
Alt/FL: 3000ft 2600ft
 QNH (992mb) (1002mb)
Weather: IMC IICL VMC
Visibility: NR 30km
Reported Separation:
 400ft V/1nm H 100ft V/O-7nm H
Recorded Separation:
 Not recorded

**BOTH PILOTS FILED****PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

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

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

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

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

On arrival in the area, they had descended to 3000ft amsl with Lossiemouth APP to gain VMC before switching to Inverness ATC for further deconfliction inbound to Tain AWR. Inverness ATC confirmed that they had no traffic to affect and so they switched back to their tactical operating frequency and checked in with Tain AWR about 10min before the reported Airprox timings. Having completed 2 bombing runs at 2500ft amsl in Tain AWR, they then repositioned to conduct a further bombing run against another Target. Positioning for this attack necessitated a leg heading of 235° (T) from Tain AWR, down the Moray Firth towards Cromarty Head at 2,600ft in order to avoid the Lossiemouth SAR HNTA which was active to 2500ft amsl. Whilst on this leg the pilot and navigator both saw

AIRPROX REPORT No 2010166

on NVGs the strobe lights of another ac operating at a similar height, near the base of cloud cover, about 2nm away. The SF34 passed about 0.7nm away to port and 100ft above their ac at the closest point. Having consulted on-board systems to confirm, via GPS, that they were operating within Class G airspace, and with both crewmembers satisfied that safe visual separation was maintained throughout, no avoiding action was deemed necessary. The sightline rate across the canopy also confirmed that they were not on a collision course with the SF34. Both crewmembers maintained visual contact and deconfliction with the other ac as they passed and throughout their repositioning until inbound to Tain AWR. He assessed the Risk as 'low'.

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

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

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

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

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

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

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

At 1946:32, the inbound SF34 called APP and reported 28nm to run, in receipt of information Lima, QNH 992mb and leaving FL135 descending to FL70. APP replied, "[SF34 C/S] *continue to the I-N-S expect no delay for the procedure from the overhead the ILS Runway 2-3 it's a procedural service for conspicuity squawk 6-1-77.*" This was acknowledged correctly by the SF34 crew who was given further descent to an altitude of 5000ft. The SF34 crew reported at 12nm at 1950:34 and APP replied, "[SF34 C/S] *on passing 10 miles descend 3 thousand 5 hundred feet Q-N-H 9-9-2 cleared for the procedure from the overhead for [RW] 2-3 three report outbound.*" This was acknowledged correctly and APP then advised, "[SF34 C/S] *and report at any stage if you wish to continue visually.*"

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

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

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

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

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

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

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GR4's level and take it into account whilst descending in IMC through the thin layers of cloud. This permitted the SF34 pilot to judge his RoD such that he could afford the GR4 as wider berth as was feasible vertically, based on TCAS, whilst endeavouring to spot it visually.

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

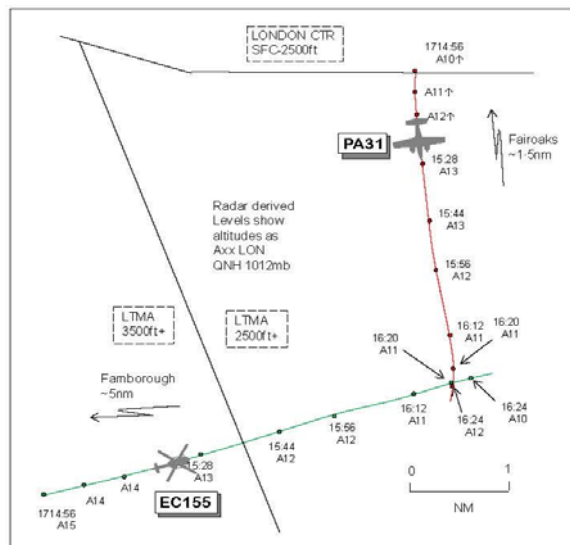
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT NO 2010167

Date/Time: 3 Nov 2010 1716Z NIGHT
Position: 5117N 00034W (4nm S Fairoaks)
Airspace: LFIR (Class: G)
Reporting Ac Reporting Ac
Type: EC155B PA31
Operator: Civ Pte Civ Pte
Alt/FL: 1100ft 1200ft
(QNH 1013mb) (QNH)
Weather: VMC CLBC VMC CLBC
Visibility: >20nm 10km
Reported Separation:
<100ft V/close H 100ft V/200ft H
Recorded Separation:
<100ft V/<0.1nm H



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EC155B PILOT reports departing Farnborough en-route to London Heliport, IFR and in receipt of a BS from Farnborough Approach on 134.35MHz, squawking 0421 with Modes S and C; TCAS 1 was fitted. The visibility was >20nm flying 300ft below cloud in VMC and the ac was coloured silver with nav and anti-collision lights switched on. After departure the ac was levelled at 1300ft QNH 1013mb having climbed to and then descended from 2000ft to remain below cloud. The crew had pre-emptively downgraded to a BS from a TS knowing that they would be below the 1500ft limit for ATC to provide a TS in that area. Heading 070° at 155kt about 8-9nm on the 250R OCK Farnborough advised of traffic “your N” at “similar altitude”. ACAS showed a contact in their 11 o’clock range, 5nm moving erratically but ‘trending’ to pass behind their ac, indicating between the same altitude and 200ft above. Both crew members were aware that ACAS is not reliable in the horizontal plane, iaw the equipment manufacturers warnings for this unit, and treated this information cautiously; a TA was received at range 4nm. A transmission was heard from another flight joining the frequency on departure from Fairoaks with a similar c/s to theirs, its pilot reporting he was “visual with traffic on my R”. They did not have this traffic in sight and elected to maintain their course as they did not know its exact position and did not want to risk possibly increasing a conflict by turning when its position was not known. The co-pilot, PF, began a descent to 1000ft as he perceived that the other ac was climbing above them; both pilots were actively looking for the other ac. It was then spotted by them both simultaneously in their 1030 position very slightly above, <100ft, in what appeared to be a fairly steep RH turn before it passed down their LHS and then behind them. No manoeuvring was felt necessary as the other ac was already clearing down their LHS side when they saw it. Neither pilot felt they could accurately gauge the distance of its lights in the dark however, the co-pilot saw the outline of the other ac as well as its lights and both pilots were left with the impression that the ac had been ‘close’. Shortly afterwards the other ac’s pilot made a transmission reporting he had “...just missed that one”. On leaving the frequency 2min later the EC155B pilot informed Farnborough of his intention to file an Airprox; the pilot of the other ac acknowledged his call and asked the controller to “keep the tapes”. He made a final transmission that “...it’s not a blame thing, it’s a safety thing” which both Farnborough and the other pilot acknowledged. He assessed the risk as high.

THE PA31 PILOT reports outbound from Fairoaks to Alderney and establishing contact with Farnborough on 125.25MHz after leaving the Fairoaks frequency, squawking 0457 with Modes S and C. The visibility was 10km flying 200ft below cloud in VMC and the ac was coloured blue with 3 point HISLs and nav lights all switched on. About 3nm S of Fairoaks heading 190° at 150kt and level at 1200ft QNH he had been unable to call Farnborough owing to other traffic including the pilot of the other reporting ac being told about the position of his ac. He first saw the traffic in his 2 o’clock range 0-5nm at the same level; he then assessed that he was above it but he found it difficult to acquire and track the ac to assess its heading/direction. He took avoiding action by turning R and

AIRPROX REPORT No 2010167

climbing, the helicopter passing 100ft below and 200ft clear on his LHS. The helicopter appeared to maintain a steady heading and its pilot was in contact with him during and after the conflict. He assessed the risk as low.

THE FARNBOROUGH APPROACH CONTROLLER reports working as an OJTI with a trainee on Approach and LARS W bandboxed. The EC155 departed Farnborough for London Heliport and was given a TS. The pilot requested own navigation to OCK, which was approved, before the pilot requested a downgrade to a BS as the flight descended below 1500ft, which was then provided. The PA31 became airborne from Fairoaks and at this time the EC155 was about 3nm to its SW tracking E'bound whilst the PA31 was tracking S. The trainee passed generic TI to the EC155 flight under the BS. As the PA31 pilot made his initial call, he instructed his trainee to call the traffic; however, the PA31 pilot called visual with the EC155 in his 1 o'clock before he was able to pass generic TI to him on the helicopter. As he was visual, the mentor told his trainee to issue the flight with a squawk, pressure and service. The PA31 pilot requested a TS but as it was maintaining 1100ft a BS was given. A couple of minutes later the EC155 pilot stated that he would be putting in some paperwork and also stated that it was not to apportion blame and that it was a 'safety thing'.

ATSI reports that the Airprox occurred at 1716:20, in Class G airspace, 4-6nm to the SW of OCK VOR, between a Eurocopter EC155B (EC155) and a Piper PA31 Navajo (PA31).

The EC155 was on a IFR flight from Farnborough to London Heliport and in receipt of a BS from Farnborough Approach Radar.

The PA31 was an IFR flight from Fairoaks to Alderney and was in the process of establishing contact with Farnborough LARS(W) as the Airprox occurred. The PA31 was displaying a squawk 0457, which is allocated to Fairoaks departures leaving the cct and intending to call Farnborough LARS.

The Farnborough controller was providing a combined Approach and LARS(W) service on frequencies 134.350MHz and 125.250MHz, with controller training in progress.

METAR EGLF 031650Z 22014KT 9999 BKN016 15/13 Q1013=

The EC155 departed from Farnborough with an allocated squawk 0421. At 1711:17, the pilot contacted Radar and reported, *"...(EC155)c/s following noise er then heading two two zero climbing altitude two thousand four hundred feet."* Radar instructed the EC155 pilot to squawk Ident and the EC155 pilot reported passing an altitude of 1100ft on QNH 1013. Radar then instructed the EC155 flight to resume own navigation OCK and asked the pilot to confirm the transponder was switched on. The pilot apologised and the transponder was switched on.

At 1713:20 Radar approved a request from the EC155 pilot for a descent to 1500ft and the pilot requested a TS outside CAS. At 1713:37, Radar advised, *"(EC155)c/s identified Traffic Service and it's descent to altitude one thousand five hundred feet taking your own terrain clearance."* The pilot responded, *"My terrain descend altitude one thousand five hundred feet (EC155)c/s"*.

Just over 1min later at 1714:56 the EC155 pilot advised, *"...we're happy to downgrade to a Basic Service and er operate not above one thousand five hundred feet."* Radar responded, *"(EC155)c/s roger radar service terminated Basic Service."*

At 1715:42 the PA31 flight made initial contact with Radar, *"Farnborough (PA31)c/s."* Radar responded by asking the PA31 pilot to standby. Radar then passed a warning to the EC155 flight regarding traffic in potential conflict, *"...(EC155)c/s there's er traffic north of you two miles southbound similar level."* The pilot replied, *"Looking (EC155)c/s."*

At 1715:56 Radar instructed the PA31 flight, *"...pass your full callsign and message."* The PA31 pilot replied, *"(PA31)c/s out of er Fairoaks a P A thirtyone Navajo maintaining not above one thousand one hundred this time and er requesting traffic squawking zero four five seven contact one aircraft my right one o'clock level."* Radar responded, *"(PA31)c/s roger squawk zero four three zero Q N H one zero one three."* The controller's written report indicated, that because the PA31 had reported visual with the EC155, no TI was considered necessary.

At 1716:20, the radar recording shows the 2 ac, 0.1nm apart, and converging. The EC155 was tracking ENE and the PA31 was tracking SSE. Both ac were indicating an altitude of 1100ft. The PA31 was in the EC155's 10 o'clock position, at a range of 0.1nm and crossing from L to R.

At this point the PA31 pilot replied *"Yeah just missed that one er er say again please for (PA31)c/s."* Radar repeated the message and the PA31 pilot acknowledged correctly, *"one zero one three er thanks er zero four three zero squawk for (PA31)c/s."*

[UKAB Note (1): The next radar sweep at 1716:24 shows the ac having passed. The PA31 is now tracking 190° indicating altitude 1200ft, having turned R 20° and climbed 100ft, in the EC155's 6 o'clock range 0.2nm, the EC155 now indicating altitude 1000ft, having descended 100ft. The CPA is estimated to be <100ft and <0.1nm.]

At 1717:10, Radar advised, *"(PA31)c/s it's a Basic Service only at your current level and say again your full callsign and destination."* The PA31 pilot confirmed the full c/s and destination.

At 1717:24, the EC155 pilot reported approaching OCK and advised of an intention to file a report.

The EC155 helicopter was in receipt of a BS. The PA31 flight called Farnborough Radar immediately prior to the Airprox and was instructed to standby whilst Radar passed a warning to the EC155 regarding an ac (the PA31) that was in close proximity. The Manual of Air Traffic Services Part 1, Section 1, Chapter 11, Page 4, Paragraph 3.1.1, states:

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

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.

As this incident occurred in Class G airspace, there was equal responsibility on both crews to maintain their own separation from other ac through 'see and avoid'. Owing to the prevailing Wx conditions, both crews elected to fly just below a uniform but low cloudbase in VMC. As it was night Members agreed that both crews would have found visual acquisition of each other's lights in the incident area difficult owing to the background lighting from the built-up areas and the 'blooming' effect from below the low cloudbase reflecting back the cultural lighting. The radar recording shows both ac approaching each other on a line of constant bearing, making both ac appear stationary in the windscreen and adding to the difficulty of seeing an ac that has no relative movement to trigger visual acquisition. The PA31 pilot became aware of the EC155B when he heard TI being passed on his ac to the EC155B crew whilst he was awaiting Farnborough to call him back after he was told to 'standby' after his initial call on frequency. However, he only saw the helicopter at about 0.5nm, which Members agreed was a late sighting and a part cause of the Airprox. The EC155B crew were aware of the PA31 from TCAS and from the traffic warning given by Farnborough. However, they only saw it as it passed down their LHS, as it was taking avoiding action, effectively a non-sighting and the second part of the cause.

Under the Rules of the Air Regulations the EC155B had right-of-way. However, this always assumes that both pilots have seen each other and can discharge their responsibilities accordingly. In this Airprox the late sighting by the PA31 pilot and his stated difficulty in assessing the helicopter's flightpath resulted in late avoiding action and the ac passing closer than intended. This left the Board in no doubt that safety had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively a non-sighting by the EC155B crew and a late sighting by the PA31 pilot.

Degree of Risk: B.

AIRPROX REPORT No 2010168

AIRPROX REPORT NO 2010168

Date/Time: 4 Nov 2010 1226Z

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

Reporter: Shoreham ATC

Airspace: ATZ/FIR (Class: G)

Aircraft 1 Aircraft 2

Type: R44 DA42

Operator: Civ Pte Civ Trg

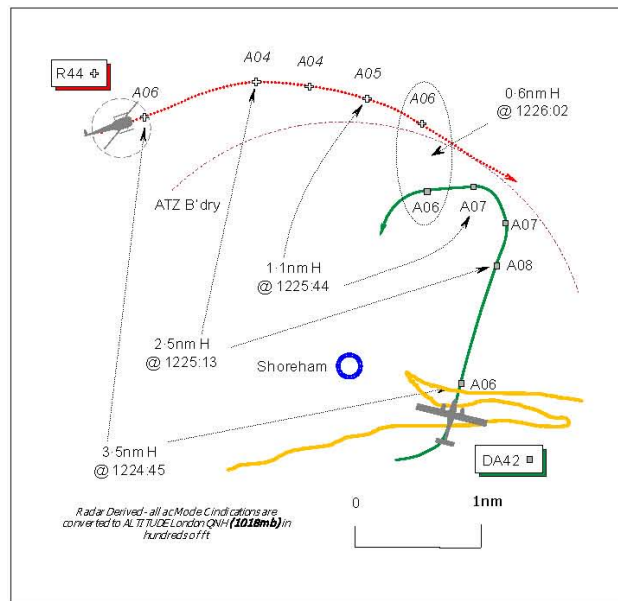
Alt/FL: NR 700ft
QNH (1021mb)

Weather: VMC NR VMC

Visibility: NR 9km

Reported Separation:
NR NK

Recorded Separation:
Nil V @ 0.6nm H



CONTROLLER REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

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

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

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

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

Downwind on their final circuit to land, they called 'Downwind' and were told by TOWER to 'report final No 1'. He checked the area of the Base-Leg and Final, saw no other ac to conflict and turned onto Base. Because his student did not allow sufficiently for the wind, their aeroplane possibly drifted onto a slightly wider Base-leg than normal. Conditions were fairly lively and the student was focused on controlling the aeroplane. Checking Final prior to the Final turn, again he saw nothing to conflict. At the start of the Final turn, flying at 100kt descending through about 700ft QNH (1021mb), he called 'turning Final' and on releasing the transmit switch he thought he heard '..below passing right to left' or words to that effect from TOWER. Having heard no other RT from any other ac in the cct he assumed the call was for them and applied sufficient back pressure to level his aeroplane briefly until either he caught a glimpse of the other ac or TOWER advised that they were clear of the traffic (he could not recall which came first). He did not see the other ac until they had passed – an R44 helicopter sighted ½nm away. On realising that they were clear of the traffic, he reverted to close monitoring of his student (who was finding the

conditions challenging) and the final approach and landing, which were completed without further incident. His student pilot did not see the conflicting ac at any point during the cct.

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

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

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

His helicopter is coloured Blue and the HISL was on.

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

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

At 1224:45, the DA42 pilot reported Downwind and the controller instructed him to report Final for RW20. The radar recording at 1225:13 shows the DA42 late downwind squawking A0401 indicating an altitude of 800ft London QNH (1018mb) with the R44 helicopter, squawking A7000 at an altitude of 400ft London QNH, 2.5nm NNW of the airport tracking E around the Shoreham ATZ. At 1225:44, the radar recording shows the DA42 inside the Shoreham ATZ, on Base-leg for RW20, indicating 700ft ALT, with the R44, indicating 400ft ALT, in the DA42's R 2 o'clock at a range of 1.1nm. The R44 continued to track E remaining just outside the Shoreham ATZ. It was at 1226:04, that the Shoreham controller first advised the DA42 pilot of the presence of the R44, *"..caution a helicopter below you not on my frequency clear now."* At this point the radar recording shows the DA42 turning onto final at 1.6nm from the Airport with the R44 passing 0.6nm behind and just outside the ATZ; both ac are indicating 600ft ALT.

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

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

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

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

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

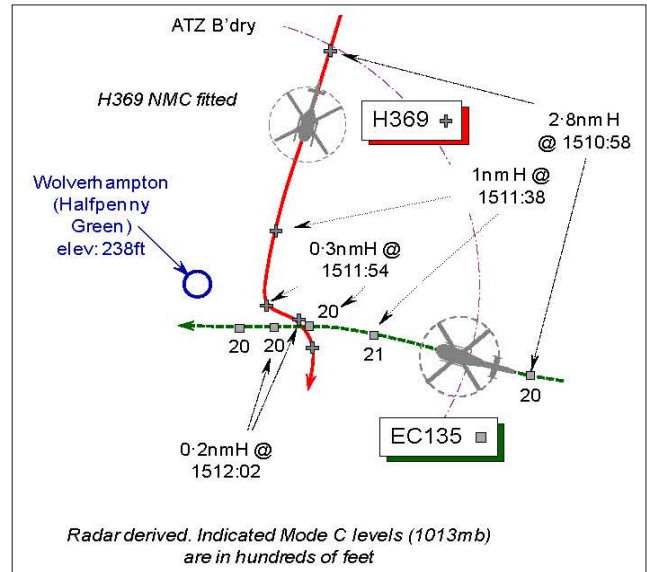
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A controller perceived conflict.

Degree of Risk: C.

AIRPROX REPORT NO 2010169

Date/Time: 8 Nov 2010 1512Z
Position: 5231N 00214W (0.7nm ESE
 Wolverhampton A/D - elev 283ft)
Airspace: Wolverhampton ATZ (Class: G)
Reporting Ac Reported Ac
Type: EC135 H369E
Operator: Civ Comm Civ Pte
Alt/FL: 600ft 600ft
 QFE (955mb) QNH
Weather: VMC VMC
Visibility: 5km 5nm
Reported Separation:
 Nil V/500m H 100ft V/1nm H
Recorded Separation:
 0.2nm H (~370m)



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EUROCOPTER EC135 HELICOPTER PILOT reports he was returning to base at Wolverhampton/Halfpenny Green from Cradley Heath (7nm SE of the aerodrome) VFR and in receipt of a BS from Halfpenny Green INFORMATION on 123.00MHz, he thought, but actually an A/G Service at the time of the Airprox. A squawk of A0032 was selected with Mode C; Mode S and TCAS I is fitted.

Advising Halfpenny Green RADIO that he was inbound from Merry Hill the A/G Operator replied with the runway in use – RW10 - and the QFE. Flying in VMC some 100ft below cloud with an in-flight visibility of 5000m, a contact was seen displayed on TCAS 6nm to the N but with no height information, which he informed his crew about. Once established on the RH downwind leg for RW10, at a range of 1.5nm DME, level at 600ft QFE (955mb) heading 270° at 100kt he called 'Downwind', to which the A/G Operator promptly replied 'no reported traffic'. As he read-back the message his LH seat observer pointed across to their 3 o'clock position and said, 'apart from that helicopter!' As he looked to his R he saw a black Hughes 500 type helicopter with a very distinctive 'T' type tail - the Hughes H369 - heading straight towards him which suddenly and abruptly made a turn to the L to pass behind him. He felt the best course of action was to maintain his height, heading and speed and let the H369 pilot take the avoiding action. Minimum horizontal separation was 500m at the same height and he assessed the Risk as 'high'.

After landing back at base, he contacted the FISO to discuss the incident whereupon it emerged the H369 pilot had not been in contact with Halfpenny Green. He then called Birmingham ATC who advised that they had a radar recording of the incident and that the H369 had indeed made a turn to the L before turning back on his original course soon afterwards at an approximate speed of 125kt. Details of the helicopter trace from Birmingham were then passed to Bristol Airport ATC who later advised that they had spoken to the H369 pilot during flight and confirmed the identity of the Hughes helicopter.

UKAB Note (1): The UK AIP at AD2 EGBO AD 2.17 notifies the Wolverhampton ATZ as a circle radius 2nm centred on RW16/34, extending from the surface to 2000ft above the aerodrome elevation of 283ft. The ATZ hours are coincident with the aerodrome Flight Information Service. An A/G Service - Halfpenny Green RADIO - may operate for short periods.

THE MCDONNELL DOUGLAS HUGHES 369E HELICOPTER (H369) PILOT reports that he had departed from a private helicopter landing site near Sutton-in-Ashfield Nottinghamshire, VFR, bound for a private site at Wellington Somerset. After tracking W to avoid the congested airspace around Birmingham whilst in communication with East Midlands ATC, he turned onto a southerly heading towards Gloucester/Bristol. Switching from East Midlands, squawking A7000 - NMC fitted - he called some aerodromes en-route that he

AIRPROX REPORT No 2010169

thought were in range including Wolverhampton/Halfpenny Green from whom he received no response, but he continued to listen out on their frequency as he was being forced towards their ATZ by weather. Heading 180° at 120kt, flying in a level cruise at an altitude of 600ft QNH, both he and his passenger had seen the EC135 in their 10 o'clock about 2nm away, at approximately the same height before the other pilot called, he thought, 'finals', but because of the poor visibility he could not ascertain its direction of flight instantly. After indicating that it was on 'final' for the active runway, Wolverhampton/Halfpenny Green cleared the other pilot to land and reported no traffic in the area. At this point, he thought 3nm E abeam of Halfpenny Green, the route of the other helicopter became clear and he turned away from the aerodrome so as not to conflict with the traffic. He also made a radio call indicating that he was visual with the helicopter. He passed some distance behind the helicopter and continued en route; minimum separation was estimated at 100ft vertically, 1nm horizontally and the assessed Risk as 'none'.

He had been listening out on the Wolverhampton/Halfpenny Green frequency for about 5min before arriving in the vicinity of the aerodrome but this was the first communication he had heard from the other helicopter, or indeed any ac on the frequency.

ATSI reports that the Airprox occurred at 1512:02, in Class G airspace, 0.7nm ESE of Wolverhampton/Halfpenny Green, between a Eurocopter (EC135) and a Hughes 369E helicopter (H369). At the time of the Airprox Halfpenny Green was providing an A/G Service. The QFE was reported as 955mb.

The EC135, based at Wolverhampton, was returning VFR after the completion of a task at Cradley Hill, which lies to the E. The H369 was operating on a VFR flight from Sutton in Ashfield (Nottinghamshire) to Wellington (Somerset).

The Birmingham 1450Z METAR was:

10008KT 6000 -RA BKN007 BKN010 04/03 Q0965=

ATSI had access to radar recordings provided by NATS Swanwick and RTF recordings provided by Wolverhampton. The timing of the RTF recordings is estimated to have a timing error of approximately +1.5min, compared with the radar recording. A correction has been applied, with the incorrect time in brackets.

The EC135 reported inbound and at 1508:55 [1510:25], A/G passed the EC135 pilot information, "*(EC135)c/s Halfpenny Green RADIO Runway 1-0 QFE 9-5-5 millibars.*" This was acknowledged, "*1-0 9-5-5 and we're er just overhead er Merry Hill this time.*" At 1510:23 the radar recording shows both helicopters tracking toward the aerodrome. The EC135 is shown 3.9nm E of the aerodrome, displaying a squawk of A0032, with Mode C indicating FL20. The H369, is shown 3.3nm NNE of the aerodrome, displaying the conspicuity squawk A7000 without Mode C. At 1510:58 the radar recording shows the H369 entering the ATZ, 2nm NNE of the aerodrome and the EC135 approaching the ATZ from the E, with horizontal separation of 2.8nm. The RTF recording indicates that no RT call was received by A/G, prior to the H369 entering the ATZ. At 1511:54 the radar recording shows both helicopters on a converging course. The EC135 is 0.9nm ESE of the aerodrome and the H369 is shown in the EC135's half past 12 position at a range of 0.3nm, crossing from R to L. At about 1512:03 [1513:33], the EC135 pilot reports, "*Er (EC135)c/s is er downwind for 1-0*" and A/G replied, "*(EC135)c/s roger no other reported traffic.*" The EC135 pilot responded, "*No reported traffic (EC135)c/s*" and shortly afterwards, "*er apart from the er Hughes 5 hundred.*" At 1512:02, the radar recording shows the two helicopters in close proximity at a position 0.7nm ESE of the aerodrome. The H369 is shown after turning L to pass 0.2nm behind the EC135, which is indicating FL20 (converts to a height of 434ft QFE (955mb) at 1mb equal to 27ft). A call is then received, "*we're visual with the helicopter*" and this was believed by ATSI, to be from the H369 helicopter pilot. The A/G operator may have believed that this call was from the EC135 pilot. A/G responded to the EC135 pilot's call, "*my apologies er (EC135)c/s.*"

The H369 pilot's written report indicated that a call was made to A/G without a response and also that he reported listening out on the frequency 5min prior to arriving in the vicinity of the aerodrome, without hearing any other ac on frequency. The RTF exchange between A/G and the EC135 pilot, occurred 3min prior to the Airprox.

The H369 pilot's written report also indicated that the EC135 helicopter had been sighted before the EC135 pilot reported on 'final'. This is considered by CAA ATSI to be the 'downwind' call made by the EC135 pilot at 1512:03.

At 1515:30 [1517.00], another helicopter called A/G, requesting information on traffic 5nm S of the aerodrome. A/G responded and indicated that this may have been the H369 that had passed to the E of the aerodrome without calling.

Halfpenny Green RADIO provided an A/G Service and was not aware of the H369 until it passed very close to the aerodrome and was sighted by the EC135 pilot.

UKAB Note (2): The applicable UK AIP entry at ENR 1-4-10 dated 17 Dec 09, extant when the Airprox occurred, states that:

2.7.2.1

' ... An ATZ assumes the conditions associated with the Class of Airspace in which it is situated. As a minimum, when flying within an ATZ, the requirements of Rule 45 of the Rules of the Air Regulations 2007 must be complied with.

2.7.2.3

Pilots should be aware that in order to comply with the provisions of Rule 45 they must adopt the following procedures:

a. Before taking off or landing at an aerodrome within an ATZ or transiting through the associated airspace.....obtain information from the flight information service unit or air/ground radio station to enable the flight to be conducted with safety.

b. Radio equipped aircraft must maintain a continuous watch on the appropriate radio frequency and advise the.....flight information unit or air/ground radio station of their position and height on entering the zone and immediately prior to leaving it.

2.7.2.4

Failure to establish two-way radio communications with the.....flight information unit or air/ground radio station during their notified hours of operation must not be taken as an indication that the ATZ is inactive. In that event, except where the aircraft is in a state of emergency or is being operated in accordance with radio failure procedures, pilots should remain clear of the ATZ.'

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, a transcript of the relevant RT frequency, radar video recordings and a report from the appropriate ATC authority.

Although the H369 pilot reports that he encountered the EC135 some 3nm E of Wolverhampton aerodrome, the radar recording shows that the CPA occurred 0.7nm ESE with both ac well inside the Wolverhampton ATZ. The Board perceived that the H369 pilot had probably not persisted with his calls to Halfpenny Green RADIO to establish two-way RT contact because he believed that his track was further to the E and clear of the ATZ. Importantly, the RT transcript shows that the H369 pilot had not established two-way RT contact with either the Halfpenny Green FISO or the A/G Operator before 1510:58 when the H369 had entered the ATZ. The A/G operator was clearly unaware of the presence of the H369 at this point. The Board accepted that the A/G operator could only relay information to the EC135 pilot about other traffic that he was aware of and, without the RT call from the H369 pilot, the A/G operator would not have been expecting to see any other traffic crossing through the cct area. It was feasible that the Halfpenny Green RT receivers had not picked up the H369 pilot's call at range. Nevertheless, without a reply, pilots must not enter the ATZ and the H369 pilot should not have flown through it before he had obtained information about their traffic from Halfpenny Green RADIO to enable the flight to be conducted with safety.

The EC135's TCAS had reportedly shown traffic to the N, but without a height read-out from the H369 it did not provide the whole picture and the EC135 pilot was thus unaware of the developing conflict before his alert observer saw the H369 helicopter closing on them from their 3 o'clock. Members agreed that the EC135 pilot could do little

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else when he first spotted the H369 himself, as it turned to pass astern of his helicopter, so maintaining his course was the wisest option. Fortunately, the H369 pilot was aware of another ac in the area whilst listening out on the Halfpenny Green frequency and had seen the EC135 from a range of about 2nm he reports, probably just as he crossed the ATZ boundary. The Board concurred with ATSI's view that the subsequent call "*we're visual with the helicopter*" was from the H369 pilot after he had turned to pass astern, with 0.2nm separation the radar recording shows. Taking all these factors into consideration the Board concluded the Cause of this Airprox was that the Hughes 369 pilot did not comply with Rule 45 of the Rules of the Air and flew into conflict with the EC135. Nevertheless, the H369 pilot had seen the EC135 and had turned to pass clear behind it which, the Board agreed unanimously, had removed any Risk of a collision.

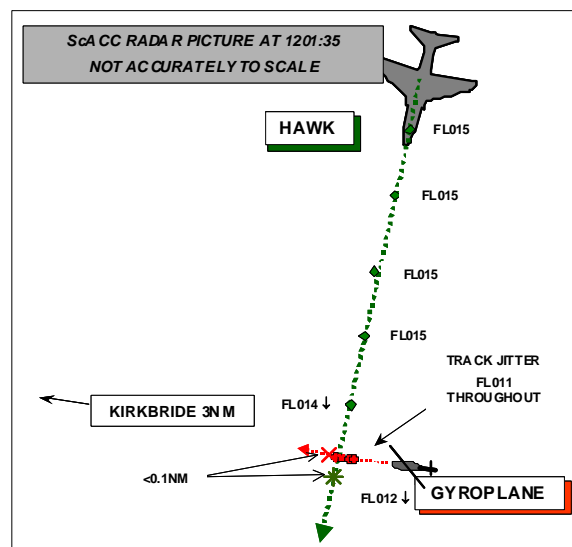
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The H369 pilot did not comply with Rule 45 of the Rules of the Air and flew into conflict with the EC135.

Degree of Risk: C.

AIRPROX REPORT NO 2010170

Date/Time: 3 Nov 2010 1202Z
Position: 5452N 00308W (2nm N Wigton)
Airspace: LFA 17/Scot FIR (Class: G)
Reporting Ac Reported Ac
Type: Hawk Gyroplane
Operator: HQ Air (Trg) Civ Pte
Alt/FL: 1000ft 800ft
(RPS 998mb) (QFE NR)
Weather: VMC CLBC VMC HAZE
Visibility: 20km 8nm
Reported Separation:
0 V/100ft H 250ft V/ 200m H
Recorded Separation:
100ft V/ <0.1nm H

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE HAWK (STUDENT) PILOT reports flying a solo low level navigation sortie in a black ac with nose light and strobes switched on, squawking 7001 with Mode C, but TCAS was not fitted. After coasting in at about 1000ft amsl about 5nm W of Carlisle, he turned onto 190° at 420kt and visually identified and avoided Kirkbride microlight site by about 3nm to the E. He saw one light ac passing beneath him and elected to remain high until approaching abeam the town of Wigton, 4nm S of Kirkbride. Approaching abeam Wigton, a descent was commenced and he saw a dark blue high-wing weight-shift microlight 150ft away, slightly left of the nose, moving from left to right, wings level, and on a collision course. He immediately broke upwards to the light buffet to avoid a collision but on checking the G meter, he found that the pull had exceeded 8G so he elected to climb out of low-level and recover to RAF Valley. An Airprox was declared to London Military and he assessed the risk as being High.

THE GYROPLANE PILOT reports flying a black Gyroplane with strobes and landing lights switched on, squawking 7000 with Modes C and S, on a local flight from Kirkbride unlicensed airfield and listening out on their frequency; PCAS was carried. He was on the approach to RW28 at 60kt and while lining up on final, a Hawk approached from the N and appeared not to have seen him. The Hawk altered course and by then he had commenced a descent out of its path but continued inbound. He was transponding and listening on 124.4 and was disappointed that the Hawk pilot was unaware of his presence and was flying so close to an active airfield. He assessed the risk as being low.

UKAB Note (1): The Carlisle METAR was:

METAR EGNC 031150Z 26018KT 230V290 9999 SCT023 11/06 Q1006

UKAB Note (2): The recording of the ScACC radars show the incident clearly. The Hawk, squawking 7001 with Mode C, approaches the CPA from the N, tracking 190°, in a descent, as described in the pilot's report above. Meanwhile the Gyroplane, squawking 7000 with Modes C and S, approaches the CPA very slowly from the E, tracking about 280°, level at FL011 (alt 900ft) throughout the recording. The Hawk passes just (<0.1nm) behind the Gyroplane at FL012 (100ft above it) still in the descent. The break is not evident on the recording until 6sec after the ac had passed. The CPA was 3.2nm to the E of Kirkbride airfield.

HQ AIR (TRG) comments that this was a late sighting by the Hawk pilot. However, as he was descending, the gyrocopter would have been below the horizon making an already small target even harder to see. The pilot's lookout was also weighted towards Kirkbride, the other side of his nose to the conflict in this case. The excess G pulled was appropriate and played a major part in avoiding a collision. It should be noted that the early sighting by the Gyrocopter pilot also played a significant part.

AIRPROX REPORT No 2010170

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted that the Radar recording showed that the Hawk had passed 3.2nm to the E of Kirkbride, a distance they considered adequate. Further, the Hawk pilot was aware of Kirkbride, positively identified the airfield and ensured that he had avoided it by a suitable margin; but since it is unpublished, he had no means of knowing that he would pass through the approach path.

Although similar in some respects, there were several areas where the two pilots' reports differed. Having discussed the reports and being briefed on the radar recording, Members were confident that the Gyroplane identified was the ac involved and the Hawk pilot had mistakenly thought it to be a microlight. Members commended the Gyroplane pilot for squawking because had he not done so his ac would almost certainly not have shown on the radar recording; since he had it was possible to verify the horizontal and vertical geometry of the incident. Members could not explain why the Hawk had not been displayed on the Gyroplane pilot's PCAS, as it had been 'line of sight' throughout and had also been squawking with Mode C. Nevertheless, the Gyroplane pilot had seen the Hawk in his 3 o'clock at a distance he estimated to be 2nm and opted not to take any avoiding action. Had the Hawk actually been 2nm away when first sighted and the Gyroplane had been flying at 60kt, then the Hawk would have passed $\frac{1}{4}$ nm behind the gyroplane in the 17sec it would have taken for the ac to cross. On the other hand the Hawk student pilot saw the Gyroplane just to the left of his nose much later, estimating that it was only 150ft away and therefore aggressive vertical evasion was required. Members concluded that although the respective clock codes reported had been correct, the Hawk must have been closer to the Gyroplane when it was first seen and the Gyroplane must have been sighted at a distance in excess of 150ft (1.6 sec) for the Hawk pilot's avoidance to be effective.

Notwithstanding that both ac could be hard to see due to their size and lack of relative movement on a near collision course, both pilots had a responsibility to see and avoid each other. Therefore Members agreed that the cause of the incident had been late sightings by both pilots. However, the Gyroplane pilot's early descent and the Hawk pilot's much later break upwards had been effective in removing any risk that the ac would have collided.

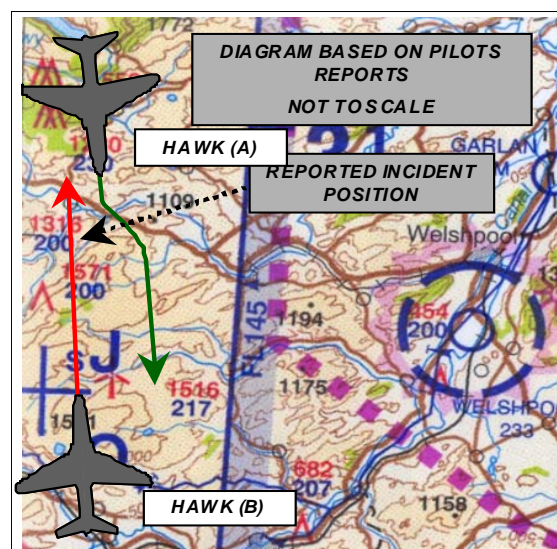
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by both pilots.

Degree of Risk: C.

AIRPROX REPORT NO 2010171

Date/Time: 16 Nov 2010 1240Z
Position: 5240N 00328W (10nm W Welshpool)
Airspace: LFA 7 (Class: G)
Reporting Ac Reporting Ac
Type: Hawk T Mk1 Hawk T Mk 1
Operator: HQ Air (Trg) HQ Air (Trg)
Alt/FL: 250ft 250ft
(RPS 1009mb) (RPS 1009mb)
Weather: VMC CAVOK VMC CAVOK
Visibility: 30km 20km
Reported Separation:
500ft H 0 V/500ft H
Recorded Separation:
NR

**BOTH PILOTS FILED****PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

HAWK (A) PILOT reports that he was a student pilot on an advanced flying training low level introduction sortie in a black ac with all lights switched on, squawking 7001 with Mode C but TCAS was not fitted. During the planning, low level deconfliction had been checked and a possible conflict had been identified. Because there was a possibility of a conflict, during the flight they had made numerous position reports on the RAF Valley low level deconfliction frequency but did not receive a reply to any of them.

Having completed 25min of 'free nav', on a southerly nav leg, heading 176° at 420kt into sun, the front seat student pilot saw [the nose light of] a fast jet on a reciprocal heading about 1nm away at the same height. Immediately assessing there to be a collision risk, he took avoiding action by conducting a 5G left break and during the manoeuvre he informed the captain of the conflict. As they passed abeam the other ac it was identified as another Hawk T1, which he assessed as passing 500ft away with a high risk of collision.

HAWK (B) PILOT reports flying a singleton instructional low level training flight in a black ac with all lights switched on, squawking 7001 with Mode C but TCAS was not fitted. Both ac captains had a general awareness of each other's routeing from the RAF Valley de-confliction procedures and while airborne he had heard calls on the de-confliction frequency. While heading 355° at 420kt flying at low level in Mid Wales he saw another black Hawk 1-2nm away at the same altitude and on a reciprocal heading; he noted the strobes, landing and nav lights of the other ac. The other ac passed within an estimated 500ft lateral displacement at co-altitude but, due to their late acquisition, neither pilot in their ac gained tally early enough to take action to avoid the Airprox. He reported the incident on the radio to Valley and assessed the risk as being medium.

HQ AIR (Trg) comments that the 500ft is a typical separation achievable in this scenario where only one ac had time to avoid. Separation might have been more comfortable had a vertical element been included in the avoidance manoeuvre. Whilst a level break is tactically sound and produces the best lateral separation, a late navigation turn or emergency break by the second ac might have put it back into conflict. Without more precise detail of the geometry it is difficult to comment on the direction of the break, which appears to be contrary to the 'go right' rule of the air; however, as drawn, with slight right aspect, the left break was correct. Hawk (B)'s report is confusing in that the reported acquisition range should have allowed ample time for avoiding action to be taken. Whether this an overestimation or whether there were other factors in play is not clear. Whilst it is likely that Hawk (B) should have had the best chance of seeing the other ac, which was flying almost into sun (it is not clear if sun was actually an issue), because of the terrain, Hawk (B) was probably sky-lined to a degree, whilst Hawk (A) would have been in relatively low ground.

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It highlights that there are deconfliction measures in place at Valley that were effective in ensuring that at least one crew was aware of the potential proximity of the other. Again, the nose mounted conspicuity light proved effective in alerting one crew to the other's presence. This incident is not uncommon amongst low level operators and highlights the imperative on all crews in Class G airspace to devote sufficient time to lookout and to take immediate avoiding action.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac and a report from the Hawk operating authority.

The Board noted that both ac had been operating legitimately in the UKDLFS and, due to RAF Valley local procedures, both pilots were aware that their ac would be in the area at the same time, thus prompting enhanced lookout; however, during free-nav any procedural deconfliction measures are less effective than when used for deconflicting specific routes and times.

Although the sightings by both pilots were relatively late, this was largely due to terrain masking concealing the opposing ac. That being the case, TCAS (as fitted to the Hawk T Mk2 but not the Mk1) would probably not have provided a significantly earlier warning since it is also dependent on 'line-of-sight' between the respective ac. The Board noted, however, that ac lighting had been a significant factor in the acquisition of the opposing ac.

The HQ Air (Trg) Member informed the Board that in these circumstances where only one ac took avoiding action while ensuring that there was no risk of collision, only 500ft horizontal separation is not unusual.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in the UKDLFS resolved by Hawk (A) pilots.

Degree of Risk: C.

AIRPROX REPORT NO 2010172

Date/Time: 24 Oct 2010 0930Z (Sunday)

Position: 5140N 00001W
(10nm NNW London/City)

Airspace: LFIR (Class: G)

Reporting Ac Reported Ac

Type: C404 M20J

Operator: Civ Comm Civ Pte

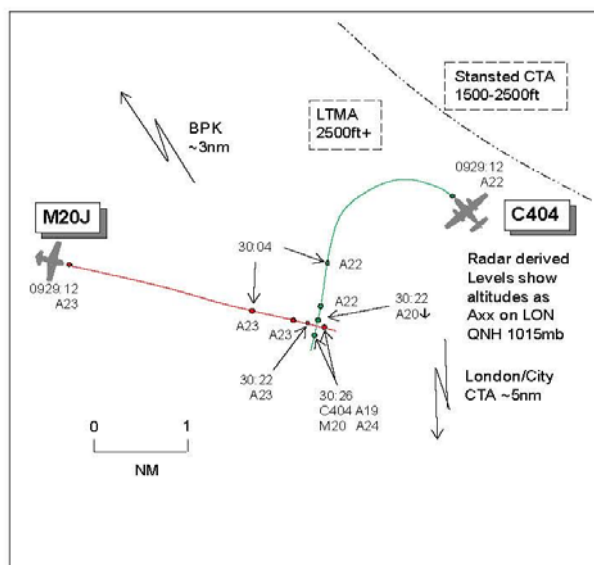
Alt/FL: 2400ft NR
(QNH 1016mb) (QNH)

Weather: VMC CAVOK NR

Visibility: >40km NR

Reported Separation:
300ft V/O-50m H NR

Recorded Separation:
400ft V/Nil H

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

THE C404 PILOT reports conducting a solo-pilot survey flight from Blackpool, VFR and in receipt of a TS from Thames Radar on 132.7MHz, squawking an assigned code with Modes S and C. The visibility was >40km in VMC and the ac was coloured blue/white with anti-collision and nav lights switched on. The Airprox occurred just after turning L to establish on the first survey line heading 180° at 120kt and 2400ft QNH 1016mb. He was outside CAS, below the LTMA base level of 2500ft altitude, although cleared into the London/City CTR as the survey line continued to O/H London/City. The traffic was first spotted in his 2 o'clock range 500-700m at what appeared to be the same altitude and on an E'ly heading and converging. He descended by 200-300ft immediately and the other ac, a single engine low-wing Piper/Socata type, passed O/H by that vertical distance with little to no horizontal separation. A warning of the traffic was given by Thames 5-10sec after their tracks had crossed and he believed the other ac was not on the Thames frequency. The flight conditions were perfect: a gin-clear day with excellent visibility and no cloud. He did not believe the other pilot saw his ac as there was no avoiding action seen and he assessed the risk as high. He apologised for the very late filing of the Airprox. It was reported to his company at the time of the incident and was picked up at a later company SMS meeting that he had not filed an Airprox to the UKAB.

THE M20J PILOT report was contacted by RAC Mil and a CA1094 was sent for completion. Two follow-up e-mails did not elicit a response. Despite numerous follow-up telephone calls, voice mails and e-mails from the UKAB Secretariat requesting the completion of the Airprox Report Form prior to the Board meeting, no report was received.

ATSI reports that the Airprox occurred at 0930:23, in Class G airspace, 10.6nm to the NNW of London City Airport.

The Airprox was reported by the pilot of a Cessna 404 Titan (C404), operating VFR and conducting an ordnance survey flight in accordance with non-standard flight (NSF) notification 051/2010.

The second ac was displaying a squawk 5031, a code assigned to Farnborough LARS. The Farnborough archived fpps showed that the other ac was most likely a Mooney 20J (M20J), operating on a VFR flight from Denham to Le Touquet and in receipt of a BS from Farnborough LARS. However no report was available from the pilot of the M20J.

The Airprox report was filed some time after the event and was received by CAA ATSI and UKAB on 26 Nov 2010. Because of the late reporting of the Airprox, the Farnborough RT and radar recordings were not available. Farnborough ATC were not aware of the Airprox and no report was available from any of the controllers concerned.

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In addition the C404 pilot's written report erroneously indicated that the Airprox occurred at approximately 1030 UTC and this resulted in a further delay in obtaining the correct period of radar replay.

CAA ATSI had access to the Thames Radar RT and Radar recordings provided by NATS Swanwick together with the C404 pilot's written report. The RT and radar recording show the incident occurred at 0930:23.

METAR EGLL 240920Z 35006KT 310V040 CAVOK 07/03 Q1015 NOSIG=

At 0923:15, the C404 flight established contact with Thames Radar and requested a TS. A squawk of 7032 was allocated together with the London QNH 1015. Thames Radar advised, "*(C404)c/s you're under a limited Traffic Service due to poor radar coverage and traffic loading.*" The C404 pilot replied, "*er limited traffic that's copied (C404)c/s.*" The radar recording showed the C404's position to be 15.8nm to the NW of London City Airport. It was noted that the Thames controller used the term 'limited' TS, when the correct phraseology should have been 'reduced' TS.

The Thames Radar controller established that the C404 pilot wanted to conduct survey work to the N and W of London City, following N-S lines at an altitude of 2400ft.

Thames Radar passed TI on 2 unknown contacts at 0925 UTC and 0928 UTC.

At 0928:29 the C404 reported in a L turn to pick up the first N-S line and Thames Radar responded, "*Understood the erm clearance limit is the southern most lake of the Lee Valley in the City Zone.*" The C404 pilot replied, "*Er clearance to the southern most er of the Lee Valley (C404)c/s.*"

At 0929 Thames Radar passed TI on another unknown contact.

At 0929:14 radar recording showed the C404 at an altitude of 2200ft, in the L turn passing through a heading of 340° as the ac positioned onto the initial N-S survey line. The M20J is shown 4.1nm WSW of the C404, tracking E and indicating an altitude of 2300ft.

At 0930:04 radar recording showed the C404 rolling out on a S'y heading at an altitude of 2200ft and the M20J in the C404's 2 o'clock position, at a range of 1nm and crossing from R to L, indicating an altitude of 2300ft. An additional primary contact was also shown to be 1nm E of the C404.

At 0930:20, Thames radar passed late TI to the C404 flight regarding the M20J, "*(C404)c/s there is further Farnborough traffic now going over the top of you two point three unverified.*" The C404 pilot replied, "*Affirm we just heard him.*"

[UKAB Note (1): At 0930:22, the radar recording shows the C404 tracking S'y descending through altitude 2000ft with the M20J in its 2 o'clock range 0.1nm at 2300ft, 300ft above. The CPA occurs before the next sweep 4sec later at 0930:26 when radar recording shows the 2 ac having passed and now diverging at range of 0.1nm, the C404 now level at 1900ft and the M20J at 2400ft. At the CPA, 0930:24, it is estimated the ac passed with no lateral separation and 400ft vertical separation.]

It was not possible to determine if the Thames Radar controller had observed the M20J prior to giving a late warning. The Thames Radar controller had restricted the TS because of poor radar coverage and traffic loading.

The M20J flight was in receipt of a BS from Farnborough LARS. The Manual of Air Traffic Services (MATS) Part 1, Section 1, Chapter 11, Page 4, Paragraph 3.1.1, states:

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

The C404 was in receipt of a Reduced TS due to 'poor coverage and traffic loading.' MATS Part 1, Section 1, Chapter 11, states:

'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.'

'There may be circumstances that prevent controllers from passing timely traffic information and/or deconfliction advice, e.g. high workload, areas of high traffic density, unknown aircraft conducting high energy manoeuvres, or when traffic is not displayed to the controller or is obscured by surveillance clutter. Controllers shall inform the pilot of reductions in traffic information along with the reason and the probable duration; however, it may not always be possible to provide these warnings in a timely fashion.'

'In high workload situations, which may not always be apparent from RTF loading, it may not be possible for controllers to always provide timely traffic information and/or deconfliction advice. High workload situations may not necessarily be linked to high traffic density.'

High traffic density can cause difficulty interpreting ATS surveillance system data and may affect RTF loading or controller workload to the extent that the controller is unable to pass timely traffic information and/or deconfliction advice on all traffic.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the C404 pilot, transcripts of the Thames Radar RT frequencies, radar video recordings, a report from the Thames air traffic controller involved and reports from the appropriate ATC authorities.

It was unfortunate that the Board were not able to assess the Farnborough ATSU aspect of the incident owing to the late filing of the incident. Also, Members were disappointed that the M20J pilot had not completed a report form, denying Members of his viewpoint of the incident. Irrespective of the ATS being provided, the incident occurred within the Class G airspace where both pilots were responsible for maintaining their own separation from other traffic through see and avoid. The C404 flight had just turned L and established onto his initial survey line about 20sec prior to the CPA, and during this manoeuvre the pilot was responsible for clearing the area into which he was turning. That said, the C404 is known to have blind-spots owing to the wing/engine configuration and the pilot's view would have been degraded during the later stages of the turn as the ac was belly-up to the approaching M20J until rolling out on his required track. It was about this time the C404 pilot saw the M20J approaching in his 2 o'clock at the same level and immediately commenced a descent to avoid it, passing clear beneath it by about 200-300ft. An experienced pilot Member, familiar with this type of operation, informed the Board that the pilot would have almost certainly have been concentrating on his instrumentation to ensure exact positioning of the ac on the survey line and this would have almost certainly reduced his look-out scan. The Board noted that the ac was being flown 'single pilot', and Members agreed that it would have been better to have an additional person in the cockpit to augment the lookout. In response to Member's questions about the options for carrying a dedicated lookout rather than a second qualified pilot in order to save on costs, the CAA Flt Ops Advisor briefed the Board that for AOC flights certified for single pilot operations, such persons can only be passengers and may not undertake any of the pilot's duties (handling the controls, operating aircraft equipment or completing flight documentation). Such passengers should not be permitted to contribute in any way to the operation of the ac. The Thames controller had limited the TS owing to poor radar coverage and traffic loading; the airspace is a transit area beneath the LTMA and between London/City and Stansted CAS and frequently busy owing to flights generated by adjacent GA airfields. Thames issued TI to the C404 flight on other unknown ac in the area but only informed the pilot about the M20J as the ac were passing each other. It was not known whether the M20J pilot had seen the C404 approaching from his L; the ac was flying into sun and the Mooney is known to have a narrow 'letterbox' type windscreen. Although the M20J had right-of-way, the Rules of the Air Regulations rely on both pilots seeing each other and discharging their responsibilities accordingly. In this occurrence Members agreed that the C404 pilot had discharged his responsibilities and his actions had quickly and effectively resolved this conflict in Class G airspace.

AIRPROX REPORT No 2010172

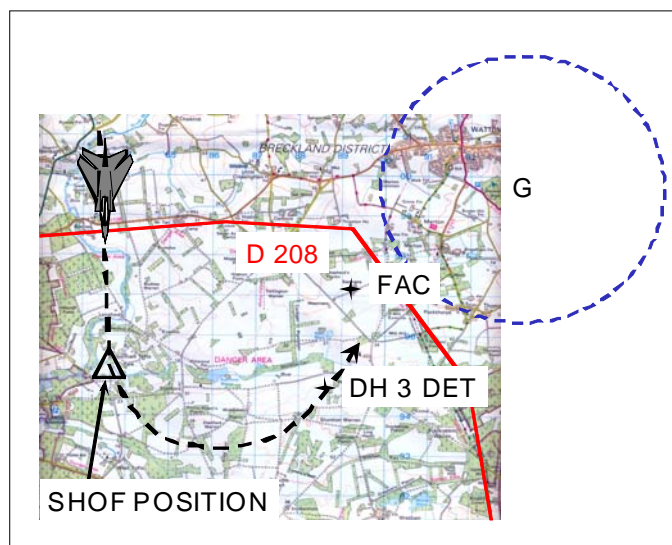
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class G airspace resolved by the C404 pilot.

Degree of Risk: C.

AIRPROX REPORT NO 2010173

Date/Time: 25 Nov 2010 1248Z
Position: 5231N 00043E (STANTA)
Airspace: D208 (Class: G)
Reporting Ac Reported Ac
Type: DH3 UAV Tornado GR4
Operator: RA HQ Air (Ops)
Alt/FL: NR 250ft
 (NK) (Rad Alt)
Weather: VMC CAVOK VMC CLBC
Visibility: 5.0km 5.0km
Reported Separation:
 100-200ft V/O H Not Seen
Recorded Separation:
 NR

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

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

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

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

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

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

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

THE TORNADO PILOT reports that they were working with a Joint Tactical Air Controller (JTAC) in the STANTA in support of a ground exercise under the control of a Tactical Ops Centre (TOC). The JTAC requested a Show of Force (SHOF) near Buckenham Tofts so his WSO contacted the controlling TOC to request clearance for the SHOF at the tasked position; they were instructed to standby while the TOC negotiated their clearance. While waiting, the crew discussed with the controlling JTAC the probability of having to return to Marham due to shortage of fuel if the clearance was delayed. The TOC then contacted them and informed them that they had clearance to ground level and were approved to carry out a SHOF. The WSO informed the TOC that the LOA would be 180°, which they acknowledged and then the WSO confirmed that they would depart to the East (left) off the target. The TOC then responded confirming that the Tornado would route East over the target and the WSO corrected them saying, *“negative, we will be heading 180 over target then turning left on to East before climbing to 10000ft”*, and they acknowledged this. They were then given clearance by the TOC down to ground level on LOA 180°, and

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carried out the SHOF at 250ft under control of the JTAC, egressing East off target at 250-500ft before climbing to 10000ft and recovering to RAF Marham.

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

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

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

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

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

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

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

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

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

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

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

HQ AIR (OPS) comments that a lack of appreciation of the airspace allocated to the DH3 appears to have been a factor and we believe this is more of an airspace infringement than an AIRPROX, however, it is difficult to understand what avoidance criteria the GR4 had been given as the dimensions of WA1 appear to be unknown. It

is not clear from the information above how close the 2 platforms got, the assessment by the DH3 IG of a 150ft agl overflight is not consistent with the report from the SHOF target site.

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

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

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members found this a very complex incident as in most cases their knowledge of such exercises is scant. Although there was a view that such incidents should be investigated by the Military authorities, the Director informed the Board that their remit included the investigation of such incidents and if possible, bearing in mind the lack of such material normally available (for instance RT and radar recordings) an investigation and report should be completed as an independent view would be welcomed by the Military authorities. Members decided that there was sufficient information available to them to decide on the cause of the incident but that since there was no information regarding the separation between the Tornado and the UAV involved or whether the Tornado had flown over the UAV, the landing site or merely infringed the UAV area of operation, the Board could not determine the degree of risk.

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

Without an RT recording (not available in Military Tactical communication systems) the Board could not determine the actual departure clearance passed to the Tornado or whether the clearance had been inappropriate or misunderstood; nor could the Board determine whether the Tornado crew's transmission was ambiguous. However, the Board was satisfied that the Tornado crew both understood that they were 'cleared' to depart to the

AIRPROX REPORT No 2010173

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

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

PART C: ASSESSMENT OF CAUSE AND RISK

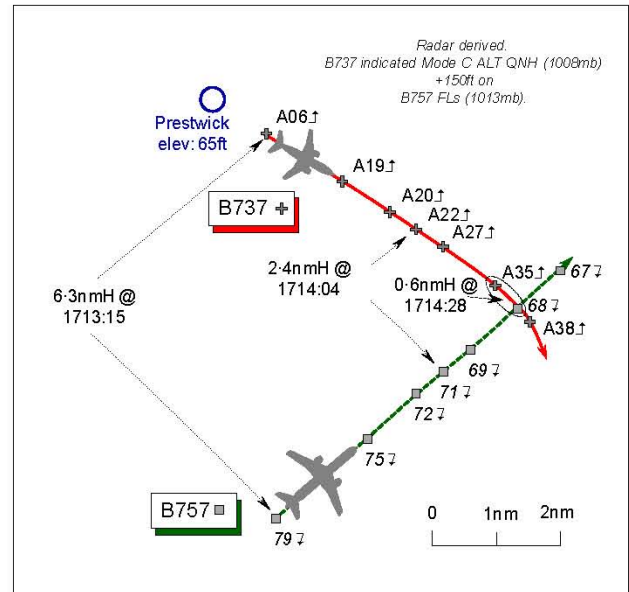
Cause: The Tornado flew close enough to the UAV to cause its operators concern.

Degree of Risk: D.

AIRPROX REPORT NO 2010174

Date/Time: 16 Dec 2010 1714Z NIGHT
Position: 5527N 00426W
 (6nm SE of Prestwick Airport elev: 65ft)
Airspace: S TMA/Prestwick CTR (Class: D)
Reporter: SAC Galloway Sector

	<u>1st Ac</u>	<u>2nd Ac</u>
<u>Type:</u>	B757	B737-800
<u>Operator:</u>	CAT	CAT
<u>Alt/FL:</u>	6000ft ↓	3000ft ↑
	QNH (1008mb)	QNH (1008mb)
<u>Weather:</u>	IMC In Cloud	NR
<u>Visibility:</u>	10km	NR
<u>Reported Separation:</u>	Not seen	NR
<u>Recorded Separation:</u>	3250ft V @ 0.5nm min H	



CONTROLLER REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SAC (PRESTWICK) GALLOWAY SECTOR TACTICAL CONTROLLER (GAL-T) reports that a military ac working ScATCC (Mil) had declared an emergency and was diverting into Prestwick Airport from the vicinity of FOYLE – 17nm N of Glasgow. This emergency traffic was co-ordinated with his Planner (GAL-P), descending to the min stack level of FL80, proceeding direct to a position 10nm Final for RW13 at Prestwick. He agreed to remain clear of this emergency ac with all GALLOWAY Sector traffic or coordinate as required. The B757, inbound to Glasgow through TURNBERRY VOR (TRN), was released at FL80 towards LANAK and transferred to Glasgow RADAR about 10nm SSE of Prestwick Airport. Glasgow then transferred an outbound flight [ac3] on a TRN SID from RW05 climbing to an altitude of 6000ft. He also detected, from the B757's Mode S Selected Level (SEL), that Glasgow had descended this ac to 6000ft. No co-ordination had been offered by Glasgow regarding the separation between ac3 and the B757, therefore, he immediately climbed ac3 and asked GAL-P to tell Glasgow. However, he then observed on radar another ac - the B737 - outbound from Prestwick off RW13 (not the notified RW in use) showing a Mode S SEL of 6000ft on a direct track in conflict with the B757 also showing a SEL of FL60 Mode S. He called Prestwick, whilst his Planner called Glasgow, asking Prestwick to stop the B737 at 5000ft which was agreed. Prestwick then called back almost immediately stating that the B737 had already been transferred to his GALLOWAY frequency, that it was climbing on the SID to 6000ft and that they had given Glasgow RADAR approval for their inbound B757 to descend in Prestwick's airspace to 6000ft. Whilst on the phone to Prestwick, the B737 crew called on his frequency passing 4000ft in the climb to 6000ft so he immediately gave the B737 crew an avoiding action to turn onto a heading of 180° to avoid the B757 and stopped the B737's climb at 5000ft QNH. Separation was not lost and eventually the B737 was co-ordinated, climbed and transferred to the TALLA sector.

THE BOEING B757 PILOT reports flying inbound to Glasgow but was unaware of any Airprox. He recalled being given extended vectors to the E, whilst flying in IMC, because of military traffic inbound to Prestwick with an emergency. However, no other ac was seen and as far as he was aware at the time, nothing untoward occurred.

THE BOEING B737-800 PILOT (B737) reports that the only indication of an impending incident was an ATC instruction to turn preceded by the term 'avoiding action'. They did not receive a TCAS TA or RA and understood from ATC that minimum separation was 2000ft.

THE PRESTWICK TOWER CONTROLLER (TWR) reports that he took over the position at 1700UTC with 1 pending departure and no other scheduled traffic until 1950UTC. Some 6min later he answered the ScATCC (Mil) line and was advised of a Tornado that had declared a PAN and was inbound to Prestwick low on fuel. A local

AIRPROX REPORT No 2010174

Standby was initiated for the safety services at 1710. The B737 departed from RW13 at 1713 after co-ordination with the GAL Sector. About 1min later he advised the APR of the B737's departure via intercom; the APR requested further details which were passed, whereupon the APR intimated the B737 could be passed direct to the GAL Sector. The B737 was duly transferred to GAL-T on 124.825MHz. A few secs later the APR requested that the outbound B737 be given a level restriction of ALT 5000ft, but he advised that the B737 had already been transferred to the GAL Sector.

THE PRESTWICK APPROACH RADAR CONTROLLER (APR) reports that he opened the APR position at short notice due to a Tornado that had called a PAN and was now inbound. After taking the Tornado's details from ScATCC (Mil), Glasgow telephoned asking for ALT 6000ft for an inbound that was passing about 3nm E of Prestwick, which was coordinated. GAL Sector was telephoned about the PAN ac to coordinate it entering the TMA. During this call, the B737 departed from RW13 - the RW in use was RW31 - but the VCR ATSA was unable to pass the airborne time to the APR. TWR came through on the intercom with the departure time, but he (the APR) had no details of the B737 and so queried its routeing; since the route was through NEW GALLOWAY NDB (NGY), he did not perceive a conflict. GAL Sector phoned shortly afterwards requesting the B737 be stopped at ALT 5000ft; he requested TWR to do this but the B737 had already been transferred to GAL-T. He immediately phoned GAL Sector to tell them the B737 had been transferred with no level restriction; during the call the B737 crew called GAL-T who stopped the climb at ALT 5000ft and passed an avoiding action turn. The B737 was passing about ALT 3000ft at this time; at no point was vertical separation eroded.

ATSI reports that the Airprox occurred in Class D CAS, SE of Prestwick Airport and was reported by the Prestwick Centre (PC) Galloway Tactical controller (GAL-T).

The B737 had departed Prestwick and was in contact with GAL-T on 124.825MHz. The B757 was inbound to Glasgow from Lanzarote and had been transferred to Glasgow APPROACH, having worked the GAL Sector previously. The GAL Sector was being operated by GAL-T and a Planning controller - GAL-P. There were no reported unserviceabilities and the controllers were using Multi Radar Tracking on their situation displays. Transcription of the telephone recordings was not possible due to technical difficulties and the quality of the recording. These issues have been addressed separately with Prestwick by the CAA's Transcription Unit.

Prestwick TOWER (TWR) and APPROACH Procedural (APP) functions were bandboxed in the Tower due to very low traffic levels. The notified runway in use was RW31. At 1704 the B737 crew called TWR on 118.150 MHz requesting start, which was approved and TWR gave RW13 [sic] for departure.

Scottish Military called TWR at 1705 pre-noting a Tornado in a state of emergency and requested a radar-to-visual approach for RW13. The Tornado was accepted by Prestwick at 6000ft. At this time the stand-by controller proceeded to open the Approach Radar (APR) position. In a subsequent conversation between the two units shortly after the ILS was confirmed as operational for RW13, an ETA for the Tornado was given as 1720.

At 1705:20 the B757 crew called GAL-T descending FL110 to be level by GIRVA on a heading of 025°. The B757 was 26.5nm SW of TURNBERRY VOR (TRN). GAL-T instructed the B757 crew to resume their own navigation to TRN, but shortly afterwards instructed the crew to route direct to LANAK.

The B737 commenced taxi to holding point Juliet for RW13 at 1708:30; Juliet/RW13 is situated a short distance from the terminal building at Prestwick Airport.

At 1709:20 the B757 crew was instructed to descend to FL80. The B757 was 16nm SW of Prestwick on a NE'ly track when it was transferred to Glasgow APPROACH on 119.1MHz at 1710:40.

The B737 crew reported ready at Juliet at 1710:45 and was instructed to line-up and wait. TWR then made a call to the airport's fire service to initiate the local standby for the Tornado; then, at 1711:45 cleared the B737 for take-off. At 1711:44, Glasgow Approach called the APR to point-out the B757 and co-ordinate its descent to 6000ft, which was approved. This was in accordance with agreed procedures as the B757 was above the Prestwick Local Area (defined in Glasgow MATS Part 2 and extending to altitude 6000ft). The B757 was 9nm S of Prestwick.

The B737 appeared on the GAL-T's situation display at 1713:15 passing ALT 600ft QNH (1008mb) with Mode S SEL observed to be set to FL60. At 1713:54, TWR called the APR to enquire if the APR "*wanted*" the B737. This was the first indication to the APR of the departure, which by now was airborne. APR asked which way the B737

was routing and later reported that there were no details on the outbound at the radar console. ADC replied "NEW GALLOWAY" but did not state that the B737 was departing from the 'non-duty' RW13. At 1714:04 APR stated, "not interested". TWR transferred the B737 to the GAL Sector at 1714:06 as the ac was climbing through ALT 2200ft. The B757 was in the B737's 2 o'clock range 2.4nm descending through FL71 for ALT 6000ft.

At 1714:09, GAL-T called the APR and asked the controller to stop the B737 at ALT 5000ft, explaining that Glasgow Approach was dropping the B757 to 6000ft and the call terminated. The descent rate of the B757 was observed to be approximately 500ft/min and the ac had approximately 45nm to run for Glasgow's RW05.

At 1714:12, the B737 crew commenced their read-back of the frequency change, during which the land-line between TWR and APR was heard to re-engage. A voice was discernible under the B737's read-back but the content of the message was inaudible. The B737 crew completed the read-back at 1714:17, immediately after which TWR stated (to APR), "Sorry he's just gone".

At 1714:25, the APR called-back GAL-T explaining that the B737 had already been transferred to the GAL Sector. GAL-T asked if APR had given Glasgow lower on an inbound. APR replied, "I've given Glasgow six thousand, yes, sorry the TOWER have just chucked him to you". By this time the tabular data blocks of both aircraft on the GAL-T's situation display had merged.

The B757 passed through the 12 o'clock of the B737 at a range of 0.6nm at 1714:28. The B737 was climbing through ALT 3500ft QNH (1008mb) as the B757 was descending through FL68, 6nm SE of Prestwick. Horizontal separation reduced to 0.5nm at 1714:32 as the B757 crossed into the B737's 11 o'clock. STCA did not activate on the GAL-T controller's situation display.

[UKAB Note (1): The B757 was displayed at FL068 within the Scottish TMA and the B737 at ALT 3700ft (1008mb) within the Prestwick CTR giving vertical separation of about 3250ft at minimum horizontal separation of 0.5nm.]

As this conversation was taking place the B737 crew called GAL-T passing 3700ft for 6000ft on the NEW GALLOWAY 1L SID. GAL-T interrupted the conversation with APR and, at 1714:39, instructed the B737 crew, "avoiding action turn right immediately heading south stop climb at 5 thousand feet". This was read-back accurately by the B737 crew. By 1714:57 the B737's turn onto a southerly heading begins to take effect.

The telephone line to the APR remained open as GAL-T co-ordinated with the GAL-P and at 1715:20 the APR interjected, asking if GAL-T had the B737 on frequency. GAL-T replied, "affirm" and the call was terminated. Shortly afterwards the B737 crew was informed they were clear of the traffic and climbed/vectored in accordance with requisite Standing Agreement. The B737 crew later reported that the turn and 'stop climb' instruction was unusual but 'not worth reporting'. The B757 crew continued inbound to Glasgow and subsequently reported being unaware of the Airprox.

GAL Sector and Glasgow Approach followed the published procedures for handling the B757 inbound to Glasgow via TRN – LANAK. Glasgow co-ordinated the descent of the B757 to altitude 6000ft in the Prestwick Local Area as required by unit procedures.

The B737 was cleared to depart from RW13, the non-duty runway, by TWR. Immediately after informing the B737 crew that departure would be from RW13, this RW was allocated to the inbound emergency Tornado and configured accordingly. APR was opened as a separate operational position in anticipation of the Tornado's arrival. However, APR had no details of the B737's imminent departure. Additionally, when TWR requested whether or not APR required to work the B737 on a NEW GALLOWAY SID, the B737's departure from the non-duty runway was not highlighted to the APR. The APR agreed co-ordination with Glasgow for the B757's descent when the APR did not know that the B737 would be departing from the non-duty RW13.

It is likely that the distraction of the inbound Tornado and the short notice opening of the APR position lead to an incomplete transfer of information between TWR and APR with regard to the traffic situation.

Further to GAL-T's request to stop the B737 at 5000ft, the APR's attempts to relay this message to TWR were unsuccessful and the B737 called GAL-T climbing into conflict with the B757. The profiles of both ac were such that there was no loss of separation; however, the sequence of events led the GAL-T controller to believe that safety had been compromised.

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Subsequent to this Airprox, appropriate remedial actions were completed at Prestwick in co-ordination with the CAA Air Traffic Standards Division's Northern Regional Inspectorate.

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.

The B757 crew, descending IMC in cloud, could not see the B737 visually and, at over 3000ft below their ac at the CPA, would have been unconcerned if it was displayed on TCAS. Neither was the B737 pilot concerned it would seem, despite his initial climb being interrupted. Whilst stipulated vertical separation had not been eroded during this encounter there was significant potential for a more serious situation to occur. Some Members were surprised that this incident was reported as an Airprox because of the eventual separation, but the prevailing view was that the reporting GAL-T controller had rightly perceived the seriousness of the occurrence and was justified in raising this as an Airprox.

Controller Members were of the view that if the APR position had not been opened for the inbound Tornado, then the conflict might not have arisen. Neither the oncoming APR, nor the receiving GAL Sector were aware that the B737 would depart from RW13, when the APR agreed to Glasgow's request to descend their B757 to 6000ft within Prestwick's assigned airspace, just as the B737 departed off RW13 climbing to the same altitude. This was a significant factor and the catalyst that initiated the conflict. A CAT pilot Member queried if the B737's departure would have been subject to a 'release' from the APR, but at the time it departed it was the same controller in the VCR that was providing the combined TWR and APP control service, so such a 'release' would not have been sought. Although the combined TWR/APP controller had offered the B737 to the APR when he was opening the position in the ACR, TWR had not mentioned the departure was from other than RW31 and a salutary omission. Therefore, the APR would not have appreciated the potential for a conflict to the SE of the airport and had declined to afford a radar service to the B737 in the erroneous belief the B737 would depart initially to the NW. Plainly, if the APR had been aware the B737 was taking-off from the opposite RW13 he would have realised it was in direct conflict with the descending B757 and would not have agreed to the co-ordination. Similarly in the VCR, TWR/APP was unaware that the APR had just allowed Glasgow to descend their B757 to 6000ft in Prestwick's assigned airspace. Thus the TWR/APP controller in the VCR did not have a full understanding of the traffic situation and neither did the controller in the ACR have the complete 'picture' of what was occurring with these two ac. This all stemmed from the APR position being opened at short notice and the controller agreeing co-ordination when he was not in full possession of the actual traffic situation. It seemed that the handover of approach control from the procedural environment controlled by APP in the VCR to that of a radar environment controlled from the ACR had been deficient and in the Member's overwhelming view was the fundamental cause of the Airprox. The Board concluded therefore, that this Airprox had resulted from an incomplete handover of the Approach Control function between TWR/APP and the APR.

In an area controller Member's view, GAL-T had done a good job in resolving this situation which required prompt action when he detected the B737 departing from RW13 in conflict with the descending B757. GAL-T had not been privy to the co-ordination between Prestwick and Glasgow, but Mode S proved its worth here by displaying to GAL-T that the B757 crew were intending to descend to the same level that the B737 crew had been cleared to. A controller member familiar with this airspace opined that Glasgow would have been endeavouring to descend the inbound B757 promptly, to get their inbound ac clear below traffic outbound on Edinburgh SIDs. Hence the B757's early descent. Nonetheless, when asked to level the B737 at 5000ft by GAL-T at 1714:09, the APR was unable to do so as the crew had already been instructed to switch to GAL-T earlier by TWR, an instruction that was read-back by the crew 3 sec later allowing insufficient time for the APR to relay the message. Therefore GAL-T, as the receiving controller, had to wait until the B737 crew called before he could interject and resolve the situation at 1714:39, when he transmitted his avoiding action turn and stop climb. The B737 was climbing through 3700ft QNH when the crew called and the radar recording revealed this was after the minimum horizontal separation of 0.5nm was achieved when the B757 had already crossed ahead of the B737. Nonetheless, 3250ft of vertical separation existed at the CPA. Some Members considered that, as both ac had been cleared to the same altitude, this was purely fortuitous and GAL-T's avoiding action turn had had little effect on the outcome. Some Members were also critical that the avoiding action was phrased in this way; however, controller Members pointed out that when dealing with TCAS equipped ac avoidance in the horizontal plane was the preferred option followed by action to ensure vertical separation, thereby reducing the potential for avoiding action instructions contrary to that demanded by an RA. The flight path of the B737 was such that it was always

going to pass below and astern the B757 and the overwhelming view of the Members was that appropriate action had been taken and there had been enough time to rectify the situation. Whilst GAL-T's stop climb instruction prevented the situation from deteriorating further, there was ample separation in the vertical plane when the two ac were at their closest horizontally, thus the Board concluded no actual Risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: An incomplete handover of the Approach Control function between TWR/APP and the APR.

Degree of Risk: C.

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AIRPROX REPORT NO 2010175

Date/Time: 14 Dec 2010 1008Z

Position: 5626N 00300W
(1nm SE Dundee A/D - elev 17ft)

Airspace: ATZ/Scottish FIR (Class: G)

Reporting Ac Reported Ac

Type: Grob 115 D2 Typhoon FGR4 pr

Operator: Civ Trg HQ Air (Ops)

Alt/FL: 1000ft 2000ft

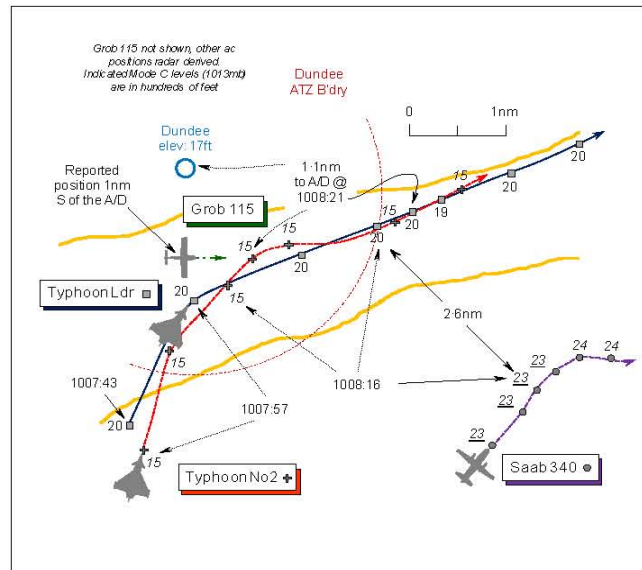
QNH (1036mb) SAS/QFE

Weather: VMC CLBC VMC CLBC

Visibility: 25km 10km

Reported Separation:
300-500ft V NR

Recorded Separation:
Not Recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GROB 115 D2 HERON PILOT (G115), a flying instructor, reports that he was conducting a local VFR training flight in the cct at Dundee; his student was the PF. He was in receipt of an Aerodrome Control Service from Dundee TOWER on 122.9MHz and squawking A7010 with Mode C; Mode S is not fitted.

Whilst Downwind L for RW27, 1nm S of the aerodrome heading 095° at 100kt, flying level at 1000ft Dundee QNH (1036mb), 2 Typhoon jets were observed in his 4 o'clock high position, he estimated 300-500ft above his aeroplane. Both Typhoons were observed in a RHD turn 1nm away tracking NE before heading E down the River Tay. No avoiding action was taken as there was no Risk of a collision. Dundee TOWER reported sighting the 2 fast-jets in close proximity to the Dundee ATZ, but had no previous notification from Leuchars ATC of their overflight. He reported the Airprox to ATC by telephone after landing.

His aeroplane is white with blue stripes; the landing light and HISLs were on.

THE TYPHOON FGR Mk4 LEAD PILOT reports he was leading a pair of Typhoons departing from Leuchars IFR and cleared to take-off and depart on a SID1, which stipulates a climb on RW track to 2000ft QFE, then R onto a track of 070° climbing to FL150. He was in receipt of a TS from Leuchars DEPARTURES (DEPS) who had applied a climb-out restriction of 2000ft QFE against an SF340 at 3000ft QFE. Departing in accordance with the published SID1, on rolling-out to track 070° he saw the SF340 in his 2 o'clock at a distance of 1nm. However, he had incorrectly reset his altimeter to 1013mb during the initial climb out. Whilst he believed he was flying straight and level at 2000ft QFE, he had in fact levelled above his assigned height at 2000ft (1013mb), which equated to 2660ft QFE (1035mb). When he saw the SF340 he assessed that there was no risk and overtook it with divergent headings before being cleared to climb further. He did not report sighting the Grob G115 flown by the reporting pilot.

The assigned squawk was selected with Modes C and S on. His ac has a grey colour-scheme and the white HISLs were on.

THE NO 2 TYPHOON FGR Mk4 PILOT reports he was flying as the No 2 of the formation, departing on a SID1 under IFR in VMC on a radar assisted trail departure to 2000ft QFE (1035mb) in accordance with their departure clearance. The formation was in receipt of a TS from DEPS. His ac was climbed to and maintained 2000ft QFE (1035mb) due to transit traffic – the SF340. Their ground track resulted in an over flight of Dundee ATZ at 2000ft QFE (1035mb), whilst following his formation leader in a 1nm radar trail; he did not see any other ac during the departure.

The assigned squawk was selected with Modes C and S on. His ac has a grey colour-scheme and the white HISLs were on.

THE SAAB 340 (SF340) PILOT did not file an Airprox report but helpfully provided an occurrence report. The SF340 was inbound to Dundee from Birmingham under IFR and was flying level at 3000ft Leuchars QFE under a TS from Leuchars ATC. About 7nm S of Dundee he observed a contact on TCAS in the vicinity of Leuchars indicating on the ground. They gained visual contact with two ac accelerating along the main runway and taking-off in their direction, which were subsequently identified as a pair of Typhoons climbing fast. As they flew N of the extended RW centreline at Leuchars with the Typhoons passing behind them TCAS RAs of Descend, Monitor Vertical Speed and Climb sounded in quick succession with the red TCAS icons coinciding with the Typhoons' positions. The A/P was disengaged ready to manoeuvre but due to the quick change of the RAs enunciated and visual contact with the traffic the RA was not followed beyond the initial descent of about 200ft. Leuchars ATC was informed of the TCAS RA and he was advised that the Typhoons had been co-ordinated to climb to a height of 2000ft on climb-out. He surmised that the Typhoons' very high initial ROC and speed triggered the 'closure rate envelope in the TCAS logic. He assessed that there was no actual risk due to the traffic co-ordination; the closest proximity was about 1nm horizontally and approximately 1000ft below as the traffic passed from R-L astern at about 90° to their track. Visual contact was maintained until the traffic passed out of sight astern.

THE DUNDEE COMBINED AERODROME AND APPROACH CONTROLLER (TOWER) reports that Leuchars ATC had co-ordinated the arrival of the SF340 for a visual LHD Base-leg join for RW27 at Dundee, whereupon he advised Leuchars of the three G115 ac in the cct. To allow the SF340 to join, the three G115 crews were instructed to orbit in the Downwind leg. Two Typhoon ac then appeared to enter the Dundee ATZ without prior notification from the S and route to the NE passing overhead one of the G115s. The reporting G115 pilot advised the Typhoon was at 1200ft. The incident was discussed with Leuchars ATC.

THE LEUCHARS DEPARTURES CONTROLLER (DEPS) reports that the 2 Typhoons were prenoted for a SID1 departure with a climbout restriction in force of 2000ft Leuchars QFE (1035mb) for the SF340 inbound to Dundee. As the Typhoon formation departed, he identified them, placed them under a TS and re-stated the climbout restriction. The SF340 was inbound for a visual L Base-leg join to RW27 at Dundee, descending to 3000ft Leuchars QFE (1035mb) and crossing the climb-out when the Typhoons departed. As the Typhoons climbed out he called the lead jet to the SF340 crew and stated that the Typhoon pair was climbing to 2000ft on a climbout restriction. Very shortly afterwards the SF340 pilot advised him of a TCAS RA against the Typhoon pair.

As the lead Typhoon started to turn he believes he passed TI on the most easterly non-squawking ac to the N of the lead Typhoon, which was displayed inside the Dundee ATZ [perceived to be one of the Grob 115s]. He cannot recall what the Mode C indications of the individual ac were, only that the climbout restriction was reinforced to the Typhoon pilots on initial RT contact and that they were departing on a SID1.

THE LEUCHARS ATC SUPERVISOR (SUP) reports that whilst the climb-out restriction provided safe vertical separation between the Typhoons departing on the SID1 and the SF340, neither ac can achieve their respective objectives – for the Typhoons a climb and the SF340 crew a descent - until they have passed clear. This particular scenario is resolved by means of a SID2, which ensures that the ac do not meet laterally in the same airspace. This point was recognised by the DEPS controller, but too late to change his plan.

UKAB Note (1): The Leuchars RW27 SID2 stipulates a climb on RW track to 2000ft QFE, then L onto a track of 100° climbing to FL150.

ATSI reports that the Airprox occurred just after 1008UTC, in class G airspace. The Dundee ATZ comprises a circle of radius 2nm centred on the mid-point of RW27 and extending from the surface to 2000ft above the aerodrome elevation of 17ft.

The Dundee 0950UTC METAR: 29003kt 9999 BKN040 03/01 Q1036=

Dundee ATC was providing a combined Aerodrome and Approach control service without the aid of surveillance radar equipment. At the time of the Airprox, Dundee had three G115 ac in the visual LHD cct for RW27 and the reporting G115 crew had completed two ccts prior to the reported Airprox. The Dundee controller's written report indicates that Leuchars ATC had coordinated the arrival of the SF340 and had been advised of three light aircraft flying in the visual cct.

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At 1007:05, less than 1min before the Airprox with the Grob, the SAC (Prestwick) radar recording shows the lead Typhoon ac, 5.5nm SSE of Dundee, squawking A0231, passing 0.75nm behind the inbound SF340 that was in receipt of a TS from Leuchars RADAR. The SF340 is shown tracking N at that point indicating FL24 [an altitude of about 3090ft Dundee QNH 1036mb]. The lead Typhoon indicating FL20 [2690ft Dundee QNH] was tracking W at that point some 400ft below the SF340. The SF340 pilot's written report indicates that a TCAS RA was received and an occurrence report was subsequently rendered. Although not a factor in the Airprox, the lead Typhoon pilot's written report indicates that the pilot had incorrectly set 1013mb for the initial climbout instead of the Leuchars QFE of 1035mb (a difference of 660ft at 30ft/mb). The lead Typhoon is observed turning R onto a northerly track towards Dundee Airport and the lead pilot's written report indicates that he was visual with the SF340 and overtook it on a diverging heading before being cleared to climb. At 1007:27, the radar recording shows the second Typhoon squawking A0233 and following the lead aircraft 1.75nm in trail indicating FL15 [about ALT 2190ft]. At 1007:35, the Grob reported downwind for RW27 and the Dundee controller instructed the Grob pilot to report before turning L base. At 1007:51, the radar recording shows the lead Typhoon 2nm S of Dundee airport, turning R to follow a track that passed 1.3nm to the SE of Dundee Airport.

At 1008:00 TOWER observed the two Typhoon ac and transmitted a warning, *"Dundee all stations just be advised two fast jets passing through the overhead."* The Dundee controller's written report indicates that there was no prior notification of the two Typhoon ac that had appeared to enter the Dundee ATZ routeing from the S to the NE. However, the radar recording shows that both Typhoon ac passed above the Dundee ATZ to the SE of the aerodrome, the lead ac maintaining an altitude of 2690ft and the No2 Typhoon maintaining an altitude of 2190ft Dundee QNH (1036mb).

The Dundee TOWER controller decided to hold the three Grob G115 ac on the downwind leg in the cct anticipating the arrival of the SF340 on a wide L base-leg. At 1011:01, the SF340 crew called Dundee TOWER and reported orbiting 4nm SE of Dundee to lose altitude.

At 1011:45 TOWER asked the Grob G115 pilot, *"Do you know how close those Typhoons got"*. The G115 pilot replied, *"Well they went straight across us..probably about 2 hundred feet above."* The Grob G115 pilot's written report indicated that the G115 was at 1000ft Dundee QNH. TOWER asked if the Grob pilot wished to file an Airprox, to which he responded, *"..negative I had them visual the whole time..."*. TOWER acknowledged the G115 pilot, *"Copied and can you just confirm they were inside the ATZ at 12 hundred feet"*, to which the G115 pilot replied, *"Affirm."*

Leuchars RADAR was aware that the Dundee cct was active and the Typhoon pair was operating IFR with a climb restriction of 2000ft Leuchars QFE (1035mb). Co-ordination or the provision of TI about the two Typhoons from Leuchars would have aided the Dundee controller's SA and would have allowed the passing of timely TI by TOWER to ac operating within the ATZ.

The G115 was operating within the Dundee ATZ in receipt of an Aerodrome Control Service at 1000ft QNH (1036mb). The Dundee TOWER controller sighted the Typhoons as they passed above the Dundee ATZ at altitudes of about 2690ft and 2190ft respectively and passed an appropriate warning. The Manual of Air Traffic Services, Part 1, Section1, Chapter 12, Page 3, Paragraph 2.1, states:

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

aircraft flying in, and in the vicinity of, the ATZ;

aircraft taking-off and landing.'

HQ 1GP BM SM reports that the Typhoon FGR4 pair was in receipt of a TS from Leuchars DEPS whilst departing the aerodrome on a SID1 departure, with a climb-out restriction of 2000ft QFE (1035mb). The radar replay shows the Typhoons tracking approximately 1.3nm SE of Dundee, indicating 2000ft (SSR Mode C with a display QNH of 1037).

The SF340 was also in the vicinity and inbound to Dundee on an IFR flight from Birmingham. The SF340 was in receipt of a TS from Leuchars and the arrival had been co-ordinated with Dundee. Although there is no comment

within DEP's report about his workload, it is clear from the transcript that it was medium to high whilst controlling multiple units at varying ranges from the aerodrome, including the SF340.

At 1007:39, DEPS passed TI to the Typhoon pair, *"traffic north half a mile tracking east, no height information appears to be Dundee visual circuit traffic at 1 thousand feet."* Although this was the first TI passed by DEPS to the Typhoons on this traffic, it is clear from the transcript that DEPS was busy in the period immediately before this transmission. The Grob G115 flown by the reporting pilot is not shown on the SAC radar recording [which does not replicate what was displayed to DEPS]. Furthermore, although the G115 pilot reports that his transponder was selected on with Mode C, it is not possible to determine whether traffic in the Dundee visual cct was painting continuously on DEPS' radar display, which might have allowed the controller to pass TI earlier.

There were no military ATM related causal or contributory factors in this Airprox.

UKAB Note (2): At the closest point, the No2 passed 1.1nm SE of Dundee aerodrome and would have been the lowest and closest Typhoon to the reporting Grob pilot's ac at the reported Airprox location 1nm S of the aerodrome. Given the tolerances applicable to Mode C of +/- 200ft, the vertical separation between the No2 and the G115 pilot's reported altitude was not less than 1000ft.

HQ AIR (OPS) comments that this complex occurrence has been extensively investigated as a result of a well meaning but erroneous estimation of the Typhoon's height by the G115 pilot. There was no infringement of the ATZ nor any risk of collision. The execution of a SID1 in this case was acknowledged as being less than ideal in that it delayed the execution of the climb/descent profiles for the Typhoons and the SF340. However, it was not unsafe and would have provided 1000ft clearance from the coordinated traffic and from normal circuit traffic at Dundee. The incorrect altimeter setting of the lead Typhoon was not in accordance with standard practice and this has also been acknowledged and debriefed. It resulted in a TCAS RA for the SF340 but both ac had each other in sight and felt there was no risk of collision.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The SF340 pilot had not reported an Airprox but it was evident that his ac's IFR transit had been instrumental in restricting the Typhoon pair's climb-out and thus a factor as to why the jets were lower than might normally be expected in the vicinity of Dundee. Whilst the SF340 pilot was aware that the Typhoon formation had been coordinated to climb to 2000ft QFE beneath his ac, he perceived at the time that it was the Typhoons' initial ROC and speed that had triggered the RAs. However, from the Typhoon leader's frank account, coupled with the recorded radar data, it was clear that the lead pilot had exceeded his assigned height, thereby reducing the vertical separation from the planned 1000ft to 400ft as the pair flew 0.75nm astern of the SF340. The HQ Air Ops Member observed that although the SF340 pilot was unaware of this at the time, in the prevailing good weather the Typhoon pilots were clearing their flight path visually and the higher lead pilot had subsequently acquired the airliner. The lead Typhoon pilot had set the QFE on his altimeter before take-off but had subsequently set 1013mb climbing through 1000ft. However, with the intervening stop at 2000ft issued by DEPS to remain beneath the SAAB, the leader had omitted to reset the QFE on his altimeter, hence, the 'height' bust. Unfortunately, neither the No2 Typhoon pilot nor the DEPS controller had commented on the RT to the lead pilot when this occurred. However, this was an acknowledged lapse by the lead pilot, which the Board noted had been addressed.

Ironically, by levelling his ac 660ft higher than his assigned height of 2000ft QFE (1035mb) – equating to about 2690ft Dundee QNH (1036mb) – the lead Typhoon pilot had inadvertently increased the separation from the Grob 115 flown by the reporting pilot who was downwind at 1000ft Dundee QNH. Some Members commented that it would have been helpful if DEPS had called Dundee when it became evident that the Typhoons would be kept low and were flying wide of the SID1 track close to the Dundee ATZ. However, DEPS might reasonably have expected the pair to be remaining over the S bank of the River Dee estuary whilst following the SID1 track and therefore normally clear to the S of the Dundee ATZ, as shown in the UK Mil AIP. Furthermore he was operating under a medium to high workload and he probably had little opportunity to liaise on the landline in the time available. It was contended that the lead Typhoon's wider ground track on departure might have been flown with the intentions of assisting DEPS by increasing the horizontal separation against the SF340 as soon as possible, thereby allowing

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the latter to descend whilst facilitating an earlier climb for the jets. Nevertheless, it was plain that a SID2 with a LHD turnout could also have accomplished this aim, as suggested within the SUP's comments.

The Grob 115 pilot's written account reports that the Typhoon pair had flown about 300-500ft above his aeroplane. However, when questioned over the RT by ATC some 3½min after the event it was evident that the Grob pilot had estimated that the Typhoons were only 200ft above his aeroplane and had entered the ATZ. Unless he had climbed significantly above the 1000ft QNH cct altitude reported, it was plain from comparison of his reported altitude and the recorded radar data that he had significantly underestimated the vertical separation that existed. Whilst it might not have been wise to fly this close to the 2017ft amsl upper limit of the Dundee ATZ without RT contact, it was evident to the Board that the Typhoon pair had not entered the ATZ without permission. The radar recording placed both the lead Typhoon and the No2 above the upper limit of the ATZ at altitudes of about 2690ft and 2190ft respectively with the lower of the pair in unregulated airspace in excess of 1000ft above the pattern altitude. Whilst the Board accepted that the Grob 115 pilot and the Dundee controller had filed their reports in good faith, they were plainly mistaken in their estimates of the altitude of the two Typhoons and the minimum separation that actually existed. In the Board's opinion, this was not an Airprox but a sighting of traffic flying above the ATZ boundary and the Members agreed unanimously with the reporting Grob 115 pilot's view that no Risk of a collision had existed whatsoever.

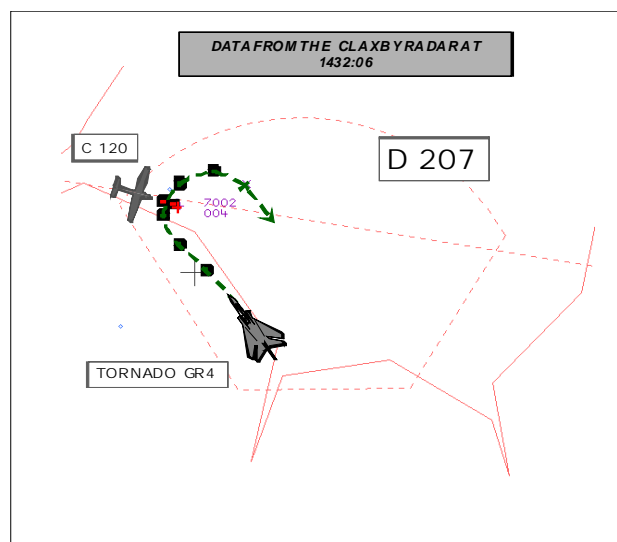
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting Report.

Degree of Risk: C.

AIRPROX REPORT NO 2010176

Date/Time: 9 Dec 2010 1432Z
Position: 52.52N 000.10E (Holbeach AWR)
Airspace: D 207 (Class: G)
Reporting Ac Reported Ac
Type: Tornado GR4 C120
Operator: HQ Air (Ops) Civ Pte
Alt/FL: 200ft NR
 (Rad Alt)
Weather: VMC NR NR
Visibility: 30km NR
Reported Separation:
 V 800ft/H 200ft NR
Recorded Separation:
 NR

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

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

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

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

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

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

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

HQ AIR (OPS) comments that the dimensions of an Air Weapons Range are not designed to protect the aircraft operating within them; crews must remain vigilant to the potential for incursions from other air platforms. Good airmanship, however, should make the avoidance of notified danger areas by non-users a priority.

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PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

Airprox	Date	Aircraft	Position	Risk	Page
2010081	02/07/10	EC135 v Grob 109	1.9nm NE Denham	B	19
2010082	02/07/10	A319 v PA38	S of Liverpool Airport	C	21
2010083	01/07/10	Basset CC1 v Dornier Alphajet	14nm W Boscombe Down A/D	C	25
2010084	03/07/10	C560 XLS v Untraced Glider	4nm SSE Cambridge	B	31
2010086	06/07/10	Lockheed L1011 v ASW27 Glider	15nm NW Brize Norton	C	36
2010087	11/07/10	ASK21 Glider v PA44	0.25nm SW Ridgewell G/S	C	39
2010088	14/07/10	Tutor v Tutor	12nm SSE Cranwell	C	41
2010089	13/07/10	EC225 v Typhoon	5nm S Wick	C	43
2010090	08/07/10	DHC8 v A320	5nm W GIBSO	C	49
2010091	10/07/10	Cessna152 v PA28B	Andrewsfield A/D – RW09RHC	C	53
2010092	20/07/10	SAAB 340B v Harrier T12	3.7nm N of Leuchars	C	57
2010094	10/07/10	FK50 v PA28	9nm N of Oxford	C	62
2010096	21/07/10	Apache AH1 x2 v Chinook HC1 x2	6½ nm E of Middle Wallop	A	66
2010097	22/07/10	Apache AH1 x2 v Chinook HC1	1½nm SE Rivar Hill G/S	C	71
2010098	21/07/10	Tucano v R44	2nm W Whitby	C	75
2010099	23/07/10	PA34 v PA31T	1.5nm NW Oxford	C	77
2010100	23/07/10	PA28 v PA28	1nm NW Wycombe	B	81
2010101	14/07/10	HS25 v A319	11nm WSW Hawarden	C	84
2010102	29/07/10	PA34-200T v PA34	Oxford/Kidlington RW01RHC	C	90
2010103	24/07/10	PA28 v PA28	Near Enstone	B	94
2010104	10/08/10	B737-800 v DA42	5nm W Bournemouth	C	96
2010105	09/08/10	Harrier GR9 v Untraced Ac	1½nm NW Daventry	C	102
2010107	12/08/10	C150 v PA46	3nm E Elstree	C	104
2010108	18/08/10	Grob Tutor II v Unk Microlight	5½nm NE of Wyton	C	106
2010109	18/08/10	Puma v Untraced Ac	4nm N Benson	B	108
2010110	19/08/10	Harrier T12 v PA28	12nm E RAF Wittering	B	111
2010111	17/08/10	BH06 JetRanger v Lynx AH7	6.5nm WNW Church Fenton	C	113
2010113	17/08/10	Tucano v GA8	Linton-on-Ouse	C	117
2010114	26/08/10	EC225 v PA23	13nm SSE Wick	C	121
2010115	13/08/10	Hawk v Hawk	5nm W Dumfries	B	126
2010116	11/08/10	Hawk T1 v Untraced Glider	2¼nm NW Ledbury	C	128
2010117	27/08/10	Tucano v Untraced Glider	2nm NE Linton-on-Ouse	C	130
2010118	31/08/10	F406 v Pegasus Flexwing M/L	1nm SE Lee-on-Solent	B	133
2010120	02/09/10	Pegasus GT450 v MD900 Explorer	0.75nm N Arclid M/Light Site	C	136
2010121	31/08/10	Tornado GR4 v PA28	Tain Range	C	138
2010122	05/07/10	Tristar KC1 v P180 II Avanti	4nm SSE Brize Norton	C	142
2010123	02/09/10	A319 v ATR72	5nm SSW TUNSO	C	149
2010124	03/09/10	Tristar v TB20	10nm SbyW Waddington	C	153
2010125	02/09/10	Merlin HC3 v Untraced Glider	7nm E Linton-on-Ouse	D	158
2010126	01/09/10	MD902 v Beagle Pup	3nm E Wyton	C	160
2010127	03/09/10	Luscombe 8E v PA28	4nm NE Blandford Forum	B	162
2010128	04/09/10	C42 Microlight v PA28-161	5nm SW Pitsford Reservoir	C	164
2010129	02/09/10	Skydiver v R44	Chatteris	A	168
2010130	08/09/10	Tornado GR4 v Tornado GR4	4nm SE Galashiels	A	170
2010131	09/08/10	C150 v PA32	5nm SE LAM	C	173
2010132	05/08/10	Lynx v Untraced Glider	5nm S Benson	B	176
2010133	14/09/10	Sentry v Tutor	6½nm SbyW Waddington A/D	C	178
2010134	14/09/10	SK76 v BE200	4.5nm N DTY	C	182

2010135	16/09/10	Harrier x2 v PA28-161	2.75nm E Coventry	B	186
2010136	19/09/10	DHC-8 v PA28R	8.5nm ENE Plymouth	C	189
2010137	18/09/10	C152 v Beagle Pup	Conington	A	194
2010138	28/08/10	Vigilant T1 MG v PA32	3¼nm S Odiham	C	197
2010139	07/09/10	BE76 Duchess v DA42 Twin Star	1.5nm FIN APP RW26 Bournemouth	A	200
2010140	21/09/10	DR400 v BE200	14nm NE Coningsby	B	204
2010142	21/09/10	MD902 v Untraced Unmanned AC	3nm S Headcorn	B	207
2010143	22/09/10	Dominie T Mk1 v DR 400	5nm SSW Binbrook	C	209
2010144	26/09/10	AW109 v R22B	170° Coningsby 14nm	C	214
2010145	16/09/10	Hawk v Lynx	Final RW31 Valley	C	219
2010146	24/09/10	Hawk x3 v Ventus B Turbo	3nm SW Appleby	B	223
2010147	26/09/10	Paragliders x3 v EC145	Corn Ridge Nr Oakhampton	C	225
2010148	29/09/10	JS41 v BE200	7nm SE Wick	C	228
2010149	04/10/10	A319 v C182	4nm Final RW24 Edinburgh	C	232
2010150	07/10/10	PA34 v PA28	6nm W Gloucester	C	237
2010151	05/10/10	Harrier T8 v MC130H	13nm E Kendal	C	241
2010152	06/10/10	Tutor v BE200	O/H RW26 Cranwell	C	243
2010153	07/10/10	Tucano v Hawk x2	4nm NE Linton-on-Ouse	A	246
2010154	05/10/10	Airbus A320 v Hawk T1	21nm S Dean Cross VOR	C	251
2010155	06/10/10	PA28 v Tornado GR4	3nm SW Montrose	B	255
2010156	12/10/10	A319 v C152	1.7nm NE Stansted	C	257
2010158	12/10/10	Grob Tutor TMk1 v Grob Tutor TMk1	8nm SE Barkston Heath	C	262
2010159	12/10/10	Grob Tutor v DA40	3nm SSW Bedford A/F	C	264
2010160	20/10/10	Mainair Blade Flexwing M/L v PA38	2nm S Ashcroft	C	266
2010161	20/10/10	Tucano x2 v Grob Tutor	Nr Grimwith Reservoir	C	268
2010162	25/10/10	Tornado GR4 v PA28	Cairngorm Mountains	C	270
2010163	13/10/10	Tornado GR4 v SAAB Gripen x2	3nm FIN APP RW23 Lossiemouth	A	272
2010164	21/10/10	B737-500 v EV97 Eurostar	9nm E Bournemouth	C	278
2010165	16/10/10	BN2T v C208	2.25nm S Netheravon	C	281
2010166	01/11/10	SAAB SF34 v Tornado GR4	8nm NNE Inverness	C	284
2010167	03/11/10	EC155B v PA31	4nm S Fairoaks	B	288
2010168	04/11/10	R44 v DA42	2nm NNE Shoreham A/D	C	291
2010169	08/11/10	EC135 v Hughes 369E	0.7nm ESE Wolverhampton A/D	C	294
2010170	03/11/10	Hawk v Gyroplane	2nm N Wigton	C	298
2010171	16/11/10	Hawk T Mk1 v Hawk T Mk1	10nm W Welshpool	C	300
2010172	24/10/10	C404 v M20J	10nm NNW London/City	C	302
2010173	25/11/10	DH3 UAV v Tornado GR4	STANTA	D	306
2010174	16/12/10	B757 v B737-800	6nm SE Prestwick Airport	C	310
2010175	14/12/10	Grob 115 D2 v Typhoon FGR4 x2	1nm SE Dundee A/D	C	315
2010176	09/12/10	Tornado GR4 v C120	Holbeach AWR	C	320