UK AIRPROX BOARD

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Analysis of Airprox in UK Airspace

Report Number 23
July 2009 – December 2009

FOREWORD

The purpose of this, the 23rd Report from the UK Airprox Board, is to promote Flight Safety by publicising the circumstances and causes of Airprox with the aim of preventing repetition in the future. The Report provides a compendium of the all the Airprox reported as occurring in UK airspace during the period from 1 July 2009 to 31 Dec 2009.

The number of Airprox during 2009 was the lowest for more than 10 years. The number of Airprox during the first half of the year was particularly low, but the in the second half of the year, the period covered by this Report, the rate of reporting increased to be close to that of the previous 5-year rolling average. Although not within the scope of this Report, the rate of reporting for 2010 is up again and close to the 10-year averages, despite the ash!

Given the low number of events, caution is required in deducing trends from the data sets available over any 6-month period. Nevertheless, the most significant changes during the period Jul – Dec 2009, a marked reduction in Airprox involving Commercial Air Transport (CAT) and an increase in Airprox involving Military aircraft, both maintain trends established in previous years.

In addition to noting the numerical values presented for the period Jul-Dec 2009, readers are invited to consider the statistics presented in the following pages as examples of the data available and possible comparators. As custodian of the Joint Airprox Recording System database, the Airprox Board is willing to assist any organisation or individual who seeks Airprox data for use in improving Flight Safety. Just ask.

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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)

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 hands-on practitioners with first-hand civil and military 'know how' on:

- Military and civil Air Traffic Terminal Control, Area Control and Airfield Control
- Fixed and rotary wing Commercial Air Transport (CAT)
- General Aviation (GA) flying, including gliding
- Fixed and rotary wing flying by the RN, Army and the 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 and identify the main causal factors
- Assess the risk levels involved
- Make Safety Recommendations where appropriate to reduce the risk of 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, fields within the appropriate record are completed by the UKAB Secretariat. 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 with details of recently assessed Airprox reports.

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

AIRPROX RESULTS FOR 2009

Numbers Of Airprox

Figure 1 shows the cumulative distribution of Airprox for 2009 compared with the average for the previous 5 years. With no obvious technical or operational reasons for the reduction in Airprox over the year, it is assumed that much of it is due to reduced activity levels as a result of the recession. The incidence of Airprox in the second half of the year was much higher than the first half and close to the previous 5-year average.

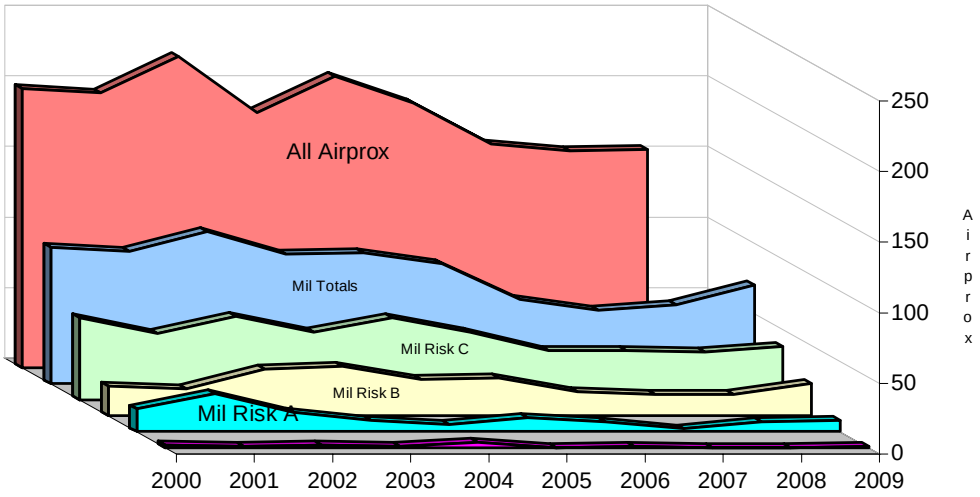


Figure 1. Numbers of Airprox during 2009.

In addition to the 147 Airprox that were fully investigated, 13 were withdrawn by the reporting pilot or controller prior to assessment by the Board. Withdrawals are usually a result of individuals reflecting on the circumstances of the occurrence, or in the light of emerging findings of the investigation.

Trends By User Groups

Airprox totals over the last 10 years are shown in Table 1 and Figure 2. Of the reduction in Civ-Civ encounters, most is a reduction Airprox involving CAT. Some of the increase in reported Mil-Mil Airprox appears to be as a result of a change in reporting culture.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Civil~Civil	100	97	109	87	109	99	95	93	93	74
Civil~Mil	78	73	77	67	69	74	46	38	38	36
Mil~Mil	18	20	31	23	22	8	12	12	17	30
Other	2	5	4	4	7	7	6	11	7	7
Totals:	198	195	221	181	207	188	159	154	155	147

Table 1. Airprox totals by main user groups.

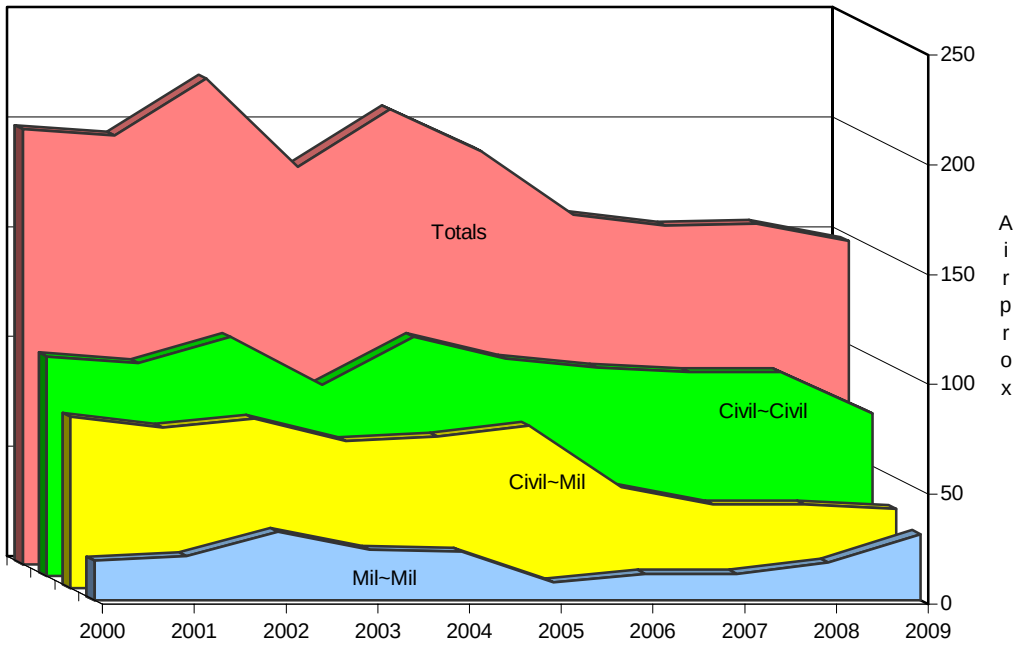


Figure 2. Airprox by User Groups.

Trends by Flight Classification

Expansion of the civilian user groups to show trends by flight classification is shown in Table 2 and graphically in Figure 3. There has been a steep fall in the number of CAT against CAT Airprox and the trend of CAT against GA aircraft continues downwards. Conversely, there has been a sharp rise in the number of Airprox involving Mil against Mil aircraft but, as noted earlier, at least some of this increase is a result of improved reporting.

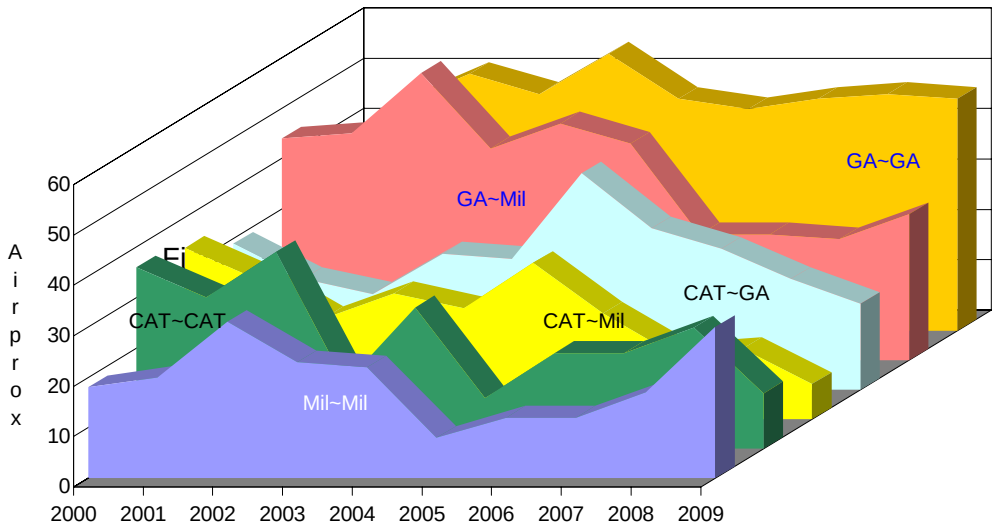


Figure 3. Airprox trends by flight classification.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
GA~Mil	44	45	57	42	47	43	25	25	24	29
GA~GA	35	45	51	47	55	46	44	46	47	46
CAT~CAT	36	30	39	13	28	10	19	19	24	11
CAT~GA	29	22	19	27	26	43	32	28	22	17
CAT~Mil	34	28	20	25	22	31	21	13	14	7
Mil~Mil	18	20	31	23	22	8	12	12	17	30
Other	2	5	4	4	7	7	6	11	7	7
Total	198	195	221	181	207	188	159	154	155	147

Table 2. Airprox Trends by Flight Classification.

Airspace

Figure 4 shows the airspace types in which the Airprox took place. As always, the lower levels of Class G Airspace and Aerodrome Traffic Zones are where most of the occurrences took place.

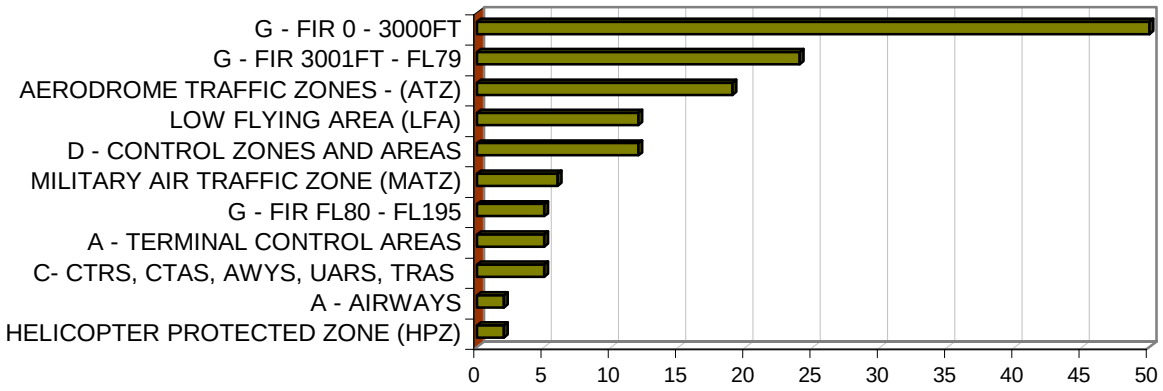


Figure 4. Airspace in which 2 or more Airprox took place in 2009.

Many of the occurrences in Class G Airspace involved late sightings and non-sightings. However, there were a significant number of conflicts in Class G between VFR and IFR traffic in which pilots operating IFR appeared to believe, erroneously, that they had priority over VFR traffic. Another notable trend was the number of Airprox in ATZs caused by pilots who did not follow the traffic patterns established by aircraft already in aerodrome circuits. Finally, there appears to be fairly widespread misunderstandings among pilots operating IFR in Class D airspace about the rules, options and separation criteria with respect to VFR traffic.

COMMERCIAL AIR TRANSPORT (CAT) SECTION

CAT Risk

The reduction in Airprox involving CAT aircraft was across all aircraft classes: CAT v CAT, CAT v GA and CAT v Mil. The data in Table 3 and the associated chart in Figure 5 show the numbers, by Risk Rating, of Airprox involving at least one CAT aircraft over the period 2000-2009.

CAT Risk	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
CAT Risk A	6	0	1	0	1	1	0	0	0	0
CAT Risk B	8	14	7	12	7	7	6	5	2	1
CAT Risk C	85	65	70	54	67	78	68	60	58	33
CAT Risk D	1	4	4	0	4	1	0	0	1	1
CAT Total Airprox	100	83	82	66	79	87	74	65	61	35
Hours x 10K	138.9	139.5	136.6	139.8	148.5	154.6	160.2	162	163.5	149.7
All Airprox	198	195	221	181	207	188	159	154	155	147

Table 3. CAT Risk Data 2000-2009.

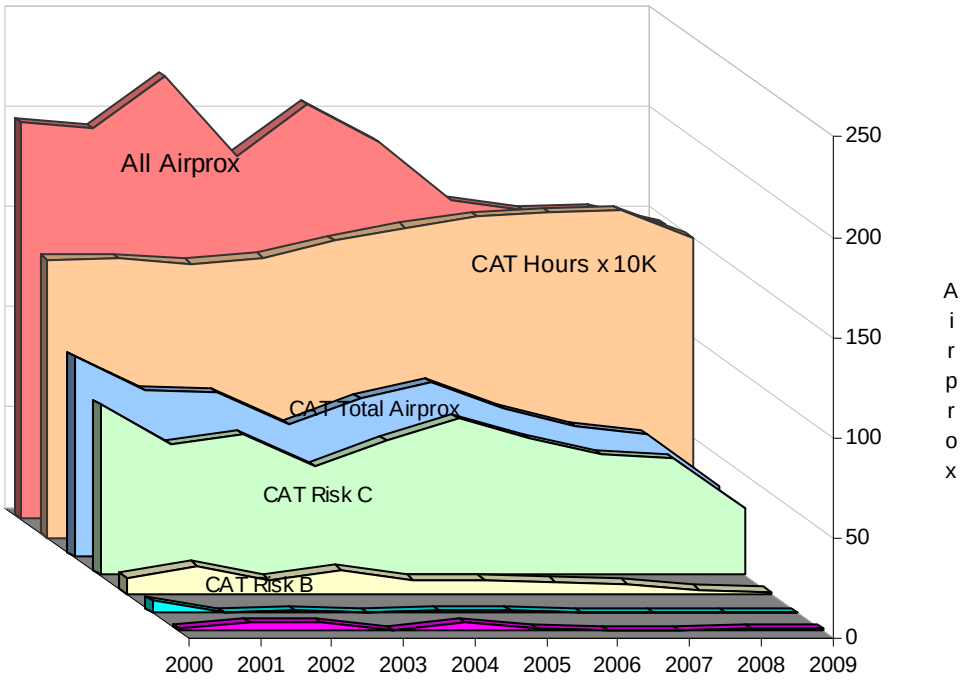


Figure 5. CAT Risk Distribution.

With only one Category B event during the year, 2009 saw lowest number of CAT risk-bearing Airprox over the 10-year period. There was also a large reduction in the number of non-Risk bearing events. The reduction in flying hours may account for part of these falls, but the rate of CAT Airprox also shows a downward trend, as shown in Table 4 and Figure 6.

CAT Rates	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
CAT Rate (A+B)	1.01	1.00	0.59	0.86	0.54	0.52	0.37	0.31	0.12	0.07
CAT Rate (A+B+C+D)	7.20	5.95	6.00	4.72	5.32	5.63	4.62	4.01	3.73	2.34
Hours x K	1,389	1,395	1,366	1,398	1,485	1,546	1,603	1,620	1,635	1,497

Table 4. CAT Airprox Rates per 100 000 flying hours.

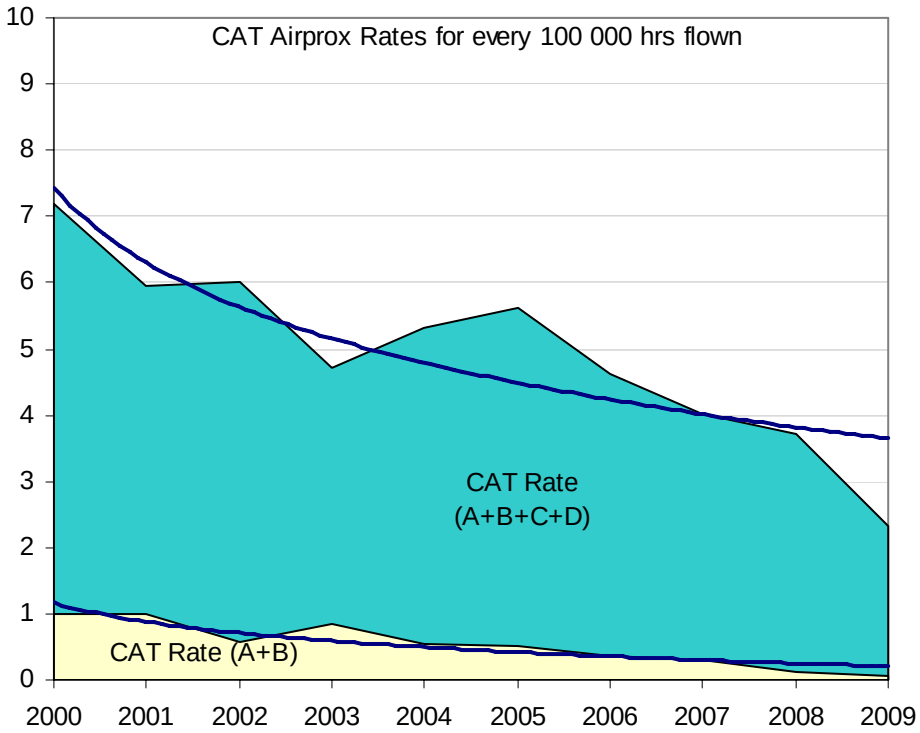


Figure 6. CAT Risk rates 2000-2009.

CAT Causal Factors

Table 5 lists the predominant causes behind the 35 Airprox involving at least one CAT aircraft. Each Airprox can have more than one causal factor and a total of 37 causal factors were assigned to the 35 CAT Airprox. Notwithstanding the lower number of incidents during the year, the causes and their rankings are similar to previous years. Airprox that are assessed to be Sighting and TCAS Reports are events that were considered reportable but are determined by analysis to be 'non–events' ie there was no loss of separation or risk. The only CAT Risk Category B Airprox (2009-037) during the year was a CAT v CAT encounter caused by the pilots in one aircraft misinterpreting an ATC message and the controller not detecting the incorrect readback.

Ser.	Cause	Totals
1	SIGHTING/TCAS REPORT	8
2	DID NOT SEPARATE/MISJUDGEMENT	8
3	CLIMBED/DESCENDED THROUGH ASSIGNED LEVEL	5
4	NOT OBEYING ORDERS/ FOLLOWING ADVICE/ FROM ATC	3
5	MISINTERPRETATION OF ATC MESSAGE	3
6	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	2
7	CONTROLLED AIRSPACE CONFLICT IN VMC	2
8	FIR CONFLICT	2
9	UNDETECTED READBACK ERROR	2
10	PENETRATION OF CAS/ATZ WITHOUT CLEARANCE	2

Table 5. Most common Causal Factors in Airprox during 2009 having CAT aircraft involvement.

GENERAL AVIATION (GA) SECTION

GA Risk

The 95 Airprox involving GA aircraft accounted for 65% of the total number in 2009, compared with 63% in 2008. There was a reduction in the number of GA v CAT Airprox, but an increase in the number of GA v Mil events; GA v GA occurrences were similar to 2008. Table 6 and Figure 7 show that the risk distribution for GA Airprox; there is a welcome reduction in the number of Risk Category B events but an increase in Category C occurrences kept the total numbers broadly the same. Just under half of the GA risk-bearing Airprox were against military aircraft and the balance were against GA aircraft.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
GA Risk A	19	24	9	10	13	16	10	8	8	8
GA Risk B	33	27	58	38	42	41	36	30	31	20
GA Risk C	54	60	57	70	71	75	57	65	55	66
GA Risk D	2	1	3	0	4	1	0	0	4	1
GA Totals	108	112	127	118	130	133	103	103	98	95
All Airprox	198	195	221	181	207	188	159	154	155	147

Table 6. GA Risk Data 2000-2009

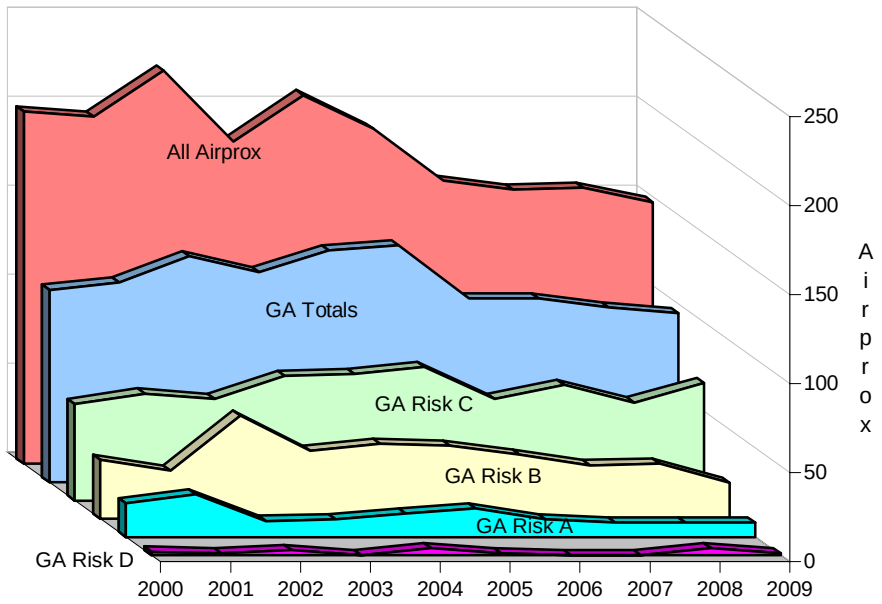


Figure 7. GA Risk distribution 2000-2009

GA Airprox Rates

The hours data available for GA aircraft is a best estimate at the time of publication that is refined as more accurate figures become available, eg from C of A renewals. The hours figures are coherent with previous years allowing a reasonably reliable comparison. From Table 7 and

Figure 8, it can be seen that although the overall rate rose slightly last year, the rate of risk bearing Airprox showed a welcome reduction.

GA Rates	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Rate for (A+B)	4.24	4.22	5.40	3.83	4.35	4.56	3.53	2.82	2.89	2.16
Rate for (A+B+C+D)	8.81	9.26	10.24	9.41	10.27	10.65	7.89	7.65	7.26	7.32
Hours flown in K	1,226	1,209	1,240	1,254	1,266	1,249	1,305	1,346	1,351	1,299

Table 7. GA Airprox Rates per 100 000 flying hours.

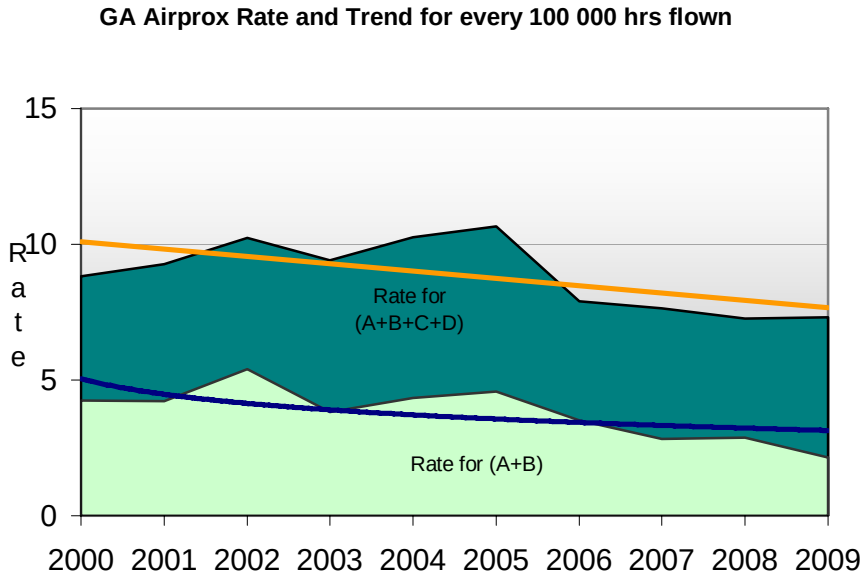


Figure 8. GA Risk Rates 2000 – 2009.

GA Causal Factors

A total of 30 different factors were assigned to the 95 GA Airprox in 2009, many of them more than once, such that there were 146 assignments in total. Table 8 shows the 10 most common causal factors and, as usual, sighting issues constitute the top 2.

Ser.	Cause	Totals:
1	LATE SIGHTING OF CONFLICTING TRAFFIC	28
2	DID NOT SEE CONFLICTING TRAFFIC	25
3	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	18
4	SIGHTING REPORT	15
5	FIR CONFLICT	8
6	CONFLICT IN OTHER TYPE OF AIRSPACE	6
7	PENETRATION OF CAS/ATZ WITHOUT CLEARANCE	5
8	CLIMBED/DESCENDED THROUGH ASSIGNED LEVEL	4
9	DID NOT ADHERE TO PRESCRIBED PROCEDURES	4
10	DID NOT SEPARATE/POOR JUDGEMENT	4

Table 8. Most common causal factors in Airprox in 2009 involving one or more GA aircraft.

Factors repeatedly contributing to late and non-sightings were poor lookout, pilots conducting instructional sorties and distraction with in-cockpit tasks. Furthermore, and notwithstanding the requirement to 'see and avoid' in Class G airspace, some of these Airprox could have been averted if the aircraft involved had been using a transponder with Mode C selected on. UKAB data is not complete, but it is likely that some Airprox occurrences involving powered aircraft and gliders could have been avoided if the powered aircraft were fitted to detect FLARM signals.

There are significant numbers of Airprox in Class G airspace involving CAT or civil commercial aircraft flying as IFR traffic filing against GA aircraft flying VFR. A regular feature of these Airprox is an apparent misunderstanding by pilots flying under IFR traffic that they have priority over VFR and/or a failure to realise that they have a responsibility to see and avoid other traffic in accordance with the ANO.

Military (Mil) Section

Mil aircraft were involved in 48% of the 147 Airprox that occurred in 2009; 44% of the Airprox involving one or more Mil aircraft were assessed to be risk bearing. The most significant increase in numbers of Airprox across all user groups and flight classifications was that of Mil-Mil events. Hot spots are the airfields and airspace associated with the Lincolnshire Area of Intense Air Activity.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mil Risk A	16	27	14	8	5	10	7	2	7	8
Mil Risk B	21	19	33	35	26	27	17	15	15	23
Mil Risk C	58	47	59	48	58	48	35	35	34	38
Mil Risk D	2	1	2	1	4	0	1	0	0	1
Mil Totals	97	94	108	92	93	85	60	52	56	70
All Airprox	198	195	221	181	207	188	159	154	155	147

Table 9. Military Risk data 2000 – 2009.

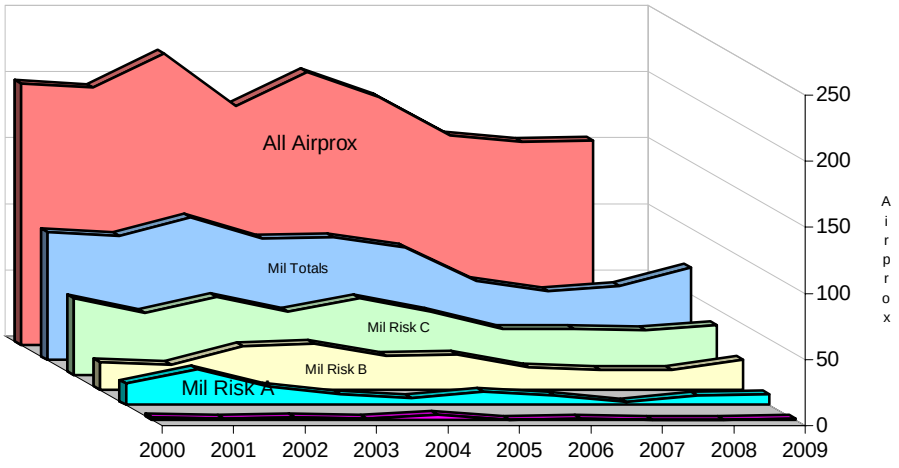


Figure 8. Military Risk Distribution 2000 – 2009.

Mil Airprox Rates

The rates of Mil Airprox are shown in Table 10. Notwithstanding the increase in the annual rates since 2007, it can be seen from Figure 9 that the rate is still just descending over the 10-year period from 2000 – 2009.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Rate for (A+B)	8.08	9.16	9.50	8.74	6.80	8.29	5.56	3.92	5.48	7.17
Rate for (A+B+C+D)	21.18	18.73	21.83	18.69	20.41	19.04	13.91	11.98	13.96	16.20
Hours flown in K	458	502	495	492	456	446	431	434	401	432

Table 10. Mil Airprox rates per 100 000 flying hours.

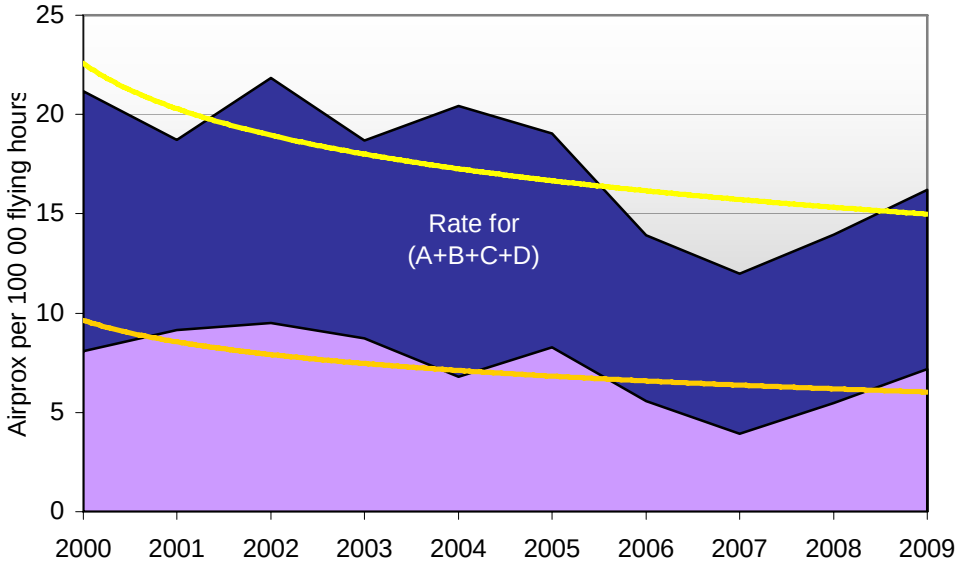


Figure 9 Mil Risk rates 2000-2009

Mil Causal Factors

A total of 30 different causal factors were assigned to the 70 Airprox involving at least one military aircraft. Those causes, which were assigned 4 or more times, are listed in Table 11 below.

Ser.	Cause	Totals:
1	LATE SIGHTING OF CONFLICTING TRAFFIC	28
2	DID NOT SEE CONFLICTING TRAFFIC	25
3	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	18
4	SIGHTING REPORT	15
5	FIR CONFLICT	8
6	CONFLICT IN OTHER TYPE OF AIRSPACE	6
7	PENETRATION OF CAS/ATZ WITHOUT CLEARANCE	5
8	CLIMBED/DESCENDED THROUGH ASSIGNED LEVEL	4
9	DID NOT ADHERE TO PRESCRIBED PROCEDURES	4
10	DID NOT SEPARATE/POOR JUDGEMENT	4

Table 11. Most common causal factors in Airprox involving at least one Mil aircraft during 2009.

Late sightings and non-sightings were the most common causes in Airprox involving Mil aircraft in 2009 and in the previous year. As in all aircraft categories, sighting reports include Airprox in which a pilot/crew has detected another aircraft only on their TCAS equipment. There were a number of such incidents, which might otherwise have gone unreported, around the airfields and airspace associated with the Lincolnshire Area of Intense Aerial Activity. There were also incidences of fast jets generating TCAS warnings in other aircraft at considerable distances during high-energy manoeuvres.

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 following information lists open recommendations and those that have been closed since the last report.

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. The CAA's Directorate of Airspace Policy has reviewed the relevant UK AIP pages and a small discrepancy between the turn point described in the NPR (I-GG 3.5NM) and that specified in the SID (I-GG DME 3NM) has been detected. This discrepancy will be corrected. Additionally, the CAA intends to clarify the diagram for the London Gatwick Southampton SID as it appears in the UK AIP. These revisions are being targeted for AIRAC 5/2009, which will come into effect on 7th May 2009.

UPDATE JUN 2009:

These revisions were not included in AIRAC 5/2009. It is now planned to include the revisions in AIRAC 10/2009, which is due to, come into effect on 24th September 2009.

STATUS – ACCEPTED – OPEN

2009-59 ASK21 GLIDER v SUPERMARINE SPITFIRE – 21 JUN 2009 - RISK: B

RECOMMENDATIONS

(i) That the MoD reviews the glider site symbology and the representation of ATZs on military LFCs and within associated Mission Planning Aids with the aim of improving their conspicuity and clarity.

(ii) That the MoD reviews the co-ordination arrangements for UAA involving military ac, such as occurred here in regulated airspace, to ensure the safe de-confliction of UAA from other established but incompatible air activities.

ACTION**: -** DAATM

UPDATE

(i) The glider site and ATZ symbology has been reviewed and is considered adequate. AMPA uses the UK LFC as its base map. This Airpox was due to a lack of detailed planning by the Spitfire pilot who also displayed a lack of knowledge of military airfields. It would be incorrect to say that such an AIRPROX will not occur again but the UK LFC is in

daily use by many aircrews and there does not appear to be reoccurrences. The symbology will be kept under review.

(ii) AUS has reviewed, and is content with, the co-ordination arrangements for UAA involving military aircraft.

STATUS – Closed

2009-74 F3 FORMATION v GROB 115 – 16 JUL 2009 RISK B

RECOMMENDATIONS

(i) The MoD should review the performance of the Watchman primary ASR and associated SSR system at RAF Leuchars to ensure that it provides appropriate solid radar coverage in the lower airspace commensurate with its role.

(ii) RAF Leuchars, together with ATC and aircraft operators at Dundee airport, should review the Dundee General Handling Areas and Air Traffic procedures to improve the mutual deconfliction of military fast jets and civilian light aircraft operating in this vicinity.

ACTION**:**

(i) MoD – DAATM COS

(ii) Tayside Aviation Ltd – Chief pilot
ATC Dundee Airport - SATCO
MoD – DAATM (Chief of Staff)

UPDATE:

The Watchman was flight checked on 19 Feb 10 and passed. The SSR was flight checked on 12 Apr 10 and passed. There are no other reviews of PSR and SRR systems' performance at Leuchars that can be undertaken; that said, there were no problems found with the PSR or SSR.

There is a close relationship between the two ATSUs at Dundee and RAF Leuchars. A User's Forum has been established, hosted by Dundee and with RAF Leuchars and Tayside Aviation as members, to provide the following:

a means of encouraging communication between a group representing the interests of Dundee Airport and its main users as well as outside agencies and organisations whose services and/or activities may directly impact on the airport and/or its users. Fostering a better understanding between members of the group and thereby improving safety by communication and understanding.

Tayside Aviation is a member of the Forum where it was agreed that:

(i) Dundee ATC would examine the feasibility of obtaining a conspicuity squawk for ac operating with Dundee outside of Dundee's visual circuit; Leuchars controllers would then be able to pass appropriate Traffic Information to Dundee for onward transmission. SATCO Dundee has applied to DAP for a conspicuity squawk and awaits the outcome.

(ii) Tayside Aviation would provide Dundee ATC with maps showing their training areas to the Northwest and east of Dundee. These maps have been copied to RAF Leuchars in order to brief aircrew and controllers.

(iii) It would not be practical for all (18) Tayside ac to use Leuchars Radar 126.50. As a general rule, aircraft operating North of the river Tay receive a more useful and safer Basic service from Dundee. All aircraft therefore operating north of the Tay have the benefit of listening out to build a traffic picture. Aircraft operating south of the Tay do use 126.50 and this does work well particularly for Fife based aircraft. However, as Leuchars are also operating UHF it is clear this receives a priority service and aircraft on VHF do not get the benefit of listening out to build up a mental traffic picture. Consideration is being given to use of VHF only at the weekends.

In addition, Tayside Aviation has fitted additional markings to the fins of their Tutor aircraft to improve their conspicuity,

STATUS – Closed

2009-76 PA28 v ASK21 GLIDER – 5 JUL 2009 – 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

STATUS – Open

2009-117 BE200 V PA28 – 23 SEP 09 - RISK C

RECOMMENDATION

The MoD is recommended to direct that, whenever it is possible to do so, aircraft in the visual circuit operate on the same frequency.

ACTION: DAATM

UPDATE:

RAF ATSUs have been advised of the requirement for having aircraft in the visual circuit operating on the same frequency; where same frequency or cross linked frequencies can not be achieved, controllers are to ensure that sufficient Traffic Information is passed to enable all pilots in the visual circuit to have appropriate SA to maintain safety.

STATUS - Closed

2009-119 DG500 V HAWK PAIR – 25 SEP 09 – RISK A

RECOMMENDATIONS:

(i) That the MoD and BGA jointly consider the promulgation of more information about gliding operations from sites that conduct ridge or mountain wave soaring, for the information of military crews.

(ii) That the MoD and the BGA should consider formulating notifying arrangements with the aim of forewarning military crews when gliding clubs are conducting ridge or mountain wave soaring.

ACTION: DAATM and BGA

STATUS - Open

2009-127 SEA KING V HAWK – 14 SEP 09 – RISK C

RECOMMENDATION:

RAF Valley procedures for the notification of the RIFA status should be reviewed.

ACTION: MAA

UPDATE:

Procedures have been reviewed. Ac operating in the RIFA wear a designated squawk that is Code Callsign Converted to 'RIFA'. All ac departing RAF Valley and RAF Mona, operating in the vicinity or likely to operate in the vicinity of the RIFA are told of the RIFA status and the activation height. Traffic operating within the RIFA is also provided with a Traffic Service. These RIFA notification and operating procedures are stipulated within the RAF Valley Flying Order Book.

STATUS - Closed

2009-130 B206 v VANS RV8 – 8 OCT 09 – RISK C

RECOMMENDATION:

The Aerodrome Operator should ensure that the Shoreham Aerodrome AIP entry regarding helicopter operations is reviewed.

ACTION: The Aerodrome Manager, Shoreham Airport

STATUS - Open

2009-151 TRISTAR v B767– 1 DEC 09 – RISK C

RECOMMENDATION:

That the MoD requests a review of the CAP413 instructions about the passing of climb-out restrictions.

ACTION: MAA

UPDATE:

A review of CAP413 was undertaken and additional guidance concerning climb-out restrictions has been incorporated.

STATUS - Closed

2009-157-A340 v B747- 11 DEC 09 – RISK D

RECOMMENDATION:

The CAA requests further information from the aircraft operator.

ACTION: CAA

STATUS - Open

aal	Above aerodrome level
ac	Aircraft
ACAS	Airborne Collision Avoidance System
ACC	Area Control Centre
ACN	Airspace Co-ordination Notice
A/D	Aerodrome
ADC	Aerodrome Control(ler)
ADR	Advisory Route
AEF	Air Experience Flight
AEW	Airborne Early Warning
AFIS(O)	Aerodrome Flight Information Service (Officer)
agl	Above Ground Level
AIAA	Area of Intense Aerial Activity
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Services
alt	Altitude
amsl	Above mean sea level
ANSP	Air Navigation Service Provider
AOB	Angle of Bank
A/P	Autopilot
APP	Approach Control(ler)
ACR	Approach Control Room
APR	Approach Radar Control(ler)
ARP	Aerodrome Reference Point
ASR	Airfield Surveillance Radar
ATC	Air Traffic Control
ATCC	Air Traffic Control Centre
ATCO	Air Traffic Control Officer
ATCRU	Air Traffic Control Radar Unit
ATIS	Automatic Terminal Information Service
ATM	Aerodrome Traffic Monitor
ATS (U)	Air Traffic Service (Unit)
ATSA	Air Traffic Service Assistant
ATSOCAS	ATSs Outside Controlled Airspace
ATSI	Air Traffic Services Investigations
ATZ	Aerodrome Traffic Zone
AWACS	Airborne Warning and Control System
AWR	Air Weapons Range
BGA	British Gliding Association
BHPA	British Hang Gliding and Paragliding Association
BINA ERS	British Isles/N Atlantic En Route Supplement
BMAA	British Microlight Aircraft Association
BS	Basic Service
c	circa
CC	Colour Code - Aerodrome Weather State
CAA	Civil Aviation Authority
CANP	Civil Air Notification Procedure
CAS	Controlled Airspace
CAT	Clear Air Turbulence
CAVOK	Visibility, cloud and present weather better than prescribed values or conditions
cct	Circuit
CFI	Chief Flying Instructor
CLAC	Clear Above Cloud
CLAH	Clear Above Haze
CLBC	Clear Below Cloud
CLBL	Clear Between Layers
CLNC	Clear No Cloud
CLOC	Clear of Cloud
CMATZ	Combined MATZ
CPA	Closest Point of Approach
CPDLC	Controller-Pilot Data- Link Communication
C/S	Callsign
CTA	Control Area
CTR/CTZ	Control Zone
CWS	Collision Warning System
DA	Decision Altitude
DAATM	Defence Airspace and Air Traffic Management
DAP	Directorate of Airspace Policy CAA
DF	Direction Finding (Finder)
DH	Decision Height
DME	Distance Measuring Equipment
DS	Deconfliction Service
DUA	Dedicated User Area
E	East
EAT	Expected Approach Time
elev	Elevation
ERS	En Route Supplement
est	estimated
FAT	Final Approach Track
FIR	Flight Information Region
FISO	Flight Information Service Officer
FMS	Flight Management System
FO	First Officer
fpm	Feet per Minute
fps	Flight Progress Strip
GAT	General Air Traffic
GCA	Ground Controlled Approach
GCI	Ground Controlled Interception
GMC	Ground Movement Controller
GP	Glide Path
GS	Groundspeed
H	Horizontal
HISL	High Intensity Strobe Light
HLS	Helicopter Landing Site
HMR	Helicopter Main Route
HPZ	Helicopter Protected Zone
HQ Air	HQ Air Command
HUD	Head Up Display
IAS	Indicated Air Speed
iaw	In accordance with
ICF	Initial Contact Frequency
IFF	Identification Friend or Foe
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
JSP	Joint Services Publication
KHz	Kilohertz
kt	Knots
km	Kilometres
L	Left
LACC	London Area Control Centre (Swanwick)
LARS	Lower Airspace Radar Service
LATCC(Mil)	London Air Traffic Control Centre (Military)
LFA	Low Flying Area
LFC	Low Flying Chart
LH	Left Hand
LJAO	London Joint Area Organisation (Swanwick (Mil))
LoA	Letter of Agreement
LOC	Localizer
LTMA	London TMA
MATS	Manual of Air Traffic Services
MATZ	Military Aerodrome Traffic Zone
mb	Millibars
METAR	Aviation routine weather report
MHz	Megahertz
MOD	Ministry of Defence
MRSA	Mandatory Radar Service Area
MSD	Minimum Separation Distance
N	North
NATS	National Air Traffic Services
NDB	Non-Directional Beacon
nm	Nautical Miles
NMC	No Mode C
NK	Not Known
NR	Not Recorded
NVG	Night Vision Goggles
OAC	Oceanic Area Control

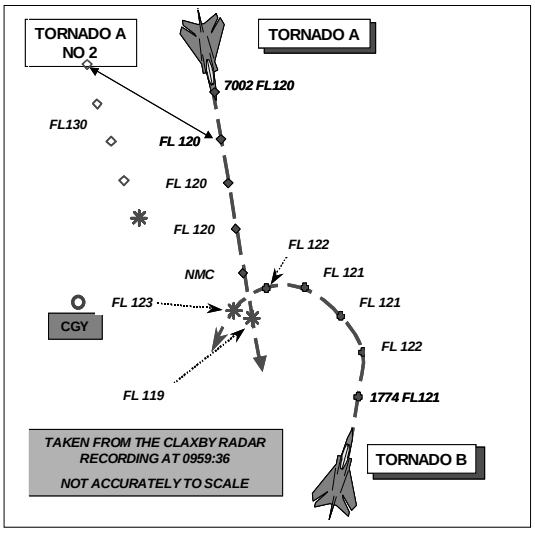
OACC	Oceanic Area Control Centre
OAT	Operational Air Traffic
O/H	Overhead
OJTI	On-the-Job Training Instructor
OOS	Out of Service
PAR	Precision Approach Radar
PCAS	Portable Collision Avoidance System
PFL	Practice Forced Landing
PF	Pilot Flying
PI	Practice Interception
PIC	Pilot-in-Command
PINS	Pipeline Inspection Notification System
PNF	Pilot Non-flying
PS	Procedural Service
QDM	Magnetic heading (zero wind)
QFE	Atmospheric pressure at aerodrome elevation
QFI	Qualified Flying Instructor
QHI	Qualified Helicopter Instructor
QNH	Altimeter sub-scale setting to obtain elevation when on the ground
RH	Right Hand
RA	Resolution Advisory (TCAS)
RAT	Restricted Area (Temporary)
RCO	Range Control Officer
RH	Right Hand
ROC	Rate of Climb
ROD	Rate of Descent
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)
SACC	Scottish Area Control Centre (Prestwick)
SFL	Selected Flight Level [Mode S]
SID	Standard Instrument Departure
SKC	Sky Clear
SMF	Separation Monitoring Function
SOP	Standard Operating Procedures
SRA	Surveillance Radar Approach
SSR	Secondary Surveillance Radar
STAR	Standard Instrument Arrival Route
STCA	Short Term Conflict Alert
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
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
UNL	Unlimited
USAF(E)	United States Air Force (Europe)
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 2009-067

Date/Time: 2 July 1059
Position: 5305N 00004W (4nm E of Coningsby)
Airspace: Lincs AIAA (Class: G)

	Reporting Ac	*Reported Ac*
Type:	Tornado GR4	Tornado GR4
Operator:	HQ AIR (Ops)	HQ AIR (Ops)
Alt/FL:	FL120	FL120
Weather	VMC CLAC	VMC CLBL
Visibility:	20km	20km

Reported Separation:
55ft V/ 0H
Recorded Separation:
55ft (RAIDS)/ 0 H (See UKAB Note (3))



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO GR4 PILOT (A) reports flying a grey ac, with HISLs switched on, squawking 7002 with Mode C selected on, at FL120 and M0.65 on a medium level transit to Wainfleet Range post a low level part of the sortie. They had just switched from a London Mil frequency to Wainfleet Range but prior to leaving London Mil they had been informed of traffic 8nm E of them at FL100 on a similar heading. After initial contact with Wainfleet the crew were preparing the ac for a medium level high-angle dive/bunt profile when the navigator shouted to the pilot to "*bunt".* This initially confused the pilot who thought that the remark referred to the weapons profile about to be flown. The navigator again shouted, *"bunt"* repeatedly before the pilot became aware of the underside of a Tornado GR4 in their 11 o'clock position 50-100ft above. The crew then informed Wainfleet of the Airprox and changed frequency to Marham APP to report the incident and ascertain the identity of the other ac. Marham APP informed them that the other ac was part of another GR4 formation (Tornado B C/S) that was working Coningsby APP. After the sortie the Rangeless Airborne Instrumented Debriefing System (RAIDS) cards were downloaded and the miss-distance was confirmed as being 55ft. He assessed the risk as being high. He also commented that the canopy arch had obscured his vision.

THE TORNADO GR4 PILOT (B) reports that as part of a routine training sortie he was leading a pair of grey Tornado GR4 ac with HISLs switched on, squawking 1774 with Mode C, [Leader] at FL120 and 320kt, in the vicinity of Coningsby and receiving a TS from Coningsby APP. APP informed them of an ac 15nm to the N at FL130 and later passed further information regarding an ac 8nm N at FL120 so, in the belief that they would be heading away from what they thought was a single ac to the N, he started a turn through W to head S. Half way through the turn a different controller informed them that there was an ac 0.5nm in their 1 o'clock at the same height. He immediately rolled out of the turn and commenced a positive climb to clear of the (same level) traffic. On the initial rollout of the turn both he and his navigator saw an ac in their 1 o'clock, [UKAB Note (1): probably Tornado A No2] but it was about 1000ft higher and 2nm away. Thinking this was the ac ATC had warned him about, he then descended back to FL120 to maintain clearance from it. They continued their turn on to a Southerly heading and were informed that an Airprox had been reported. At the time he did not believe there had been any risk of collision. However, on return to his Sqn the RAIDS showed that they had reacted to the No2 of the other formation that was at FL130 and no threat, while the Leader passed 55ft below them. .

UKAB Note (2): Both Coningsby and Marham Controllers and Supervisors provided reports; since they are in agreement with the Mil ACC report below, for brevity they have not been included in full.

MIL ACC reports that due to a technical un-serviceability Tornado A No2 had elected to recover independently direct to Marham for a precautionary single engine recovery having declared a PAN. His leader had split from him and was 2nm ahead, operating VFR and routeing towards Wainfleet Range. Tornado B formation, another pair of

GR4s from the same base, were general handling to the SE of Coningsby prior to entering the low level system and were in receipt of a TS from Coningsby Zone (Zone).

Coningsby APP was passed TI on Tornado A formation by the Assistant on Consol 13 LATCC (Mil) when the ac were well to the NW, inbound to Wainfleet; the Wainfleet RCO also passed TI to Coningsby APP on the planned attack profile of Tornado A (Leader). Tornado B Leader first made contact with Zone at 0954:38 having been handed over from Marham APP, *'CGY C/S on **handover** FL120'* and Zone responded, *'C/S CGY Zone identified FL120 Traffic Service'.* An exchange of transmissions was made with the Zone controller suggesting a clear area to operate to the SE of CGY, and not in the overhead as requested. At 0958:30 Zone passed the first TI, *'C/S traffic North 15 miles tracking South FL130', which* was acknowledged. This was immediately updated 14 sec later, *'C/S further traffic North 8 miles tracking South FL120* believed *to be C/S'* [Tornado A]*;* the pilot again acknowledged, *'C/S looking'.* Zone updated the further TI at 0959:06, *'C/S traffic North 5 miles tracking South FL120'* and 17sec later the Supervisor transmitted, *'C/S same level half mile crossing right left',* and again the pilot acknowledged immediately *'C/S looking',* followed a further 6sec later by *'C/S visual descending'.* Zone then updated the TI for Tornado B No2 at 0959.42, *'C/S traffic North sorry straight ahead half mile crossing right to left'.* The formation then repositioned to the N without further incident.

The Supervisor's report states that LATCC (Mil) and his own unit were busy, London Mil had refused a service to other ac due to their 'working to capacity' and that he had split the LARS task due to a pair of Typhoons requiring a quiet frequency. His report also stated, '*The response from the aircrew [Tornado B] left me feeling that they had not yet acquired the conflicting traffic and, with them all indicating a similar level and closing fast I transmitted a further information call on the LARS frequency'.*

In a busy Class G operating environment despite the best efforts of the LATCC (Mil) assistant, the Wainfleet Range Officer and the Coningsby controllers this Airprox still occurred. The Zone controller provided accurate and timely TI iaw the Traffic Service as defined in CAP774 Chap 3 Para 1:

a. 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.

In addition the Supervisor also provided an update of the TI when they felt the aircrew had still not acquired the traffic.

UKAB Note (3): The recording of the Claxby radar commencing at 0958:49 shows the incident clearly. The Tornado (A) formation approach the CPA from the N tracking 170° and squawking 7002, with the leader at FL120 and No2 just over 2nm in his 4 o'clock at FL130. Meanwhile Tornado (B) is 6nm SSE of Tornado (A) formation in the Leader's 12 o'clock tracking 030° at FL121 and squawking 1774. At 0959:00 Tornado (B) (at FL121), in Tornado (A's) 1130 at a distance of 6.5nm, commences a left turn. At about 0959:36 the ac cross between sweeps with Tornado B indicating FL122 but Tornado (A's) Mode C has dropped out; Tornado (B) crosses Tornado (A) from its 0930 to its 0330 and on the sweep after the CPA the vertical separation indicates 400ft.

A projection of the respective tracks indicates that the horizontal separation was too small to calculate with any degree of accuracy. RAIDS derived information showed the vertical separation to be 55ft.

HQ AIR (OPS) comments that this extremely close call took place despite the best efforts of the CGY controllers who did their best to talk Tornado B crew's eyes onto the confliction. It may well have been that Tornado A was obscured to B during their left turn onto S. The Navigator in Tornado A provided encouragement to his pilot to descend and, thus, avoid the confliction.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that both ac were operating legitimately at medium level in the Class G airspace of the Lincolnshire AIAA where the crews had an equal and shared responsibility to see and avoid other ac. Although both had been in receipt of a radar service to assist with this responsibility, at the time of the incident Tornado A had left the LATCC Mil frequency and the crew was communicating with the Wainfleet RSO prior to joining the range. Members were informed by the DARS Advisor that range-joining is a high workload period, involving both crew members; range joining checks are performed, the target and its lead-in features must be identified and confirmed, several transmissions must be made and clearances obtained. In the case of Tornado A, the range joining process was further complicated by a change to their requested attack direction directed by the RSO. In sum, both crew members would have been very busy; however, it is well known that this is a busy period and crews are aware of the requirement to ensure that lookout is not degraded. That said, the pilot's view in the 10 and 2 o'clock is partially obscured by the canopy arch and the navigator's view in the front sector, from where Tornado B appeared, is limited by front and rear cockpit instrumentation and the airframe. Notwithstanding the mitigating factors, the crew had a responsibility to see and avoid other traffic, which, after some misunderstanding, they did, albeit very late; Members agreed, therefore, that this had been part of the cause.

It was clear to Members that the crew of Tornado B had not assimilated accurately the TI passed by the Coningsby controller and that this had led to them forming an inaccurate mental picture of the situation. Controller Members observed that when the RT transcript was scrutinised the information passed was generally accurate and timely. Although it is considered best practice to pass TI on ac presenting the highest threat first, controller Members considered that sufficient information had been passed (the phrase *'further traffic'* being used) to indicate that there were 2 conflicting ac. Most pilot Members, however, considered it was likely that the crew had not assimilated the word *'further'* and interpreted the flow of information with its decreasing ranges to be related to a single ac. All agreed that this sequence would not have appeared logical in relation to a single ac if the controller had passed the TI on the highest threat first and therefore, it would have been clear to the crew of Tornado B that in reality there were 2 ac. As it was, both pilot and controller Members agreed that based on the TI passed, the crew of Tornado B believed that there was only one ac to the N heading towards them.

The Board discussed whether the crew of Tornado B was wise to turn L, rather than R in seeking to remain ahead of the reported traffic to the N. At that time Tornado B was in a restricted area of Class G airspace, 5nm to the E of Coningsby with D308 (Wainfleet Range) a further 5nm to the E making a L turn a better option. However, the crew of Tornado B was not to know that, although Tornado A Leader and No 2 were generically to their N, the actual bearing was 340°. When the TI was passed at 0959:06, (just as Tornado B commenced its left turn) stating that Tornado A was 5nm to the N the radar recording shows it to be 5.0nm on a bearing of 329°. This geometry and the fact that Tornado B was heading to the E of N, thereby increasing angle and time required to turn through W on to S, prevented Tornado B rolling out of its turn ahead of Tornado A.

During their turn onto S, the Tornado crew were belly up to, and partially unsighted to the threat approaching from the N. The Board commended the Supervisor for stepping in with his correct and timely call at 0959:23; it was an example of the highest standards of 'controllership' and one that, in other circumstances, could be the difference between a near miss and a collision. Unfortunately in this case, when, following the Supervisor's call, the crew of Tornado B saw a Tornado in their 1 o'clock that they were able to evade with relative ease, and believing that there was only one ac heading towards them from the N, they perceived that they were clear of any conflicting traffic.

There was some discussion about the actual miss-distance as the RAIDS measures pod-to-pod separation, so the actual separation between the fin of A and the belly/wing of B would have been somewhat smaller.

The Board agreed that although the bunt undertaken by Tornado A had most likely taken effect before the ac crossed, its lateness, since the pilot did not react immediately to the navigator's call, and the verified very close proximity of the ac, persuaded them (unanimously) that there had been a risk that the ac would have collided.

PART C: ASSESSMENT OF CAUSE AND RISK

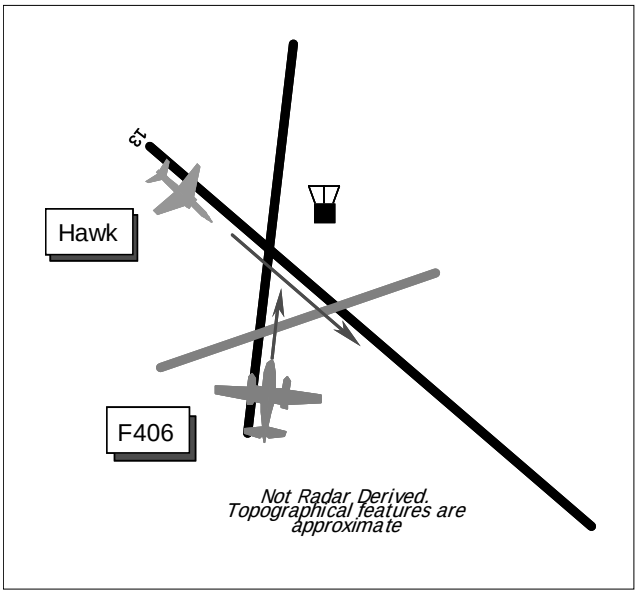
Cause: 1. The crew of Tornado B flew into conflict with Tornado A due to inaccurate Situational Awareness.

2. Late sighting of Tornado B by the crew of Tornado A.

Degree of Risk: A.

AIRPROX REPORT NO 2009-068

Date/Time:	1 July 0730	
Position:	5315N 00432W (Overhead Valley aerodrome - elev 36ft)	
Airspace:	Valley ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Hawk TMk1	F406
Operator:	HQ Air (Trg)	Civ Comm
Alt/FL:	500ft	500ft
	QFE (1020mb)	QFE (1020mb)
Weather	VMC CLOC	VMC
Visibility:	>10km	15nm
Reported Separation:		
	Nil V/200ft H	100ft V/18m H
Recorded Separation:		
	Not Recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK T MK1 PILOT reports he recovered to his base at Valley from the direction of the A5 pass after completing a solo weather check sortie over Wales. The recovery to RW13 was flown across Anglesey at about 3500ft QFE (1020mb) whilst in receipt of a TRAFFIC Service from Valley RADAR; however, no traffic was reported to him.

Switching to the TOWER UHF frequency [Stud 2] he requested a visual cct join whereupon TOWER replied, "..join runway 1-3 QFE 1020". He reported at INITIALS for RW13, but no reply was heard from the TOWER. A further 2 RT calls were made reporting "[C/S] INITIALS". After the third attempt a reply was heard from TOWER, which alluded to an ac crossing the MATZ not above 500ft. At this point he was heading 135° on the 'RUN-IN' for the BREAK at 500ft QFE, about 1nm from the airfield boundary, flying at approximately 6nm/min [he reported 350kt at the time of the Airprox]. Upon hearing TOWER's call about another ac he initiated a climb and transmitted to TOWER requesting its position, before breaking into the visual cct climbing to 1000ft QFE. During the BREAK TOWER asked if he was visual with the other ac, to which he replied "negative climbing to 1000 feet". Just before rolling wings level starting the DOWNWIND leg he spotted a white, low wing, twin-engined ac – the F406 - directly below his Hawk in a level cruise at about 500ft agl crossing the visual circuit to RW13 at right angles. He perceived that he had not seen the F406 because his lookout had been concentrated to his L to clear his intended flight path, coupled with an assumption that there were no other ac airborne anywhere over Anglesey. Minimum separation was estimated at 200ft horizontally at the same height and he assessed the Risk as *"very high".*

An eyewitness to the Airprox stated to him that the F406 would have been on the starboard side of his Hawk just before the BREAK was initiated. The HISL and his ac nose light were both on.

THE F406 PILOT-IN-COMMAND reports that he was the PF whilst carrying out a Fisheries Patrol flight under VFR in VMC. Valley RADAR was contacted on VHF to request a BASIC Service and to transit the Valley MATZ through their overhead. RADAR approved their MATZ transit not above 500ft QFE (1020mb), and instructed them to contact TOWER on 122·1MHz.

His initial call to TOWER on VHF 122·1MHz drew no response so he recalled RADAR to confirm the TOWER freq was 122·1MHz. This was confirmed by RADAR. Upon recalling TOWER the controller responded and he perceived the MATZ crossing/coordination had been approved. The MATZ transit was made overhead Valley tracking N at 150kt, during which a Hawk jet crossed in front of his F406 heading E. The next call made to Valley TOWER, was when he had exited the MATZ to the N and requested a climb to a height of 1000ft (1020mb), whereupon TOWER instructed him to call RADAR. The Hawk ac was first spotted about ¼ nm away – about 3sec

before it crossed 18m ahead from L to R - some 100ft above his ac with a *"low"* Risk of a collision. The jet had crossed ahead before any avoiding action could be taken.

THE VALLEY AERODROME CONTROLLER (TOWER) reports that his workload was "high" whilst monitoring all the Valley TOWER and GROUND frequencies [3xUHF & 1xVHF]. The Hawk pilot called to join the visual cct on UHF [Stud 2] and was given a standard joining clearance for RW13, including the circuit state that was clear. He was then informed of a MATZ crossing ac routeing from W to E through the overhead not above 500ft QFE (1020mb) on VHF. With 3 other ac on the GROUND frequency, there were 4 ac under his 'control' when the F406 crew called on 122·1MHz, making a total of 5 ac; the F406 pilot's transmission was stepped on by another frequency. The Hawk pilot called at INITIALS and [in response to the third call from the Hawk pilot] was given the surface wind. He subsequently attempted to establish comms with the F406 pilot to determine his position. When he made contact on RT, the F406 was inside the airfield boundary tracking E not above 500ft QFE (1020mb). At this point he informed the Hawk pilot about the MATZ crosser. As the two ac were going to be in close proximity to one another he asked the Hawk pilot if he was visual with the F406, to which he replied, "negative climbing to 1000 feet". Because both TOWER and GROUND were bandboxed, with the F406 on VHF, the number of "inputs" was significant and there were many occasions when he had to ask crews for a repeat call because a number of RT transmissions were being made simultaneously. This led to delays in the passage of information.

THE VALLEY ATC SUPERVISOR [& RADAR CONTROLLER] (SUP) reports that in the time leading up to this incident he was in the APPROACH Control Room (ACR). [Note (1): It is evident from the subsequent DAATM report that the ATC SUPERVISOR was monitoring another controller fulfilling the RADAR function who was only qualified on DEPARTURES, whilst operating as the combined RADAR controller and ATC SUPERVISOR.]

The Hawk was on a visual recovery to Valley and the F406 was 5nm SW of Valley requesting a MATZ crossing from W to E through the overhead. The position of the F406 was passed to the TOWER controller and a MATZ crossing was obtained not above 500ft Valley QFE. The TOWER controller was bandboxed with GROUND and he became aware that the controller's workload was increasing so he left the ACR and proceeded to the Visual Control Room (VCR). As he got to the top of the VCR stairs the Airprox had just occurred in the visual cct. The F406 pilot was asked to call the ATC SUP upon landing.

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

UKAB Note (3): The UK AIP at ENR 2-2-2-4, notifies the Valley ATZ as a 2½nm radius centred on RW13/31, extending from the surface to 2000ft above the aerodrome elevation of 37ft. The Valley ATZ is encompassed within the Valley/Mona CMATZ, controlled by Valley extending from 3000ft above the elevation of the highest aerodrome – Mona – at 202ft amsl.

DAATM reports that the F406 crew was in contact with Valley TOWER on 122·1 MHz (VHF) having received a clearance through the Valley MATZ from Valley RADAR manned by the SUP. The Hawk pilot was recovering VFR via INITIALS after conducting the morning weather check and was operating with TOWER on 268·626 MHz (Stud 2 UHF).

The F406 crew first made contact with Valley RADAR on 125·225 MHz at 0723:47, *"Morning this is* [F406 C/S]*".* RADAR acknowledged the call and at 0723:53, the F406 crew requested a BASIC Service, "[C/S] *is F406..to Blackpool we're carrying out Fisheries patrols at a thousand feet and below our squawk is 7400 currently southeast of you..by 11 miles..requesting a BASIC service* [C/S]*".* [UKAB Note (4): RADAR placed the F406 under a BASIC Service and issued the Holyhead RPS at 0724:10. After calling at 0726:44 and being asked by RADAR to standby, at 0727:32 the F406 pilot requested a MATZ penetration *"..now to the south by..4 miles request MATZ penetration to transit your overhead"* initially at 1000ft QFE. However, RADAR replied, *"..er negative we're currently active".* When asked to repeat the message by the F406 pilot RADAR responded *"that's er negative we can take you..not above 5 hundred feet or..over the top"?* The F406 pilot requested "*..not above 500 feet then please* [F406 C/S]". At 0728:09 RADAR transmitted, "[C/S] *roger report not above 500 feet on Valley QFE 1-0-2-0".* The F406 pilot read-back the clearance at 0728:14, *"transiting your overhead not above 5 hundred feet on QFE 1-0-2-0".* Some 13 sec later at 0728:27, the SUP instructed the F406 pilot *"your MATZ crossing is approved continue with Valley TOWER on 1-2-2 decimal 1",* which the F406 pilot acknowledged.]

Between 0720:58 and 0728:37, TOWER responded to 20 different transmissions as pilots checked in on various frequencies, this did not include several liaison calls on landlines and management radio calls to vehicles on the airfield.

[UKAB Note (5): At 0728:16, the SUPERVISOR (acting as RADAR) called on the landline and advised TOWER *"there's gonna be a MATZ crosser* [F406 C/S]". TOWER replied *"7-4-0-0",* referring to the F406's displayed squawk on the 'Hi-Brite' Aerodrome Traffic Monitor, to which the SUP advised *"yeah, south west by 4 miles wants to come through the overhead not above 500 feet and he's coming to you now".* The liaison call ended at 0728:25, when TOWER acknowledged *"Roger".*]

At 0728:37 the F406 crew made their first call to TOWER on VHF, *"Valley TOWER good morning this is* [F406 C/S]..*with you for..a MATZ penetration and transit over your head..not above 5 hundred feet on..QFE 1-0-2-0* [C/S]". At that point the TOWER controller was busy with a helicopter and a request for taxy from another ac not involved in the incident on 2 separate frequencies. With no reply to his first transmission, at 0729:00 the F406 pilot transmitted on VHF, *"Valley TOWER* [F406 C/S] *radio check on 1-2-2 decimal 1".* At 0729:01, the subject Hawk pilot transmitted on Stud 2, "[Hawk C/S] *request join".* TOWER replied at 0729:03 on Stud 2, "[Hawk C/S] *Valley TOWER join runway 1-3 QFE 1-0-2-0 circuit clear",* which was read back by the Hawk pilot. At 0729:12 TOWER tried to establish communications with the F406 crew on VHF, *"*[C/S]..*Valley TOWER apologies stepped on by other frequencies say again your last".* [After the F406 pilot had recalled RADAR to recheck the TOWER VHF frequency] at 0729:21, a further transmission was made by the pilot on VHF, *"*[F406 C/S] *Valley TOWER you on this".* At 0729:29, the F406 pilot again transmitted on VHF, *"Valley TOWER good morning this is* [F406 C/S]". [UKAB Note (6): TOWER did not immediately respond to this call before, 1 second later, the Hawk pilot called INITIALS on Stud 2 for the first time.] At 0729:32 TOWER transmitted on VHF, *"*[F406 C/S] *Valley TOWER",* the F406 crew replied immediately, *"..am with you for a transit of your over head..not above 5 hundred feet* [C/S]", [but no further acknowledgement was given by the controller on RT]. At 0729:38 - some 3 seconds later - the Hawk pilot repeated his transmission on Stud 2*, "*[Hawk C/S] *INITIALS".* TOWER replied on Stud 2, "*Station calling Valley TOWER say again stepped on",* the Hawk pilot reported [for the third time], *"*[Hawk C/S] *INITIALS".* TOWER responded, *"*[Hawk C/S] *surface wind 0-6-0 10 knots",* before transmitting at 0729:53 on Stud 2, "[Hawk C/S]..*there is a MATZ crosser through the overhead not above 500 feet".* The Hawk pilot responded, "[Hawk C/S] *request* [position?]*".* Before the TOWER controller could reply another pilot called on VHF to join. At 0730:09 the Hawk pilot transmitted on Stud 2, "[C/S] *BREAK to LAND".* The TOWER controller replied, "[Hawk C/S] *are you visual with the MATZ crosser".* The Hawk pilot responded at 0730:14, *"Negative climbing to a thousand feet'.* Another pilot on a different frequency requested a departure clearance before the TOWER controller replied at 0730:16 on Stud 2 to the Hawk pilot, *"just over the Tower now".*

A total of 77 transmissions were made on 3 different frequencies in the 10min period of this incident. The F406 pilot explained in his report that he had experienced difficulty establishing two-way RT contact with TOWER on 122·1MHz having been given a MATZ crossing approval by Valley RADAR and been instructed to call TOWER for the crossing. The pilot had returned to the RADAR frequency before finally achieving satisfactory comms with TOWER; this may have added a delay and further complicated the situation. This is more likely to be the result of the workload of the controller rather than any serviceability issue.

At the time the subject Hawk pilot called to join the cct, TOWER had not issued a clearance to the F406 to cross through the visual cct, although the F406 pilot correctly reported that he had received a MATZ crossing approval from the Valley RADAR controller - he should have been passed a conditional clearance that would have provided a safe transit of the visual circuit. Therefore, it is understandable that TOWER stated the circuit was clear.

The TOWER and GROUND control positions were band-boxed together and TOWER was operating 3 frequencies whilst also conducting radio checks on a fourth. Neither a GROUND controller nor qualified RADAR controller was available in the unit until 0800 [30min after the Airprox had occurred]. The ATC SUPERVISOR was screening a controller that was qualified in DEPARTURES only and, because of this, was unable to provide assistance to the busy TOWER controller. It was this controller that conducted the Hawks earlier recovery from an aborted weather check and it was the SUPERVISOR who passed the MATZ crossing clearance. The operation of multiple frequencies and their loading, particularly the timing of each transmission, conspired to work against the TOWER controller.

Had a GROUND controller been available or the SUPERVISOR been able to assist the TOWER controller then this Airprox might have been averted. SATCO has already made changes to the working practices at Valley and a GROUND controller and qualified RADAR controller are now available prior to the weather check ac getting airborne.

UKAB Note (7): The 0650UTC Valley METAR gave: 40Km Vis, Few @ 3700ft, BKN @ 7000ft; and at 0750: 40Km Vis and FEW @ 4000ft, BKN @ 8000ft.

HQ AIR (TRG) comments that in the build up to this Airprox the TOWER Controller was working 5 ac on 4 mixed U/VHF frequencies and was experiencing multiple calls some of which were treading on other transmissions. Consequently the flow of timely and accurate traffic information was disrupted and the Hawk pilot having been informed '*circuit clear*' was unaware that there was another ac in the circuit area until very late. Having been informed of the F406 the Hawk pilot initiated a climb reducing the risk of an actual collision. The changes made to the working practices by SATCO Valley should prevent a repeat of the circumstances that led to this Airprox.

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.

It was evident here that a seemingly routine cct join resulted in a close quarters encounter with an ac crossing the MATZ and this Airprox, overhead the aerodrome, contained several lessons for the unwary.

RADAR's response to the F406 crew's initial call for the MATZ crossing was delayed by 48sec, so when the crew advised at 0727:32 *"..now to the south by..4 miles request MATZ penetration to transit your overhead"*, at only 4 miles away the ac was actually already within the MATZ. Although some controller Members suggested this was too close, and the pilot's initial requested transit height of 1000ft was denied, it was evident that RADAR was content to allow the F406 through the MATZ *"..not above 5 hundred feet*..", which was agreed and read-back by the F406 pilot. The subsequent perfunctory liaison effected between the SUP and TOWER occurred immediately after this transmission, the transcript revealing that the bandboxed controller in the VCR was told by the SUP directly at 0728:16, *"there's gonna be a MATZ crosser..",* before advising that the F406 would be *"..through the overhead not above 500 feet and he's coming to you now".* An experienced controller Member recognised that the TOWER controller had spotted the F406's displayed squawk on the 'Hi-Brite' Aerodrome Traffic Monitor, and so TOWER would have been aware how close the ac was and the direction it was crossing the MATZ; however, no mention was made at all of the Hawk and how the two ac would be deconflicted, which was left entirely to the TOWER controller to sort out. Generally, the MATZ below 2000ft is the aerodrome controllers preserve, but here TOWER was not asked to approve the crossing through the ATZ and the cct area, rather he was told it was going to happen. It was suggested that the SUP's plan was to advise TOWER to instruct the Hawk pilot to fly his join at 1000ft QFE thereby effecting vertical separation above the transiting twin. Plainly this did not happen and could still have resulted in a conflict from the FINALS turn. The controller was therefore presented with a 'fait accompli' by the SUP when the F406 was switched to TOWER for the crossing, which was just about the time that TOWER's RT difficulties started.

It seemed to the Board that the F406 crew had done all that was asked of them by RADAR prior to the crossing. After reading back the controller's instruction, *"transiting your overhead not above 5 hundred feet on QFE 1-0-2-0",* the approval to cross the MATZ at the height requested by RADAR was reiterated when the F406 pilot was instructed to call the TOWER. However, this approval was not repeated by TOWER, nor was any further permission given to transit the embedded ATZ or the cct area once the F406 crew had finally established two-way contact with TOWER. Procedures for crossing a CMATZ are promulgated in the UK AIP at ENR 2-2-3-2; these state that it is the responsibility of the pilot to ensure that a clearance is obtained to transit each embedded ATZ. Indeed the DAATM report suggested that TOWER should have passed a conditional clearance that would have provided a safe transit of the visual circuit. Nevertheless, in the Board's view, the F406 pilot had good reason to expect that RADAR had co-ordinated his crossing correctly with the TOWER and he had reiterated the overflight of the aerodrome upon his first call to TOWER. Subsequently, when 2-way RT was established, TOWER had little opportunity to influence events in the ATZ as the F406 was already inside the aerodrome boundary; at that stage all he could do was tell each pilot about the other ac but he did not do so straight away, which controller Members thought was indicative of misplaced priorities. No traffic information was passed to the F406 pilot about the joining Hawk at all and there was nothing to suggest to the F406 pilot that there was any other ac in the vicinity likely to affect his transit, as instructed by RADAR. Whilst one pilot Member believed that the Hawk was plainly there to

be seen and should have been spotted earlier, the overwhelming view of the Members was that without a cue from ATC it was not surprising that the Hawk was not spotted until it was about ¼ nm away – about one fifth of the length of RW13 - which was the first time the F406 pilot was aware of another ac in the ATZ.

The Supervisor left the ACR for the VCR after the two ac had been switched to TOWER because he was aware that TOWER was busy. It seemed plain from the DAATM report that the extremely busy TOWER controller was unable to cope under this "high" workload whilst operating the 3 UHF and single VHF TOWER/GROUND frequencies. That TOWER was unable to answer the F406 pilot immediately when the latter checked in on the TOWER VHF frequency was evident from the RT transcript; with no response forthcoming it was entirely understandable that the F406 pilot would recall RADAR, thus unfortunately adding to the delay in establishing two way RT contact with TOWER. Furthermore, TOWER's response to the Hawk pilot's INITIALS call was delayed, because the controller was responding to the F406 pilot when the latter returned from RADAR at 0729:32 and reported *"..am with you for a transit of your over head..not above 5 hundred feet.."*. This was when two-way RT was finally established on VHF but an opportunity was missed by TOWER at this point to pass a warning to the F406 pilot about the Hawk. The aerodrome controller was plainly aware of what the F406 was doing from the SUP's earlier liaison call, but it was evident that no traffic information was passed to the F406 pilot about the Hawk at all. Similarly, it was not until after the third iteration of "INITIALS" from the Hawk pilot that TOWER responded and subsequently informed the Hawk pilot at 0729:53 about the "…*MATZ crosser through the overhead not above 500 feet".* A controller Member stressed that the standard communications equipments fitted in RAF Control Towers do not permit cross-coupling UHF & VHF frequencies together so that pilots operating on UHF can hear what is said on VHF. In order to cut down on intrusive transmissions to other flights, controllers will very often switch UHF to receive only when transmitting on VHF, and vice versa, thus involving controllers in a lot of 'switchery' leading to increased potential for error. Perhaps this was why TOWER was seemingly unable to communicate immediately with airborne ac. It seemed that TOWER's communications with other flights on the ground in the absence of a separate GROUND controller were a factor here and experienced controller Members suggested that TOWER might not have accorded appropriate priority to his instructions to airborne ac. Missed responses coupled with the additional workload of operating GROUND at the start of the flying day suggested to the Board that TOWER was overloaded. The DAATM advisor suggested that the Hawk pilot had returned from his weather check flight earlier than anticipated, but such events are clearly inevitable from time-to-time. Although not the case here, controller Members stressed that ac emergencies can arise at any moment and if the aerodrome is open for routine station flying at a normal state of readiness then ATC should be quite capable of dealing with routine traffic loadings and situations such as occurred here. The DAATM report reflected that the Unit had clearly absorbed the lessons from this Airprox and the Board was reassured that staffing measures had been taken to reduce the potential for a recurrence locally. Nonetheless, this Airprox provides a salutary lesson for all SATCOs, their Deputies and ATC Supervisors at busy flying units to guard against the perils of running the Watch 'light' at periods that might reasonably have been foreseen to be busy.

Whereas at military aerodromes it is normal for pilots to adjust their own spacing in the cct and afford whatever visual separation is necessary, this is based on information provided by the aerodrome controller about ac in the circuit, together with traffic information on transiting ac. Consequently pilots joining will be aware of other ac and be looking for this traffic whilst entering the cct area. As had been pointed out in the DAATM report, with no other circuiting ac at the time the cct state passed by TOWER to the Hawk pilot – "circuit clear" - was entirely correct. Thus the Hawk pilot would not have been expecting to encounter any other ac within the cct area. No traffic information whatsoever had been passed to the F406 pilot about the Hawk, similarly, the Hawk pilot was completely unaware that there was any other ac airborne in his vicinity as he flew through INITIALS at 350kt lined up for RW13 into the regulated environment of the ATZ. Fortunately TOWER eventually provided a warning to the Hawk pilot about the F406 but at a very late stage – just before the Break it would seem. This was the first occasion that the Hawk was aware of the possibility of another ac being in the MATZ and more importantly the cct area. The Board was briefed that local procedures permit Station based pilots to fly there visual 'RUN-IN' to the BREAK optionally at a height of 500ft or 1000ft QFE. In this instance the Hawk pilot reported he had elected to 'RUN-IN' at 500ft QFE, which unbeknown to the Hawk pilot beforehand, was also the maximum height the F406 had been instructed by the SUP to penetrate the MATZ.

One fast jet pilot Member suggested the lookout of both pilots could have been better and he believed pilots should be prepared for the unexpected, however, in the regulated environment of the ATZ/MATZ the Board was convinced that ATC could have done more to avert this Airprox. The SUP should have been aware of the joining Hawk as it was provided with a TRAFFIC Service earlier during the recovery and he should have realised the potential for conflict. No matter who actually spoke on the RT, only the SUP was qualified to provide a service from the ACR

here and it was he who instructed the F406 crew to fly through not above 500ft, advising that the crossing was *"approved"* before effecting the liaison with TOWER. Experienced military controller Members opined that a transit for the F406 above 1500ft would have prevented this Airprox, but any lesser height would potentially result in a close quarters situation. No separation had been engineered by ATC beforehand and the Members were unanimous in their view that the SUP had, in effect, set up the conflict that TOWER under his high workload was unable to avert in the time available. After a wide-ranging and comprehensive debate, the Board agreed that this Airprox had resulted because the Valley SUPERVISOR had approved the penetration of the F406 through the MATZ at a height which brought it into conflict with the Hawk.

The reporting Hawk pilot had assessed the Risk as *"very high",* whereas the F406 pilot's view was that the Risk was *"low".* The Board was briefed that in discussions with UKAB Staff, the Hawk pilot had explained that moments before the BREAK when he became aware that there was another ac in the vicinity from TOWER's transmission "..*there is a MATZ crosser through the overhead not above 500 feet",* not knowing exactly where the other ac was located he wisely elected to vacate 500ft. This occurred as he passed abeam the upwind threshold whereupon he "eased his jet up" by climbing 200ft to 700ft before breaking at the runway midpoint and climbing to the cct height of 1000ft QFE. It was clear to the Members that the Hawk pilot had not seen the F406 before he steadied and levelled DOWNWIND at 1000ft when he spotted the twin for the first time directly below him crossing at 500ft agl. Thus the fast jet pilot had not seen the F406 at all before the conflict arose - in effect a non sighting on his part. In the absence of recorded radar data it was not feasible to determine the exact geometry that pertained here, nor the minimum separation, but it was evident there was also an anomaly between the reported direction of crossing of S-N as stated by the F406 pilot and the W - E direction stated by ATC. Whatever the actual direction, events conspired to place the Hawk directly over the aerodrome at 500ft as the F406 approached at about the same height. Whereas the F406 pilot did see the Hawk - 3 sec before the jet crossed from L – R 18m away and some 100ft above the twin he reports - he was unable to do anything in the time available and at this height and closing speed there was little room to manoeuvre. It was clear that the Hawk pilot's decision to climb was wise, for if he had not done so it seemed to the Board that he would have inevitably met the F406 closer than he did. An experienced fast-jet pilot Member opined that if the Hawk had been a fraction slower or the F406 a little faster then a collision at 500ft above the aerodrome might well have resulted so luck had played a significant part here. One pilot Member considered that the Hawk pilots climb at the last moment had prevented an actual collision but as he was unsighted on the F406 the overwhelming view of the Members was that the final separation achieved here was purely fortuitous. Taking all these factors into account the Board concluded that an actual Risk of collision had existed in the circumstances reported here.

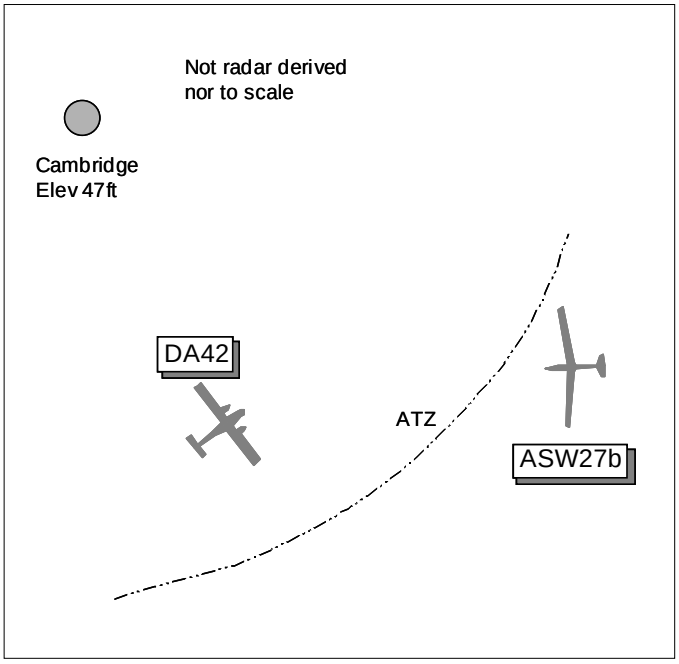
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Valley SUPERVISOR approved the penetration of the F406 through the MATZ at a height which brought it into conflict with the Hawk.

Degree of Risk: A.

AIRPROX REPORT NO 2009-069

Date/Time:	4 Jul 1122 (Saturday)	
Position:	5211N 00013E (2nm SE Cambridge - elev 47ft)	
Airspace:	ATZ	(Class: G)
Reporter:	Cambridge ADC	
	1st Ac	*2nd Ac*
Type:	DA42 Twin Star	ASW27b Glider
Operator:	Civ Trg	Civ Club
Alt/FL:	1000ft	1000ft
	(QNH 1012mb)	(N/K)
Weather:	VMC CLOC	VMC CLBC
Visibility:	20km	'Very good'
Reported Separation:		
ADC	<200ft V/<0·2nm H	
	Nil V/0·25nm H	Nil V/'adequate' H
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CAMBRIDGE ADC reports that the glider pilot called on the Tower frequency stating that she was at 1000ft to the E of Cambridge. After concentrating his lookout in that direction he saw the glider in a late downwind/L base leg position for RW23. This was confirmed using the ATM and he believed the radar returns had merged. As the DA42 turned L base he informed its pilot of the glider's position. The glider pilot then found some lift and climbed to 3000ft, out of the ATZ.

THE DA42 TWIN STAR PILOT reports flying a training sortie from Cranfield to Cambridge VFR, in communication with Cambridge Tower on 122·2MHz and squawking 7000 with Modes S and C, he thought. The visibility was 20km flying below cloud in VMC and the ac was coloured white/grey with strobe lights switched on. They had joined the cct at about 1100 and had already done a touch and go. At about the mid-downwind position, heading 050° at 105kt and 1000ft QNH 1012mb, they heard a call from a glider pilot stating she may have to land. ATC informed them of the glider joining on L base and, looking out, they saw it in their 2 o'clock range 0·5nm and assessed there was enough room to pass safely in front, which they did by 0·25nm. They decided to extend downwind to give the glider room should she need to land. Once on base leg they lost sight of the glider and it did not affect the rest of their flight.

THE ASW27B GLIDER PILOT reports flying a local cross-country from Gransden Lodge and in communication with Cambridge Tower on 122·2MHz; no transponder was fitted. The visibility was very good below cloud in VMC and the ac was coloured white. The sortie profile was from Gransden Lodge E to Framlingham, W to Bedford then E to Newmarket before returning to Gransden. As she routed S of Cambridge she had difficulty contacting lift to enable her to continue. After trying several clouds and finding no lift and with fairly heavy sink around, she returned to be closer to Cambridge airport to give her a safe landing option. Before entering the ATZ she changed to Cambridge Tower frequency, which was busy; the controller was heard to say that 'he was struggling on his own'. After a few minutes she managed to get a call in on the radio but it was a further few minutes, she thought, before the controller called her back. She corrected his mistake with her c/s and she stated that she was now within the ATZ and may need to land. By now she was heading W (S of a twin engine ac she could see) at 1000ft at 58kt to position herself for downwind. At the time the twin was heading E just to the N of her. No avoiding action was needed but she manoeuvred with the twin in sight, effectively positioning to join after the twin should it be necessary. The controller told her about a 'twin' in the cct and she confirmed that she was visual with it. She received no further instructions from ATC at this time. Shortly afterwards she contacted a very strong thermal. Prior to that her intention had been about to lower her undercarriage and request joining instructions, taking the

safe option to land at the airport. After 1 turn it was clear that the thermal was very strong so she used it to climb away and made 2 further calls to ATC, the final one as she left the ATZ. The GPS data-logger showed she entered the ATZ at 521224N 0001436E at 1124UTC at 1184ft and departed at 1138UTC at 2050ft.

ATSI reports that the DA42 flight first established communications with Cambridge at 1108 and requested joining instructions. The ADC instructed the flight to report O/H for a standard O/H join for R23 LH cct and issued the QFE 1011mb. The pilot read back the instructions and indicated he would join on the QNH 1012mb, which the ADC confirmed was the current value. The DA42 was conducting training and its pilot requested "*two or three circuits before returning to Cranfield".* Cambridge Airport is situated in Class G Airspace. The ATZ is a circle radius 2·5nm centred on the longest notified runway (05/23) and extends vertically from the surface to 2000ft aal. The airfield elevation is 47ft amsl. The Cambridge weather at 1120 UTC was 200/06kts 130V260 10km or more, FEW049, 26/12, QNH 1012mb

The DA42 entered the circuit and following a touch and go on RW23, made a L turn to re-enter the circuit. At 1121:43, it reported downwind. In the brief gap that followed, the Glider flight made its first call to *"Cambridge Tower"* with c/s only, at 1121:50. The ADC first responded to the DA42, instructing it to report *"…before turning left base traffic is a Cessna 177 about to establish right base".* Once a correct read back was obtained from the DA42, the ADC addressed the Glider at 1122:11(though misquoting the c/s). Its pilot reported *"…out of Gransden Lodge erm I'm currently a thousand feet just to the south of the airfield I may need to land".* The ADC responded, using the correct c/s *"…roger keep me informed er the ATZ is active left-hand with a twin in the visual left-hand circuit now",* though he did not provide the current QNH. The Glider pilot responded with *"Okay I've got the twin visual".*

In his written report, the ADC recalled, incorrectly, that the Glider had reported to the E of Cambridge. After seeing the glider late downwind and having this confirmed by the ATM and seeing the DA42 turning L base the ADC transmitted at 1123:12, *"(DA42 c/s) you may have a glider to your left-hand side I believe possibly routeing in at this time",* the pilot replying *"…roger I'll look out for the glider".* The DA42 turned on to final and completed its approach, its pilot making no further reference to the glider. Some minutes later at 1128, the glider pilot called Cambridge and reported *"…climbing quite quickly so I should be out of your ATZ very soon".* Another ac, not involved in the incident, then advised the ADC that he could see a glider about 1·5nm to the E of the airfield. The glider made no other transmissions until 1134 when its pilot reported climbing through 3000ft and returning to a glider frequency.

ATSI Note: The RT recording shows the Cambridge ADC was experiencing a moderately busy traffic level, but at no stage did he state he was 'struggling', as reported later by the Glider pilot. He did, however, at 1127, make a comment to a pilot who had requested start that he was currently on his own and would call back shortly. Enquiries show that the controller was referring to the temporary absence from the Tower of the ATSA, who was attending to other tasks. As a consequence, the controller did not have immediate access to flight-plan or booking-out information.

MATS Part 1, Section 2, states that *"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; c) aircraft moving on the apron; d) aircraft and vehicles, obstructions and other aircraft on the manoeuvring area."*

On this occasion, the Cambridge ADC acquitted his responsibilities under the terms of the Aerodrome Control Service being provided to the subject ac.

UKAB Note (1): The incident is not captured on recorded radar. The DA42 is seen intermittently as a primary only return LH downwind for RW23 1·8nm SE the ARP; however, the ASW27b glider is not seen at all.

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.

A glider pilot Member opined that the ASK27b pilot had acted very sensibly when she was unable to find lift on her cross-country flight. Contrary to her recollections, she had called in good time, prior to entry into the ATZ, and ATC

had replied almost immediately with good TI on the DA42 in the cct. The glider pilot had already seen the Twin Star and was manoeuvring to position behind it. The DA42 pilot had visually acquired the glider to his R, after hearing her first RT call, and had judged that he could safely pass ahead of it, which he did. The glider pilot had then entered the ATZ in preparation for landing but had subsequently found lift and climbed clear of the ATZ before leaving the frequency. In light of these facts, Members quickly agreed that the ADC's concerns had been unfounded, as he had acted promptly when he became aware of the glider pilot's predicament. Furthermore both pilots had discharged their responsibilities for maintaining separation from other traffic through 'see and avoid'. These actions taken by all parties had been effective in removing any risk of collision, ultimately leaving the Board to classify this incident as a controller perceived conflict.

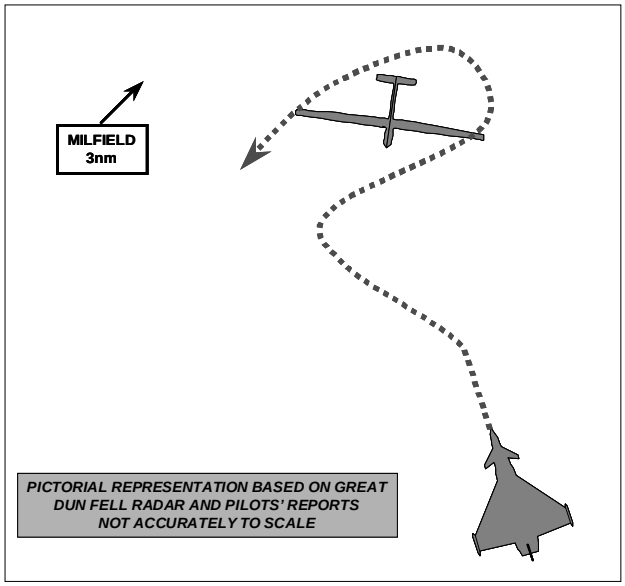
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Controller perceived conflict.

Degree of Risk: C.

AIRPROX REPORT NO 2009-070

Date/Time:	2 July 1555	
Position:	5532N 00210W (3nm SW of Milfield)	
Airspace:	Scottish FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Grob Astir	Typhoon FGR4
Operator:	Civ Club	HQ AIR (Ops)
Alt/FL:	7000ft	7000ft
	(QFE 1014mb)	(RPS)
Weather	VMC	VMC
Visibility:	>20km	>10km
Reported Separation:		
	0ft V/50m H	Not Seen
Recorded Separation:		
	NR (See UKAB Note (2))	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GROB ASTIR PILOT reports flying a white glider and with no SSR or TCAS fitted, listening out on a gliding common frequency in CAVOK conditions. While climbing in wave, heading 210° at 45kt, he heard a roar from his right side and when he looked over he saw a grey delta winged fighter ac, possibly a Typhoon, a few thousand feet below but coming straight towards him from below; the ac continued to pull up to what looked to him like a vertical climb. He then looked forward and considered what action he should take but as he was unsure what the ac was doing and because of his low speed he took no action. The ac passed very close on his right with the underside of the jet facing him. It then passed above him and went down his left side with the canopy facing towards him. He assessed the risk as being very high and reported the incident to the Duty Instructor.

THE GLIDER DUTY INSTRUCTOR reports that 6 or 7 Gliders were soaring in the immediate vicinity of the incident, the next closest being about 200m away and 1000ft below. The gliders were all soaring in good wave at heights between 2500 and 9000ft and at least 4 were at a similar height to the Glider involved in the Airprox. The glider site was NOTAMed as being active at the time (See UKAB Note (3). He, in turn, reported the incident to ScACC.

AIRPROX REPORT No 2009-070

THE TYPHOON FGR4 PILOT reports flying a grey ac with another pilot in the rear seat, with strobes and nav lights fitted operating in OTA E as a 2-ship formation versus 2x GR4 at low level and one EW ac at med level. The other Typhoon was manoeuvring with GR4s at low level while he was providing top cover above 5000ft RPS. Neither Typhoon pilot saw the reporting glider.

UKAB Note (1): Although the Typhoon pilot reported that he was operating under a Traffic Service from an Air Defence radar unit no record of this can be found on the RT recording. AWACS tapes were also checked again with no record of them providing a service to the Typhoon.

UKAB Note (2): The Typhoon shows on the recording of the Great Dun Fell radar throughout, squawking an AEW assigned squawk. The ac is tracking about 330° level at FL063 towards an intermittent primary only contact presumed to be the glider (no other primary contacts can be seen but the incident took place at a considerable distance from the radar head). When about 1½ nm from the glider the Typhoon turns left 30° for 15 sec before turning hard right, having descended 1000ft, towards the contact and then reversing into a hard left turn round the position where the glider contact disappeared. Although the vertical separation cannot be calculated it is estimated by projection that the Typhoon came within 0.1nm of the reporting glider's position. The Typhoon then disappears from the radar for 8 sec, its Mode C then drops out for 1 sweep before reappearing at FL079 momentarily as the ac enters a very hard right turn towards two other pop-up primary contacts, also presumed to be gliders. The Typhoon continues to manoeuvre aggressively in the vicinity of the gliders until the recording ends 2min after the original CPA.

UKAB Note (3): Milfield glider site is promulgated in the AIP (ENR 5-5-1-4) with winch, tug and motor glider launches up to 2000ft agl (2150ft amsl) sunrise to sunset Sat, Sun and Public Holidays. NOTAM B1213/09 amended this to being active sfc to 2100ft HJ (i.e. 7 days per week) from 8 Jul (6 days after the incident) – 24 Sep. No other NOTAM was issued regarding gliding activity at Milfield.

HQ AIR (OPS) comments that the Typhoon pilot was probably not expecting to see the glider at 7000ft climbing in wave. Combining this with the known problem of visually acquiring gliders, and the Typhoon pilot concentrating on visually acquiring his low level targets resulted in this very close pass. The continuation of the briefings to FJ crews on glider operations will help to ensure that this type of Airprox is minimized.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members sympathised with the situation that the glider pilot found himself in, whereby he saw the Typhoon for some time but was unable to determine a safe 'withdrawal' strategy due to its high energy and unpredictable combat manoeuvring. The Board thought it likely that the Typhoon pilots might not have been aware of the existence or significance of the good mountain wave conditions and were therefore unlikely to have expected to encounter glider activity at medium level; the BGA nominated Member pointed out that depending on the precise nature of the wave, Milfield, among others, can be a prime launch site. He also informed the Board that in such conditions it is not uncommon for there to be 20-30 gliders flying in the wave outside CAS or in the TRA (G)s.

Members agreed that white gliders with no conspicuity enhancement aids are very difficult to see especially when viewed head-on. Further they observed that this was one of the very few sets of circumstances when a transponder would not have helped since the Typhoon was apparently not in receipt of a radar service and was not TCAS equipped.

When addressing the degree of risk, the Board noted the glider pilot's assessment of the miss-distance and, in the absence of any contradictory information, accepted it as an accurate estimate. Since the Typhoon pilots did not see the glider and, despite early visual contact, the glider pilot was unable to take any effective avoiding action due to the Typhoon's manoeuvring, the Board agreed that there was a risk that the ac could have collided.

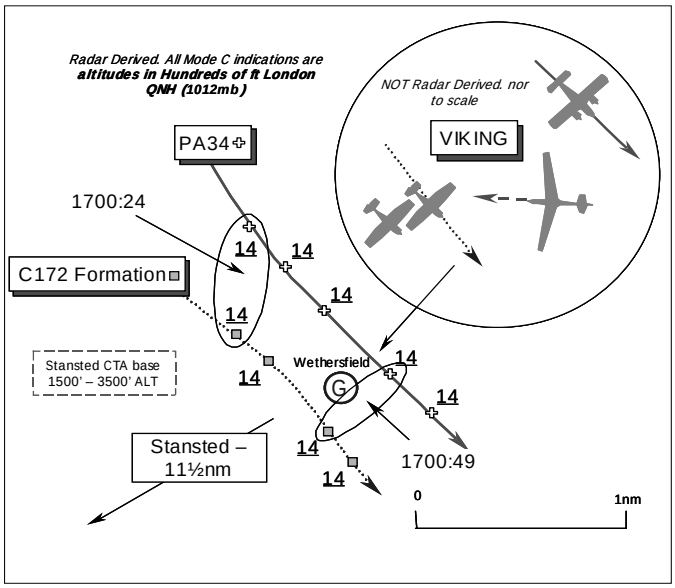
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the Typhoon pilot.

Degree of Risk: A.

AIRPROX REPORT NO 2009-073

Date/Time:	11 July 1700 (Saturday)	
Position:	5158N 00031E (O/H Wethersfield Gliding Site - elev 321ft)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Grob Viking	PA34 Seneca
Operator:	HQ Air (Trg)	Civ Pte
Alt/FL:	1300ft	1350ft
	QFE (1004mb)	QNH (1012mb)
Weather:	VMC	VMC
Visibility:	>10km	15km
Reported Separation:		
	Nil V/25m H	0-30ft V/100m H
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GROB VIKING T Mk1 GLIDER PILOT reports that he was executing a winch launch from Wethersfield Glider Site whilst in communication with Wethersfield RADIO A/G Station on 129·975MHz. Level at 1300ft QFE (1004mb), he had just released the winch cable at the 'top of launch' and was heading 285°(M) at 50kt whilst completing his post launch lookout and trimming. Two Cessna 172/182 ac were seen in formation about 100ft above and 500m ahead so to ensure there was no conflict with these two ac a lookout for a right-hand turn was commenced whereupon a White & Red Piper PA34 Seneca was spotted at 4 o'clock - about 25m away at the same height. At this point the two Cessna ac had drawn left into his 11 o'clock so to remain clear of all three ac he maintained a straight and level attitude. The PA34 appeared to be nose high in a climb and turned L away from his glider as it passed about 25m away at the closest point. The two Cessna ac were not a "danger" to his glider, but none of the three ac had made contact with Wethersfield RADIO A/G Station. He assessed the Risk against the PA34 as *"very high" and a* call was made to Wethersfield RADIO to report the Airprox. His glider is coloured white with orange stripes on the Wings.

After the Airprox occurred a telephone call was made to Group Supervisor (GS) Airports North at LTCC that revealed the three ac had Farnborough RADAR squawks. The Farnborough controller then telephoned the VGS and discussion took place over the incident in Class G airspace. Details of the VGS were passed to the Cessna and Seneca pilots, who telephoned upon landing at their destination. Both pilots were apologetic stating they saw the glider and were operating in Class G airspace, under see and avoid. In discussion it was ascertained the pilots were using Jeppessen VFR GPS charts, which do show Wethersfield glider launching site. Whilst the airspace surrounding the Gliding site is Class G, it is situated under the northern part of the Stansted CTA [CTA-1 1500-3500ft amsl]; a letter of agreement is in place with Essex RADAR.

In his view, to assist in avoiding future incidents it might be advisable if:

Air traffic services point out to pilots that they are approaching gliding sites.

When Duxford has a fly in they notify pilots on departure of Wethersfield.

An ATZ/MATZ is established around Wethersfield.

THE PA34 SENECA PILOT reports he departed Duxford's RW24 at 1651 UTC under VFR bound for Lydd. For planning and navigation he had used a commercial VFR - GPS chart - 2009 Edition and GPS/mapping. After leaving Duxford's ATZ he had contacted London INFORMATION, passed his flight details and, as far as he can remember, was instructed to call Farnborough LARS, which he did. Flying VFR in a level cruise at 1350ft QNH heading 130° at 130kt, some time after radio contact with Farnborough was established, he received traffic information about the two Cessnas, which departed Duxford just before he did. He had seen them already at about 2 o'clock - less than 0·5km away, flying the same heading and at the same altitude overtaking them quite quickly, which was subject of comments by his PPL co-pilot and passengers. Shortly afterwards his co-pilot spotted the glider – coloured white with bright red markings – in their 12 o'clock, at the same altitude, about 1km away, crossing from L to R. As the glider had crossed their path already he did not consider any avoiding action was necessary, so he only banked to the L a little, without any change of altitude, to indicate to the pilot that his glider had been seen and avoided. He estimated the minimum horizontal separation was about 100m as he flew past about no more than 30ft above the glider and assessed the Risk as *"low".* The flight continued uneventfully and he landed at Lydd at 1732 UTC.

Some minutes after passing Wethersfield he had heard communication between the Cessna pilots and Farnborough' LARS, with a request to call the Gliding Site by phone after landing; he said to himself that they must have come very close together. Immediately after, to his surprise, he was asked to do the same and was given the telephone number. According to his GPS track record, the event happened at 1701. His ac is coloured white and red with gold stripes and the HISLs were on.

ATSI reports that following departure from Duxford, C172 (A), the lead pilot of the two subject C172s, established communications with Farnborough LARS North at 1653:30 ('North' was combined with LARS 'East' at the time). The pilot provided details of C172 (B) that made up the formation, which was en-route from Duxford to Midden Zeeland via the CLN (Clacton) VOR. The controller issued the squawk - A4650 - and the London QNH (1012mb), adding that a BASIC Service would be provided. The squawk and QNH were read back correctly, but the pilot did not acknowledge the level of Service. This passed unchallenged by the controller.

MATS Part 1, Section 1, Chapter 11, Page 4, Paragraph 3.1, defines a Basic Service:

"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.

BASIC Service relies on the pilot avoiding other traffic, unaided by controllers. It is essential that a pilot receiving this service remains alert to the fact that, unlike a TRAFFIC Service or a DECONFLICTION Service, the provider of a BASIC Service is not required to monitor the flight."

Guidance on identification of flights under a BASIC Service appears in Paragraph 3.4.1:

"A controller may identify an aircraft to facilitate co-ordination or to assist in the provision of generic navigational assistance, but is not required to inform the pilot that identification has taken place",

and in Paragraph 3.5.1 Traffic Information:

"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 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".

At 1655:25, the controller asked the lead C172 pilot to report his level on the London QNH. Reporting at 1500ft, the pilot was then warned *"……you're at the base of Controlled Airspace..no higher please..underneath the Stansted Zone*". The pilot agreed to stay *'under'* 1500ft. The CAS referred to is the Stansted Control Area (CTA-1), Class D CAS, which extends vertically from 1500ft to 3500ft amsl.

At 1659:41, the subject PA34 pilot established communications with Farnborough LARS North, reporting en route from Duxford to Lydd. Similarly, this flight was issued a discrete squawk, the London QNH (1012mb) and provided with a BASIC Service. Again the level of Service was not read back and not challenged by the controller.

The tracks adopted by the C172s and the PA34 would take them in the vicinity of Wethersfield airfield, which lies beneath Stansted CTA-1 and has no ATZ. The airfield is marked on UK Aeronautical charts as a Glider Launching Site with winch launching to a maximum of 2400ft amsl. There is also the warning of "Intense Glider Activity". The Farnborough MATS Part 2, APR 5.3.16 contains brief information on Wethersfield:

"Gliding activity occurs within 2.5nm radius of Wethersfield, excluding that portion north of a line Great Bardfield-Howe St-Toppesfield, up to 2321ft amsl (2000ft agl) under an airspace sharing agreement with Terminal Control. [The] *Gliding School at Wethersfield notify Terminal Control of commencement and cessation of gliding operations. Traffic in receipt of a service from Farnborough and operating in the vicinity of Wethersfield should be encouraged to avoid the area as detailed above."*

The Farnborough LARS North controller elected not to 'encourage' the transit aircraft to avoid the area. ATSI subsequently undertook discussions with Farnborough about the wisdom of the current MATS Part 2 guidance, had it been employed. It was decided to remove the expression 'encouraged to avoid' and add an instruction to controllers that traffic, in the category referred to, **must be advised** of the activity status of the Gliding site at Wethersfield. Information on the activity status held by the Terminal Control Group Supervisor (Airports) would, in future, be extended to Farnborough LARS North. An SI will be issued to implement these MATS Part 2 changes.

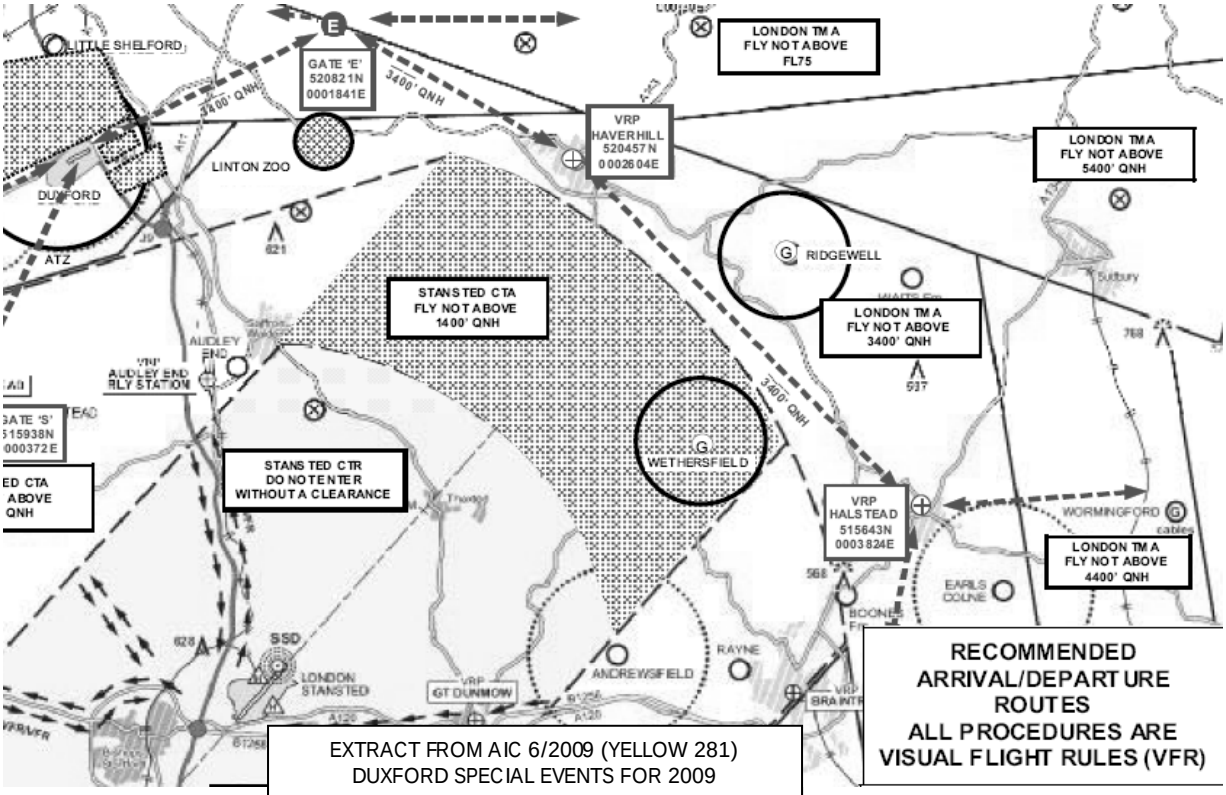
C172 (B) was still wearing A7000 with Mode C, but its SSR label was obscuring the leader's SSR label and preventing adequate monitoring of Mode C levels in relation to the base of Stansted CTA-1. Consequently, the controller requested, at 1700:42, that the pilot of C172 (B) 'switch off' its transponder.

Following a request by the controller, at 1701:04, the PA34 pilot confirmed his level as 1300ft [London QNH (1012mb)]. The controller then asked *"…are you visual with a couple of aircraft in your vicinity Cessnas 1-7-2 departed..Duxford",* to which the pilot replied *"Yeah traffic in sight er four o'clock now".* None of the three pilots reported at any time, seeing a glider or being involved in an incident.

At 1703, the TC GS Airports received a telephone call from the Gliding School at Wethersfield. The caller asked if TC were working "an Aztec or Seneca and two Cessna 152s" that had recently passed through the overhead. The GS advised that the observed ac were wearing Farnborough LARS squawks and it was agreed that Farnborough would be requested to phone the Gliding School. This call took place at 1706, the controller confirming that he had worked aircraft in that area. The Gliding School representative stated that one of their pilots took avoiding action on the Seneca and that all three had flown through the 'top end' of the circuit over the winch. The Farnborough controller agreed to ask the transiting pilots to telephone the Gliding School after landing. At 1710:30, the LARS North controller relayed the message from Wethersfield to C172 (A) and the pilot agreed to make the call after landing. A few minutes later the same message was passed to the PA34 and acknowledged by its pilot.

The PA34 and the two C172s had departed from Duxford on one of the airfield's Special Events dates. To promote the safe conduct of flights to and from Duxford on these dates, a UK AIC was published on 26 February (6/2009 (Yellow 281) providing comprehensive guidance and information for visiting aircraft. It included recommended routes in class G airspace, with appropriate cautions, for aircraft arriving and departing the airfield VFR. The recommended route for traffic departing to the SE is initially towards Gate E - a point approximately 6nm NE of Duxford - and then south-easterly via VRP Haverhill and Halstead. Aircraft adopting this route would remain clear of the boundary of Stansted's CTA-1 and in an area of Class G Airspace where the base of Controlled Airspace (LTMA) is 3500ft amsl.

AIRPROX REPORT No 2009-073



EXTRACT FROM AIC 6/2009 (YELLOW 281)
DUXFORD SPECIAL EVENTS FOR 2009

Annex A Arrival/Departure Routes

UKAB Note (1): AIC 6/2009 (YELLOW 281) – Duxford Special Events for 2009 – includes a note at 3.4(b) *"Note: Beware of Wethersfield Gliding Site…".*

UKAB Note (2): The UK AIP at ENR 5-5-1-6 promulgates Wethersfield Glider Launching Site situated at 51° 58' 27'' N 000° 30' 14''E as active from Sunrise to Sunset (HJ) on Saturdays, Sunday and PHs and from 1600 to Sunset in Summer; at other times by NOTAM. Launching by Winch and Tug ac may be encountered up to 2000ft above the Site elevation of 321ft amsl.

UKAB Note (3): The LATCC (Mil) recording of the Stansted radar does not illustrate this Airprox as the glider flown by the reporting pilot is not shown at all. The PA34 flown by the reported pilot is shown passing the Cessna 172 formation about ½nm to port as the ac approach the vicinity of Wethersfield tracking SE. Both the C172 formation and the PA34 maintain 1400ft London QNH (1012mb) beneath the Stansted CTA – broadly 1079ft above the site elevation of 321ft amsl - as they pass respectively to the SW and NE of the plotted location of Wethersfield Glider Site at a range of about 0·2nm.

HQ AIR (TRG) comments that had the PA34 and the two C172s followed the Special Events UK AIC routeing they would have remained clear of the Wethersfield glider launch site. The change to MATS Pt 2 requiring the Farnborough' LARS North Controller to advise pilots of the activity status of Wethersfield will improve the SA of crews operating in the area and should reduce the risk of a similar occurrence happening.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was evident to the Board that the event organisers at Duxford had taken care to promulgate for the benefit of the many visitors flying in to their displays recommended outbound routeings from the aerodrome, which took into account of the proximity of other aviation activities in the vicinity such as Wethersfield. The gliding/GA Member commented that this was one of the better examples of advice promulgated by event organisers for the benefit of visiting pilots and it seemed that Duxford had exercised their local knowledge to the full and taken great care to develop appropriate routeings around other local aviation facilities. It seemed clear that the PA34 pilot, and the C172 formation pilots, had not followed recommended routeings contained in the AIC for pilots departing Duxford under VFR to the SE. The Board agreed that if the PA34 pilot had followed the AIC routeing via Gate E and thence to Haverhill & Halstead VRPs, he would have avoided Wethersfield glider site by a substantial margin. One Member, noting the importance of preventing a recurrence, suggested that a call to Wethersfield RADIO might have helped. However, the Board were unanimous that it would have been preferable to avoid Wethersfield glider site in the first place by following the procedures Duxford had developed and promulgated to do just that; these procedures were easily accessible to all visiting pilots, including a link to the AIC on the Duxford website]. The consensus amongst the pilot Members was that this Airprox could have been prevented through wiser airmanship and more thorough flight planning. [Post Meeting Note: The Aerodrome Operator confirmed the Duxford procedures stipulated in their AIC, insofar as pilots are required to state their intended departure 'gate' when obtaining prior permission to land at Duxford. This ensures that pilots have read the AIC and are cognisant of the existence of the recommended VFR routes to/from Duxford before their arrival. Moreover, large-scale charts depicting these routes are also displayed in the Flight Planning Office for the benefit of departing pilots.]

The Gliding Member explained that Wethersfield Site is used predominantly, but not exclusively, for circuiting by the VGS and thus the gliding activity is concentrated in its immediate vicinity unlike many other sites from which sport gliders might roam far and wide. The radar recording shows that the PA34 had remained below the 1500ft amsl base of the Stansted CTA, and below the altitude that the Viking attained following the winch launch; it passed approximately 0·2nm abeam the glider site (~370m) – in the Board's opinion far too close. The gliding Member stressed the hazard from the virtually invisible winch wire, which could potentially attain an altitude of 2321ft amsl [under the airspace sharing arrangement with LTC stipulated in the ATSI report] and it seemed that the PA34 pilot had been oblivious to the inherent threat. A Member wondered if it was expecting too much of Farnborough LARS controllers to be cognisant of all such activities within their 'local area' and be able to warn transiting pilots accordingly. However, the ATSI report had made it plain that Farnborough ATC was entirely cognisant of the intense gliding activity at Wethersfield. Advice for controllers was contained within their MATS Pt 2, that "*Traffic in receipt of a service…should be encouraged to avoid the area*" so it was unfortunate that this was not pointed out by the LARS controller at the time. However, the ATSU's subsequent modification of this advice in the light of this Airprox to require controllers to advise pilots flying in the vicinity of the activity status of the gliding site at Wethersfield was a laudable and a worthwhile step.

The Viking Glider pilot's report illustrated the vulnerability of gliders during the launching phase as it was not until he had released from the winch cable and completing his lookout post launch that he saw the Cessna formation crossing about 500m ahead. The very high nose-up attitude coupled with the steep climb-out gradient can inhibit all-round lookout from gliders, which exacerbates the difficulties of catching sight of other ac – a point that should be borne in mind by other pilots when operating in the vicinity of glider launching sites. Although the glider pilot was clearly unable to manoeuvre whilst attached to the winch cable, launches can be aborted in extremis. Here it was clear that after spotting the PA34 to starboard in his 4 o'clock at very close range – about 25m away at the same height he reports - the Viking pilot wisely elected to maintain his course and not turn R as he had intended, whilst the PA34 crossed 25m astern as the formation ahead drew left and cleared to the S. The Board assessed that the Viking pilot had promptly assimilated the geometry and chosen a sound course of action to prevent the situation from deteriorating further and thereby had ameliorated the Risk.

The PA34 pilot had been alerted to the presence of the Viking glider by his co-pilot, which in this case was possibly not an easy spot. Unless primed, many pilots will be surprised by ac climbing at such a steep angle and high rate from below and all the more reason to give winch launch glider sites as wider berth as feasible. However, here the glider was seen at a range of 1000m as it crossed ahead in the PA34's 12 o'clock from L – R and it seemed the bright orange markings helped somewhat. No avoiding action was necessary, the PA34 pilot reports, other than a little bank to the L, without any change of altitude. Estimating the minimum horizontal separation to be about 100m, he reports flying about 30ft above the glider. Pilot Members opined that the PA34 pilot should have given the glider a much wider berth after spotting it. Unfortunately the radar recording did not capture the presence of the glider and thus the pilots' different perceptions of the minimum separation that pertained here – between 25 and 100m - could not be resolved independently. However, it was the pilot of the twin-engine aeroplane that

ultimately chose the final separation and clearly that was of concern to the reporting pilot of the Viking. Moreover, if the PA34 pilot had followed the advice promulgated for traffic departing from Duxford this Airprox could have been entirely averted. The Board determined that this Airprox resulted because the PA34 pilot did not follow the recommended VFR departure route contained in the AIC and flew close enough to the Viking to cause its pilot concern. However, despite the minimum separation reported here as the PA34 pilot had acquired the glider 1000m away, was always going to pass astern and able to turn further away if needs be, in these circumstances Members agreed unanimously that no risk of a collision had existed.

Turning to the Viking pilot's suggestion that an ATZ/MATZ around Wethersfield might preclude such occurrences as reported here, the DAP Advisor commented that such proposals had been reviewed in the past. Here, beneath the Class D CAS of the Stansted CTA, an ATZ around Wethersfield would in effect present a solid brick wall to GA pilots in transit through Class G airspace, which they could not climb above and might have the undesirable side-effect of funnelling traffic into confined areas and causing difficulties elsewhere, possibly resulting in infringements of CAS. In the Advisor's view, Duxford had provided recommended routes that skirted clear of Wethersfield and, if followed, would guide ac clear of the glider site and the inherent danger from the winch cable. Other pilot Members agreed that whilst the aeroplanes involved here flew too close to the glider site an ATZ might not be the answer. A CAT pilot Member suggested that more publicity should be given to Airprox such as these, so as to illustrate the inherent dangers with the aim of encouraging pilots to give glider sites a wider berth and the Chairman agreed that more impact might be achieved throughout the GA community by publishing accounts of these Airprox in pilot-orientated aviation magazines. [Post Meeting Note: Duxford have also suggested that they will use this Airprox Report to illustrate what can occur if visiting pilots deviate from the recommended VFR routeings contained in their AIC.]

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA34 pilot did not follow the recommended VFR departure route contained in the AIC and flew close enough to the Viking to cause its pilot concern.

Degree of Risk: C.

AIRPROX REPORT NO 2009-074

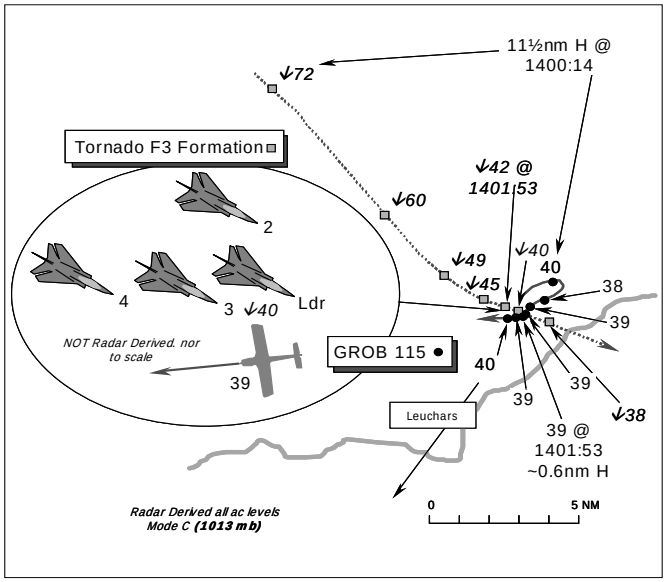
Date/Time: 16 July 1402

Position: 5633N 00239W (12nm NE of Leuchars - elev 38ft)

	Reporting Ac	*Reported Ac*
Airspace:	Scottish FIR	(Class: G)
Type:	Tornado F3	Grob 115 D2
Operator:	HQ Air (Ops)	Civ Trg
Alt/FL:	4000ft	4000ft
	QFE (1014mb)	QNH
Weather:	VMC CLBC	VMC NR
Visibility:	>25km	>30km

Reported Separation: 300-400ft V/200m H 100ft V/500m H

Recorded Separation: 100ft V as SSR contacts merged [~0·3nm H]



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO F3 PILOT reports he was leading a formation of 4 grey F3s on recovery to Leuchars after taking part in a CQWI sortie. The formation disposition was 'Arrow heavy side right' but in the descent he had Nos 2&3

in reverse Vic with No 4 tied on in 1nm trail. Scottish Mil provided a TS in transit and, whilst descending the formation through a 2800ft thick cloud layer heading 145° at FL90 at Mach 0·55, he was given the following TI at 1359:25 "[C/S] traffic 12 o'clock 12 miles right left indicating FL40". This was the last and only traffic update he received from Scottish Mil before being handed over to Leuchars APPROACH (APP) at 1400:04. At this point, before taking his formation across, he should have requested an update on the previously called traffic but did not do so. Upon contacting Leuchars APP the formation was identified, placed under a TS and he then requested further descent. No further traffic calls were received from APP, nor was he given any indication he was in an area of poor radar performance. He was flying under VFR, in good VMC at FL70, when APP instructed him to descend to a height of 3000ft QFE. Approaching a position 12nm NE of Leuchars, in the area between Carnoustie and Arbroath, heading 112° whilst descending through 4000ft QFE at Mach 0·62, he had relaxed the formation into 'Arrow heavy side right', whereupon he saw the other ac – a white Grob 115 D2 – at the same time as his No2 transmitted the position of the Grob to the other formation members. He saw the Grob about 3sec before the Airprox, which occurred at 1401:56; a collision risk was apparent to his No3 who actioned a pull to avoid the Grob. Minimum vertical separation was 300-400ft vertically and 200m horizontally and he assessed the Risk of a collision as *"high"*. Whilst positioning the formation to release flares that had to be dispensed over the sea, changing formation and all the while receiving calls from ATC regarding controller training his workload was moderate to high. It was also the first time in 4 years that he had led a 'four-ship' recovery.

THE GROB 115 D2 HERON PILOT reports that he was conducting an instructional VFR flight teaching Stalling - Part 1, whilst in receipt of a BS from Dundee on 122·9MHz. A squawk of A7000 was selected with Mode C on; Mode S is not fitted. The HISLs were on and his aeroplane is coloured white.

He had been operating in one of their general handling (GH) areas at 4000ft Dundee QNH for the previous 10min. About halfway between Arbroath and Carnoustie, some 1½nm 'onshore', he had just completed another 180° lookout turn onto 260° and was in the process of teaching the setup of the fully developed stall with the speed decreasing from 90kt. He opined frankly that his eyes were inside more than they should have been, but when he looked to the R he saw the closest F3 in his 4 o'clock turning left behind him at a range of about 500m - possibly descending. He then saw two other F3's outside the first ac and slightly further behind him but he did not know if they were turning. Upon looking forward he saw a fourth F3 passing in front and a little lower (possibly turning slightly right and descending). As far as he was aware, all the jets were descending from altitude for recovery to Leuchars and continued to descend offshore. Minimum separation was 100ft vertically and 500m horizontally.

He opined candidly that this was obviously a late sighting on his behalf due to workload – for which he had no excuse and he wondered that instead of working Dundee, if he had obtained a BS from Leuchars ATC, would they have given him a 'heads-up' about the fast jets in the area. He also postulated whether it would be worthwhile talking to Leuchars more than he does at present because he is aware how very busy Leuchars ATC are at times.

THE LEUCHARS COMBINED APPROACH, DIRECTOR AND LARS CONTROLLER reports that he was instructing a trainee controller whilst working Leuchars APP, DIRECTOR and LARS combined on the APP position. ScATCC(Mil) handed over the formation of 4 F3s in a position about 100° ANGUS 5nm descending to FL70. During the handover, traffic in their 12 o'clock - 12 miles was notified as having been called. This traffic was squawking A7000 and indicating FL40 Mode C. Shortly after the formation leader called on frequency the A7000 squawk disappeared from radar as did the primary radar return. On initial contact the F3 leader requested descent and was given 3000ft QFE for a radar to visual approach, before being asked if his formation had sufficient fuel for instrument recoveries for controller training. The F3 leader gave a negative response and then requested to route out to sea before recovery to dispense some flares, for which he was given his own navigation.

Another flight then called on 126·5MHz requesting a BS from Bass Rock heading N for a MATZ crossing. At the same time the ScACC landline rang and were told to standby, before one of the F3 Formation called to say that they had got close to a Tutor in the vicinity of Barry Budden and did we have any traffic in that area. By that stage the F3 formation were about 10nm off the coast but there were no radar returns showing anywhere in the Barry Budden area.

It was noted that although the Watchman primary ASR, SSR and other equipment was all fully serviceable and operating on a 40nm range, permanent echoes persist in the vicinity of the Airprox location which is "standard" for the Leuchars Watchman. The Leuchars Weather was reported to be CC: BLU; Vis: 50Km; SCT @ 2500ft, SCT @ 9000ft, BKN 25000ft; RW27RHC; QFE: 1014mb.

DAATM reports that the Leuchars APP position was manned by a Mentor and controller who was training in the APP and DIRECTOR (DIR) positions but held endorsements for DEPARTURES (DEPS) and ZONE. Although not common practice, especially when training is taking place, the APP, DIR and ZONE tasks were combined; the traffic levels were low and within the controllers' capability.

At 1359:41 ScATCC (Mil) Assistant 5 (ASST5) called APP to handover the F3 formation. At the end of the handover, ASST5 provided somewhat vague information regarding traffic that had been called to the F3 *"Stud 4, has traffic in his 12 o'clock has been called"?* APP did not state that they had radar contact with the called traffic but replied *" Yep Leuchars."* The ATSU's investigation report indicates that there was a radar return indicating FL40 squawking A7000 that could have been the ac called to the F3 formation by ScATCC (Mil) [displayed at some stage]. At 1400:13, the F3 formation leader checked in with APP at FL70 requesting further descent. APP identified the F3 at 1400:21, provided a TS and gave the weather details including an instruction to set the Leuchars QFE of 1014mb. At 1400:36, after reading back the QFE set, the lead F3 pilot was given an instruction by APP to *"..descend to height 3000ft".* No mention of the traffic previously called by ScATCC (Mil) was made. The Leuchars ATC report indicates that the radar contact that could have been the conflicting traffic had faded from radar and was therefore not considered a factor. The Aberdeen Radar recording obtained from ScATCC Mil, based on the 30nm range scale, shows the conflictor maintaining FL40 Mode C squawking A7000. The conflictor was initially crossing the F3 from right to left as reported by ASST5 but turned back in a westerly direction. The conflictor and the F3 then maintained a constant bearing until the point of the Airprox. At 1400:38, the F3 formation leader was asked if elements could carry out evolutions for controller training to which the lead F3 pilot replied that they could not as the formation had to route out to sea to dispense some flares. The F3 leader stated that they would route behind Bell Rock before recovering under their own navigation. Between 1402:13 and 1402:55 an unrelated landline call and a freecall from an aircraft requiring a Basic Service was dealt with by APP. At 1403:58 the F3 reported *"..2* [reporting on behalf of the formation] *we just had a close* [indistinguishable word] *with a Tutor somewhere in the vicinity of Barry Budden, you got any traffic there at the moment?"* APP replied negative before the F3 formation recovered to Leuchars without further incident.

APP provided the F3 formation with a TS iaw CAP774. The F3 formation were given a descent instruction through the level of an aircraft known to have been in the vicinity of the formation but which was no longer showing on the Leuchars radar display. ASST5 informed APP of traffic in confliction with the F3, which had been called to the formation, during the handover but the information was ambiguous and was not appropriately acknowledged by APP. The F3 formation leader did not ask for, and was not given, an update on the conflicting traffic by APP after the initial traffic information call from ScATCC (Mil); nor was the F3 leader informed that the conflicting traffic had faded from radar.

The Leuchars unit investigation report states that, although the controller in this incident did not break the rules of the provision of a Traffic Service, controllers are being mentored to improve their radar skills in order to prevent a reoccurrence of this type of incident. Furthermore, whilst not considered a contributory factor in this incident, band-boxing [combining] of operating positions whilst training is in progress will only occur in extremis.

ATSI reports that the Transcription Unit visited Dundee to obtain the RTF recording over the period of the Airprox; however, this was not possible due to a reported disc read error. Consequently, no RTF recordings were available for this Airprox; the Unit is in the process of changing its recording equipment. Dundee ATC is not radar equipped and thus had no knowledge of the presence of the Tornados.

HQ AIR (OPS) comments that pilots conducting training and general handling in the vicinity of busy airfields should be advised to obtain a TS if at all possible, equally traffic once notified as a potential confliction should be given a wide berth until it is visually identified. The crews involved in this Airprox were lucky that they did not come any closer, both elements could have done more to maintain separation. Leuchars has already taken action to minimise occurrences of "bandboxing". This Airprox will be forwarded to DAATM to consider whether this practice needs to be restricted further.

UKAB Note (1): Just at the time the lead pilot was 'checking-in' with APP, the Aberdeen Radar recording shows the Tornado F3 formation as an single SSR contact identified from the lead ac's squawk of A0201, descending through FL72 verified Mode C at 1400:14, with one of the F3 formation elements in trail. Simultaneously, the Grob 115 is shown squawking A7000 and indicating FL40 unverified Mode C in the jet's 11:30 at a range of 11½nm, just before the Grob turns R about from ENE onto a generally WSW'ly course. The F3 formation maintains a SE'ly course descending through FL49 – some 1000ft above the Grob indicating FL39 – which is 2·8nm away at 1401:34

and now tracking westerly. The Grob crosses through the jet's 12 o'clock from L to R. However, the picture quality and large scale of the recording, coupled with the absence of primary radar contact on the individual formation elements is not conducive to accurate measurement of the range/CPA. The F3 formation seems to pass marginally astern of the Grob into its 4 o'clock whilst descending through FL40, just as the lead F3's SSR contact merges with that of the Grob indicating FL39, broadly substantiating the overall geometry of the encounter as reported. Minimum horizontal separation is in the order of 0·3nm just as the F3's Mode C indicates a descent through the indicated level of the Grob.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

This Airprox occurred in Class G airspace where each operator had an equal responsibility to 'see and avoid' other ac. Whereas the Grob pilot was receiving a BS from a non radar-equipped ATSU and, in the Board's view, given the stage of training of his Student, was solely reliant on his own lookout scan to detect other ac, the F3 formation leader had wisely obtained a radar service to enhance his situational awareness.

It was evident from the F3 leader's comprehensive account that his formation had been under a TS from ScATCC (Mil) and the presence of the Grob 115 had been pointed out to him as it crossed ahead some 12nm away, prior to the hand-over to APP. Unfortunately the transcript of the ScATCC (Mil) frequency was not available, but there was no reason to doubt the veracity of the F3 leader's report on this aspect and he had clearly referred to recorded data whilst writing his account that had proved so helpful here. The military area controller Member thought that the TI given by ScATCC (Mil) showed commendable awareness on the part of Controller 5 as the F3s were still at FL90, some 5000ft above the Grob's indicated level, at the time but when they descended for recovery the contact could potentially be a factor. It was significant that the direction of the Grob had been specified as crossing from R – L, which the radar recording had shown was accurate when it was given. Board Members realised that without any further updated TI this might have instilled a belief in the F3 leader that the Grob had cleared to the NE of his intended track and was thus no longer a factor during their recovery. However, the Grob 115 had subsequently turned about and was now re-crossing the F3's track from L - R. Although ScATCC (Mil) ASST 5 had highlighted to Leuchars APP that the contact had been called to the F3s, considerable debate revolved around the issue of a traffic update by APP. Whilst the F3 leader had not asked for further TI on the Grob, controller Members were overwhelmingly of the view that, if the Grob had been shown on the Leuchar's displays, it should have been evident to the controllers that it continued to pose a definite hazard and thus further TI was warranted. The APP Mentor reported that shortly after the formation leader called on frequency the Grob's A7000 squawk together with its primary radar return had disappeared from his radar display. The Air Command fast-jet Member suggested that poor radar performance to the N of Leuchars was a known issue and the APP Controller had reported that the Airprox had occurred in an area where permanent echoes persist. The area controller Member contended that traffic information can only be provided if a radar contact is displayed. However, the DAATM Advisor stressed that, if the Grob's contact had faded or entered an area of permanent echoes, this should have been mentioned to the F3 crews, and no mention had been made of a known area of poor radar performance in the Unit report. The civilian Area Member, who is familiar with this airspace, suggested that, if it is an area of known poor radar performance, the TS should have been limited accordingly; however, there was no such limitation placed on the radar service evident from the Leuchars APP RT transcript. The Board agreed that aircrew should be warned when approaching areas of poor radar performance unless the warning is already promulgated in standing orders or instructions. [Post meeting Note: The Leuchars Flying Order Book (FOB) states that *"Owing to poor radar performance, radar services will be reduced in the sector 230° - 280° from Leuchars beyond 10nm and within 10nm of the radar overhead."* This Airprox occurred some 12nm NE of Leuchars – outside of the area of poor radar performance noted in the FOB.] Whilst the Leuchars controllers might have assumed that the contact (the Grob 115) had now flown below coverage, APP had been aware of the contact ahead and below the F3s and had issued instructions for the formation to descend through the level of that ac. The Board agreed with the Command's view that the loss of contact was significant and the F3 leader should have been advised that no updates were possible.

There is currently no stipulated requirement for terminal ATSUs to record their displayed radar picture. Although the Aberdeen radar recording had captured the Airprox - 12nm NE of Leuchars and well within theoretical solid radar cover of the Leuchars Watchman - the Board was keenly aware that it was not indicative of the picture

displayed to the controllers at Leuchars. The absence of any return at all from the Grob on a fully serviceable radar – especially SSR - in the period leading up to the Airprox was of considerable concern to controller Members. The composite structure of the Grob would not enhance its detection by ASRs, and primary radar can also be susceptible to a host of different variables that can attenuate the received radar return. However, the Grob was transponding on Modes A & C, which should have aided the ac's conspicuity, and it was therefore surprising that the Grob was not displayed to the Leuchars controllers. Controller Members considered that the circumstances surrounding this Airprox warranted a technical investigation into the radar performance. This was the overwhelming view of the Membership who agreed a Safety Recommendation was justified. Consequently, the Board recommended that the MoD should review the performance of the Watchman primary ASR and associated SSR system at RAF Leuchars to ensure that it provides appropriate solid radar coverage in the lower airspace commensurate with its rôle.

Fast Jet Pilot Members noted that no AI radar contact had been gained by the F3 formation on the Grob 115, as none had been alluded to in the formation leader's account. Therefore, in compliance with APP's instructions and without any further prompt from ATC about the presence of the Grob, the F3 formation descended towards the light ac unaware that the Grob had turned about and was crossing unseen directly ahead. It was not until the lead pilot spotted it about 3sec before they passed, at the same time as his No2 transmitted the position of the Grob to the other formation members, that any of the F3 crews were aware of its presence. This was undoubtedly a late sighting by the formation crews and part of the Cause. However, despite the lateness of the sighting, there was time for the No3 F3 to take effective action to avoid the Grob. This 'pull' by the No3 F3 pilot had reduced the risk of a collision, but at the distances reported here, with 5 ac involved and little time or space to react, the Members agreed unanimously that the safety of the ac involved had been compromised.

From the Grob pilot's candid report, it was evident that he had sighted the F3s at a late stage, just as he was 'bracketed' by the formation with no time and little space to effect any avoiding action. The Members agreed unanimously that a late sighting by the Grob 115 pilot was the other part of the Cause. Members recognised that the Grob pilot was operating VFR within Class G airspace whilst legitimately conducting his training flight, but he had mentioned that he was operating in one of their GH areas. Further discussion with the Grob pilot revealed that these GH areas are to de-conflict other training flights originating from Dundee, but the Grob pilot had obviously considered the possibility of enhancing his situational awareness by obtaining an ATS from Leuchars. Without any radar, in the Board's view, Dundee was not the best option here and under a BS from Leuchars the controllers were under no remit to pass TI, which did not seem to fit the bill. Clearly if the Grob instructor wanted to receive TI then a radar service was appropriate; a TS would enhance his overall situational awareness, if it was compatible with his task, and in this case could have resulted in a warning of the hazard posed by the formation. To that end the Board suggested that Dundee based civilian training ac should make use of a TS, when available, from Leuchars Radar. Whether Leuchars knew of the Grob pilot's 'GH areas' was unclear, but if training flights are regularly conducted in the area through which fast jets also recover, further liaison would be worthwhile. [Post Meeting Note: these 'GH Areas' are only used internally by this flying training unit.] The Board's intent here was to suggest communication so that each was aware of the activities that were taking place in the local area; perhaps some simple arrangements could be made to establish which GH areas are in use on the day, with the overall aim of improving mutual deconfliction between military fast jets and light training ac. After a wide ranging debate the Board elected to make a further Safety Recommendation, that ATC and aircraft operators at Dundee airport, together with RAF Leuchars staff, should review the requirement for agreed General Handling Areas and Air Traffic procedures to improve the mutual deconfliction of military fast jets and civilian light aircraft operating in this vicinity.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sighting by the Grob 115 pilot and the F3 crews.

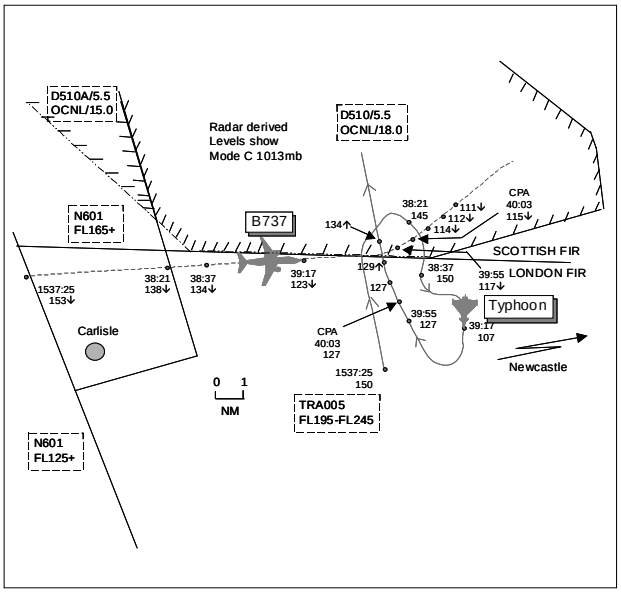
Degree of Risk: B.

Recommendation: (i) The MoD should review the performance of the Watchman primary ASR and associated SSR system at RAF Leuchars to ensure that it provides appropriate solid radar coverage in the lower airspace commensurate with its rôle.

(ii) ATC and aircraft operators at Dundee airport, together with RAF Leuchars staff, should review the requirement for agreed General Handling Areas and Air Traffic procedures to improve the mutual deconfliction of civilian light aircraft and military fast jets operating in this vicinity.

AIRPROX REPORT NO 2009-075

Date/Time:	16 Jul 1540	
Position:	5500N 00229W (28nm W Newcastle)	
Airspace:	SFIR/LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	B737-700	Typhoon
Operator:	CAT	HQ AIR (Ops)
Alt/FL:	↓FL80	12600ft (RPS 1011mb)
Weather:	IMC KLWD	VMC CLBL
Visibility:		10km
Reported Separation:	1000ft V/2nm H	1000ft V/3nm H
Recorded Separation:	1200ft V/2·4nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports inbound to Newcastle IFR and in receipt of a DS from ScACC and then Newcastle squawking with Modes S and C. Routeing as per FPL from BLACA direct to NATEB (O/H Newcastle) on handover to ScACC TAY, whilst descending they were further cleared to FL80. When advised by ATC of traffic approximately 10nm ahead, they replied that they had contact with the traffic on TCAS and that they were IMC. They were then handed-over to Newcastle ATC heading 090° at 230kt; during the frequency change it became apparent from the intermittent TCAS positions and heights that the other ac was carrying out high-energy manoeuvres. On first call to Newcastle they advised ATC of the TCAS traffic and were given an avoiding heading whilst TCAS produced a TA alert. The other ac passed with about 1000ft vertical and 2nm horizontal separation; no RA was received. The other ac was not seen visually owing to IMC and he assessed the risk as high.

THE TYPHOON PILOT reports conducting tactical training within TRA005 using Spadeadam Electronic Warfare Range squawking 1741 with Mode C. Owing to layers of cloud in his operating block he was in receipt of a DS from Spadeadam and had accepted a top level of FL230 to deconflict from traffic routeing N at FL250. About 3min before the Airprox he commenced his final run towards D510 from the S at 15000ft and about 40sec later ATC asked if he could accept a TS. He expected to complete his exercise within 2min and he was not aware of any traffic other than that at FL250 so he accepted the TS offer. Fifteen seconds later he started the dynamic portion of the exercise during which he turned R through E then onto S whilst manoeuvring rapidly between 17000ft and 8000ft on the RPS 1011mb. During this manoeuvre at 1538:47 Spadeadam advised him of traffic 10nm to the W of his position heading E descending through FL130. At 1539:25 he terminated the training, as his fuel state now required him to proceed to TRA007 for the next portion of the sortie. He had manoeuvred S by about 4nm and was now IMC and he estimated the previously called traffic would now be to the N of him and heading away. He started a climb and levelled at 12600ft Tyne RPS 1011mb in a VMC layer at 360kt whilst turning onto a NW'ly heading to track behind where he thought the other traffic would be. He had no radar contact on this traffic. At 1539:34 ATC then asked if he could maintain no further N of his present position for 2min but as he was flying VFR at the time he offered to accept any level to avoid traffic. ATC replied that the traffic was N of him range 5nm at FL117 descending and simultaneously he saw a medium-size low-wing twin-engine airliner in his 1 o'clock range about 3nm at least 1000ft below and heading away. He informed Spadeadam that he could see the traffic and was visually deconflicted from it; no avoiding action was needed, as there was no risk of collision. He continued on his current heading and completed the sortie uneventfully, as planned. He assessed the risk as low.

UKAB Note (1): TRA005 vertical limits are FL195-FL245. D510 was active up to 5500ft amsl.

UKAB Note (2): ScACC Tay and Newcastle RAD1 controllers both submitted reports but these have been omitted for brevity as the majority of the pertinent details are included in the ATSI report below.

AIRPROX REPORT No 2009-075

ATSI reports that the B737 was inbound to Newcastle from Belfast. In accordance with local procedures, the ScACC Tay Sector had obtained a squawk and an acceptance level (FL80) from Newcastle. To assist the handling of such flights, it is usual practice for the Talla Sector to work the aircraft through Tay's airspace and then transfer it direct to Newcastle Approach. Accordingly, at 1523, the Talla Sector telephoned the Tay Sector to obtain the local squawk and level, in order to carry out the procedure. However, 13min later, Talla telephoned Tay to advise that because the sector was busy, they intended to transfer the flight to Tay. It was agreed that it would descend to FL130, to remain within CAS and be transferred shortly. At the time, the Tay Controller was performing both the Planner (P) and Tactical (T) functions. He reported that he had been happy to elect to work single manned, as the workload had not been high. In the event, prior to the B737 flight contacting the sector, the Tay Controller had requested a Planner, as the workload of the sector had increased substantially.

The B737 flight established communication with the ScACC Tay Sector at 1536:30, reporting descending to FL130 to NATEB. In accordance with its acceptance level, the B737 flight was instructed to *"descend Flight Level Eight Zero clear to leave controlled airspace"*. NB The base of CAS, in its vicinity, is FL85. In the event, the ac left CAS laterally, after passing NW of Carlisle, where the base is FL165. The flight was instructed to select the Newcastle allocated squawk.

The Tactical believed that the Planner arrived at the sector at about this time. He was unable to inform him about the situation because of the high loading of the frequency and the complexity of the traffic. Approximately 30sec after the pilot of the B737 read back the Newcastle squawk, just after 1537:30, the controller informed the pilot *"traffic information for you traffic when you leave controlled airspace is unknown traffic in your one o'clock at a range of eleven p-point six miles crossing right to left indicating One Five One unverified"*. The pilot replied *"Okay thanks we're IMC we've got him on our radar"*. The controller added *"Yes should pass well ahead"*. The radar timed at 1537:25 shows the B737, just leaving CAS just NW of Carlisle Airport where the base level changes from FL125 to FL165, passing FL153. The unknown traffic (subsequently identified as the subject Typhoon), showing SSR code 1741, an RAF Spadeadam allocated squawk, at FL150, tracking N in the B737's 1 o'clock at 13·4nm. The UK AIP, Page ENR 1-6-2-4, states that *'All Spadeadam squawks indicating above FL50 will be validated and verified by Spadeadam ATC/Range control'*.

By 1538:21 the B737 is passing FL138 and the Typhoon is in its 1130 position at a range of 8·9nm. The latter is in a R turn, passing through SE, at FL145. At the time, the controller advised the pilot of the B737 *"I've lost that the primary con- that contact now in your twelve o'clock at a range of seven miles he's manoeuvring indicating One Four F- One Five One"*. As the controller was transmitting, the radar return of the Typhoon did disappear momentarily, before returning to indicate that the ac was climbing. The pilot commented *"we keep losing him on TCAS thanks he's popping about we can see he's two thousand above us and we're just expediting our descent"*. The controller responded *"Roger that ties with me you can contact Newcastle One Two Four Three Seven Five"*. As this message is passed, at 1538:37, the Typhoon is just R of the B737's 12 o'clock, at 7·9nm, turning R through a S'ly heading at FL150. The B737 is passing FL134.

Meanwhile, Spadeadam telephoned Newcastle, at 1538, to pass TI about the subject Typhoon manoeuvring 30nm W of Newcastle. It was reported to be operating between surface and 23000ft, in receipt of a TS. Newcastle informed Spadeadam about the B737, which had not yet called him but was descending to FL80 with ScACC. Newcastle said that, on contact, he would route the B737 N'bound, to avoid the Typhoon. Spadeadam suggested a turn to the S, if possible, as he did not know the Typhoon's intentions but would *'call you in to him anyway as soon as I can'*.

The B737 flight contacted Newcastle Approach at 1539:17, reporting *"descending Flight Level Eight Zero direct NATEB and we've got TCAS traffic approximately five miles popping on and off our TCAS radar"*. The radar recording shows the Typhoon, still in its R turn, having just passed through S, at FL107. The B737 is NW of it, 6·3nm away, passing FL123. The Newcastle APR replied *"good afternoon and avoiding action then turn left heading Zero Six Zero degrees keep you clear of traffic to the southeast of you by five miles manoeuvring indicating Flight Level One Two Zero"*. The pilot replied *"Left er Zero Six Zero degrees and we've now got er ????? ????? traffic ????? ????? ?????"* (several words unintelligible). The controller transmitted *"that traffic now to the south of you by two miles heading towards height is er unknown"*. The pilot responded *"TCAS says er a thousand feet above"*. The radar recording at 1539:55 confirms that the ac are separated by 1000ft at the time, the B737 is passing FL117 and the Typhoon, which is 2·7nm S of it, tracking N, is level at FL127. The controller advised the pilot of the B737 *"roger and er now to the southwest by two miles heading Zero Six Zero is the best for avoiding action indicating Flight Level One Two Five and climbing"*. Shortly afterwards, the controller updated the

information *"that traffic now the er west of you by four miles heading northbound Flight Level One Three Five and climbing"*. The radar recordings show that the closest point of approach occurred at 1540:03, when the two ac were 2·4nm apart. The Typhoon, at FL127 is SW of the B737, which is passing FL115. Thereafter, the climbing Typhoon passes 3·1nm behind the descending B737, the vertical separation having increased to 2300ft.

The MATS Part 1, Section 1, Chapter 5, Page 1, states: '*Pilots must be advised if a service commences, terminates or changes when: a) they are operating outside controlled airspace; or b) they cross the boundary of controlled airspace'*. On this occasion, the Tay Controller did not advise the pilot of the B737 when he had left CAS or the type of service being provided thereafter. Additionally, the MATS Part 1, Section 1, Chapter 11, 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 they require'* (apart from certain circumstances not applicable to this Airprox). The pilot of the B737 reported that he was of the belief that he was receiving a DS from ScACC. The Tay Controller stated, in his report, that he did not take into account the fact that the pilot of the B737 had reported being IMC. Had this registered he would probably have issued the flight a R turn as avoiding action. He commented that he was busy at the time, dealing with traffic elsewhere in the sector. Because of his high workload, he did not think it would have been possible to provide a full DS and would have had to reduce the service as necessary. However, he believed that there would be a vertical separation of at least 3000ft between the subject ac and their radar returns would not have merged. This is the deconfliction minima for a DS stated in the MATS Part 1 against uncoordinated traffic, albeit the latter minima is not required if Mode C has been verified. Undoubtedly, with hindsight, it would have been prudent to keep both the Planner and Tactical Controllers in position on the Tay Sector. This may have allowed the controller(s) more time to provide an improved service to the B737 or to coordinate an action with Newcastle. In the event, the controller complied with procedures as if he was providing a TS. Under either service, it is the pilot's responsibility to avoid other traffic.

The Newcastle APR reacted quickly to the situation, issuing an avoiding action turn to the B737 on initial contact. Although no service was agreed with the pilot, due to the time constraint, the controller endeavoured to provide a DS to the extent possible.

DAATM comments that Spadeadam were unaware of this incident being filed as an Airprox. Spadeadam were contacted by RAC Mil during tracing action to establish the identity of the Typhoon but it appears that the signal of the Typhoon pilot's report that was sent was not received by DAATM and neither was a copy of the report sent by UKAB. Consequently the Spadeadam RT recording was not impounded and the controller was unable to provide a meaningful report when informed of the incident several months later.

HQ AIR (OPS) comments that B737 pilot may have perceived this as an Airprox when in fact it was not; the Typhoon was operating in class G airspace, both ac were reported to each other and the Typhoon was in visual contact with the B737.

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 ScACC and Newcastle air traffic controllers involved and reports from the associated ATC authorities.

An experienced ATCO Member familiar with ScACC operations expressed sympathy for the Tay controller's predicament, as Tay was not expecting to work the B737 initially. Newcastle ATC normally take over control from the Talla Sector as the ac leaves CAS just W of Carlisle, about 40nm W of Newcastle, owing to the short time that the flight would work Tay Sector after Talla and before Newcastle, in this case 2min. Although no level of service was requested by the crew or offered by Tay, the Tay controller had given TI as if he was providing a TS to the B737 flight as it left CAS (on the Typhoon as it crossed R to L N'bound well ahead) and the crew reported IMC but able to 'see' the traffic on TCAS. The B737 crew believed that they were under a DS from Tay but no agreement had been established before or after the ac left Class A CAS and entered into Class G airspace. Without a clear agreement as to a level of service, the B737 crew believed that they were receiving a higher level of service than that being provided. A salutary lesson for all pilots and controllers to note, the importance of agreeing an ATS so that there is no misunderstanding as to the service being afforded at any time.

Subsequently TI was updated as the Typhoon manoeuvred S'bound across the B737's track 7nm ahead from L to R, the B737 crew reporting it as being 2000ft above from TCAS and that they were expediting their descent. At this stage, with the Typhoon not in confliction as it diverged away from the B737's projected track, it was understandable that the Tay controller transferred the B737 to Newcastle. However, during the period between the B737 leaving the Tay frequency and calling Newcastle, the Typhoon had manoeuvred back to the NW after completing the high-energy part of its sortie with Spadeadam. Without the benefit of a DAATM report it was unclear why the Spadeadam Range controller had 'down-graded' the level of service given to the Typhoon pilot from DS to TS. Under a DS Spadeadam would have had either to coordinate with Tay or Newcastle to establish a plan to deconflict the subject ac or have passed avoiding action to the Typhoon. That said, the Spadeadam controller had discharged his responsibilities under a TS and passed TI to the Typhoon pilot twice: once when the flight was S'bound in IMC with the E'bound B737 10nm to its W and again when the Typhoon was NW'bound with the B737 to its N. The Typhoon pilot had shown good situational awareness with respect to the B737 but had estimated that the B737 would be clear of his intended flightpath i.e. further to the E, when he turned R and climbed to route to TRA007. However, the TI had allowed the Typhoon pilot, who had climbed to 12600ft into VMC between layers, to visually acquire the B737 in his 1 o'clock which was 1000ft below, about 3nm away, and diverging.

The Chairman asked why the B737 had flown on this direct route which placed the flight in Class G and into an area where military ac frequently carry out high-energy manoeuvres. Members opined that even if the B737 had routed NE from Belfast within CAS towards TLA VOR, as the base level of the airway that then routes SE towards Newcastle increases, any flight landing at Newcastle from this direction would also leave CAS in the descent and would transit through Class G for a similar period of time. The only route which exhibits contiguous CAS involves extensive track distance from Belfast via IOM to the Manchester area before routeing NNE'bound past Leeds via airway P18, which Members believed would probably not be operationally viable.

Pilot Members opined that the B737 pilot appeared to have anticipated more separation than that which pertained at the time; he reported 2nm separation and 1000ft at the CPA. Had there been a coordinated resolution between Tay or Newcastle and Spadeadam the separation minima would have been 3nm or 1000ft. Irrespective of the ATS being provided, within Class G airspace crews were responsible for maintaining their own separation from other traffic through 'see and avoid', the B737 flight with assistance from ATC under an ATS. From the TI given and the TCAS derived information available, the B737 crew had gained good situational awareness of the rapidly evolving situation and elected to increase their ROD. On first contact with Newcastle, RAD1 had issued the B737 flight an avoiding action L turn, away from the manoeuvring Typhoon, having previously informed Spadeadam of his intended actions during the telephone conversation a minute earlier. At the time the Typhoon was tracking S but had shortly afterwards climbed and turned R onto a NW'ly track, which undoubtedly had caused the TA alert to be generated on the B737 flightdeck as the Typhoon's vector had temporarily breached its TCAS 'safety bubble'. However, the Typhoon pilot had quickly levelled at 12600ft in VMC between layers and had seen the B737 as it diverged in his 1 o'clock about 1000ft below. Meanwhile the B737 crew were uncomfortable with the Typhoon's high-energy manoeuvres, which had caused intermittent positions and heights to be displayed on TCAS, and because they were unable to visually acquire the Typhoon during the latter stages owing to IMC. Although this incident had been a somewhat untidy, all parties had taken appropriate actions – Tay and Spadeadam giving TI, Newcastle giving avoiding action, the B737 crew increasing their ROD and the Typhoon pilot's visual sighting. The recorded radar clearly shows the geometry of the encounter, the B737 crossing well ahead of the Typhoon with the CPA of 1200ft/2·4nm occurring after the B737 had passed through the Typhoon's 12 o'clock and out of confliction. These elements were enough to allow the Board to conclude that this incident was a sighting report (TCAS) and that no risk of collision had existed during this encounter.

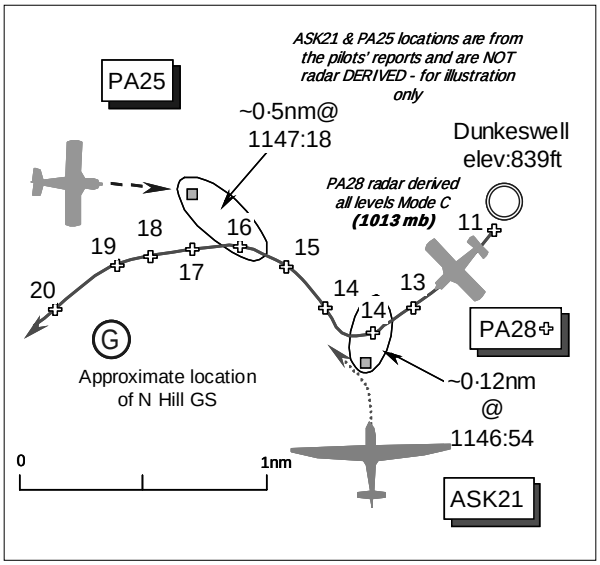
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report (TCAS).

Degree of Risk: C.

AIRPROX REPORT NO 2009-076

Date/Time:	5 July 1147 (Sunday)	
Position:	5051N 00316W (about ½nm SW of Dunkeswell Aerodrome - elev: 839ft)	
Airspace:	Dunkeswell ATZ	(Class: G)
	Reporting Ac	*Reporting Ac*
Type:	PA28A	ASK21
Operator:	Civ Trg	Civ Club
Alt/FL:	1800ft	450ft
	QNH (1015mb)	QFE
Weather:	VMC CLOC	VMC CLOC
Visibility:	20km	25nm
Reported Separation:		
	100ft V/50m H	Nil V/20m H
Recorded Separation:		
	Not recorded	



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA28A PILOT, a student on the last leg of his PPL qualifying cross-country exercise, reports that he was departing from Dunkeswell bound for Exeter, flying solo under VFR and in communication with Dunkeswell RADIO A/G Station on 123·475MHz. On the climb out from Dunkeswell's RW23, heading 230° whilst climbing through 1800ft QNH (1015mb) at 90kt, he observed an ac as it passed from R to L ahead. Almost immediately he observed another ac in his 12 o'clock some 100m away at a similar level, which he considered would be a risk if no action was taken. To ensure separation from the other ac, which he believed initially was a powered ac, he turned R using 45° AOB whilst lowering the nose. However, the other ac then turned to port and it became apparent to him that it was a glider. It was at this point that the two ac were at their closest - he estimated 50m horizontally and 100ft vertically - so he continued the turn maintaining visual contact with the glider until it was clear below. Dunkeswell RADIO then called on the RT to advise that he was near a glider site [North Hill Glider Site] to which he responded, "roger I am visual with the glider". There was significant activity in the Dunkeswell area at the time due to a rally taking place. He assessed the Risk as *"low".* The ac has a burgundy & cream colour scheme; the anti-collision beacon and landing light were on.

THE ASK21 GLIDER PILOT reports he was in the cct to North Hill Glider Site with the P2 flying his glider from the front seat and in communication with North Hill Glider Site on 129·90MHz. About 1¼nm WSW of Dunkeswell, descending on base leg heading 360° at 55kt at a height of 450ft North Hill QFE (1380ft amsl), the P2 suddenly saw a PA28 climbing and converging from the right very close and on a collision course. The P2 immediately took avoiding action and continued to land the glider further up the airfield. He had not seen the approaching PA28 himself as it was hidden from view by the starboard wing. Minimum horizontal separation was 20m as the PA28 passed at the same height with a *"very high"* risk of collision, its pilot seemingly oblivious to the presence of his glider or North Hill Gliding Site.

The PA28 then flew into conflict with the Tug aircraft that was on a RH downwind leg, whereupon the PA28 turned L and flew over the glider winch at about 700ft.

THE PA25 PAWNEE TUG PILOT reports that he was in communication with North Hill BASE on 129·90MHz whilst recovering to North Hill Glider Site at 100kt having released a glider. Descending through a height of 500ft on a right hand downwind heading of 100° for North Hill's RW27, he first saw the PA28 about 500m away climbing out from Dunkeswell's RW23. The PA28 then turned R and continued to climb. Realising that there would be little separation between the PA28 and his ac he turned L into a holding pattern at the end of his downwind leg, he also observed the ASK21 glider on a L base leg having to take avoiding action. The PA28 passed 500m to starboard

and at the closest point was 200ft below his ac as it continued to climb maintaining a steady course. After the PA28 had passed by he continued onto a right base leg and carried out a normal landing. It seemed as though the pilot of the PA28 had not seen his PA25 or the glider during the period of the incident. He assessed the Risk as *"medium".*

THE PA28A STUDENT PILOT'S INSTRUCTOR reports that Dunkeswell A/D is very close to North Hill Glider Launching Site and indeed the runway heading on departure from Dunkeswell will put you onto the downwind for North Hill. It appears he saw what he took to be a powered ac ahead and took what would seem to be the correct avoiding action ie turning to the R. Unfortunately, it would seem it was actually a glider in the North Hill cct turning L from the downwind to base-leg and so the R turn made by the PA28A student not only put him squarely into the North Hill cct but also into the path of the glider.

UKAB Note (1): The UK AIP at AD2-EGTU-1-2 promulgates the Dunkeswell ATZ as a circle radius 2nm centred on the longest notified runway 05/23, extending from the surface to 2000ft above the aerodrome elevation of 839ft amsl and active in Summer from 0830-1700, with an A/G Service from Dunkeswell RADIO. Additionally a warning is included at EGTU AD 2.20 – Local Traffic Regulations – that:

Glider launching takes place at North Hill [Lat & Long given] West-South-West of Dunkeswell.

UKAB Note (2): The UK AIP at ENR 5-5-1-4 promulgates North Hill Glider Launching Site situated at 50° 51' 07'' N 003° 16' 39''W as active from Sunrise to Sunset (HJ). Launching is by winch and by tug ac, which may be encountered up to 2000ft above the site elevation of 921ft amsl.

UKAB Note (3): This Airprox is not shown clearly on radar recordings. The Burrington Radar shows the PA28, squawking A7000, climbing out from Dunkeswell to 1400ft unverified Mode C (1013mb) – broadly 1340ft amsl. At 1146:54 a single primary contact is shown ~0·12nm SSW of the PA28, which might, or might not be the ASK21 glider. The PA28 turns sharply R, as reported, and maintains the climb through 1600ft unverified Mode C at 1147:18. At this point another single primary contact is shown ~0·5nm NW of the PA28, which again might, or might not be, the PA25 Pawnee Tug, as the PA28 makes a wide L turn to pass about ¼nm NW abeam North Hill Glider Site at 2000ft unverified Mode C – about 1940ft amsl - onto a SW'ly course.

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 PA28 Student pilot's instructor.

Although encounters between light ac and gliders are not uncommon this was an unusual Airprox because it involved a pilot departing an aerodrome with an ATZ, who was confronted with a glider circuiting to a glider site located away from the aerodrome but within its ATZ. The PA28 Student pilot had reported that he spotted the glider (that he had first mis-identified as a powered ac), assessed there was a potential for a conflict and turned R in avoidance. It was unclear how many other gliders were operating in the North Hill cct at the time; however, the similarities in the geometry of the encounter reported by both pilots reinforced that the PA28 Student had actually spotted the subject ASK21 glider. It seemed that the PA28 student was unable to turn L to avoid the glider in the first instance because of another ac that he had seen crossing ahead from R – L. As it was, the PA28 had seen the glider but at a late stage and elected to turn R, leaving the glider to port and thus allowing the glider pilot to manoeuvre onto final for the glider site, albeit that he had to land 'long' and perhaps further up the site than he would have wished. It was reported that the ASK21 P2 suddenly saw the PA28 very close by, climbing and converging from the right; although possibly a late sighting by the P2, he appeared to have seen the PA28 before its avoiding action R turn as it was still apparently closing on a collision course when first seen. The absence of any tangible radar contact on the ASK21 glider did not permit the geometry of this close encounter or the minimum separation to be verified independently although it did clearly show the track of the PA28. Therefore the Board could only base its assessment on the reports from the pilots involved, supplemented with the report from the PA25 Tug pilot in the opposite cct. Some might argue that the PA28 Student should have spotted the glider earlier than he did – about 100m away – but the Board was aware that a white glider of small cross-sectional area with perhaps only the crossing motion to draw attention to it would have been difficult to spot. Given that the PA28 Student had just taken-off from Dunkeswell solo, possibly under significant pressure coping with a high workload, suggested to Members that under these circumstances he probably saw the ASK21 as early as he could. Although the glider pilot might have been concentrating on the landing site to his L he had seen the other ac in time to take avoiding

action albeit perhaps later than ideal. This led the Board to conclude that this Airprox was the result of a conflict in the Dunkeswell ATZ, which was resolved by the actions of both pilots.

Consultation with the Dunkeswell Aerodrome operator and the Gliding club that operates at North Hill revealed that, although these closely located units had operated successfully over many years, they have not stipulated any method of de-confliction between themselves nor promulgated any procedures in aeronautical publications for the benefit of visiting pilots. Thus there were no mutually agreed procedures to ensure the satisfactory integration of North Hill gliding site and Dunkeswell aerodrome cct traffic. Experienced pilot members commented that, at face value, Dunkeswell did not seem to be a good choice of aerodrome to which to send a Student pilot for a solo cross-country landaway. In the Board's view, it was incumbent on the Instructor to ensure that his Student was briefed precisely on what he might expect at Dunkeswell and how to avoid tangling with North Hill's mixed traffic environment, but in the Board's view, the absence of any published procedures was a contributory factor to this Airprox.

The GA Member emphasised that with minimal experience to back-up their decision making process Students will understandably do odd things occasionally. However, in the Board's view, it was asking a lot of an inexperienced student to cope with avoiding other traffic operating inside the Dunkeswell ATZ, but in an entirely separate cct pattern divorced from the aerodrome without any form of prewarning from other pilot's RT calls. Whilst a L turn would have been preferable here and kept the PA28 out of the North Hill cct area, it seemed the PA28 Student pilot was unable to do this because of other traffic. In concluding their assessment of the Risk, Members agreed unanimously that at the distances quoted here the safety of the ac involved had indeed been compromised.

The Board was briefed that the UK AIP and commercially available aviation guides do not indicate how the disparate activities within the Dunkeswell ATZ operate together, except for a warning about the existence of North Hill. No specific procedures are promulgated in the AIP about how the two aeroplane circuits are deconflicted from one another, other than being flown in opposite directions; nevertheless this still did not take account of the RW27 left-hand cct at North Hill for gliders as flown here. Thus it was not clear to the Board how the PA28 Student's departure routeing was supposed to avoid the circuit at North Hill as a departure off Dunkeswell's RW23 to Exeter was virtually a straight line but in opposition to any LHD glider cct. Indeed the PA28 Student's Instructor had commented that his Student's avoiding action against the glider had unfortunately placed him in North Hill's pattern. Here the PA28 student had spotted and avoided the glider albeit to the detriment of the ASK21 pilot's cct and caused him to fly very close to the NW of the glider site. The radar recording confirming that the PA28 had flown in opposition to the RHD cct causing the tug pilot to hold at the end of the downwind leg to maintain separation against the PA28. Moreover, with North Hill traffic operating on their own gliding frequency and not that of Dunkeswell RADIO, this seemed at odds with the requirements of Rule 45 of the Rules of the Air Regulations. Plainly the PA28 Student pilot was required to maintain a continuous RT watch with Dunkeswell RADIO whilst within the Dunkeswell ATZ and communicate his position and height on leaving it. It seemed to the Board that this same Rule applied to North Hill's traffic equally when within the Dunkeswell ATZ. Consequently, the Board made two Safety Recommendations: first that 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; Second, the Board also recommended that the CAA should review the disparate operations within the ATZ at Dunkeswell aerodrome and at North Hill Glider Site, to ensure they are in accord with the requirements of Rule 45 of the Rules of the Air Regulations.

AIRPROX REPORT No 2009-077

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the Dunkeswell ATZ resolved by both pilots.

Degree of Risk: B.

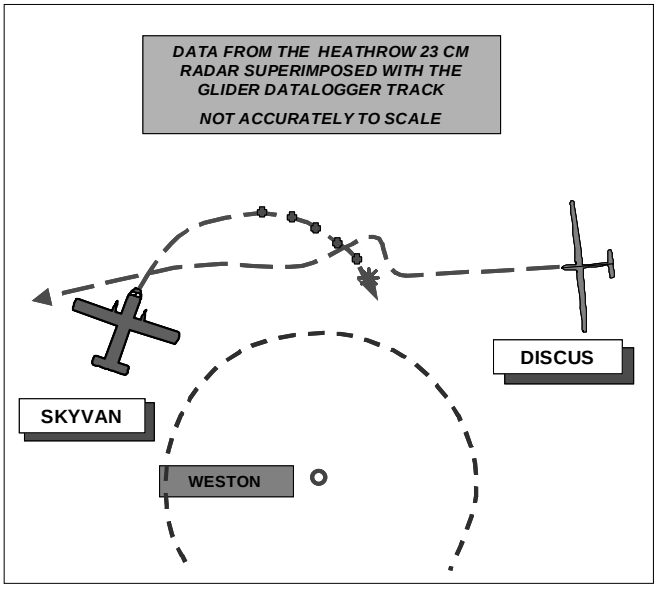
Contributory factor: The absence of any promulgated procedures to deconflict gliding operations at North Hill Glider Site from Dunkeswell aerodrome traffic.

Recommendations: (1) 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.

(2) 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.

AIRPROX REPORT NO 2009-077

Date/Time:	18 July 1515 (Saturday)	
Position:	5156N 00113W (3nm N Weston on the Green)	
Airspace:	Oxford AIAA	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Duo Discus	SC7 Skyvan
Operator:	Civ Pte	Civ Comm
Alt/FL:	4150ft (QNH 1012mb)	3000ft (1013mb)
Weather	VMC	VMC CLBC
Visibility:	>30km	>10km
Reported Separation:	0ft V/500m H	0ft V/100m H
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DUO DISCUS PILOT reports flying solo on a soaring flight from Dunstable in a 2-seat white glider with no SSR fitted but listening out on a glider common frequency. Following a climb in a thermal N of Bicester to about 4500ft amsl, he was cruising to the W at 60kt in clear air when he became aware of a powered ac ahead, above and to his right on a reciprocal course. It appeared to be following a right hand curving and rapidly descending path that would bring it directly towards him. He waggled his wings to try to gain the pilot's attention but the other ac's course remained unchanged. The ac was approaching rapidly from his 2 o'clock and he made a steep right turn to expose the maximum wing planform to the other ac while checking his forward movement. He then swung left towards his original track, passing behind the other ac; he could see inside the ac as its rear door was open. The other ac then continued the descent and landed at Weston on the Green. He tried unsuccessfully to contact the parachuting club at Weston on landing and reported the incident to the UKAB, assessing the risk as being high.

UKAB Note (1): The incident took place about 4nm N of Weston on the Green and outside D129, (Weston on the Green parachuting area, 2nm radius).

THE SC7 SKYVAN PILOT reports flying a local parachuting sortie solo from Weston on the Green under VFR, in communication with London Military [no record on the RT tapes of the ac receiving a service from London Mil] then Weston Info. While descending at 140kt in a RH turn through E onto S over the M40 near Upper Heyford [the incident position], he saw a white glider flying straight and level. While passing through same level as glider, it was seen to make LH turn that would potentially bring it into his path so he increased his rate of turn (to right) to maintain separation. He was 1.5nm horizontally clear of small fine-weather cumulus cloud in good VMC with infinite visibility, giving excellent gliding conditions and he saw many other gliders that day. He was operating within 3nm of Weston on Green, a known sky diving airfield. He assessed the risk as being low so he did not report the incident.

UKAB Note (2): The recording of the Heathrow 23cm radar shows the Skyvan throughout. An intermittent primary only contact, thought to be the glider, can be seen tracking W in the reported area of the incident; however, it fades from radar 30sec before the reported time of the incident. At 1515:25 the Skyvan is at FL084 descending as the SSR drops out in a turn from N through E onto 170°, rolling out at FL047 at 1515:52. The glider's datalogger verifies the pilot's report and shows the glider turn right at 1515:43. By combining the radar and datalogger information it can be confirmed that the Skyvan approached the glider from its 2 o'clock in a fairly steep descent. At 1515:46 the Skyvan indicated 5100ft, descending by 400ft per sweep (4sec); at 1515:43 the glider datalogger shows it to be at 4163ft. The timings may differ by a few sec. Although the respective ground tracks and alts come very close just after the reported time of the incident, unfortunately even by combining the information, the CPA cannot be estimated with any degree of accuracy.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Weston on the Green is a fairly busy and well-promulgated parachuting airfield. Parachutists dropping there are protected by D129, which is active up to FL120. The BGA nominated Member pointed out that the purpose of the Danger Area is to protect the parachutists, not the dropping ac. The curving, fairly rapid descent, normally flown after the drop is complete takes place in Class G airspace, largely outside the DA and is SOP. That being the case, the Board observed that the pilots of both ac had an equal and shared responsibility to see and avoid other ac. Although this can be quite difficult in a rapid descent, measures should be adopted to clear the airspace ahead and below. In this case the Skyvan pilot did see the glider and considered that no avoidance was required, despite estimating the miss-distance as being 100m. The glider pilot also saw the Skyvan and executed a timely steep RH turn and estimated that he missed the Skyvan by ½km, although assessing the risk as being high.

Since both pilots carried out their responsibility to see and avoid the opposing ac in Glass G airspace, the Board agreed unanimously the this incident had been a conflict resolved by the glider pilot's timely RH turn with no resultant risk.

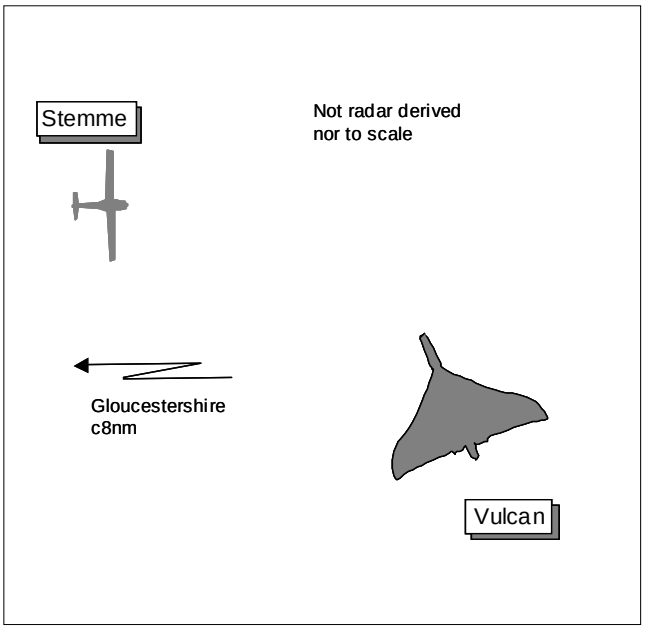
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G Airspace resolved by the Duo Discus pilot.

Degree of Risk: C.

AIRPROX REPORT NO 2009-078

Date/Time:	18 Jul 1410 (Saturday)	
Position:	5155N 00158W (8nm E Gloucestershire)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Stemme S10-V Motorglider	Vulcan
Operator:	Civ Pte	Civ Pte
Alt/FL:	2400ft (QNH)	2000ft (RPS)
Weather:	VMC CLBC	VMC CLBC
Visibility:	20km	>10km
Reported Separation:	150ft V/100m H	300ft V/100m H
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE STEMME S10-V MOTORGLIDER PILOT reports flying a local sortie from Bicester, VFR with another pilot in the LH seat and not in communication with any ATSU. The visibility was 20km flying 1500ft below cloud in VMC and the ac was coloured white/orange. They had recently restarted the engine on the Cotswold ridge about 6nm ENE of Gloucestershire airport after the W'ly wind had slackened and the lift became intermittent. They set an E'ly course for Bicester heading 090° at 070kt and about 2400ft QNH. About 10nm E of Gloucestershire airport he was looking ahead assessing the potential lift under a cloud about 1nm away when he became aware of something on his starboard side. He looked and was horrified to see a Vulcan bomber about 150m away very slightly below him in what appeared to be a nose up attitude. The pilot seated in the LH seat simultaneously saw the approaching ac but only the rounded front of the ac and the adjacent leading edge of the swept-back wing. He immediately took avoiding action by pulling up hard and rolling R, watching the Vulcan pass about 150ft almost directly underneath, within 100m laterally, heading NW apparently taking no avoiding action and holding a steady course. They heard no unusual sound nor encountered any turbulence and the ac was only seen for a fraction of a second. He assessed the risk as very high.

THE VULCAN PILOT reports flying a local sortie from Fairford VFR and in receipt of a TS, he thought, from Brize Norton squawking an assigned code with Modes S and C, he thought. The visibility was >10km flying about 1000ft below cloud and the ac was military camouflaged; no strobes were fitted. During a transit below cloud tracking 336° at 240kt and 2000ft RPS, he thought, they were aware there was a lot of gliding activity in the area 10nm E of Gloucestershire airport and they were alerted to traffic ahead at 6nm and then 1nm. The PF in the RH seat saw a glider crossing from L to R in his 10 o'clock range about 400m and >200ft above. The glider was not immediately visible to the Capt in the LH seat because of the large 'A' pillar. No avoiding action was required but the PF instinctively descended by about 100ft as they passed about 300ft below and 100m in front of the glider. The observed glider definitely appeared to have a round (smooth) nose and did not appear to be a motor-glider and was coloured white with a small amount of colour. He assessed the risk as low.

UKAB Note (1): The Stemme S10-V Motorglider is fitted with an engine mounted behind the cockpit driving a nose mounted retractable/folding propeller via a drive shaft. When the engine is not in use, the propeller is stowed inside a moveable nose cone.

DAATM reports that the Vulcan was taking part in the RIAT event at Fairford although not directly at the time of the Airprox. The Vulcan had departed Fairford en-route Cosford VFR in receipt of a BS from Fairford Director (FFD) at

Brize Norton ATC, a controlling position used for the purpose of managing RIAT air traffic. The Stemme was operating autonomously from Bicester VFR along the Cotswold Ridge. The radar replay did not capture the incident.

At 1406:37 the Vulcan flight called FFD and was given a BS and acknowledgement of a climb to 3000ft 1010mbs QNH; the Cotswold pressure of 1006mbs was also passed. The Vulcan pilot reported that he was levelling 2500ft 1006mb, which was acknowledged. At 1409:12 FFD transmitted *"Vulcan Basic Service however traffic eleven o'clock three miles crossing left right slow moving no height information".* The crew replied *"Vulcan copied."* The controller stated in his report that the conflicting traffic was deemed to represent a possible risk of collision which is why it was called. At 1409:41, as the conflicting traffic approached the Vulcan's 12 o'clock, the controller reported *"Previously called traffic twelve o'clock one mile left right no height".* The crew replied (1409:51) *"Vulcan er visual with the glider we're descending slightly"*. Thereafter the flight continued en-route as planned and was transferred to Birmingham.

CAP774 Ch2 defines Basic Service as: *'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… … any other information likely to affect safety. The avoidance of other traffic is solely the pilot's responsibility. A BS relies on the pilot avoiding other traffic unaided by controllers/FISOs'.*

Although the Vulcan pilot stated in his report that he was in receipt of a TS from Brize Norton, the FFD controller clearly stated BS on initial contact and again prior to passing TI.

In conclusion, the Vulcan departed Fairford under a BS from Brize Norton. In compliance with CAP 774 Ch 2, TI regarding unknown traffic was twice passed to the Vulcan crew as the controller assessed the risk of collision was high.

UKAB Note (2): The Airprox is not captured on recorded radar as the Stemme Motorglider does not show at all during the period of the radar data supplied. The Vulcan is first seen 0·5nm W of Fairford tracking NW'ly squawking 4777 (ORCAM Special Events code) indicating FL022 (1990ft RPS 1006mb) and climbing. The next 2 radar sweeps shows the Vulcan at FL024 (2190ft RPS) but thereafter NMC is displayed for the duration of the recording. When the Vulcan pilot reports visual with the Stemme at 1409:51, the Vulcan is passing 8nm ENE of Gloucestershire airport on a NW'ly track.

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 believed that the Stemme pilot would have had better SA if he had been talking to an adjacent ATSU. As the Airprox location was some 8nm E of Gloucestershire airport and the Stemme had previously been closer when he started his engine, a BS from Gloster APP should have been available. However, with the intended route E to Bicester, an early call to Brize Norton would have been more appropriate as the ac would be very quickly entering and transiting the Oxford AIAA. It was also noted that Vulcan crew were under the mistaken impression that they were in receipt of a TS whereas the DAATM report revealed that the Fairford Director clearly stated twice that a BS was being provided. Nevertheless, Members agreed that although the passing of TI to the Vulcan was outside the terms of a BS, FFD had shown good 'controllership' in doing so, as he assessed that there was a high risk of collision. Indeed Members thought the Vulcan crew should have perhaps asked for a higher level of service (TS or DS) from the outset to supplement their lookout, particularly as the 'letter box' cockpit windscreen with large pillars restricted the pilot's view.

UKAB Post Meeting Note: The difficulty of looking out of the Vulcan is one of the factors behind an application to the CAA for an IMC clearance for the aircraft that would increase the opportunities for it to transit at higher altitudes and above much of the GA traffic.

Both pilots had equal onus to 'see and avoid' in this Class G airspace, the Vulcan having right of way under the Rules of the Air. The Vulcan had approached from the Stemme's R and slightly below, possibly blending into the background owing to its camouflage paint scheme. Similarly, the Stemme would almost certainly have been skylined and more difficult to see against the backdrop of cloud. However, the opportunity to see each was there

for some time prior to the Airprox but, for whatever reason, both pilots only saw each other's ac late and this had caused the Airprox.

Turning to risk, the Stemme pilot saw the Vulcan briefly on his R, about 150m away and had instinctively pulled up and turned R, estimating it passed 150ft below and within 100m. The Vulcan pilot was twice given TI on the Stemme and they saw it 400m away >200ft above and, although no avoiding action was necessary, he instinctively descended 100ft to increase separation before passing 300ft below and 100m ahead. Members noted the difference in reported vertical separation and opined this may have been because, from the Stemme cockpit the Vulcan, a large ac, had in fact been further away than it appeared to be. In the end both pilots saw each other and acted promptly to resolve the situation, which allowed the Board to conclude that any risk of collision had been quickly and effectively removed.

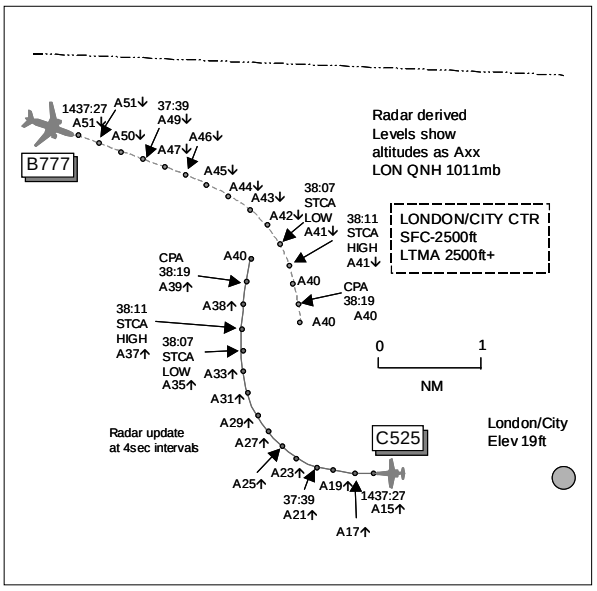
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by the pilots of both ac.

Degree of Risk: C.

AIRPROX REPORT NO 2009-079

Date/Time:	27 Jul 1438	
Position:	5132N 00001W (3·5nm NW London/City - elev 19ft)	
Airspace:	LTMA	(Class: A)
	Reporting Ac	*Reported Ac*
Type:	B777-300	C525
Operator:	CAT	Civ Exec
Alt/FL:	4000ft (QNH 1011mb)	3400ft↑ (QNH)
Weather:	VMC CLOC	VMC CLOC
Visibility:	8km	10km
Reported Separation:	100ft V/400m H	500ft V/1500m H
Recorded Separation:	100ft V/0·5nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B777 PILOT reports inbound to Heathrow IFR and in receipt of radar vectors from Heathrow Approach squawking an assigned code with Modes S and C. On an intercept heading 185° to RW27R at 4000ft QNH 1011mb and 180kt they received a TCAS TA and then an RA to avoid traffic climbing through 3000ft. The RA command was initially a brief 'descend' and then a 'climb'. The A/P was disengaged and throttle advanced to comply with the RA and the traffic was seen as a light-brown coloured light twin-engine ac passing to their R by 400m and 100ft below. He assessed the risk as very high.

THE C525 PILOT reports outbound from London/City IFR at 190kt and in receipt of a RCS from City Radar on 128·02MHz squawking an assigned code with Modes S and C; TCAS 1 was fitted. The visibility was 10km in VMC and the ac was coloured white/green and the landing, nav and strobe lights were all switched on. Their ac was in the climbout from City on the 4T departure route. They had received clearance from City Radar [passed by City Tower] to climb to 4000ft. Being very familiar with the City procedures (step climb up to 3000ft until LON 25·5D then up to 4000ft) they interpreted the clearance as a climb directly to 4000ft because they had the incoming B777

in sight all the time. This ac was in descent and in a 'soft' turn and they would pass well above the B777 when crossing its track. Further, on realising that both ac would come closer than usual, they turned L about 30° to pass well behind it, separation estimated as 500ft vertically and 1500m horizontally; no TA alerts were received. From their viewpoint there was no risk of collision at any time as under the VFR conditions the flightpath of the B777 was continuously monitored by them.

THE LONDON/CITY AIR CONTROLLER reports the pilot of the outbound C525 called for start and clearance at 1426hr and was given 'C525 c/s start's approved you're clear to Sion Dover 4 Tango departure maintain altitude 3000ft squawk 0511'. The C525 pilot read back '4 Tango departure maintain 4000ft start approved squawk 0511'. He immediately noticed that the SID was missing but did not notice that the pilot had read back an incorrect altitude. He obtained a read back of 'Dover 4T' and then issued the QNH.

THE THAMES RADAR CONTROLLER reports that about 20min before the incident he was informed that a London/City inbound ac, AC3, had a possible emergency and wanted to hold off. This flight then decided to make an approach so he called back the Coordinator to assist, as there was a high possibility of a diversion. Whilst dealing with this ac on a 15nm final, the C525 departed London/City on a DVR SID. He identified and verified the ac and immediately turned his attention back to the inbound emergency. Another controller had come back and was preparing to take over his position and said 'watch out for your departure'. He scanned back to the C525 and due to garbling took a few seconds to realise that it had climbed up to 4000ft. During this time he started to ask the flight its altitude but upon confirming its altitude on radar he immediately instructed the crew to descend to 3000ft. The C525 was garbling with a Heathrow inbound flight either at or in the descent to 4000ft. He spoke to City Tower after the event and confirmed that their fpss showed the C525 had been cleared to 3000ft only, as per SOP.

THE HEATHROW FINAL DIRECTOR reports he turned the B777 R onto base leg heading 185°. Shortly after this the crew requested information on an ac climbing towards them. He noticed the garbled Mode C of a London City outbound climbing above the SID level of altitude 3000ft. As both ac were in a turn he decided a climb would resolve the confliction quickest and asked the B777 crew if they could climb to 5000ft. The crew acknowledged this but the ac had passed each other around this time. He then stopped-off another of his ac at 5000ft to resolve another confliction. The SID ac was a C525, which was seen to continue on the SID, and he saw it descend back to 3000ft about 5min later.

ATSI reports that the Air and Ground positions at London City were combined. The controller, who had recently passed his Certificate of Competence at London City, described his workload as low.

The C525 flight requested start up, for its flight to Sion, Switzerland, at 1426. The ADC approved the start up and passed the pilot his clearance as *"C525 c/s Tower start-up is approved you're cleared to Sion Dover Four Tango departure maintain altitude Three Thousand feet squawk Zero Five One One"*. The pilot replied *"So it's er a Four Tango departure climbing Four Thousand feet start up approved and er squawk is Zero Five One One"*. Realising that the pilot had not read back the SID completely, the controller responded *"c/s affirm it's Dover Four Tango"*. The pilot then acknowledged the SID correctly and was issued with the QNH. The controller did not register that the pilot had read back clearance to 4000ft and not 3000ft as instructed. The MATS Part 1, Appendix E, Page 11, states *'Errors in a read-back must be corrected by the controller until the pilot gives an accurate read back'*. The C525 flight was, subsequently, cleared to taxi and line up on RW27. London City departures were on 'free flow' at the time, so it was not necessary to telephone Thames Radar for a release. The flight was cleared for take-off at 1436 and was transferred to Thames Radar at 1437:27. The radar recordings show that, at the time the pilot acknowledged the transfer frequency, the ac was proceeding straight ahead and was passing 1500ft. There is no Mode S return of the Selected Flight Level. The Dover 4T SID: *'Climb straight ahead. At **I-LSR** D1.5 turn right (MAX 210KIAS) onto **LON VOR** R076 continue climb to cross **LON** D18 at **3000** (7.94%) and resume normal climb speeds. At **LON** D25.5 at **3000** turn right onto **BNN VOR** R106 and climb to **4000** (5.75%). Crossing **BNN** D35.5 (waypoint GINTI) at **4000** turn right onto **DET VOR** R337. Cross **DET VOR** at **4000**. At **DET VOR** intercept **DVR VOR** R288 to **DVR VOR**'*.

Meanwhile, Heathrow Approach had been vectoring the subject B777 downwind RH from LAM for RW27R. At 1435, the B777 was transferred from the INT DIR N to the FIN DIR, on heading 115°, descending to 4000ft. On first contact its speed was reduced to 180kt and at 1437:38, it was instructed to turn R heading 185°. Shortly afterwards, at 1438:05, the pilot of the B777 commented, *"Er B777 c/s we have a traffic alert"*. NB: There is a TCAS audio alert heard in background on the RT recording. The radar recording at 1438:07 shows the subject ac

were 1·1nm apart at the time and turning on to conflicting tracks. The C525 was turning R, passing N, climbing through 3400ft. The B777 was at 4100ft in a R turn about to take up its S'ly heading. The controller replied, *"B777 c/s affirm he's bust his level can you climb climb to maintain Five Thousand feet"*. The pilot transmitted, *"Five Thousand feet"*. Three seconds later, at 1438:16, i.e. approximately 50sec after it had been transferred by London City, the pilot of the C525 contacted Thames Radar reporting, *"Thames Radar er C525 c/s Dover Four Tango departure Four Thousand"*. The frequency had been busy prior to the C525 flight establishing contact. The Thames Radar and Special VFR frequencies were combined at the time. The Thames Radar Controller reported that there was sufficient staff to split the positions if required. However, he added that even if the sectors had been split, the ac would still have been on the same frequency. The radar recording at 1438:15 shows that, when the C525 flight contacted Thames Radar, the 2 ac were just about to pass each other, 0·5nm apart, tracking N and S respectively. The C525 was at 3800ft and the B777 at 4000ft. Thames Radar requested the C525 to, *"squawk ident"*, which was acknowledged by the pilot. The controller responded, at 1438:28, *"C525 c/s report your altitude",* and without waiting for a response continued, *"C525 c/s descend immediately descend to altitude Three Thousand feet"*. The pilot read back the descent clearance to 3000ft correctly. The minimum separation of 0·5nm/100ft, was recorded at 1438:19 just after the C525 contacted Thames Radar.

The London City Aerodrome Controller did not ensure, as required, that he received, from the C525 pilot, an accurate read back of his outbound altitude restriction.

UKAB Note (1): The AAIB carried out a Field Investigation as it was treating this as a 'Serious Incident'.

NATS UNIT INVESTIGATION reports that Mode S Data downlinked from the C525 shows the ac is equipped with enhanced Mode S and that its ROC was just under 3000fpm, increasing to 3300fpm as it passed 3000ft. However, from the radar recordings, the SFL was not downlinked so this information was not available to the Heathrow and Thames Radar controllers. A TCAS performance assessment was carried out using InCAS simulation and this also showed no TCAS alerts being downlinked from the C525, which was unexpected given the alerts known to have been received by the B777. It should be noted that the B777 did not treat the C525 as being Mode S equipped, contrary to the evidence found.

Following a request to the B777 Operator, the Capt provided additional information: -

'There were 4 pilots in the cockpit at the time. He was in the LH seat as PM [Pilot Monitoring] and an FO under training as PF in the RH seat. On the observer seats were another FO under training on the centre seat and another qualified Capt, who was flying as the relief pilot, on the RH observer seat. They were on the intercept heading for the ILS for RW27R at 4000ft when they first received a TA and consequently an RA. With the TA he reduced the range of the map display and with the RA took over the commands, disengaging the A/P and complying with the RA to climb with increased pitch and power.

The InCAS simulation indicated that the B777 received a TA at 1437:40 followed by a 'crossing descend' RA at 1438:02 (1500fpm+); this RA was confirmed by the downlinked messages by the Eurocontrol ATM Safety Monitoring Tool (ASMT) at 1438:04. This changed to an 'increase descend' RA 7sec later (2500fpm+) and then to a 'reversal climb' 4sec after that (1500fpm+); ASMT downlinked messages confirmed times as 1438:10 and 1438:15 respectively.

Further comment from the B777 Capt was: - *'He recalled a TA and very brief RA to descend but he had already expanded the map display and noticed the traffic was at 3 o'clock and climbing so a descent would only increase the risk of collision. The 'descend' RA soon changed to climb which he quickly complied with'*.

The simulation indicates that at the time the B777 received its first 'crossing descend' RA the ac was approaching 4000ft with a ROD 1800fpm, simultaneously with the pilot reporting *"we have a traffic alert"* i.e. TA not an RA. The radar shows the B777's descent continuing at between 1200 and 1000fpm until reaching 4000ft approximately 7sec later. The InCAS data indicates that when the B777 received the 'increase ROD' RA [1438:10] the Mode C was 41 and 40 on the next sweep. About the same time, the Heathrow FIN DIR asked the B777 crew if they could climb to 5000ft. The TCAS RA 'reversal climb' was received by the B777 at 1438:13 when the ac was still in a descent. InCAS indicates that at 1438:20 the B777 received a 'clear of conflict' message and 1sec later the ac's SFL changed to 50 and the ac commenced a climb. The C525 was seen only by the observer on the RH seat at the 3 o'clock position between 100 to 200ft below.

NATS Investigations made 6 recommendations including the removal of the 'step climb' element in all London/City SIDs, elimination of lateral interaction between London/City SIDs and base-leg turn for ac positioning for Heathrow and that lateral interactions are minimised for airspace development projects in future NATS operations. The last 3 recommendations dealt with risk assessment and accountability within the NATS safety management system.

THE AAIB report included 5 recommendations. Three recommendations were directed at NATS: - 1) demonstrate to the CAA that mitigation has been put in place to reduce the risk of an accident resulting from a level bust by an ac departing London/City or on base leg turn for Heathrow; 2) London/City amends all SIDs so that they terminate at 3000ft and 3) London/City removes Step Climb procedures from its SIDs. The fourth recommendation was addressed to the operator of the B777 to ensure that its TCAS training complies with the ACAS Training Guidelines contained in ICAO PANS-OPS (Doc8168). The final recommendation was to the CAA to consider whether the carriage of TCAS II should be mandated for ac operating in those parts of the LTMA where London/City SIDs interact with traffic positioning to land at Heathrow.

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.

It was noted that when the C525 flight called for start-up clearance, the Air controller had approved the start but had then continued, in the same transmission, to issue its ATC departure clearance in full. The NATS Advisor informed Members that there had been a 5-6sec pause before the C525 pilot commenced his read back, which indicated that the pilot might not have been ready for the ATC clearance; however, airline pilot Members stated that it was not unusual to receive both clearances at once. The C525 pilot's read-back was incorrect in 2 respects: he omitted the DVR element of the SID and then read back 4000ft, not 3000ft as passed. The Air controller had identified the missing DVR part at the start of the transmission but had not assimilated the incorrect altitude restriction later in the read back. This was a part cause of the Airprox. It was not known whether he had misheard the altitude read back or whether he did not hear it as his attention was focussed on his need to correct the DVR element. Either way, he simply replied with, *" affirm it's Dover Four Tango"* which the C525 pilot repeated. Notwithstanding this error by the controller, Members were in full agreement that the C525 crew had an obligation to read back the clearance, as passed, in full. The crew, although apparently familiar with the step climb profile from previous flights, had misinterpreted the ATC clearance and believed that they were cleared direct to 4000ft. This was also a part cause.

Members then looked at various aspects of the incident that followed these initial causal elements. The B777 flight was turning R onto its assigned base-leg heading when its pilot reported a *"...a traffic alert"* to the FIN DIR. Although TA alerts are not normally reported, only RAs, Members acknowledged that crews should not hesitate to advise ATC if they see a potential conflict that they believe ATC might not have noticed. However, the Board considered that this RT call might have put doubt into the FIN DIR's mind as to whether the pilot was reporting a TA or RA. Following an RA call, a controller is no longer responsible for separation of an ac from other traffic and should not issue further instructions until the pilot reports 'clear of conflict'. This may have been why the FIN DIR, now aware of the 'level bust' by the C525, asked the B777 crew if they could climb to 5000ft. The normal action would be for the controller to give avoiding action when separation has been lost. However, it was apparent that whilst the B777 crew reported a TA on the frequency, TCAS was generating a 'crossing descend' RA quickly followed by an 'increase descend'; these short duration RAs were not reported or followed by the B777 crew. The TCAS allows for a 5sec reaction time between the generation of the RA and a pull-up/push-over of 0·25g (2-5° pitch change depending on speed) to achieve the initially demanded 1500fpm vertical rate and if an enhanced RA follows, either an additional 2-5° pitch change in <3sec or a reversal change in about 5sec. The Capt reported being aware of the TA and a very brief RA 'descend' and, having adjusted his display, noticed the traffic was climbing and passing down his RHS. These actions had led to the RA reversal 'climb' RA, which agreed with the ATC climb request to 5000ft, but resulted in the ac only climbing after the CPA. It was noteworthy that, since the C525 only carried TCAS I, there was no mutual exchange of 'resolution intent' between the ac via Mode S data links and therefore the TCAS RAs generated by the B777 equipment were uncoordinated, leaving all of the RA avoidance manoeuvre to be completed solely by the B777. Where both ac are TCAS II equipped the resolution is shared between both crews in order to achieve the required vertical separation at the CPA.

Considering the potential for STCA to have prevented the Airprox, the Board noted that, following the transfer from London/City, the C525 pilot called Thames Radar at about the time STCA activated; this initial call had been late owing to the frequency being busy. The activation of STCA is not unusual with respect to London/City outbounds owing to the high ROC flight profile adopted to follow the SID. Furthermore, the Thames Radar controller and FIN DIR were not aware of the potential confliction as the Mode S SFL data from the C525 was not downlinked. The Thames Radar controller at the time was focussing his attention on another ac (AC3), which had an emergency. After acknowledging the C525 pilot's call, which stated that the flight was climbing to 4000ft, Thames Radar requested an altitude report but then, on noticing the ac's altitude on radar, which was not immediately apparent owing to label garbling, he immediately instructed the crew to descend to 3000ft. However, by now the subject ac were passing one another.

Discussion then moved on to the SID profile. The Dover Four Tango SID is designed with a stepped climb to ensure that ac departing London/City remain at 3000ft until clear of Heathrow inbound ac on base leg for RW27 (at 4000ft) before climbing to 4000ft where, in the event of a radio failure, they would remain within CAS. The NATS Advisor informed Members that the reminder issued to pilots to stop-off at 3000ft was introduced owing to the number of level busts that had occurred when pilots had misread the step climb profile on the SID chart. However this 'stop-off' revision effectively cancelled the SID which, pilot Members agreed, could then create further problems for crews as to when they could climb higher in the event of radio failure. The 3000ft restriction is still reiterated to London/City departures in order to reduce the risk of a 'level bust', but it is passed in a separate transmission after the SID clearance has been passed and a read back obtained. In addition the altitude restriction is broadcast on the ATIS.

Turning to risk, it was clear that the STCA and TCAS safety nets had not been effective in resolving this confliction. However, the C525 crew had seen the B777 early in the encounter and had maintained visual separation against it throughout, although this is not approved within the Class A airspace of the LTMA. Although this had been a close encounter and had had the potential to be a very serious incident in other circumstances i.e. in IMC, the actions taken by the C525 crew were enough to allow the Board to conclude that in this occurrence, any risk of collision had been effectively removed.

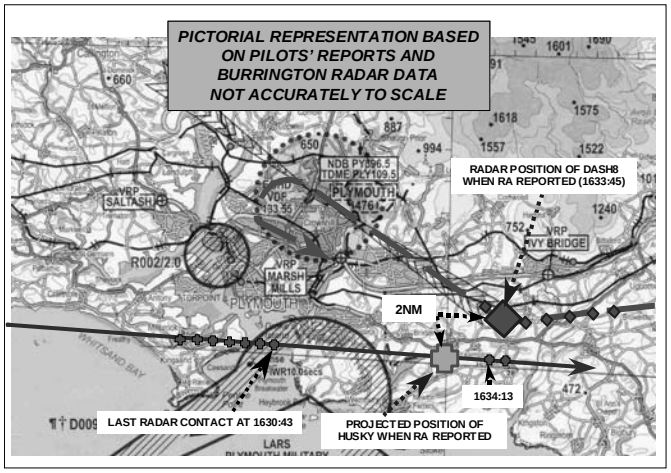
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The C525 crew misinterpreted their clearance and the Air Controller did not detect the incorrect read back.

Degree of Risk: C.

AIRPROX REPORT NO 2009-080

Date/Time:	2 August 1634 (Sunday)	
Position:	5021N 00400W (6nm RW31 Plymouth)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	DH8C	Aviat A-1B
Operator:	CAT	Civ Pte
Alt/FL:	3000ft (QNH)	2500-2600ft (RPS 1008mb)
Weather:	VMC CLOC	VMC CLBC
Visibility:	10km	>10km
Reported Separation:	NR	800-600ft V/2-3nm H
Recorded Separation:	Estimated 2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DH8C PILOT reports flying a scheduled passenger flight to Plymouth under IFR. They were squawking 7000 with Mode C. While heading 306° at 160kt passing 2400ft on the approach to RW31 on a 3.5° ILS, they noted proximate traffic contact on the TCAS about 3nm W and 500ft below them. They continued the approach and at about 5nm, they noted that the contact was now indicating 300ft below, again at a range of 3nm. About 10sec later the TCAS contact jumped to inside the 2nm ring on the display and this was immediately followed by a TCAS RA 'climb, climb now' which they followed until 'clear of conflict' was enunciated. The captain then levelled the ac at 3000ft QNH (1015mb) and ATC then cleared them for a visual left downwind join for RW31 from which they flew a normal visual approach and landing. He did not see the other ac or assess the risk.

THE AVIAT A-1B (Husky) PILOT reports flying a blue and white ac on a private flight under VFR from Bodmin to Shoreham. He was about 8nm SE of Plymouth at 2500ft QNH, heading 115° at 117kt squawking 7000 with Mode C and was in receipt of a BS from Plymouth APP, when he saw a DASH8 appearing out of, or from behind, the cloud. It was in a right turn and appeared in his upper left front windscreen, in his 11 o'clock position, about 1½ to 2nm away, 700 to 1000ft above him and was descending. It rolled out of the turn pointing to his left, still slightly above, but continuing to descend, and its direction was opposite to his but almost parallel, about 2nm to the N. The ac was about the size of a thumbnail on his windscreen and neither he nor his passenger could see the airline markings or registration.

Plymouth APP had advised them to stay clear of localizer and he tried to comply; however that was difficult to achieve since his ac does not give any view to the rear, and therefore he could not see the airport behind him. In addition, he uses a GPS system that does not give any view to the rear and the extent of the localizer is not marked on the XXX GPS VFR charts used [UKAB Note (1): copy provided – the localiser is not marked]. Furthermore, no ground reference to track to or heading to fly was given, either of which would have been useful as he is not familiar with the local area. A clear course to follow would have been much more helpful.

He assessed the risk as being low.

UKAB Note (2): Plymouth ATC provided reports but since they are essentially the same as the ATSI report below, for brevity, they have not been included.

UKAB Note (3): An analysis of the Burrington Radar was conducted. Both ac show initially, the Husky squawking 7000 with Mode C and the DASH 8 also squawking 7000 with Mode C. The Husky approaches the incident position on a steady track of 095°, indicating FL028 and passes 5.2nm to the S of Plymouth. As it approaches the Eastern shoreline of Plymouth Sound the contact disappears and does not reappear until 1634:13 at a position 2.2nm S of the RW31 centreline, still at FL028. The position of the CPA on the diagram above is a projected

position assuming no change of track between the contact disappearing and reappearing. This is consistent with the Husky pilot reporting that he was well to the S of the ILS centreline and the DASH8 pilot's report that the ac indicated 3 then 2nm on TCAS. The DASH 8 tracks from Berry Head to intercept, and turn onto, the centreline at 5½nm. At the time of the reported RA it is in the turn onto the localiser. There may be small timing discrepancies between the RT and the Radar recordings. At the time when the Plymouth Controller reported that the DF showed that Husky *'now crossed the three one approach',* the projected position (from the radar data) showed that the Husky passed through the centreline tracking 095° at a distance of about 10nm; it was 1½ nm S of the centreline at 6nm.

ATSI reports that Plymouth ATC is not a radar-equipped unit.

The Husky pilot established communication with Plymouth APP at 1617:42 reporting, '*VFR from Bodmin to Shoreham currently overhead Polkerris altitude Two Thousand Seven Hundred on One Zero One Four';* the controller asked whether he required a Basic Service, the pilot replying *'that would be appreciated'*. Establishing that the ac would route south of Plymouth, the controller continued *'report passing south abeam the airfield remain well clear of the ATZ please traffic is a Dash Eight just about to depart to the northeast off runway One Three climbing'*. The pilot *responded 'we will remain clear well clear of the ATZ and currently maintaining Two Thousand Eight Hundred on One Zero One Four'*. The controller confirmed it would be a BS and passed the Wessex RPS 1008mb but although the pilot read back the pressure correctly, he did not confirm the service. (His report confirmed he was aware he was being provided with a BS).

The DHC8 made its initial call on the Plymouth Approach frequency at 1631:00. The pilot reported *'descending Flight Level Six Zero we are One Five DME are established on the Berry Head Two Six Three and we understand you have traffic at Three Thousand feet to the south of the airfield'*. The controller confirmed the traffic was *'about Two Thousand Eight Hundred feet to the south of the airfield routeing southeast bound'*. [UKAB Note (4): Although apparently a Procedural Service, the type of service was not offered, agreed or readback iaw MATS Part 1]. The ac was cleared for the ILS approach to RW31 and messages were then passed to both pilots. The Husky pilot was advised to *'remain well clear of the runway Three One approach there is traffic a Dash Eight inbound on the ILS approach to runway Three One';* the pilot replied *'that's understood we will do'*. The DHC8 pilot was informed *'that traffic is a Husky currently just passing Rame Head he's crossing the Sound Two Thousand Eight Hundred feet under a Basic Service and has been advised to remain clear'*. [UKAB Note (5): At 1632:15, the time this TI was passed, the projected position (from radar data) of the Husky was 7nm E of Rame Head and it would have been in the DASH8's 12 o'clock at 7-8nm]. At 1633, the pilot of the DHC8 reported at a range of 8.5nm DME, passing 3700ft in the descent and shortly afterwards, reported fully established on the ILS. Thirty seconds after acknowledging a call about further traffic, information concerning an inbound helicopter from the NNE, the pilot of the DHC8 transmitted (with no callsign) *'RA'*. The controller requested confirmation with the DHC8 pilot that he had made the call and the pilot replied *'Affirm TCAS RA ac two hundred feet below me six miles out on the ILS'*. Initially, the DHC8 pilot intended to proceed to the PY to start another procedure but, subsequently, he carried out a visual approach.

The controller asked the pilot of the Husky his position. He reported *'just east of er ?????* (one word intelligible) *er two thousand six hundred'*. He denied having crossed the RW31 approach, although the controller commented that DF indicated that he was now east of the approach path.

The crew of the DHC8 made two transmissions on the frequency about the proximity of the Husky: *'he was within hun- within a hundred and fifty feet of us climbing at er about er four miles'*; *'we were sort of in and out of the er cloud there but er we were at about er twentyseven hundred feet he was two hundred below us er at about er six miles on the ILS'*.

From the reports of the pilots concerned and the RTF recording, the DHC8 was operating on the QNH 1015mb and the Husky on the RPS 1008mb.

The Plymouth APP Controller provided TI to both flights, together with advice to the Husky pilot to avoid the RW31 approach path. This was in excess of requirements for providing a Basic Service. MATS Part 1, Section 1, Chapter 11, 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. Basic Service relies on the pilot avoiding other traffic, unaided by controllers. It is

essential that a pilot receiving this service remains alert to the fact that, unlike a Traffic Service and a Deconfliction Service, the provider of a Basic Service is not required to monitor the flight. Pilots should not expect any form of traffic information from a controller, as there is no such obligation placed on the controller under a Basic Service outside an ATZ, and the pilot remains responsible for collision avoidance at all times'.

The DHC8 was being provided with a Procedural Service. 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 ac 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 ac to which the controller is providing a Procedural Service in Class F/G airspace'. The following Supplementary Instruction (SI 01/09) was published by Plymouth ATC on 16th September 2009:

Supplementary Instruction No. 1 of 2009

INSTRUCTIONS TO TRANSIT AC UNDER A BASIC SERVICE

This Supplementary Instruction is an addition to the re-issue of the Plymouth MATS Part 2 (Amendment 01 dated 1st September 2009) and replaces the memo from SATCO dated 3rd August 2009.

INTRODUCTION

There have been a number of AIRPROXs to the south-east of the airport between transit ac under a Basic Service and inbound Dash 8 ac positioning for the ILS where the transit ac have not followed, or have not understood, the instruction *'to remain south of the ILS'*.

Under the terms of the new ATSOCAS it is not strictly necessary to issue traffic information or routeing instructions to traffic under a Basic Service. However, in the light of these incidents and following discussions with CAA SRG, the following procedure is to be followed by all controllers when transit ac, or Plymouth Flying School ac departing to the south-east, may conflict with inbound ILS traffic.

2. MARSH MILLS ROUNDABOUT / AVON ESTUARY VRPs

Traffic information must be passed to both ac.

A new VRP has been established at Marsh Mills roundabout which will be displayed on all new charts and the track from Marsh Mills to the Avon Estuary VRP on the south coast should keep transit ac sufficiently clear of the ILS localiser track until ac are visual with each other.

The phrase 'remain south of the ILS' or similar phraseology is not specific enough in this situation, particularly when given to transit ac that are probably not familiar with the area. Therefore, with immediate effect, all controllers are to use the phrase:

'Route to the Avon Estuary and report the ILS traffic in sight'

'Route Marsh Mills VRP to the Avon Estuary VRP, traffic is.....'

or similar.

Controllers should also consider giving transit ac an instruction to route overhead if appropriate, rather than remain south of the ILS, to keep them clear of the localiser.

Transit ac may be advised to resume their own navigation once it is certain that they are clear of ILS traffic.

In the event of any AIRPROX or TCAS Resolution Advisory (RA), the SATCO or Deputy SATCO are to be informed immediately.

AIRPROX REPORT No 2009-080

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members agreed that, despite that this incident might at first sight seem complex, in reality it was fairly straightforward. The incident took place in Class G airspace where the pilots of both ac had an equal and shared responsibility to see and avoid other ac, despite one operating under IFR and the other VFR. Although the DHC8 crew had not seen the Husky visually, since it was squawking 7000 with Mode C, they saw it on their TCAS and reacted appropriately; the Husky pilot saw the DHC8 visually at a distance of about 2nm and, due to the airliner's coincidental change of track, he visually maintained a separation of 2nm or more. One commercial pilot Member suggested that, had the airliner not been TCAS equipped or the Husky not been squawking, the DHC8 crew would never have been aware of its presence due to their relative positions and the latter's right bank in the turn. The Board therefore agreed that this had been a TCAS generated event and that both pilots had acted correctly, professionally and displayed good awareness. Further, although not required to do so in these circumstances, the Plymouth controller had passed as accurate and effective TI as possible without any radar information.

Although it transpired that it was not a factor as the Husky maintained a track that took it well clear of the instrument approach path, the Board noted the pilots comments about his GPS system and its mapping database; a Member pointed out, however, that other low-cost commercially available systems display ILS approach paths as well as VRPs. There was some discussion regarding the promulgation of VRPs, which are currently promulgated in the respective airfield sections of the UKAIP; although local pilots would be aware of them, Members agreed that it would be unreasonable to expect pilots of transit ac to check the AIP for all airfields along their route. The DAP Advisor informed the Board that the promulgation of VRPs was currently under review.

One Controller Member warned of the danger of ATC over-controlling; he reiterated that the area round Plymouth is Class G airspace and warned that if units located in such airspace try to 'control' the local area this might have the undesired effect of discouraging GA pilots from calling them. He also pointed out that in these circumstances controllers can **request** pilots to route via VRPs or geographical points such that they avoid instrument traffic but they cannot **require/direct** them as IFR traffic does not have any priority over VFR, the Rules of the Air applying equally to both. The Board noted, however, that the Husky pilot stated that a defined routeing or heading to fly would have been more useful to him.

Again, although not having a direct bearing on the cause of the incident, the Board discussed the TCAS RA generated in the DHC8; one pilot Member expressed surprise that the relative movement between the ac was within the parameters to generate an RA. It was thought that, during the period that the Husky did not show on the radar recording it might also have been obscured to the DHC8's TCAS system, or had an SSR fault, whereby when it reappeared it generated a falsely high closure rate; this however was conjecture and the Board considered further investigation was unwarranted as it was not relevant to the cause or degree of risk.

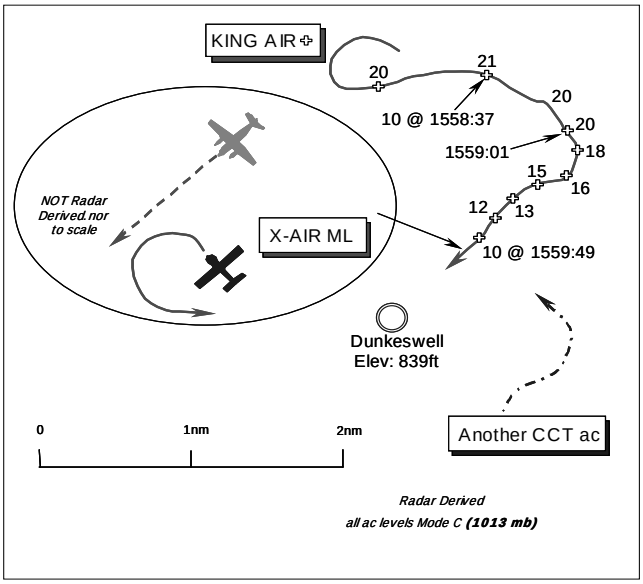
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report (TCAS).

Degree of Risk: C.

AIRPROX REPORT NO 2009-082

Date/Time:	2 August 1600 (Sunday)	
Position:	5052N 00313W (Dunkeswell Aerodrome circuit elev: 839ft)	
Airspace:	Dunkeswell ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	X-Air Microlight	BE99 King Air
Operator:	Civ Pte	Civ Comm
Alt/FL:	500ft	NR
	QFE (998mb)	(N/K)
Weather:	VMC CLOC	VMC NR
Visibility:	20nm	NR
Reported Separation:		
	50ft V/150m H	NR
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE X-AIR MICROLIGHT (ML) PILOT reports that he was inbound to Dunkeswell under VFR from a private strip and was in communication with Dunkeswell RADIO on 123·475MHz. At a range of 2nm he had called with his intentions to join on a L base-leg for RW23L to land. Whilst established on base-leg descending through 500ft QFE (998mb) heading 320° at 50kt just about to turn final, a parachuting ac – the BE99 King Air – joined the cct onto final at a higher speed and at a low angle of approach. It seemed that the King Air pilot had assumed he had precedence to land and when in his 2 o'clock - 300m away made a late call of finals to land. This forced him to take immediate avoiding action in his microlight by turning to port into a left orbit to avoid a collision with the white/ silver King Air that passed 150m to starboard and 50ft above his microlight with a *"high"* risk of collision.

His microlight is coloured blue with yellow leading edges. An Airprox was reported to Dunkeswell on landing.

THE BE99 KING AIR PILOT reports that he was operating VFR from Dunkeswell and in communication with Dunkeswell RADIO whilst executing parachute drops. A squawk of A0033 selected with Mode C. He was not aware of any Airprox and can only assume that the ML was in the aerodrome pattern and that he overtook it with separation that was sufficient from his perspective, but insufficient from the point of view of the ML pilot.

The King Air cruise speed is about 200kt; it flies at 150kt in the pattern with gear down, 120kt on approach and 100kt over the RW threshold.

UKAB Note (1): The UK AIP at AD2-EGTU-1-2 promulgates the Dunkeswell ATZ as a circle radius 2nm centred on the longest notified runway 05/23, extending from the surface to 2000ft above the aerodrome elevation of 839ft amsl and active daily in Summer from 0830-1700, with an A/G Service from Dunkeswell RADIO on 123·475MHz. Circuit height for RW23 is 800ft. At note at EGTU AD 2.22 b. states: *No overhead joins as parachuting is in operation 7 days a week between daylight hours. c. Subject to parachuting pilots may request an overhead join only when in two-way communication with the A/G radio station otherwise the pilot is to join on the downwind or base leg for the RW in use.*

UKAB Note (2): This Airprox is not shown clearly on radar recordings; although an ac is evident as a primary contact circuiting L in Dunkeswell's RW23 pattern downwind, before turning base leg at about 1nm, it is perceived to be following the X-Air ML, which is not evident at all. The Burrington Radar shows the BE99 King Air, squawking A0033, on a wide R base leg at 2000ft unverified Mode C (1013mb) – the QNH was also (1013mb). At 1559:01, the BE99 turns R inbound onto a long final at a range of 1¾nm from the aerodrome and then commences a continuous descent. Radar contact on the BE99 is then lost after it passes 1000ft Mode C (1013mb) at a range

of about 0·8nm from the aerodrome at 1559:49. The X-Air ML pilot reports the Airprox occurred at 1600 UTC, thus the reported close quarters encounter with the BE99 is not replicated on the radar recording.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Here it was evident that the BE99 pilot was involved in parachuting at the aerodrome. Whilst parachute drops were not actually in progress at the time of this Airprox, overhead joins are not permitted when parachuting is taking place - this is promulgated in the AIP for all concerned. Therefore it was evident that both ac here had joined the Dunkeswell cct from opposite directions on their respective base leg joins. A GA pilot Member opined that it was incumbent on operators at multi-activity aerodromes not only to broadcast their intentions on RT, but also to ensure that their procedures and the nature of their activity is well known to other aerodrome users - especially visitors - by ensuring the fullest information is available in the UK AIP and popular commercial flight guides.

The Board was briefed that, in general, aerodromes are not required to record their A/G Stations' RT traffic. It was unfortunate, therefore, that the absence of an RT recording did not allow the Board to determine independently what calls had been made on the Dunkeswell frequency within the cct pattern. Moreover, it was not feasible to determine when the respective 'final' calls were made. It seemed from the recorded radar data, coupled with the X-Air ML pilot's account, that the BE99 pilot had joined from a wide R base-leg onto a long final before he made a call of 'finals to land' when in the X-Air's 2 o'clock some 300m away; at this point, the X-Air pilot had just established on a shorter L base. It seemed that the BE99 pilot was not aware of the proximity of the much slower ML on base leg as he made his approach to the aerodrome, which resulted in this conflict on 'final'; conflicts of this type can readily occur when such dissimilar ac types as these are operating in the same cct. Whilst the nature and size of MLs can make them very difficult to see, the BE99 pilot should have been able to hear the RT calls by the ML pilot. Therefore he should have been looking out for the ML when it's pilot reported on RT that he was established on L base. From the brief account provided it seemed plain that the BE99 pilot was either not aware of the Airprox or, if he had seen the ML, he was not concerned at the reported 150m horizontal separation at the time. Whilst there was no reason to doubt the veracity of the ML pilot's report, the exact geometry of the encounter could not be verified without a radar contact on his ac. Nevertheless, in the light of the ML pilot reporting that he was forced to take immediate avoiding action by turning to port into a left orbit to avoid a collision, the Board concluded unanimously that this Airprox had resulted from a conflict in the Dunkeswell circuit that had been resolved by the X-Air ML pilot. The Board also agreed that, when baulked in the cct by the faster BE99, the ML pilot had wisely given-way to the faster twin thereby removing any Risk of collision.

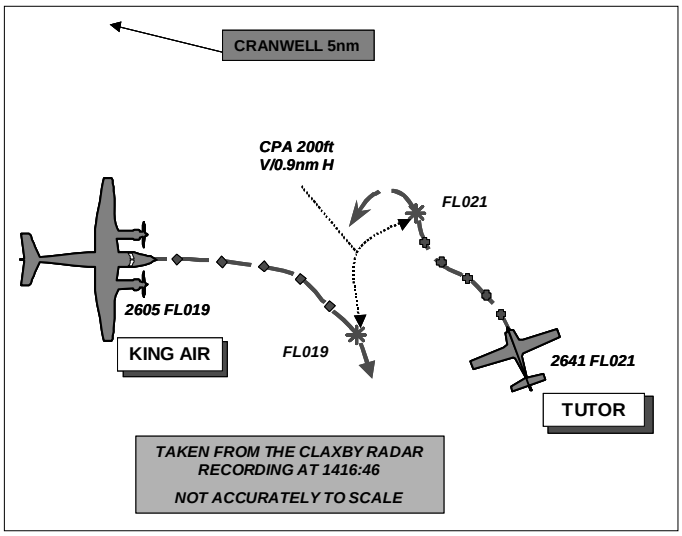
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the Dunkeswell circuit resolved by the X-Air microlight pilot.

Degree of Risk: C.

AIRPROX REPORT NO 2009-083

Date/Time:	5 August 1417	
Position:	5300N 00021W	(5nm ESE Cranwell)
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Beech King Air	Grob Tutor
Operator:	HQ AIR (TRG)	HQ AIR (TRG)
Alt/FL:	1800ft	1900ft
	(QFE 1010mb)	(RPS NK)
Weather:	IMC CLBC	VMC In Rain
Visibility:	8km	>40km
Reported Separation:		
	0ft V/0.5nm H	500ft V/3-4nm H
Recorded Separation:		
	200ft V/0.9nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE KING AIR PILOT reports that he was flying a local IF training flight with all lights switched on, with the student handling, under an IF visor, the QFI in the right hand seat and conducting the look out and an additional student in the jump seat. They were in receipt of a TS from Cranwell DIR, were squawking as directed with Mode C and S, and TCAS was fitted. Whilst in the instrument pattern at 144kt and 1800ft QFE, tracking 080°, being vectored for an SRA to RW27, they were just about to turn base, when TI was passed on an ac 3nm ahead, crossing from right to left; the traffic was seen as 'proximate traffic' on the TCAS. It became apparent that this traffic was converging and, whilst the QFI and student in the jump seat conducted a visual search, the TCAS displayed a TA. The QFI saw the other ac (a white Tutor seen against cloudy backdrop) late, took control and initiated a steep turn to the right to avoid it; the Tutor was seen to manoeuvre after the King Air had taken avoiding action. The Tutor was at the same height and the minimum horizontal separation was about ½nm; the King Air pilot assessed the risk as being Medium and reported the incident on landing.

THE GROB TUTOR PILOT reports they were on a local QFI standardisation sortie teaching intro to low level (EFT/ UAS Exercise) in a white ac with all lights switched on, squawking as directed with Mode C; they were initially in receipt of a TS from Cranwell Dir before squawking 7001 and transferring to the Low Level common frequency. The QFI was teaching how to enter low level and was conducting a wide lookout turn from an initial Nly heading through W to enter low level heading S from an easily distinguishable position at a large drain/railway line crossing. At the reported time of the Airprox, they were approx 2nm N of the point, flying at 120kt turning through W and beginning a descent from 1900ft RPS when a King Air was seen at a distance of 3-4nm and above them on an Ely heading. He assessed that there was no risk of confliction and that their path would take it expediently away from the projected path of the King Air. As they continued their flight path, the King Air was observed to enter a turn to the right, still at a distance of some 2-3nm and above them so they continued onto Sly track and descent to low level at 500ft MSD. He assessed the risk as being Low and therefore did not make any report.

UKAB Note (1): The Cranwell controller and Supervisor provided reports but, since they are essentially the same as that provided by Mil ACC, for brevity they have not been included.

UKAB Note (2): The recording of the Claxby Radar shows the incident clearly. The King Air approaches the CPA from the W tracking about 090° Squawking 2605 with its Mode C steady at FL019 (1800ft amsl). Meanwhile the Grob is steady at FL021 (2000ft amsl) initially tracking about 320° and crosses the King Air's projected track about 1½nm ahead. When it is in the King Air's 10 o'clock the Grob turns left then right (this could be track jitter) as the King Air turns to the right, both ac maintaining alt throughout. The CPA is at 1416:41 when the Grob is in the King Air's 9 o'clock as shown above.

AIRPROX REPORT No 2009-083

DAATM reports that the King Air was established in the instrument pattern at Cranwell under a TS from DIR. At 1413:11 DIR transmitted, *'C/S descend to height 1800 feet'* and instructions were then passed to another callsign recovering to Barkston Heath, also under a TS. At 1414:31 DIR transmitted, *'C/S cockpit checks report complete'* and the pilot acknowledged. At 1415:12 DIR passed TI, *'C/S traffic south east 4 miles tracking Northeast indicating similar level'.* Another ac was then passed information before DIR gave the King Air a positioning turn at 1416:25, *'C/S turn left heading 360 degrees'* and the (King Air) pilot responded, *'C/S avoiding that traffic it was head to head'.* Once clear of the traffic the pilot resumed his approach without further incident.

Cranwell DIR passed accurate TI to the King Air crew that enabled the QFI to acquire the conflicting traffic visually. Although the newly endorsed DIR was only working 2 ac in the instrument pattern, they were to 2 different airfields; both ac required TI to be passed on conflicting traffic at a similar time and he updated the TI to the ac recovering to Barkston Heath, confirming that he was aware of his responsibility. The controller provided a Traffic Service passing accurate TI iaw CAP774 Chap 3 Para 1 defined as:

'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.'

HQ AIR (TRG) comments that accurate TI had been given to the King Air pilot and he assessed that avoiding action was necessary; on the other hand the Tutor crew saw the King Air and assessed that no such action was needed. Given that both crews had seen each before the CPA, there was little risk of an actual collision.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted that this incident took place in a very busy area of Class G airspace to the SE of Cranwell where both pilots had an equal right to operate under the see and avoid principle, the King Air effectively IFR and the Grob VFR. Notwithstanding that and the Grob instructor's limited options in selecting an area for his exercise, a military pilot Member was surprised that he planned to enter his low level route in such a busy area very close to the Cranwell (also his base) instrument pattern. The King Air crew were in receipt of a radar service to assist with their lookout responsibility and Cranwell DIR gave them timely and accurate TI, helping to identify the Grob both visually and on TCAS. Since the Grob crew had correctly changed to Low Level Common frequency to enter their low level route, they were unable to receive a radar service; however, they saw the King Air at some distance. That being the case, both pilots saw the opposing ac at a distance great enough to ensure that there was no risk of collision, albeit the King Air took avoiding action and the Grob pilot deemed none to be required.

Although the radar analysis showed that the King Air pilot had underestimated the separation and the Grob pilot overestimated (in poorish weather), the ac missed each other by about 1nm and 200ft, which the Board considered a reasonable and safe margin.

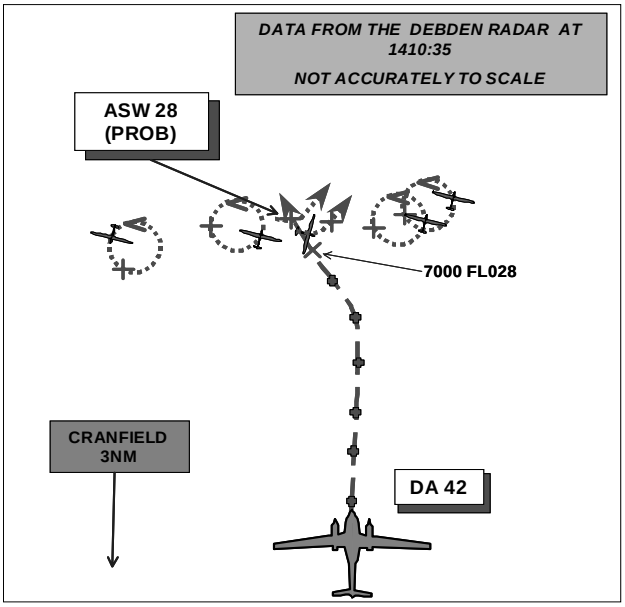
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT NO 2009-084

Date/Time:	28 July 1411	
Position:	5207N 00040W (4.3nm NW Cranfield)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	ASG 29	DA 42
Operator:	Civ Pte	Civ Trg
Alt/FL:	2700ft	NR
	(QNH)	(QNH 1016)
Weather:	VMC CLBC	VMC NR
Visibility:	>10km	NR
Reported Separation:		
	0ft V/50m H	100ft V/ 200m H
Recorded Separation:		
	NR (See Note: (2))	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ASG29 PILOT reports flying a white glider with a red fin, competing in the National Gliding Championships from Husbands Bosworth. He was flying on a task with turn points of Crowland – Newport Pagnal – Papworth – Husbands Bosworth. He was cruising after a climb just past Newport Pagnal, heading towards Bedford, looking for a suitable cloud for his next climb when he saw a Twin Star ac with its strobes and landing lights on (this caught his attention very quickly) at the same level in his 1230 position, about 300m away and closing quickly. He immediately turned hard left and pulled, waiting for the bang! He then rolled out and continued his task not seeing the ac again. He thought [incorrectly] that it might have been Coventry-based and returning there, as it seemed to be tracking from Cranfield to Coventry.

He has FLARM fitted to his glider and he also has a logger trace, a copy of which he helpfully provided. He reported the incident on landing and assessed the risk as being high.

UKAB Note (1): At about the reported time of the Airprox the glider datalogger trace shows that the glider makes a hard left turn in a position 334°/3.9nm from Cranfield.

THE DA42 PILOT reports flying on a local asymmetric instructional flight under VFR in a white ac with strobes selected on. They were in receipt of a Basic Service (BS) from Cranfield APP and were squawking 7000 with Modes C and S. The student had been the handling pilot until level off (approx hdg 360° at 120kt), when the instructor took control to demonstrate the effects of a port engine failure. During the demonstration, the rear seat passenger pointed out a glider in their 2 o'clock position and about 300ft above. The glider appeared to be circling in a thermal. Immediately after, the instructor saw another glider directly ahead (about 300m away and 100ft above); it also appeared to be turning in an anti-clockwise [to the left] direction, directly towards them so he initiated a left turn to avoid it.

UKAB Note (2): An analysis of the Debden Radar shows the incident. At 1410 the DA42 can be seen tracking North, squawking 7000 and indicating 2700ft on the London QNH of 1017mb, towards a group of at least 5 primary only contacts manoeuvring 3-4nm NNW of Cranfield. At 1410:28 the DA42 turns about 20° to the L as one of the primary contacts, in its 12 o'clock at ½nm and tracking about 170°, also turns left. The track taken up by the DA42 (about 340°) takes it directly towards a second primary contact, passing very close to it (less than 0.1nm) at 1410:52. Although that contact is intermittent and its track cannot be determined, at that time the DA42 was steady on 340° and its Mode C indicated that it had climbed from 2800ft to 3100ft; at the time the glider's datalogger showed it to be fairly level just above 1000m (3280ft) amsl on a 'straight' track.

AIRPROX REPORT No 2009-084

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Gliding Member suggested that since the competition task as described by the ASG29 pilot seemed quite short, the weather that day might have been 'poorish' with a reduced cloudbase. He advised that GA and Military pilots flying VFR in the vicinity of notified (NOTAMED) gliding competitions should stay well clear of airfields and operating areas. It was pointed out, however, that normally such NOTAMs only promulgate the event and timings and not routes [actual NOTAM at UKAB Note (3) below]; daily route details have to be determined by telephone using the number provided. Another pilot Member considered that, even having read the NOTAM, bearing in mind the distance of the incident from Husbands Bosworth, he would not have considered the gliding competition a significant factor in planning a flight such as the DA42's.

UKAB Note (3): The following is the text of the actual NOTAM:

EGTT/QWGLW/IV/M/W/000/050/5226N00103W005

MAJOR BRITISH GLIDING ASSOCIATION GLIDING COMPETITION INC X-COUNTRY ROUTES.

MAIN ACTIVITY WI 5NM RADIUS PSN 5226N 00103W (HUSBANDS BOSWORTH GLIDING CLUB, LEICESTERSHIRE). UP TO 50 GLIDERS AND 8 TUG ACFT MAY PARTICIPATE. GLIDERS WILL NORMALLY OPERATE BELOW THE INVERSION LEVEL OR BTN THE TOPS OF ANY CU CLOUDS AND 500FT AGL. AFTER LAUNCH MOST ACFT MAY BE CONCENTRATED JUST DOWNWIND OF THE SITE OR ON THE FIRST LEG OF THE X-COUNTRY RTE. FOR INFO ON ROUTES FOR THE DAY AND LIKELY ETD CONTACT GLIDER CONTEST CONTROL TEL 01858 881582. RTF CONTACT

127.575MHZ.

AUS 09-07-0166/AS2.

LOWER: SFC UPPER: 5000FT AMSL

FROM: 25 JUL 2009 00:00 TO: 02 AUG 2009 23:59

H2485/09

SCHEDULE: SR-SS

Husbands Bosworth is 25nm N of the incident position

Notwithstanding the NOTAM, both pilots were operating legitimately in Class G airspace conducting their respective activities; therefore both had an equal and shared responsibility to see and avoid other ac. Although the ANO requires powered ac to give way to sailplanes, 'see and avoid' depends on early acquisition by both pilots, which is often not easy. Glider pilots often fly tight orbits during which they need to monitor their instruments to ensure that they are getting 'lift'. Similarly, instructors flying GA instructional flights need to devote some of their capacity to teaching and monitoring their students. In both cases the first, but nonetheless safety critical, activity to suffer can be lookout. Further, visually acquiring small cross-sectioned white gliders against a background of light summer cumulous cloud can also be very difficult regardless of a conscientious lookout. Members agreed that in these circumstances it is always wise, as the ASG29 pilot did, to assume the opposing pilot has not seen your ac and react immediately.

The Board noted, and were grateful for, the detailed and apparently accurate reports and data provided by both pilots, which allowed them to analyse the precise details of the encounter. From the description provided by the ASG29 pilot it was clear that the DA42 identified was the one involved; the, albeit incomplete and projected, radar data suggested that the CPA had been very close laterally, in the Board's view slightly less than the 200m reported by the DA42 pilot. The Airprox Board Inspector who investigated the incident reiterated that the diagram, although based on radar data was a compilation of several very intermittent primary only returns taken from several consecutive radar sweeps; the gliders appearing on one sweep and disappearing on the next making it impossible

to determine an accurate position or track before, at or after the CPA. In his opinion, the positions shown on the diagram are reasonably accurate and there were at least 5 gliders in the area. Given the number of gliders in the area, it was possible that the DA42 pilot had not seen the glider that he came closest to; furthermore, it could not be determined whether the DA42's left turn shown on radar was the avoidance turn reported by the DA42 pilot or an earlier turn for some other reason. However, given the similarity in the accounts provided by both pilots, the Board concluded that it was likely that the DA42 pilot did see the reporting glider, albeit at a late stage. Of note, although pilots seldom mention it, Members noted that the DA42's lights had first caught the glider pilot's attention. While its utility can vary enormously in differing light conditions, as witnessed in this case, lighting can be a most important factor in visually acquiring other ac.

There was considerable discussion regarding the degree of risk. Since Members agreed that the DA42 instructor had most likely seen the reporting glider, discussion focussed on whether the respective pilots' reactions had been in sufficient time for their ac to change their respective flight paths sufficiently to remove the risk of collision. Ignoring the forward speed of the glider as it orbited, the DA42 had been closing at 120kt or about 62m/sec; assuming that the pilot's estimate of his first sighting distance of 300m was accurate, he had just under 5sec to see the glider, assimilate the threat, make a control input and for the flightpath of the ac to change by enough to ensure the safety of both ac. Although this was considered possible, Members agreed unanimously that due to the lateness of the sightings, the subsequent reactions by both pilots had probably not been early enough to prevent a risk of collision.

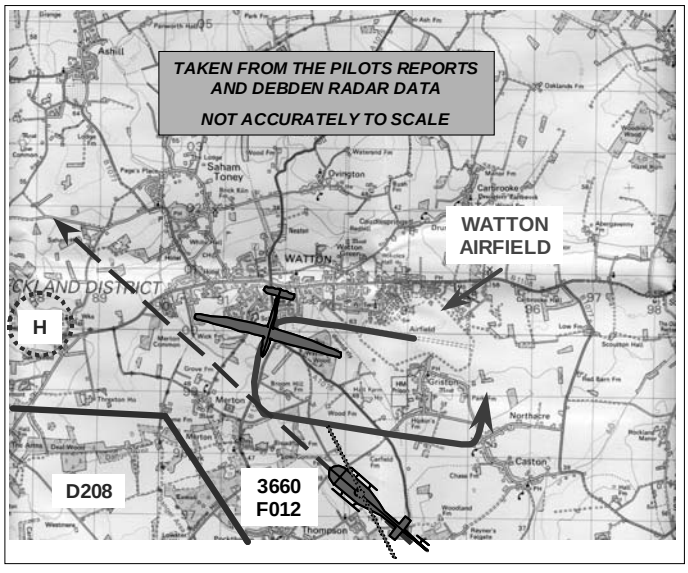
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by the pilots of both ac.

Degree of Risk: A.

AIRPROX REPORT NO 2009-085

Date/Time:	6 August 1147	
Position:	5233N 00049E (2 nm W Watton elev 175ft)	
Airspace:	London FIR	(Class:G)
	Reporting Ac	*Reported Ac*
Type:	Viking T1Glider	B206B
Operator:	HQ AIR (TRG)	Civ Pte
Alt/FL:	1100ft (QFE)	1000-1500ft (QNH)
Weather:	VMC CAVOK	VMC NR
Visibility:	30km	NR
Reported Separation:	0ft V/300m H	not seen
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VIKING T1 PILOT reports flying a local gliding training flight with a trainee in the front cockpit in a white glider with red wing stripes listening out on Watton Radio but with no SSR fitted. After a winch launch from RW29 they flew a left hand circuit and were approaching the high key area on the Southerly cross-wind leg at a height of 1100ft due to rising air, when a small black helicopter was seen 400m away, tracking North directly towards them, and closing quickly at the same height. The helicopter made no attempt to manoeuvre out of their path. He took control from the student and made a rapid descending turn to the right to provide maximum separation laterally and

vertically from the path of the helicopter. He looked back at the helicopter, which had continued on its track, that was taking it just to the N of D208. After landing he contacted Lakenheath Approach and Norwich ATC but neither had seen the helicopter on radar nor had they been in contact with it.

The trainee pilot did not see the helicopter before the instructor took control. This was his check flight prior to going solo and the instructor thought it likely that the ac would have collided if this had taken place on the student's first solo flight; he therefore assesses the collision risk as high. This was one of 6 recent 'infringements' sic of the Watton gliding site, which was NOTAMed as active mid-week.

UKAB Note (1): Watton is promulgated in the UKAIP ENR 5-5-1-6 as a glider launch site (winch and tug) up to 3000ft agl Friday 1200-SS, Sat Sun HJ, other times by NOTAM. NOTAM H3088/09 promulgated gliding activity within 2nm of Watton Aug 03-07 0700-SS PLUS15 from surface to 3200ft amsl. The incident took place on 6 Aug and was, therefore, within the period of the NOTAM.

THE B206B PILOT reports flying a grey and light blue helicopter with HISLS switched on, from one farm site to another near Swaffham at 100kt and between 1000 and 1500ft amsl. He was in receipt of a Basic Service from Marham and was squawking as directed with Mode C. He flies this route regularly and always avoids, as much as possible, small airfields because there are often a lot of gliders and small ac in the area. He normally flies a track of 317° outwards and reciprocal on return, unless he is called to another farm, as he has found that this avoids all the airfields and takes him between Watton and D208 directly to his landing site; he does not recall the actual flight as he was not contacted until over week after the incident but he thought that Watton was NOTAMed as active, but his track avoids the airfield.

He did not see the glider and was unable to assess the risk.

He helpfully provided a diagram showing the areas of poor visibility from the Jet Ranger cockpit and also a map showing his route.

DAATM reports that they were not contacted until after the Marham RT tapes had been returned to use.

UKAB Note (2): The recording of the Debden radar shows the helicopter tracking NW at FL012 (1350ft amsl/ 1200ft agl) about 1km NE of the NE corner of D208 (3km WSW of the centre of Watton Airfield). The glider does not show at any time.

HQ AIR (TRG) comments that the lack of supporting information about this occurrence makes assessment difficult. Clearly the Viking instructor saw the helicopter with sufficient time to take avoiding action but this was as a result of a helicopter being flown close to a NOTAMed gliding site such that it caused the Viking instructor concern.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board observed that this incident took place in a constricted part of Class G airspace where the respective pilots/crews had an equal and shared responsibility to see and avoid other ac. Although the extended hours of glider operations at Watton had been correctly promulgated by NOTAM, this serves only as a warning to other aviators; it is not an airspace restriction and offers little or no protection to ac operating from there. Although the B206 pilot routed well away from the dangerous area surrounding the winch, pilot Members agreed that, although he was not under any obligation to do so, he would have been wiser to route well clear to the E of Watton rather than through the fairly tight gap between Watton and D208.

VGS (and other) 'gliding camps' are periods of intense, generally quite localised flying, often involving very inexperienced young trainee pilots. GA and military ac alike should, if possible, give them a wide berth.

That said, and despite any lack of experience of the student pilot, and notwithstanding that powered ac should give way to gliders, in the Class G airspace of the open FIR pilots are obliged by the ANO to see and avoid other ac. In this case, possibly because of workload or ac blind-spots the B206 pilot did not see the glider and the glider

crew only saw the helicopter at a late stage. However, Members agreed that since the glider instructor saw the helicopter and took control in time to take effective avoiding action, he had removed any risk of a collision.

A gliding instructor Member observed that lookout in the circuit should be a good teaching point for trainee glider (and other) pilots operating in Class G airspace.

PART C: ASSESSMENT OF CAUSE AND RISK

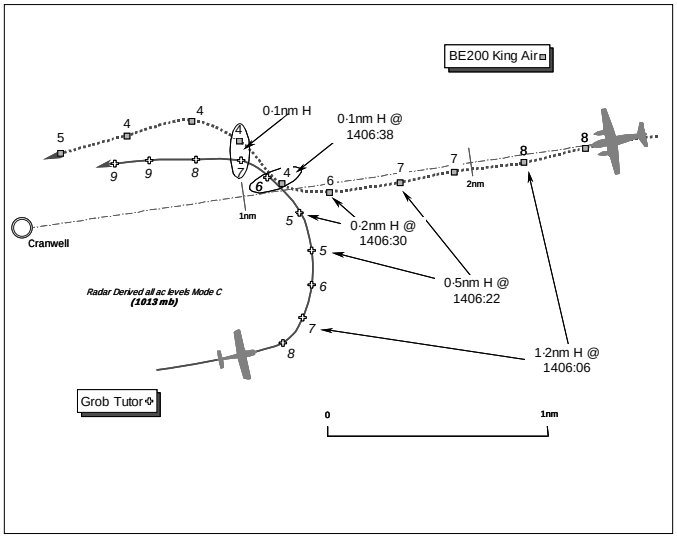
Cause: Non sighting by the B206 pilot and late sighting by the Viking crew in Class G airspace.

Degree of Risk: C.

AIRPROX REPORT NO 2009-086

Date/Time:	6 August 1406	
Position:	5302N 00027W (1¼nm FINAL to Cranwell RW27 - elev 218ft)	
Airspace:	MATZ/ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	B200 King Air	Grob Tutor
Operator:	HQ Air (Trg)	HQ Air (Trg)
Alt/FL:	600ft	600ft
	QFE (1011mb)	QFE (1011mb)
Weather:	VMC CLOC	VMC CLOC
Visibility:	25km	20km
Reported Separation:		
	Nil V/50-100m H	100ft V/Nil H
Recorded Separation:		

200ft V @ 0·1nm Min H; 100ft Min V @ 0·2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BEECH 200 KING AIR PILOT, a QFI, reports that he was completing the last detail of an IF training sortie at Cranwell. A PAR was being flown in good conditions to RW27 with his student pilot occupying the left hand seat as PF under an IF visor; the QFI was occupying the right hand seat as the PNF looking out and acting as safety pilot. An Air Cadet was seated in the jump seat.

On final to RW27, heading 265° at 127kt, the TALKDOWN controller issued a continue instruction, which was read-back. At about 2½nm from touchdown TALKDOWN enquired if they were visual with the airfield, which they were, so after this positive response TALKDOWN instructed them to continue visually and switch to the TOWER frequency of 125·050Mhz. Descending through 600ft Cranwell QFE (1011mb) [broadly 660ft (1013mb)], just prior to checking in with TOWER, he [the QFI] looked up from changing the radio frequency selection to see a Grob Tutor directly ahead, at the same height, belly up to their cockpit about 50-100m away in a L banked turn with a very high risk of a collision. To avoid a potential collision with the Grob he took control from his student and dived his ac aggressively in a steep right hand banked turn. This resulted in his ac flying at a height of about 250ft, close to the stall speed – with the stall warner sounding - and full power applied. He reported an Airprox to TOWER when he checked in on the RT, whereupon the ac was recovered via a visual cct.

The subject Grob Tutor was painted in display markings and was identified from the ac's registration. The King Air has a white and blue colour-scheme; the landing light and HISL were selected on. A squawk of A2603 was selected with Mode C. Mode S and TCAS is fitted, but neither a TA nor RA was enunciated.

AIRPROX REPORT No 2009-086

THE GROB 115E TUTOR STUDENT PILOT reports he had just flown a VFR solo sector reconnaissance, in CAVOK, which was his first solo flight outside the circuit area. Returning to Cranwell he was flying his third cct to RW27 whilst in communication with TOWER on VHF – 125·050Mhz. A squawk of A2641 was selected with Modes C & S on.

After he called final, TOWER asked if he was visual with the King Air that was making an approach with radar. The King Air had been spotted at a range of 2½nm on final approach so he replied that he was visual and was instructed by TOWER to continue. Descending from 600ft QFE (1011mb) he then heard his instructor call on the RT saying that he could not continue in front of the King Air, but should fly behind it, followed by TOWER instructing him to go around. He rolled out of the L turn onto 360° at 75kt, applied full power and climbed back to cct height whence he saw the King Air to his right, passing at least 100ft below him. He completed another cct to land and was later informed of the Airprox by his QFI.

His ac is coloured white, with a distinctive air display colour-scheme of reflective blue stripes on the sides and upper wings, plus a large roundel on the under surface of the main plane; the HISLs and landing light were on.

THE GROB 115E TUTOR STUDENT PILOT'S INSTRUCTOR reports he had authorised his student to fly the sortie solo, following a dual flight of the same profile. His solo student was back in the aerodrome circuit when he took off to instruct on another dual sortie teaching circuits. Following his initial take-off, he was flying directly behind his solo student on this circuit to RW27L. After his solo student called downwind to roll, he was informed by TOWER of 2 ac ahead, 1 on radar. When his solo student called final, another Tutor was still on the runway rolling from his approach, and the controller asked his solo student "are you visual with the radar traffic?"; he replied "affirmative" and was instructed by TOWER to continue. From the QFI's point of view, it appeared that his solo student was turning in front of the King Air so he transmitted on the TOWER frequency telling his student that he could not continue in front of the twin, but should go behind it. TOWER then instructed the solo student to go around. His solo student rolled wings level, enabling him to watch the King Air, and climbed heading N, passing across the runway centreline in front of, then above, the King Air onto the deadside of the cct. As the Tutor cct is flown downwind at 800ft QFE, with a continuous finals turn to roll out at 400ft on final at about 0·8nm, all of the turn would be completed above the flightpath of the radar traffic flying a 3° glidepath [318ft/nm]. Since his solo student had rolled wings level half way around the turn, at about 600ft, and climbed, this vertical separation would have been further increased.

Although his solo student should have had his transponder on standby, when asked later, he thought that he had left it on. The Grob Tutor student pilot had a total of 20.25hr 'dual' and 1.25hr 'solo' experience.

THE CRANWELL AERODROME CONTROLLER (ADC) reports that he had a constantly busy aerodrome circuit. The King Air crew was instructed to "continue visually, 1 ahead" after being continued at the 3-mile call. The Grob solo student had already been given a "2 ahead" call and told one was a King Air from Radar at 5nm, in response to his downwind with intentions call. Once the Grob solo student called final the King Air on PAR was inside 2nm, so he asked the Grob solo student, "are you visual with the radar traffic at 2 miles?" The Grob solo student responded with a "Yes I am", so he then instructed him to continue. Within seconds a transmission was made to the Grob solo student "..when you continue you are supposed to continue behind the radar traffic" – or words to that effect. This transmission was believed to be from another Tutor in the visual circuit. After hearing this transmission, he instructed the Grob solo student to go around. The Grob solo student acknowledged the go around and the King Air pilot broke off his approach at approximately ½nm final but had still not called on the TOWER frequency. As a result the two ac flew within close proximity of each other. The King Air pilot then called on VHF requesting to join and to file an Airprox.

The Cranwell Weather was reported to be: Colour Code BLU; QFE 1011mb; Cloud FEW 2400ft, OVC 6500ft. The aerodrome circuit was busy, with 3 to 4 ac in the visual circuit and radar traffic. At the time of the Airprox the weather was allowing full visual ccts.

DAATM reports that the Grob Tutor student pilot was conducting visual ccts to RW27. The King Air crew was flying a PAR at the end an IF sortie. The TOWER controller (ADC) was a first tourist having held an endorsement in the position for 7 weeks.

The Cranwell visual cct was busy with up to 4 ac operating at any time in addition to radar traffic being integrated into the pattern; all RT was on VHF 125·050MHz. The Grob solo student was in the visual cct on completion of

the pilot's first solo flight outside the cct. At 1403:22, the ADC received a standard radar intercom call from TALKDOWN warning-in the King Air for a PAR at 7nm from touchdown to LAND. Immediately after this call an ac not involved in the Airprox [a/c1] was cleared to take-off into the visual cct. Some 4sec later another ac [a/c2] called downwind to roll. Twenty seconds later at 1404:06 a third, uninvolved, ac [a/c3] called for a visual join. Standard joining instructions were given to a/c3 including the cct state of '2 in' [the Grob solo student and a/c2], with 1 on [the runway] for departure [a/c1] and radar traffic at 6nm [the King Air]. Some 9sec after a/c3 acknowledged the joining instructions, the Grob solo student called "*downwind land".* The ADC acknowledged by passing "*2 ahead* [a/c1 and a/c2] *1 radar 5nm, Kingair*". The Grob solo student did not acknowledge the cct state. At 1404:37 another ac [a/c4] called TOWER to join the circuit. Again standard joining instructions were given for an overhead join with the circuit state as *"2 in* [a/c2 and the Grob solo student, but no mention was made of a/c1], *radar traffic 4 miles* [the King Air], *1 other joining via initials* [a/c3]. The pilot of a/c2 immediately called *"final"* and was cleared to roll. At 1405:38, the ADC received a call from TALKDOWN on the radar clearance line *"3nm* [King Air C/S] *to land"*. Because a/c2 had been given the runway, TALKDOWN was told to *"call by 2"* - a radar continue. The ADC broadcast *"King Air, 3 miles continuing"* on the TOWER frequency to alert all cct traffic that the ac on PAR was continuing its approach inbound. The pilot of a/c1 then reported *"downwind roll"* to which the ADC replied with the cct state *"3 ahead"* [a/c 2, the King Air and the Grob solo student]. Although the previously reported cct states did not tally with the number of ac that now appear to have been in the cct from the RT, this had no bearing on the Airprox.

At 1405:54, TALKDOWN called the ADC via the radar clearance intercom line with *"2 and a quarter miles* [King Air C/S] *land",* the standard call for an ac on a delayed clearance. Three seconds later, the Grob solo student called "[Grob solo student C/S] *final"* on the TOWER frequency. Via the radar clearance line the ADC instructed the TALKDOWN controller that the King Air should continue visually, with 1 ahead. At this point TALKDOWN asked the King Air pilot if he was visual with the airfield and when the pilot replied that he was, the continue visually instruction was passed. In response to the Grob solo student reporting final, the ADC asked *".. are you visual with the radar traffic 2 miles?"* The Grob solo student replied, *" Yeah, I am* [C/S]" to which the ADC replied, *"*[C/S] *continue."* At 1406:13, 5sec after the Grob solo student was told to continue, a transmission was made on the TOWER frequency: "[Grob solo student C/S] *you need to be behind the radar* [traffic] *not in front."* It later transpired that the transmission was made by the Grob solo student's QFI in a/c1. Alerted by the QFI's transmission, the ADC instructed the Grob solo student to go around; the Grob solo student complied with this instruction. When the King Air crew called on the TOWER frequency at 1406:52, the pilot notified the ADC that he wanted to declare an Airprox.

The report submitted by the Grob solo student reiterated the sequence of events but did not indicate the student's thought process. Therefore, it is unclear as to whether the student pilot intended to route behind the King Air or was continuing to fly a standard circuit profile by rote. The Grob solo student's instructor [pilot of a/c1] reported that from his point of view, it appeared that his solo student was turning in front of the King Air and therefore he elected to transmit advice to him. The QFI described the Tutor flight path in detail and opined that the manoeuvre would have been completed above the flight path of radar traffic on a 3° approach.

The ADC's instruction to the Grob solo student to continue after confirming that the student pilot was visual with the radar traffic was standard practice, as was the expectation that the Grob solo student would self-position behind the King Air as radar traffic. The radar replay clearly shows both ac involved in the Airprox. The Grob can be seen to fly in front of the King Air passing from the latter's L to R; minimum horizontal separation of 0·1nm is evident.

During these events, a Duty Instructor was present in the VCR monitoring a student not involved in the Airprox. When the Duty Instructor's attention was drawn to the incident by the Grob solo student QFI's transmission, he looked up and confirmed that it was very difficult to ascertain the relative positions of the ac involved from the viewpoint of the VCR. There is a 'Hi-Brite' Aerodrome Traffic Monitor (ATM) console fitted in the VCR, but its position is such that to monitor the screen, the controller's focus would have been drawn away from the actual situation, which was on the opposite side of the VCR.

The ADC was controlling a busy visual cct whilst integrating radar traffic using standard procedures and phraseology. Circuit priorities were clearly indicated with cct state calls although it appeared that at one stage the number of ac in the circuit was more than that indicated by the ADC. However, this error did not have a bearing on the Airprox.

UKAB Note (1): The Claxby Radar recording shows the King Air established on final indicating 800ft Mode C (1013mb), with the Grob Tutor flown by the solo student at 11 o'clock – 1·2nm away descending through 700ft Mode C (1013mb) - broadly 760ft QFE (1011mb) – as the latter turns L onto final. The two ac converge as the Grob maintains a L turn descending to 500ft Mode C – now 100ft below the King Air that is descending through 600ft (1013mb) at a range of 0·2nm whilst 1¼nm distant from the aerodrome. A rapid descent by the King Air of 200ft to 400ft Mode C is evident 8sec later on the next sweep timed at 1406:38, minimum horizontal separation was no more than 0·1nm – 185m - as the Grob climbed to 600ft Mode C. This horizontal separation is maintained as the Grob turns inside the twin onto the deadside and climbs further before the King Air, now maintaining 400ft Mode C – broadly 460ft QFE - opens wider onto the deadside.

HQ AIR (TRG) comments that this was another incident involving radar traffic integrating into a visual circuit. Had the King Air crew been on the TWR frequency earlier their SA of the busy circuit traffic may have drawn their attention to the Tutor ac turning final sooner and avoided the late sighting and necessity to fly such an aggressive avoiding action. The limited experience of the student pilot contributed to this Airprox, having been told to continue he did just that until he was told to go around. This Airprox occurred in the circuit area of a major flying training unit and clearly demonstrates the need for both instructors and controllers to always be prepared to intervene when students are not getting it right.

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.

This Airprox was a salutary example of what can occur at a busy flying-training unit. With 1:25 solo hrs under his belt, the Members empathised with the Grob Student's situation but it seemed evident to the Board that this Airprox stemmed from the extreme inexperience of the exceedingly low-hours Grob Tutor solo student pilot when confronted with IFR traffic. For the benefit of civilian colleagues, the military fast-jet Member explained the basic methodology for teaching military student pilots to fly ccts at military aerodromes, which is somewhat different to that encountered in the civilian flying training environment. Here the Grob Student would have been taught to follow a standard ground track on the downwind leg and begin the final turn at an appropriate position relative to the runway threshold; extending downwind for separation is discouraged because it introduces variables into the final approach. Rather than extend downwind, pilots are taught to go-around from the point at which the final turn would normally commence and, if necessary, extend upwind on the dead side to adjust separation between preceding traffic.

When he reported final to land and was questioned by the ADC *".. are you visual with the radar traffic 2 miles?"* the Grob solo student replied positively, which led the ADC to reply with *"*[C/S] *continue"* in accord with standard military practice. This caused a civilian controller Member considerable concern and he explained that civilian practice would dictate that TOWER would specify that the Grob pilot was to continue as No2 to the King Air. In this manner the situation would have been spelt out more clearly for the ab-initio Grob solo student. However, the military pilot Member pointed out that before he had been allowed to fly solo the student's instructor would have taken great care to brief his student on how to operate in the cct. This briefing would include the priority of IFR radar traffic over VFR cct traffic in the aerodrome pattern and what to do under such circumstances – in general the onus being on the visual cct traffic to 'give-way' to the approaching IFR traffic. The DARS Advisor stressed that the circumstances described here were in accord with standard military cct procedures; if they are not in visual contact with the PAR traffic circuiting pilots will be instructed to 'go-around', whereas if they have sighted the other ac the standard response from the ADC will be to continue as here, allowing the pilot to maintain his own visual separation against the approaching IFR ac. It is then for the circuiting pilot to make up his own mind whether he needs to go-around from that point. If the cct spacing does not allow the cct to be 'continued' to a satisfactory landing/roll etc, a 'go-around' will be initiated aiming to fly clear astern of the radar traffic onto the deadside [if one exists] and giving it as wider berth as necessary - bearing in mind that any IFR approach can turn into a 'missed approach'. Here the Grob solo student's cct was such that he was not going to fly clear of the approaching King Air, according to the account by the Grob solo student's QFI and he had wisely warned his Student on the RT, which was subsequently reinforced by the ADCs instruction to 'go-around'. The Board commended the Grob student's QFI for his astuteness and presence of mind. Given this high-pressure cct environment some Members debated whether the Grob solo student had the capacity to recognise what was actually occurring. Pilot Members postulated that in the 1:25 hrs he had accumulated solo he might not have ever encountered such a situation

before with IFR traffic in the cct. A Member suggested that at this very early stage of training the solo student was probably flying the cct 'mechanically' by rote, which might explain why he did not do better. The lesson here for all aviators and controllers, both highly experienced and ab-initio alike, is that in an intense instructional environment to always be on your guard and prepared for students to act unpredictably!

Thus, unfortunately, the Grob ended up crossing ahead of the King Air at which point the QFI in the latter spotted it. Experienced pilot Members were surprised that the QFI, acting as safety pilot, had not acquired the cct traffic beforehand as the ac approached the aerodrome, but acknowledged that he was seated in the RHS and looking out of the small flight deck windshield across the cockpit. Moreover, as they had been broken off from their PAR and instructed to continue visually, the crew would have received no cct state, which is normally transmitted with the final clearance at 2½nm. At this stage, the King Air crew were visual with the aerodrome and No2 to ac2 that was rolling on the RW, and which the ADC expected clear the RW in time for the King Air to be issued with a landing clearance. So the instrument approach had been terminated, they had been switched to TOWER and the King Air was now approaching the RW for a visual straight-in to land. Nevertheless, the King Air still had 'right-of-way' and the cct state would have been issued as soon as the crew checked-in with TOWER. The conflict developed before the King Air crew was able to establish contact with TOWER as a result of the Grob solo student crossing ahead as he climbed to cct height. Therefore, the Board concluded that the Cause of this Airprox was that the Grob solo student pilot in the visual circuit flew into conflict with the King Air, which was joining the circuit from a radar approach.

When confronted with the Grob Tutor directly ahead, at the same height, belly up to the King Air about 50-100m away in a L banked turn – as broadly replicated by the radar recording - robust action was undoubtedly called for. However, the Board questioned whether diving the King Air aggressively in a steep right hand banked turn was the best form of avoiding action. Nonetheless, Members accepted that the QFI took the action he thought appropriate at the time. The radar recording substantiated the King Air QFI's view of events as they unfolded; the Grob climbed through the King Air's level and crossed ahead of it at close quarters. This convinced the Board that the safety of the two ac involved had been compromised.

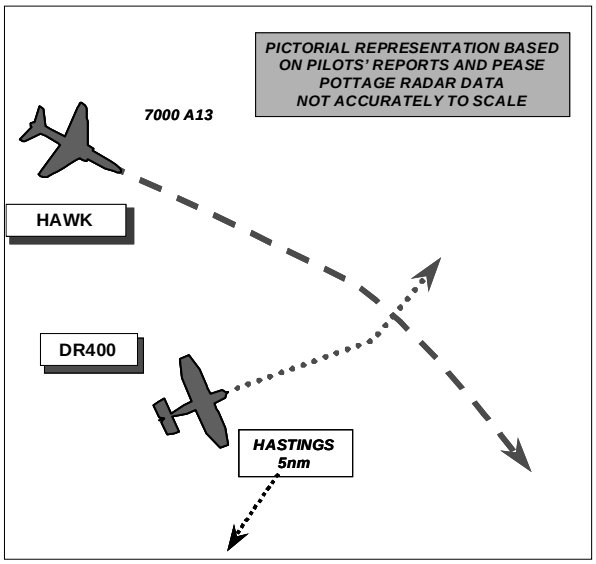
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Grob solo student pilot in the visual circuit flew into conflict with the King Air, which was joining the circuit from a radar approach.

Degree of Risk: B.

AIRPROX REPORT NO 2009-088

Date/Time:	14 August 1618	
Position:	5046N 00040E	(5nm NE Hastings)
Airspace:	UKDLFS/Lon FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Hawk T1A	DR400
Operator:	HQ AIR (TRG)	Civ Trg
Alt/FL:	1500ft	1500ft
	(QNH 1016mb)	(QNH)
Weather	VMC	VMC
Visibility:	>10km	>20km
Reported Separation:		
	20ft V/150m H	150-200ft V/0.5nm H
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK TMK1A PILOT reports flying a black ac with HISLs switched on, on a transit from Biggin Hill to Eastbourne airshow in excellent weather at 400kt, straight and level at 1500ft on the QNH of 1016mb. He was booked into LFA 18, was squawking 7000 but not in communication with any agency and was looking out meticulously as he was in an area of known glider activity. As he looked from his 9 o'clock through to his 3 o'clock he sighted a low winged, single-engined light ac very close [150m away] and pulling up so he bunted to avoid it, considering the collision risk as being high. Due to the nature of his flight he decided not to report the Airprox until he returned to Biggin Hill.

THE DR400 PILOT reports a PPL local training flight in communication with Lashenden Radio flying in good visibility but light turbulence; he was unsure if his SSR was switched on. His student had not flown for six months and was initially uncomfortable with the turbulence. Just as she was starting to relax with the conditions and after informing the student where they were, he, as the handling pilot at that time, looked out then initiated a 30° level turn to the left. He did not see the opposing traffic until established in the turn when he spotted the fast jet traffic approaching from their 10 o'clock at about 1200ft agl. He barely had time to initiate a climb as the black Hawk ac passed underneath him from left to right; he thought that it had descended slightly and turned left.

He was aware that there was a considerable amount of display traffic around that week but he was certain that they were well clear of any TRAs and NOTAMs, so he used the experience as a teaching point for his student, assessing the risk as being high. He cannot recall if MODE C was on or serviceable at the time.

UKAB Note (1): The recording of the Pease Pottage Radar shows the Hawk throughout, tracking 130° at 1600ft on the London QNH of 1016mb. A primary only contact can be seen intermittently in the area 5nm NE of Hastings. The track of the Hawk passes through the position where the intermittent contact was last seen. The CPA, therefore, cannot be determined.

HQ AIR (TRG) comments that this Airprox took place in Class G airspace and neither ac was in receipt of a radar service. Both pilots saw each other's ac late but there was sufficient time for both to take avoiding action and reduce the actual risk of collision.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that this incident took place in Class G airspace where both ac had an equal right to operate and therefore the 'see and avoid' principle pertained. However, both pilots recognised that they saw the opposing ac late, only when they had closed to a distance of about 100m on conflicting tracks and at about the same alt. It was clear from the radar-derived diagram above that there would have been little relative movement between the ac when viewed from either cockpit and, it is possible that the opposing ac could have been obscured by the respective canopy arches. Both pilots did, however, see the opposing ac and both commenced late, but most likely effective (from the pilots' reports), evasive manoeuvres thereby removing any actual collision risk. Notwithstanding the effectiveness of the manoeuvres, Members agreed that the lateness of their implementation had contributed to a reduction of normal safety margins.

Members also agreed that, due to her low experience level and her unease with the situation, the student pilot would not have be expected to contribute towards the lookout from the DR400.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by both pilots.

Degree of Risk: B.

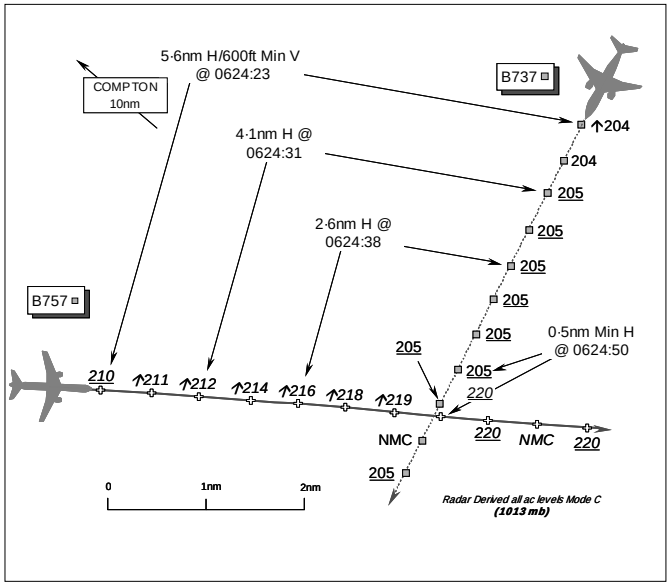
AIRPROX REPORT NO 2009-089

Date/Time: 17 August 0624

Position: 5122N 00101W (10nm SE of COMPTON VOR)

Airspace: London TMA (Class: C)

	Reporting Ac	*Reported Ac*
Type:	B757-200	B737-800
Operator:	CAT	CAT
Alt/FL:	FL210	FL204↑
Weather:	VMC NR	VMC NR
Visibility:	10km+	10km
Reported Separation:	1000ft V	NR
Recorded Separation:	600ft Min V @ 5·6nm H 0·5nm Min H @ 1500ft V	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B757-200 PILOT reports that he was eastbound from Bristol International Airport under IFR and had just called London CONTROL [LAC S25] on 132·165MHz. Approaching a position 10nm SE of COMPTON VOR, on a radar heading of 100° at 300kt, level at FL210 in VMC whilst waiting for a further climb a TCAS CLIMB RA was enunciated [at 0624:19]. The 1st Officer PF disconnected the AP and followed the demanded RA, whilst he as PNF looked for the other ac. [At 0624:33 the B757's CLIMB RA weakened to ADJUST VERTICAL SPEED.] Another controller then issued an instruction to expedite a climb to FL270. Once clear of conflict [enunciated at 0624:56] the PF re-engaged the AP and initially started to descend as he had not heard the further climb instruction to FL270. They saw a B737-800 cross from L to R about 1000ft below his ac. An Airprox was reported to LAC on the frequency in use.

He added that ATC was very busy at the time and they were given 3 frequency changes in a few minutes. The controller spent so long transmitting the climb clearance and apologising, that neither he nor the B737 crew was able to report the TCAS RA on RT. It seemed that the B737 had been cleared to climb to the same level by a

previous sector, but the controller on our frequency [LAC S25] was expecting the B737 to stop its climb at FL200. ATC apologised and said the B737 had been given the wrong level by the previous SC [TC Capital]. He assessed the risk of collision as *"high"*.

THE B737-800 PILOT reports he was outbound from London Stansted to Newquay under IFR and in receipt of a RCS from London CONTROL. Approaching a position 030° SAM 22nm heading 200°(M) level at FL200, the controller cleared them to climb to FL210 and instructed them to change frequency to 132·165MHz [LAC S25]. Climbing wings level at 1000ft/min at 290kt, VMC between layers, he was unable to check-in immediately with the [LAC S25] controller as the new frequency was very busy. The subject B757 [he reported the company C/S] was on their right about 1000ft above them. As they climbed a TCAS "advisory" [the B737 crew was issued with a TA at 0624:06] was enunciated so he reduced their RoC. A TCAS RA ADJUST VERTICAL SPEED was then enunciated [at 0624:26 instructing the pilot to reduce the RoC] as they passed FL204, which was followed in accordance with TCAS instructions and company procedures. When he made contact on 132·165MHz, the controller appeared to be aware of the situation. The B757 was not seen visually; he assessed the minimum vertical separation as 800ft from TCAS and the Risk *"medium".*

THE LTC CAPITAL CONTROLLER (TC CAP) reports that he was working the Sector bandboxed which was relatively busy but nothing unusual for the time of day. Another flight had been co-ordinated at a non-standard level of FL170 eastbound off L9, which involved a re-think for a previously co-ordinated northbound overflight through COMPTON VOR (CPT) inbound to Coventry that had also been agreed at FL170. Due to this flight requiring descent for Coventry at some stage, he had spent a few moments agreeing FL160 with TC SW and S19. Returning to the CPT area he climbed the B757 outbound from Bristol to FL210 and transferred it to S25 in good time some miles W of CPT. Subsequently the B737 out of Stansted was climbed to FL210 to de-conflict it from traffic departing Birmingham that was being vectored behind the B737. After the B737 was also transferred to S25 he realised almost immediately, aided by STCA, that FL210 was still occupied by the B757 now well inside CAPITAL Sector's airspace abeam CPT. (He noted that Bristol jet departures seldom actually get into CAPITAL's airspace due to their climb profile). Realising what had happened he phoned S25 primarily to resolve the ongoing conflict between the B757 and B737, but also to apologise for the error. S25 PLANNER expressed surprise that the B737 was also climbing to FL210 but they believed that CAPITAL was still working the ac; this was not the case and hence he could not resolve the conflict on RT by stopping the B737 at FL200. The B757 was subsequently climbed out of FL210 and the conflict was resolved, but he believes that prescribed separation was not achieved.

THE LAC SECTOR 25/26 PLANNER CONTROLLER (S25 PLAN) reports that when the B757 crew checked in on transfer from TC CAP, the ac was tracking E on a radar heading maintaining FL210. The B737 was tracking SW on a standing agreement from TC CAP. At around 6:22 he received a phone call from TC CAP reporting that they had climbed the B737 to FL210, into conflict with the B757. He immediately highlighted this to the trainee ATCO and OJTI operating S25/26 TACTICAL, who gave the B757 crew an expedited climb. The B737 crew checked in passing FL204 and was given a climb to FL210 when safe to do so.

THE LAC SECTOR 25/26 TACTICAL CONTROLLER (S25 TAC) reports that the B757 was flying a radar heading of E level at FL210. The B737 was climbing towards SAM but not on freq when STCA was triggered. His PLANNER received a phone call advising that the B737 was climbing to FL210 in confliction with the B757. The B757 crew were instructed to 'expedite climb' to avoid the B737 and traffic information was given to the B757 crew. The B737 crew then called on the Sector frequency and was given a climb back to FL210 "when safe". During this period the traffic level was moderate to busy with the trainee 'plugged-in'. He estimated that prescribed separation was eroded to 4nm horizontally/600ft vertically.

ATSI reports that the LTC CAPITAL Sectors – COMPTON & VATON - were combined. Additionally, in view of the traffic situation, it was not considered necessary for a Co-ordinator to be in position. The combined radar controller/co-ordinator described his workload as moderate, with most of the traffic being in the COMPTON section.

The B737 crew established communication with TC CAP at 0619, reporting turning L heading 215° and climbing to FL160. Shortly afterwards, the B757 crew contacted the sector heading 100°, at FL180. The ac was SW of Lyneham, in LAC S23's airspace but released to TC CAP. The 'Standing Agreement' level from LAC S23 to LTC is FL180, level abeam KENET. The conditions are: *"Where traffic is transferred on a radar heading, this heading will be retained until the aircraft enters TC Capital airspace"*. The subject ac were about 60nm apart at the time.

After confirming which flight had called him, the controller instructed the B757 crew to climb to FL200 and after dealing with other traffic, a further climb to FL210 was issued. This is the Standing Agreement level for transferring the ac to LAC S25. The B757 crew was then transferred to S25 TAC. At the time, the B757 was some 24nm from CPT i.e. still not in TC CAP's airspace (its western boundary is approximately 5nm W of CPT). TC CAP could not recollect whether he had removed the B757's fps from the display in the belief it would be climbed above his sector before reaching the boundary - the upper limit of TC CAP is FL215. The LAC MATS Part 2, Page BCN-23, states:

"The aircraft is released for climb to S25 [TAC] up to FL270 whilst within the confines of S23, irrespective of whether the aircraft is transferred from TC Capital or S23. Where the traffic is transferred on a radar heading, the heading will be retained until the aircraft enters S25 airspace".

The LTC MATS Part 2, GEN-136, states:

"A Flight Progress Strip may be discarded from the active bay when the subject aircraft is clear of all conflictions within the geographical area defined on the strip designator. The final strip on the Flight Progress Display Board should be retained until the subject aircraft is clear of all conflictions/potential conflictions within the sector AND has been transferred off the frequency. Where a controller opts to discard the final strip before the subject aircraft has left the physical confines of the sector boundary or the RMA (Radar Manoeuvring Area), he/she should ensure that such action will not compromise the completeness of the traffic picture for him/herself or another controller who may refer to the strip display or use it for handover/takeover purposes".

The radar recordings, timed at 0620:58, as the B757 is being transferred, show the subject ac on conflicting tracks 45nm apart - the B737 maintaining FL160 and the B757 passing FL196.

At 0621:21, the B737 crew was instructed to climb to FL190 and 30sec later to FL200. When the latter instruction was issued, the radar recordings show the subject ac still on conflicting tracks, 35nm apart - the B757 passing FL207 and the B737 FL162. The TC CAP controller explained that the stepped climb was in respect of the B757. Having instructed the B737 crew to climb to FL200, the controller became busy co-ordinating traffic in the southern part of the sector.

After finishing his telephone call concerning the traffic co-ordination TC CAP instructed the B737 crew to climb to FL210 at 0623:00, the Standing Agreed Level with S25. He explained that he assumed that S25, in accordance with usual procedures, had climbed the B757 out of FL210 but in fact this had not occurred and it was still maintaining that level. He believed he might have observed on the radar display another ac [of the same company as the B757], which was tracking about 18nm behind the subject B757 at FL230, and he might have erroneously believed that this was the B757. The subject ac were now 22nm apart, with the B757 maintaining FL210. The B757's Mode S Selected Flight Level (SFL) DAP shows it's SFL as FL210. [Mode S information is only currently displayed to TC controllers – it is not accessible on LAC displays.] After turning traffic outbound from Birmingham to pass behind the B737, the TC CAP controller transferred the latter flight to S25 at 0623:35, requesting that the pilot report his heading to S25 TAC. TC CAP commented that he had still overlooked the presence of the B757 at FL210. He added that, in future, he will 'box' the SSR labels of aircraft eastbound from Bristol, to make him more aware of their presence. The radar recording shows the subject ac, at this time, 14·9nm apart - the B737 passing FL196 and the B757 maintaining FL210.

The TC CAP controller stated that he became aware of the potential confliction when STCA activated. Radar recordings show this occurring at 0623:50, shortly after the B737 was transferred. He immediately telephoned S25 to warn them about the situation. He asked S25 PLAN if the B737 was being stopped at FL200. The S25 PLAN was surprised to hear from the TC CAP controller, that it was climbing to FL210. At the time, as the B737 crew had not yet contacted S25 TAC, at 0624:10 TC CAP called the ac on his RT frequency, but received no reply.

The S25 TAC was operating with a trainee. The B757 crew contacted the sector at 0622:10, reporting at FL210, heading 100° - the trainee acknowledged the call. There was no requirement for the flight to be climbed at this point. Subsequently, some 2min later, having observed STCA activating and overhearing S25 PLAN's telephone call, intimating that the B737 was climbing to FL210, the S25 TAC mentor took over the frequency and instructed the B757 crew, at 0624:23, to *"expedite your climb now Flight Level 2-7-0 good rate of climb please"*. By now, the two ac were 5·6nm apart, the B757 still at FL210 and the B737 at FL204. The pilot of the B757 replied "[C/S] *is already in the climb"*. During this transmission, an audio alarm is heard in the background. Traffic information was passed *"there's traffic beneath you climbing to ????? looks like he's..descending back to Flight Level 2 hundred*

now". As soon as the pilot acknowledged this transmission, the B737 crew contacted the sector. The controller apologised for the situation, continuing *"you can climb now Flight Level 2-1-0"*. Neither pilot reported receiving a TCAS alert on the frequency, the pilot of the B757 stating later, in his written report, that he was not able to alert the controller to his TCAS RA because the frequency was too busy. Just before leaving the frequency, the pilot of the B737, commented that he would be filing a report. S25 TAC explained the incident briefly. The pilot reported *"unfortunately I couldn't I was unable to talk to you at the time 'cause you were busy talking to somebody else"*.

The radar recordings show that the B737 stopped its climb at 0624:31, when it was at FL205. At the time, the B757 was in its 1 o'clock – 4·1nm away, passing FL212. By the time the distance between the ac reduced to 2·6nm, vertical separation had increased to 1100ft - the B757 indicating FL216 and the B737 FL205. As the 2 ac passed 0·5nm apart, vertical separation was 1500ft, as the B757 continued its climb.

TC CAP did not ensure that standard separation would exist between the subject ac when he transferred the B737 to S25 TAC climbing to the same level as the B757. In the process he had overlooked the presence of the B757, mainly because he assumed it would have been climbed above FL210 by S25 TAC.

UKAB Note (1): NATS Ltd helpfully provided an assessment of the TCAS warnings received during the encounter using the InCAS simulation tool in conjunction with Resolution Advisory (RA) messages downlinked via Mode S extracted by the ATM Safety Monitoring Tool (ASMT). The InCAS simulation based on radar track data from the Cromer (the Airprox diagram is based on the Heathrow 23cm recording) single source radar indicates that 0624:06 the B737 crew was issued with a TRAFFIC ALERT (TA). Five seconds later at 0624:11 the B757 crew was also issued with a TA. At 0624:19 the B757 crew was issued with a CLIMB RA while in level flight at FL210. Seven seconds later at 0624:26 while climbing through FL204 the B737 crew was issued with an ADJUST VERTICAL SPEED RA instructing the pilot to reduce the RoC. At 0624:33 the B757's CLIMB RA weakened to an ADJUST VERTICAL SPEED RA instructing the pilot to reduce the RoD. The simulation indicates that CLEAR OF CONFLICT was issued to both crews at 0624:56.

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 Board considered whether the presence of a trainee controller on S25 TAC might have caused a slight delay in the climb of the B757 out of FL210 to a higher level. However, the ATSI Advisor explained that the trainee had no reason to climb the B757 any earlier and was not compelled to do so. He opined that a qualified controller, working the Sector alone, might well have been a bit quicker off the mark and perhaps this explained why TC CAP assumed that the level had been vacated by the B757. An experienced area controller Member said that, with hindsight, this was a simple mistake by TC CAP who, prompted by the STCA, realised what had happened and immediately took steps to correct his error. From the comprehensive reports provided the root cause of the Airprox was plainly evident; the Board concluded with little further debate that this Airprox had resulted because the TC CAP controller had climbed the B737 into conflict with the B757.

It was clear that STCA had proved it's worth here by alerting the TC CAP controller and S25 TAC mentor to the impending conflict. Consequently the S25 TAC mentor was able to initiate prompt corrective action by instructing the B757 crew to expedite a climb at a good rate out of FL210. Although the S25 TAC mentor was swift to act, it was evident that TCAS was already interceding as the pilot's reply of "..*already in the climb"* indicated that the B757 crew was responding to their CLIMB RA and the next recorded radar sweep immediately after the controller's climb instruction was transmitted shows the B757 in the climb. Whilst controller Members were surprised that the S25 TAC mentor had not prefixed his transmission with 'avoiding action' it was plain that the B757 crew had reacted promptly to their RA. Controller Members emphasised that avoiding action in the vertical plane should be emphasised as such using the prefix *"avoiding action";* simply requesting an expedited climb will not necessarily achieve the desired response. It was also evident from the radar data that the B737 crew had levelled their ac in response to their ADJUST VERTICAL SPEED RA, instructing the crew to reduce their RoC. CAT pilot Members pointed out the importance of using the correct RT phraseology when reacting to a TCAS RA. It was unfortunate that neither crew were able to advise S25 TAC that they were reacting to their TCAS RA, which removes any further responsibility from the controller for initiating avoiding action. Whilst not intending to be critical of the crews, it was worth repeating here the latest RT phraseology from CAP 413 Edition 19, which specifies that pilots should report TCAS manoeuvres as "[C/S] *TCAS R-A"* and then reporting (even if it was not possible to notify the

controller that an RA had occurred) "[C/S], clear of conflict" coupled with either: *"..returning to* (assigned clearance)" or, "(assigned clearance) *resumed".* Nonetheless, in this Airprox both crews' swift response to their respective RAs ensured that vertical separation was quickly restored, as 1100ft of vertical separation was achieved before horizontal separation reduced below 2·6nm, and 1500ft was evident as the B757 crossed 0·5nm ahead of the B737. Given these circumstances, the Members agreed unanimously that there was no Risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LTC CAPITAL controller climbed the B737 into conflict with the B757.

Degree of Risk: C.

AIRPROX REPORT NO 2009-090

Date/Time: 13 Aug 1154

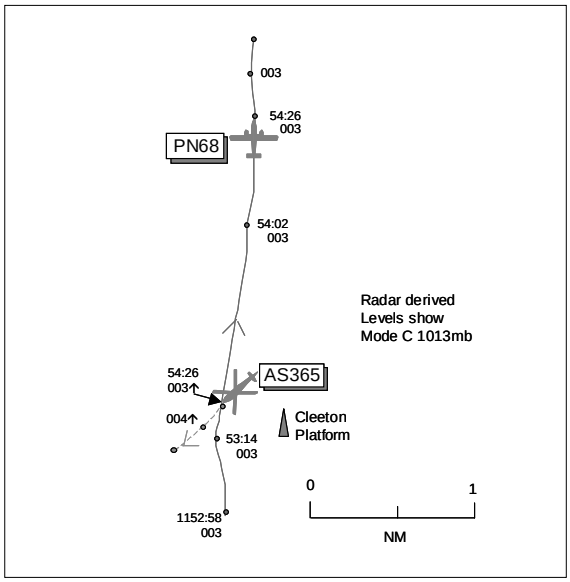
Position: 5402N 00043E (Cleeton Platform - elev 187ft 40nm ENE OTR)

Airspace: HPZ/LFIR (Class: G)

	Reporting Ac	*Reported Ac*
Type:	AS365	PN68
Operator:	CAT	Civ Comm
Alt/FL:	Helideck	300ft (QNH 1018mb)
Weather:	VMC CLOC	VMC CLNC
Visibility:	10km	30km

Reported Separation:
63ft V/0·25nm H 150ft V/>0·5nm H

Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AS365 PILOT reports on the helideck of Cleeton Platform ready for departure to Humberside, VFR and in receipt of a Flight Watch from Company Logistics (Log) on 129·875MHZ squawking 0234 with Mode C. On the previous leg they were inbound to Cleeton from Humberside and following an SK76 to the same deck with a time spacing of 10min. Whilst under the control of Anglia Radar their details were passed to Company Log offshore and Flight Watch cover was acknowledged by them before they requested descent and frequency change with Anglia. At this time they were made aware of a fixed wing ac, the subject PN68, operating within the Ravenspurn field at low level, not above 250ft. Anglia Radar then established comms with the PN68 pilot, who was at the time operating close to the Cleeton Platform, advising him of the intentions of his AS365 and the SK76 ahead. The PN68 crew was told to stay clear and to the E of the platform until both the inbound SK76 and his AS 365 were clear of the platform. Anglia actually vectored the PN68 away from the platform to facilitate the approach and landing of the SK76. Whilst maintaining comms with Anglia they relayed positional reports of the PN68 to the SK76 flight prior to its departure from Cleeton Platform, as it is not possible to communicate with Anglia from deck level. They, in turn, then landed on the Cleeton Helideck. At 1153 they transmitted a full departure call on the field frequency including time of lift (1253A), number of crew, pax, weights of pax baggage, freight, fuel quantity, cruise altitude and time enroute; this was acknowledged by Company Log. Ready to lift into the hover he, the Capt, requested a final lookout scan from himself and co-pilot to ensure their departure path was clear, in particular looking for the PN68 as nothing had been heard post landing as to its whereabouts. Looking hard over his L shoulder the co-pilot spotted the PN68 in his 7 o'clock range 0·5nm on a N'ly track to the W of Cleeton Platform

at a height of 250ft (calculated as 63ft above the helideck, height 187ft) before passing within 0·25nm to the W of the platform on a N'ly heading and maintaining such, crossing their departure path of 340° (surface wind 340° 10kt); he immediately aborted the take-off. Had they not sighted the PN68, noting it was approaching from behind, they would have lifted and departed on what must be considered to have been a very dangerous situation. Once the PN68 had cleared away, having crossed the departure track, they departed and reported the incident to Anglia Radar. The PN68 pilot then asked ATC what the problem was as he had been maintaining a listening watch on the field frequency. In that case the PN68 pilot would have heard their departure call and should have responded with either a position report or at least deviation from his track to avoid conflict. Furthermore, the PN68 pilot did not respond to earlier attempts to communicate with him on the field frequency nor did he establish RT comms with BP Log to make his movements known within the field. He assessed the risk as medium.

THE PN68 PILOT reports flying a wildlife survey VFR from Humberside to Liverpool and in receipt of a BS from Anglia Radar on 128·925MHz (Box 1) and a listening watch with Ravenspurn Oil Rig on 129·875MHz (Box 2), squawking 0224 with Modes S and C; TCAS was fitted. During the N-S transects in and out of the Cleeton HPZ not above 300ft, he was asked by Anglia Radar to report turning N and S owing to a helicopter wanting to lift from the rig platform and a second helicopter approaching the same rig. Whilst routeing N away from the rig, Anglia Radar passed him the Ravenspurn oil rig frequency which he confirmed, informing the controller that he would maintain a listening watch on comms Box 2. He also informed Anglia of his intention to turn onto a S'bound track which was acknowledged with 'roger'. On approaching the rig, E abeam, Anglia asked if he could maintain his current track to enable a helicopter to lift to the N and the second helicopter to make an approach to land on the platform. Anglia informed both helicopter flights of his position, 1nm E of the rig S'bound. He informed Anglia that he was visual with both helicopters and was told that the controller would inform him when it would be OK to turn N. He tracked S for an additional 8nm before the controller said it was OK to turn N. As he tracked toward the start point for his next transect he was still in 2-way comms with Anglia, below radar cover, whilst maintaining a listening watch on Ravenspurn frequency on Box 2. Approaching the start point of the next transect waypoint he was visual with the helicopter on the platform and at this time its pilot was communicating with the rig operator. On passing 0·5-1nm W abeam, about 150ft above the helicopter on the rig, on a N'ly track at 110kt, he was at a safe and legal distance from the rig platform whilst he continued to monitor the rig frequency and maintained visual contact with the helicopter, which was stationary on the platform; he continued on a constant heading, altitude and speed. Before lifting the helicopter pilot confirmed with Anglia Radar his position [actually after lifting, having left the Flight Watch frequency and after establishing 2-way comms with Anglia] at which point its pilot was informed that his ac was over 1nm N of the rig routeing N away. The helicopter pilot had confirmed on the Ravenspurn frequency that he was visual with his PN68 and continued to lift from the platform. No avoiding action was taken or was necessary and no TCAS TA or RA warnings were received during the incident. He assessed the risk as low.

THE ANGLIA RADAR CONTROLLER reports the AS365 pilot on first call, soon after lifting off the Cleeton rig within the Ravenspurn HPZ, reported that a twin-engine fixed wing ac had crossed his departure track as he lifted off the rig. When the AS365 pilot called, the PN68 was already showing to the N of the AS365 and tracking N, indicating 300ft. The PN68 was already working within the Anglia area of responsibility under a BS carrying out a wildlife survey not above 500ft amsl on the Humber RPS. TI had already been given to both flights as the AS365 had entered the Ravenspurn HPZ and the AS365 was told that the PN68 was carrying out a survey transiting through the HPZ on N-S runs not above 500ft. The PN68 pilot had been asked earlier to contact the HPZ on Box 2 (frequency 129·875MHz) and was informed that the AS365 was landing on the Cleeton rig.

ATSI reports that the UK AIP, Page ENR 1-15-1, states the procedures for the 'Southern North Sea Low Level Air Traffic Services and Helicopter Operating Procedures'. The 'Introduction' explains the services available: *'To enhance flight safety and expedite Search and Rescue in the Southern North Sea Airspace, a Deconfliction Service, Traffic Service, Basic Service and Alerting Service is available from the Air Traffic Service Unit (ATSU) at Aberdeen Airport (Anglia Radar). These services are available to helicopters operating in support to the off-shore oil and gas industry and to civil and military aircraft transiting the area at and below FL 65'*. Additionally, ENR 1-15-2 states: *'Pilots of civil and military fixed-wing aircraft intending to fly within the area of responsibility of Anglia Radar are strongly advised to make use of the services provided. Whenever possible civil aircraft should be flown above the Transition Altitude at the appropriate quadrantal level. Pilots are also advised that the helicopters on the inter-platform flights in the same field complex normally operate at 500 ft amsl and frequently carry underslung loads which limit the pilots ability to take sudden avoiding action'*.

Accordingly, the PN68 was receiving a BS (due low altitude) from Anglia Radar. The sector was manned by a mentor and trainee and traffic levels were described as medium. The PN68 was carrying out a wildlife survey at

300ft RPS 1015mb, routeing N/S through the Ravenspurn Oil Field, which is situated approximately 40nm ENE of OTR.

In the period leading up to the Airprox, there were 2 helicopters inbound to the Cleeton Platform receiving an offshore DS from Anglia Radar, the second of which was the subject AS365. Cleeton platform is situated at the western end of the Ravenspurn Helicopter Protected Zone (HPZ). HPZs are described in the UK AIP, Page ENR 1-15-2: *'HPZs are established to safeguard helicopters approaching and departing platforms and for helicopters engaged on extensive uncoordinated inter-platform flying. Inter-platform flying by civil helicopters within HPZs contained within the OSA (Offshore Safety Area) will be conducted on the company or field discrete frequency. HPZs consist of the Airspace from sea level to 2000 ft ALT contained within tangential lines, not exceeding 5 nm in length, joining the neighbouring circumferences of circles 1.5 nm radius around each individual platform helideck'*. They are within Class G airspace and there is no requirement to obtain a clearance to enter the zones.

The PN68 flight was informed about the first of the 2 helicopters, an SK76, inbound to Cleeton at 1127. The SK76 pilot was then advised about the presence of the PN68. At 1132, Anglia asked the pilot of the PN68 *"are you talking on your box other box to the Cleeton Ravenspurn field"*. The pilot replied *"No I haven't no but if you give me his frequency I er give them a call"*. The frequency was passed and acknowledged correctly. Just after this, the AS365 contacted Anglia Radar en route to Cleeton. At 1137, the PN68 pilot reported *"maintaining listening watch on the Ravenspurn frequency"* and was advised about the AS365. Shortly afterwards, the pilot of the AS365 requested an early descent and frequency change. He was informed *"not below one thousand feet for the moment there is also (PN68 c/s) believed to be talking to the Cleeton not showing on radar at the moment last seen on radar to the north of the Ravenspurn he's going through the field on a survey not above two hundred and fifty feet further descent will be at your discretion"*. The PN68 was then identified, still on a BS and TI was updated to both flights. The PN68 flight was requested to route S of the platform to allow the SK76 to depart and the AS365 to land. The PN68 pilot confirmed he would continue S until advised, not above 500ft. Subsequently, the pilots of the subject ac reported sighting each other. Once the PN68 flight was clear of the departing SK76 helicopter, it was informed, at 1147:30, there was no restriction on its turn N'bound.

No further calls were made by the subject ac until some 6min later, when, at 1154:15, the AS365 contacted the frequency. The Anglia Controller informed the pilot *"the Partenavia's believed to be just to the north of you range of about one mile tracking northbound at low level not above five hundred feet"*. The pilot commented *"he was aware that we were out????? and he's just flown straight through our departure track here at low level and he's not speaking to anybody in the field at all"*. Radar recordings show that, at 1153:18, the PN68 passed very close to the W of the Cleeton platform, indicating 300ft. The pilot of the PN68 later stated *"I have been maintaining listening watch on the Ravenspurn frequency as you said I was visual contact with both aircraft the one on the rig and the one approaching the rig as I was heading southbound to accommodate"*. The controller explained the confliction was on the N'bound track, adding *"I think you need to actually call them every time you go through the HPZ because the HPZs are not under the control of Anglia Radar to actually tell them what you are doing"*. The pilot asked if the helicopter pads had any radar and was advised they were not equipped.

Anglia Radar is responsible for providing an appropriate ATC service, depending on the surveillance and VHF cover, to helicopters *'from off-shore installations, from the time two-way communications is established with the ATSU, until the time that the pilot is in contact with the destination landing pad or other agency'*.

'A Basic Service is an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. A Basic Service relies on the pilot avoiding other traffic, unaided by controllers. It is essential that a pilot receiving this service remains alert to the fact that, unlike a Traffic Service and a Deconfliction Service, the provider of a Basic Service is not required to monitor the flight. Pilots should not expect any form of traffic information from a controller, as there is no such obligation placed on the controller under a Basic Service outside an ATZ, and the pilot remains responsible for collision avoidance at all times'.

The Anglia Radar controller passed appropriate TI to both flights as the AS365 approached the Cleeton Platform. In fact, the controller issued more information and advice than is required for the provision of a BS. The pilot of the PN68 would have been aware, as a result of this information, of the presence of the AS365 on the Cleeton Platform. The controller was unaware that the AS365 was departing from the platform, as lifting calls are made on the field frequency. TI, about the PN68, was issued to the pilot of the AS365 as soon as he contacted the frequency after departure from Cleeton.

THE NATS UNIT REPORT provided additional background information. The Capt of the AS365 telephoned the Aberdeen Watch Manager shortly after landing post-incident and explained that his company had become involved because the Cleeton Helideck Landing Officer (HLO) had reported the incident as he saw it to Company Logistics. Also, this had been a second confliction (first on the 11th August) between a company helicopter and the PN68 offshore, which had led to an internal occurrence report being generated and the company contacting the PN68 operator advising them of the proper procedures to be followed within the HPZs. The AS365 Capt stated that the crew of the SK76, who departed Cleeton ahead of his arrival, had tried to call the PN68 pilot twice before they lifted on the field frequency but had not been able to make contact. The PN68 pilot also spoke to the Aberdeen Watch Manager and stated that he had not heard the SK76 flight trying to contact him but he had heard the AS365 pilot say on the Ravenspurn frequency that they were visual with his ac whilst on the helideck. He was under the impression that traffic in the HPZ was under the control of Anglia Radar and flights would call Anglia prior to lifting from an installation. Although he had been maintaining a listening watch on the field frequency he had not realised that common practice for helicopters flights operating within the HPZs to make calls reporting their intentions and giving position updates.

UKAB Note (1): The Claxby recorded radar does not capture the Airprox owing to the helicopter being stationary on the helideck. At 1152:58 the PN68 is seen as a secondary only response about 0·6nm SW of Cleeton Platform tracking N indicating FL003 (360ft RPS 1015mb). After passing within 0·5nm W abeam the platform at 1153:14, the ac continues tracking N'ly maintaining FL003. The AS365 first appears at 1154:25 0·4nm WNW of the platform tracking SW indicating FL003 and climbing whilst the PN68 is by now 1·8nm to its N and diverging.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear to Members that there were some misconceptions within both cockpits of the subject ac. The AS365 pilot was apparently expecting more protection within the HPZ than was available; a HPZ is not an ATZ nor is it exclusive to helicopter traffic. The HPZ is within Class G airspace with no ATC service available, the frequency being manned by ground personnel and is licensed for administrative and logistic purposes associated with safe offshore operations. The DAP Advisor commented that the procedures followed by helicopter operators whilst flying within the HPZ were established by local agreement, there being no procedures promulgated for traffic transiting a HPZ – clarification of fixed wing procedures in the UK AIP are pending. Similarly, the PN68 pilot had believed erroneously that Anglia Radar controlled helicopter traffic in the HPZ with flights calling on the frequency prior to lifting. The PN68 flight was in receipt of an ATSOCAS from Anglia, the pilot being responsible for maintaining his own separation from other traffic through 'see and avoid'. The PN68 pilot was listening out on the Ravenspurn frequency and could have announced his intentions but there was no requirement to do so. The Anglia controller was responsible for providing a service to traffic within the OSA, albeit limited owing to the limitations of RT and radar coverage. This service is provided to helicopter traffic until flights leave the frequency immediately prior to landing on the platform and after flights return to the frequency after lifting. Anglia Radar had informed the PN68 about the departing SK76 and AS365 when it was inbound but could not warn about its impending takeoff because Anglia would be unaware of how long the helicopter would be stationary on the rig prior to departure. The PN68 pilot had seen both helicopters when inbound and had later heard the AS365 pilot's call on the Ravenspurn frequency broadcasting his intention to lift. He saw the AS365 on the helideck and he had heard its pilot report being visual with the PN68. Members agreed that the PN68 pilot was always in a position to manoeuvre his ac away from the AS365 should it have become necessary. The AS365 crew had shown good situational awareness and their actions in delaying their takeoff had quickly averted the potential confliction and effectively removed any risk of collision. This left the Board able to conclude that this incident was a sighting report in a HPZ.

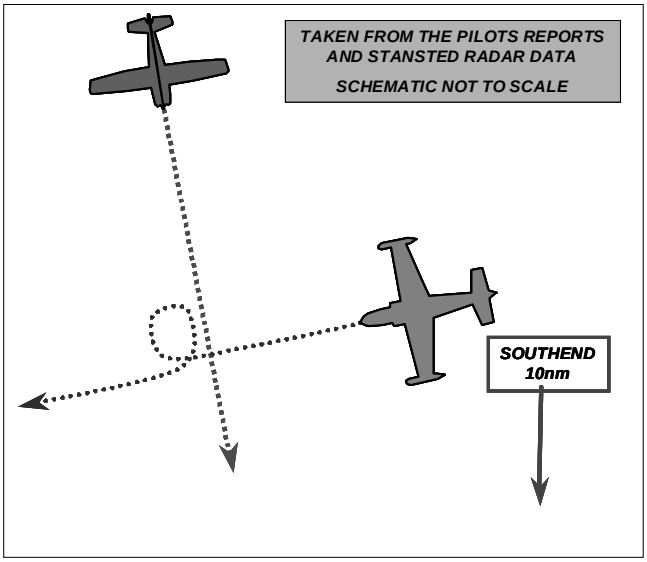
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report in a HPZ.

Degree of Risk: C.

AIRPROX REPORT NO 2009-092

Date/Time:	16 August 0930 (Sunday)	
Position:	5142N 00041E	(10nm N of Southend)
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Cessna 172	Jet Provost Mk3
Operator:	Civ Pte	Civ Pte
Alt/FL:	2900ft	NR
	(QNH 1014)	(N/K)
Weather	VMC CAVOK	
Visibility:	NR	
Reported Separation:		
	NR	Not Seen
Recorded Separation:		
	NR V/<0.5nmH (est)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CESSNA 172 PILOT reports that he was flying a white and burgundy ac with all lights on, on a private flight from Fenland to Le Touquet under VFR. At the time of the incident he was flying at 80kt and 2900ft heading S, out of sun, in receipt of a BS from Southend squawking as directed with Mode C. His co-pilot called him to look out in the 2 o'clock position where he saw an inverted silver and red Jet Provost (JP) at the top of a loop about 500m away and 500ft above pointing directly towards them. The ac continued to complete the loop and passed on their right pointing vertically downwards. They did not take evasive action, as it was not possible to ascertain the pilot's intention during his looping manoeuvre. He thought that there would have been a very high risk of collision had the JP pilot 'rounded off' (rolled through 180°) on the descending part of his manoeuvre. He reported the incident to the Southend APP on the RT.

THE JET PROVOST (JP) MK3 PILOT reports they were flying a practice air display routine for the issue of a display authorisation, with the SSR switched off. They conducted the practice to the NE of Osea Island in the Blackwater estuary [10nm N of Southend airfield]. At the reported time of the incident they had finished their routine [he thought] and were transiting back to North Weald. During the transit back they saw a number of ac, none of which he considered to be in conflict.

[UKAB Note (1): The C172 pilot reported the incident as taking place 10min before that ac are seen to cross on the radar recording (see UKAB Note (2)). The was the incident reported by the C172 pilot was passed to the JP pilot. The incident time in the data block above has been amended and is accurate.]

ATSI reports that the C172 pilot contacted Southend APP at 0924, requesting a BS and reporting en-route from Fenland to Le Touquet, via Southend and Dover, adding that he was 5nm S of Earls Colne at 2400ft; in responding the Controller confirmed that he would provide a BS. Information was subsequently passed about an opposite direction light aircraft. At 0930 the C172 pilot reported *"we've just come very close to a Jet Provost doing aerobatics have you got him on radar"* but the controller replied that the ac was not on his frequency.

There are no ATC causal factors to the Airprox, as the controller did not know the presence of the JP.

'A Basic Service is an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. Basic Service relies on the pilot avoiding other traffic, unaided by controllers. It is essential that a pilot receiving this service remains alert to the fact that, unlike a Traffic Service and a Deconfliction Service, the provider of a Basic Service is not required to monitor the flight. Pilots should not expect any form of traffic information from a controller, as there is no such obligation placed on the controller under a Basic Service outside an ATZ, and the pilot remains responsible for collision avoidance at all times'.

UKAB Note (2): The recording of the Stansted radar shows the incident. At 0928 when the recording starts, the C172 can be seen squawking 7000, 12nm N of Southend tracking about 177° and indicating 2300ft on the QNH of 1015. At that time the JP can be seen as a primary only contact in the C172's 1030 position manoeuvring (possible aerobatics). At 0928:25 the JP adopts a generally Westerly course towards the C172, but it is still manoeuvring. At 0929:30 the JP crosses from L to R about ½nm ahead of the C172, which is indicating 2200ft, but the JP's alt cannot be determined. Although hard to tell with no Mode C data, the JP appears to commence a loop, axis 260°, from a point just under ½nm in the C172' s 1230 position. The C172 continues to close on its Southerly track, passes abeam the JP and then clears the area to the S; meanwhile the JP continues to manoeuvre until just before 0931 when the recording ends. The JP's primary only contact is intermittent during the high-energy manoeuvres. (There may be a small discrepancy between the recorded timings on RT transcript and the Stansted Radar).

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Following some uncertainty, there was discussion regarding the actual time of the incident; the C172 pilot reporting the incident time as 0940 and the JP crew reporting that at *'the reported time of the incident'* they had completed their display practice and were returning to North Weald. However, radar analysis showed the CPA to be 0929:30 and a check of the records shows that Radar Analysis Cell (RAC) correctly passed that time to the JP pilot. The Board concluded therefore, that although both pilots recollection of the time of this incident had been incorrect by a few minutes, the radar analysis on which the above diagram is based was accurate.

The Board noted that the JP pilot had his SSR switched off. Although high rates of climb flown below the base of CAS could trigger TCAS RAs in ac operating within it, this does not explain why he was not displaying 7004, the aerobatics conspicuity code, possibly with Mode C selected off, contrary to the recommendation in the UKAIP. However, in the event, Southend does not have any SSR so it is unlikely that any radar derived TI could have been passed to the C172 pilot regarding the presence or flight profile of the JP. The Board also discussed the suitability of the area selected by the JP crew to conduct their aerobatics practice; the airspace there is very restricted but an ATC Member observed that the point selected was the closest area to North Weald, overland, where the base of CAS rises from 3500ft to 4500ft. That being the case, Members accepted that the selection had been reasonable. Having said that, a GA pilot Member suggested that good practice would have been for the JP pilot to give Southend an information call, passing his area, time and alt of ops when operating close to them.

The radar recording showed that the JP passed through the C172's nose at a distance of about ½nm but, in the absence of a squawk, its relative altitude could not be determined. Further, it could not be determined from the primary returns precisely when the JP commenced its loop, Member's opinions differing; a majority of Members, however, thought that the JP would theoretically have been visible to the C172 pilot and, since it was only observed by his passenger when inverted in their 2 o'clock i.e. after that ac had crossed, the sighting had been late; this was considered significant to the cause of the incident.

When assessing the JP pilot's sighting, Members noted that, despite the crew's incorrect recollection of the timing, they had passed within ½nm of the C172 while conducting aerobatic manoeuvres and had not seen it; they therefore agreed unanimously that this too had been part of the cause. A Military Pilot Member pointed out the importance of lookout when conducting aerobatics, even more so when flying sequences.

Since, by analysis the C172 pilot had apparently not seen the JP until after it had crossed through his nose at an undetermined alt and the JP pilot did not see the C172 throughout his aerobatic sequence, despite the reasonable separation that pertained, Members agreed unanimously that chance had been a significant factor and therefore safety had not been assured in this incident.

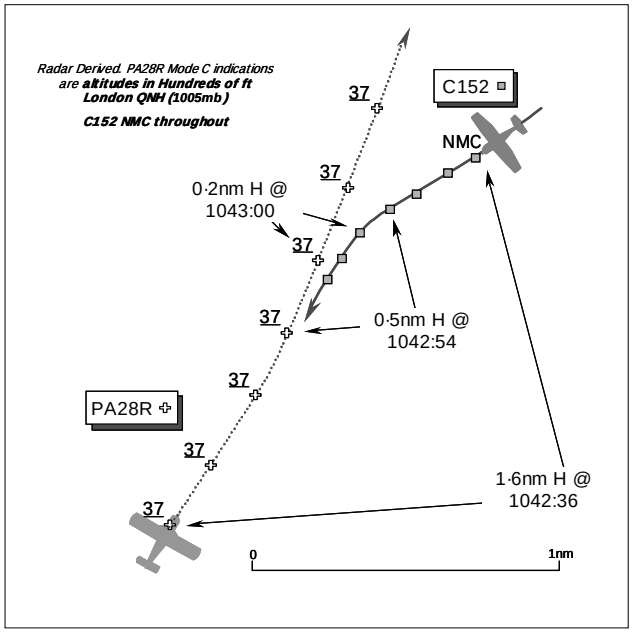
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non sighting by the JP crew and late sighting by the C172 pilot.

Degree of Risk: B.

AIRPROX REPORT NO 2009-093

Date/Time:	24 August 1043	
Position:	5158N 00056E (9½nm S of Wattisham - elev: 283ft)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	C152	PA28
Operator:	Civ Pte	Civ Club
Alt/FL:	3600ft	3400ft
	QNH (1005mb)	QNH (1005mb)
Weather:	VMC CLBC	VMC CAVOK
Visibility:	>10km	30-40km
Reported Separation:		
	200ft V/300m H	300-500ft V/0·25m H
Recorded Separation:		
	<0·2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C152 PILOT reports he was flying VFR in VMC, some 3000ft below and 20km clear of cloud whilst flying within his local area of Colchester, Harwich, and Ipswich. He had originally requested a Traffic Service (TS) with Wattisham APPROACH (APP), but as their radar was unserviceable he was operating under a Basic Service (BS) with APP on 125·8MHz, whilst on the return leg of his flight back to Earls Colne aerodrome. About 1nm S of Raydon disused airfield, heading 230° at 90kt routeing to the N of Colchester, he heard on the RT the pilot of another ac report overhead Abberton Reservoir at an altitude of 3400ft, routeing via the overhead of Crowfield with the intention of landing at Horham. He anticipated there might be a potential conflict and so he recalled APP to report his position, altitude, estimate for the North of Colchester of 1045 and to advise the controller that he would keep looking for the other ac. He then climbed to an altitude of 3600ft (1005mb) to establish a little more potential height separation. Some 3-4min later at a position given as 315 CLN VOR 9·5DME [the Airprox actually occurred about 4½nm N of the position given – some 9½nm S of Wattisham] he spotted a white Piper Arrow in his 11o'clock - about 300m away, about 200ft below his ac. To avoid the other ac [whose registration was given] he initiated an urgent climbing L turn to the South. After the Piper Arrow had passed he resumed his own navigation for Earls Colne. Assessing the Risk as *"medium"*, he reported the Airprox by telephone to Wattisham APP after landing. His ac is coloured white and the red tail-mounted anti-collision beacon was on. SSR was selected on with Mode C [although not evident on the radar recording].

THE PIPER PA28R ARROW PILOT reports that he had departed Lydd bound for Earls Colne for a 'touch and go', before returning to Lydd. He was maintaining a level cruise at 3400ft Wattisham QNH in CAVOK heading 025° at 125kt, whilst in receipt of a BASIC Service from APP on 125·8MHz.

A small single engine aeroplane – possibly a C152 – was spotted <½nm away. From what he remembers the other ac passed him on his right hand side about ¼nm away some 3-500ft above his PA28R, having turned left and climbed. As far as he was concerned it was a fairly late sighting, but he assessed that there was *"no"* risk of a collision and he did not need to take any avoiding action. It was a normal event in Class G airspace whilst VFR. The event was so unremarkable he took little note of the details - a white plane was seen fairly late on that flight, so he's assuming that was the C152, but in his view it was not an Airprox. He added that it was a good job that he hadn't changed course, because if he had it would have been to the R - as per the Rules of the Air – but into conflict.

AIRPROX REPORT No 2009-093

ATSI reports that Wattisham APP was providing both flights with a BS. Traffic levels on the frequency were low at the time of the Airprox. The pilot of the C152 had requested a TS but he had been informed that this was not possible as the radar was out of service.

The C152 pilot contacted Wattisham APP at 1017, reporting *"in the local area 2 miles south of Colchester altitude 3 Thousand 5 Hundred feet"*. The pilot was instructed to squawk A4501, the Wattisham conspicuity code, and informed it would be a BS, which he acknowledged. The controller suggested that if he wanted a TS, he could try Southend. The pilot opted to remain with APP on a BS and was issued with the Wattisham QNH - 1005mb. Some 19min later, the pilot of the P28R established communication with Wattisham APP, reporting *"from Southend on a Navex to Crowfield with an unknown diversion currently overhead Abberton Reservoir 3 Thousand 4 Hundred feet on QNH 1-0-0-5 just requesting a Basic Service"*. The ATS was confirmed, the pilot instructed to squawk A4501 and requested to report turning at Crowfield. Abberton Reservoir is situated about 5nm S of Colchester.

Shortly afterwards, the pilot of the C152 called APP and commented *"…* [C/S] *just south of Raydon 3 Thousand 5 Hundred feet routeing to the north of Colchester we'll look out for the traffic just overhead Abberton Reservoir same altitude"*. The pilot confirmed he was routeing back to Earls Colne, estimating Colchester at 1045. Approximately 5min later the C152 reported N of Colchester at 3500ft, requesting to change frequency to Earls Colne, which was approved.

The next call from the P28R pilot occurred about 1min later, when he reported approaching overhead Crowfield, turning direct to Earls Colne. He subsequently, left the frequency at 1058. Neither pilot made any comment, on the frequency, about the close proximity of any other traffic.

A BS is an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights, which relies on the pilot avoiding other traffic unaided by controllers. It is essential that a pilot receiving this service remains alert to the fact that, unlike a TS and a Deconfliction Service, the provider of a BS is not required to monitor the flight. Pilots should not expect any form of traffic information from a controller, as there is no such obligation placed on the controller under a BS outside an ATZ, and the pilot remains responsible for collision avoidance at all times'.

UKAB Note (1): The Debden Radar recording shows the C152 approaching on a steady SW'ly, squawking the assigned Wattisham conspicuity squawk – A4501 - but with No Mode C displayed at all throughout the encounter. The PA28R is shown squawking the same code maintaining a level cruise at an altitude of 3700ft London QNH (1005mb) on a NNE'ly course at a radar calculated ground speed (RGS) of broadly 150kt during the period of the encounter. The 2 ac closed to a range of 0·5nm at 1042:54 - the C152 at a RGS of broadly 60kt – whilst converging on a position 9½nm S of Wattisham. The reported avoiding action L turn effected by the C152 pilot is shown from this point onwards but with no indicated Mode C the climb is not illustrated. The two ac pass starboard to starboard, in between sweeps, just after 1043:00 when they are shown 0·2nm apart.

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.

It was immediately evident to the Board that both these flights were under a BS from the same ATSU and the ATSI report had made it plain that there was no requirement for ATC to provide TI to the 2 pilots. Thus in the 'see & avoid' environment of Class G airspace, the pilots were responsible for separation from each other's ac. Fortunately, these two flights were operating on the same RT frequency and this enabled the C152 pilot to hear the PA28R pilot's routeing and transit altitude, thereby highlighting to him the potential for a conflict along his own route. Although there was no compunction to do so, the C152 pilot had wisely climbed to 3600ft – some 200ft above the PA28R's altitude of 3400ft - to provide a degree of vertical separation. However, with no indicated Mode C, the radar recording does not show the climb or the minimum vertical separation. Pilot Members agreed that this was a sensible precaution but it was unfortunate that the C152 pilot had not broadcast his intentions on the frequency for the benefit of the PA28R pilot, who potentially might have performed the same manoeuvre thereby negating the reporting pilot's astute actions. Pilot Members also recognised that under the Rules of the Air the PA28R pilot was responsible for giving way to traffic on his R – as was the C152 in this instance. Nevertheless, the 'Rules' can only work if traffic is sighted in sufficient time to take effective action. Here, the PA28R pilot reports that the C152 was spotted less than ½nm away and the other ac passed him on his right hand side having turned

left and climbed. So for his part the PA28R pilot assessed that there was no Risk and that he did not need to take any avoiding action, albeit that it was a fairly late sighting. The GA pilot Member did not consider visual sighting at this range unreasonable and the radar recording reflects that the C152 pilot was initiating his avoiding action climbing L turn at this point. The Members concluded unanimously that this Airprox had resulted from a conflict in Class G airspace resolved by the C152 pilot. Whereas the recorded radar data showed that the PA28R had passed less than 0·2nm away to starboard and was apparently not less than 200ft below the C152 according to the latter pilot's report, it was apparent that both pilots had sighted each other's ac by that stage. Therefore, in the Board's view, the C152 pilot's action had been effective and removed any Risk of a collision.

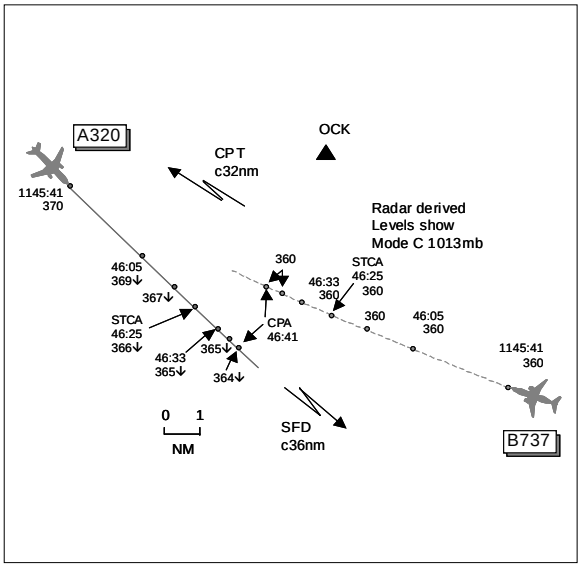
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace resolved by the C152 pilot.

Degree of Risk: C.

AIRPROX REPORT NO 2009-094

Date/Time:	20 Aug 1147	
Position:	5113N 00030W (5nm SSW OCK)	
Airspace:	UIR/UA34	(Class: C)
	Reporting Ac	*Reported Ac*
Type:	B737-800	A320
Operator:	CAT	CAT
Alt/FL:	FL360	↓FL350
Weather:	VMC CLBL	VMC CLAC
Visibility:	50km	>10km
Reported Separation:	Nil V/3nm H	NK V/5nm H
Recorded Separation:	400ft V/2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports enroute to Ireland IFR and in receipt of a RCS from London on 134·460MHz, squawking 0447 with Modes S and C. About 15nm NW SFD heading 330° at 450kt and FL360, an A320 was first seen 2000ft above and descending from R to L. A TCAS TA alert was generated and the A320 was seen to clear through their level on their LHS by 3nm at which time ATC issued a late avoiding action turn of 90°. No RA warning was received and he assessed the risk as moderate to low.

THE A320 PILOT reports enroute to France IFR and in receipt of a RCS from London squawking with Modes S and C. During an enroute descent through FL350, he thought, heading 180° at M0.78 a TCAS TA alert was received. Another flight was instructed to take avoiding action and they saw a B737 pass down their LHS about 5nm away with no significant threat.

THE S1/24 TACTICAL reports being monitored by a safety controller following a period of extended absence. It was a busy lunchtime session including a number of Manchester inbounds from the S and there was a lot of verbal coordination with S2T. The A320 was cruising at FL370 towards SFD and this flight was required to be level at FL310 by SFD. The B737 was heading towards CPT from the SANDY area cruising at FL360. The S1/24T gave the A320 flight instructions to descend to FL360 and STCA alerted the S1/24T to the traffic which led to a loss of

separation. Immediate avoiding action was given to the B737 flight to head 030° and then the A320 flight was told to climb to FL370. Both crews reported they had traffic on TCAS but neither reported an RA warning.

THE S1/24 SAFETY/MONITORING CONTROLLER reports the S1/24T had done a very busy/complex session and it was coming to an end when the controller descended the A320 through the level of the overflying B737. He advised the S1/24T to give avoiding action (as he had no training box due to monitoring), which was done, and he was confident that there was no risk of collision as the A320 had already passed over the top of the B737. Both flights reported visual and TCAS.

THE S1/24 PLANNER reports the Sector had experienced a busy period handling various Manchester TMA inbound ac and an array of overflights and LTMA outbounds. The traffic situation on S1/24 had peaked and sector workload was declining when he became aware of the S1/24 T issuing avoiding action to the B737 and A320. There was a loss of separation of approximately 2-3nm and he informed the LAS.

THE LAS CENTRAL reports the sector was configured with Sectors 1 and 24 bandboxed, Sector 2 on its own and Sectors 25 and 26 bandboxed. TLPD had earlier indicated that S2 was going to be very busy and it had been regulated but the decision had been taken to take the restriction off due to lack of demand. TLPD indications were that all the sectors were busy but not excessively. The S1/24 T was returning to work that day, following an extended period of absence, so was being monitored by an OJTI. He believed the S1/24T held competency but not recency on the Sector having last worked in July. At about 1145 he was standing near to Sector 1/24 position when he noticed STCA activating and saw a loss of separation occurring; S1/24T was heard to issue avoiding action. He made arrangements for the Tactical and Planner controllers to be relieved immediately. The OJTI told him that he considered the Sector at the time to be overloaded and the Planner thought it was extremely busy.

ATSI reports that the S1/24T was being monitored by a safety controller because this was her first day of operation, having just returned to duty after a long period of absence. (This role is described later). The controller described her workload as high, due to the number of ac on the sector and the need to carry out much coordination with S2. However, the traffic levels were beginning to subside at the time of the Airprox. The fact that the 2 sectors were combined was not considered by either the controller concerned or the local ATC investigation, to have been a causal factor.

The A320 crew established communication with S1/24, at 1135, reporting, incorrectly, at FL360 towards MID. The flight was actually maintaining FL370 and the pilot corrected his error shortly afterwards, reporting at the correct level. The controller commented that she had not registered the incorrect level. The ac was routed direct to SFD. For the next 4min the controller was very busy dealing with other traffic in the sector, before the B737 flight made its initial call on the frequency. The pilot reported at FL360, direct to CPT, the transmission being acknowledged by the controller. Due to a direct routeing issued by S2, the ac was further S than its planned route i.e. via SANDY/ BIG. The controller could not recollect if she was aware of its exact position and routeing. She added that, if the sector had not been so busy, she would have moved the fps from the BIG/MAY to the SAM/GWC bay to show any potential conflictions with S'bound traffic via MID e.g. the A320. Consequently, any potential confliction between the subject ac would not have been readily observed from the fps display. The RT recording shows that, again, over the next 4 to 5 minutes the frequency was busy.

At 1145:40, the S1/24T instructed the A320 flight to descend to FL360 i.e. the same level as the B737. This descent instruction was to separate the A320 from other N'bound traffic at FL350 [before descending the flight further to FL310 by SFD]. At the time, the subject ac were 14·3nm apart, on potentially conflicting tracks. The controller then turned her attention to traffic in the NW part of the sector. Approximately 30sec later STCA activated between the subject ac. This was the first time the controller, or the safety controller, became aware of the situation and she immediately issued avoiding action instructions to the B737 flight*"...avoiding action turn right immediately heading Zero Three Zero"*. The pilot replied *"Left heading Zero Three Zero B- and we have the traffic"*. NB He did report a L turn, not R as instructed but as he did have the traffic in sight, he would have been unlikely to turn towards it. The controller then turned her attention to instructing the A320 flight to *"...climb climb Flight Level Three Seven Zero"*. The pilot read back the instruction adding *"we had that traffic as well we did get a TCAS"*. The B737's pilot then stated that he had received a TCAS alert also. The radar recordings show that neither ac reacted to their respective ATC instructions to climb or turn before they had passed each other 2nm apart and separated by 400ft vertically, the A320 descending through FL364 with the B737 in its 8 o'clock level at FL360. The required separation was 5nm horizontally or 1000ft vertically.

The S1/24T said that she had overlooked the presence of the B737, when instructing the A320 to descend to the same level. The positioning of the fps, due to the B737's direct routeing, did not show the confliction. Additionally, the B737's SSR label was overlapping with other returns at the time and also she may have forgotten its presence because she had not communicated with the ac following its initial call some 5min earlier. She added that she was moving some SSR labels at the time, to overcome the amount of label overlapping but this, she believed, did not include the B737's.

The S1/24T had completed her last full shift in December 2008. However, since that time she had undertaken the requisite (at the time) number of 3 'Keep in Touch' (KIT) days. The last of these was in July 2009. On these days, she worked 4hr on a console, 1hr for each position she held a Certificate of Competence. On these occasions, an On the Job Training Instructor (OJTI) had been monitoring her as a safety controller. On the day of the Airprox, the S1/24T had been briefed by her line manager that she would be operating on her own licence, with a safety controller, who would assist her as necessary. This situation would occur for 2 cycles, followed by a check of her competence. The safety controller in position, at the time, had monitored her in that role during her previous 'KIT' days. He had not received a briefing on his responsibilities prior to plugging in with the controller but had agreed with her that she was operating on her licence. As far as he was concerned, he believed he was there to provide confidence not instruction, albeit there was some confusion in his mind about his duty of care as a safety controller. He was not using a training box. During the period immediately leading up to the Airprox he had been distracted by an operational matter with S2. Consequently, he did not register the S1/24T instructing the A320 flight to descend to FL360. He became aware of the situation at the same time as the S1/24T, i.e. when STCA activated. It is understood that the issue of controllers returning to work after a long absence is being reviewed and the results will be publicised in the next addition of the Unit Competence Scheme.

As a result of a number of incidents, including this Airprox, a TOI (059/09) has been issued by LAC, with an effective date 14/09/09, to address the issue of direct routeings to CPT from the SE:

Temporary Operating Instruction (LAC): Westbound VESAN Traffic Sent Direct to CPT – Trial

S Effective: 14/09/09

Introduction

Following a number of losses of separation in the past few weeks ATSI, the CAPC Group and AC Ops have become concerned that the relative position of westbound traffic, sent off route by S2 towards CPT, may not always be correctly assimilated by the S1/24 Controller when climbing or descending southbound traffic through MID. The PFS on the S1/24 may also not be conducive to the correct representation of conflicts, as a CPT strip on the westbound traffic may not show a conflict which actually occurs in the MID area as the strips are in different bays. In addition, controllers may not always spot the westbound traffic (which may be several miles south of its flight planned track) on radar. Therefore, for a trial period of three months, the following procedure is to be adopted. This procedure will become effective on 14th September 2009.

Following the detailed losses of separation on LUS, it has been agreed that ATC Procedures will facilitate a LUS workshop to examine the problems associated with LUS strip bays and strip production.

Procedure

S2 controllers should exercise caution prior to sending Westbound traffic from VESAN direct to CPT at times when there may be a high number of southbound ac. This traffic must be coordinated with S1/24 before reaching SANDY. Traffic must not be sent direct before reaching VESAN.

The S2P must send an electronic point out to S1/24 T & P on any traffic sent direct as above.

The S1/24T should consider moving the PFS on the westbound traffic into the most relevant bay to reflect any changed conflict points.

Additionally, a local recommendation has been made, as a result of the number of incidents, for the LAC Operations Department to determine the best solution for highlighting ac on direct routeings in potential confliction with ac on standard routes.

AIRPROX REPORT No 2009-094

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The NATS Advisor informed Members that the comment by the Safety controller (OJTI) to LAS Central, that he believed the Sector was overloaded, was made immediately after the controller had been relieved from the position. This was at odds with his written report and his post incident debrief where he said that it had been a busy session but it was coming to an end. Analysis had shown that although Sectors 1 and 24 were bandboxed, no traffic was on S24 at the time and the combined Sector had not been overloaded. Although the Safety controller had not received a briefing prior to commencing his time on the Sector, he had monitored the S1/24T previously during her 'KIT' days and had continued to offer her support to boost her confidence but not provide instruction as an OJTI.

[Post Meeting Note: The role of the Safety controller had evolved to accommodate situations such as these, whereby a member of staff had fulfilled the requirements of competency but not recency. Since this event, NATS and the CAA have agreed that this is not an appropriate solution. NATS has issued clarification on this aspect of the UCE scheme such that any controller returning to work in LTC or LAC following long term absence will be regarded as a trainee controller operating under the responsibility of an OJTI.]

The Sector was undoubtedly busy but Members were concerned that there had been opportunities to detect the potential conflict and subsequently take proactive action to avert it. The S1/24T had apparently not been able to detect the confliction from the PFSs, as she had not moved the appropriate strip in the PFS display. The A320 was flying further S than its planned route on a direct track to CPT issued by S2 prior to transfer to S1/24T's frequency. The NATS Advisor stated that during their investigation, the S1/24T had said that she wasn't too busy to move the PFS but that she was out of practice. Members welcomed the NATS introduction of a TOI with respect to direct routeings, the Advisor informing Members that data was still being collected with an action ongoing to produce new procedures. The conflict should also have been apparent from the radar but the B737's SSR label was apparently overlapping other radar returns and the S1/24T had been moving SSR labels to reduce the screen clutter immediately prior to the incident. It was also noteworthy that the safety controller was assisting the S2 with another operational matter when the S1/24T controller descended the A320 into conflict with the B737, which had caused the Airprox.

Turning to risk, the Board noted that S1/24T only became aware of the confliction as STCA activated, the A320 having already crossed through the B737's 12 o'clock with the two ac about to pass port to port. The S1/24T issued an avoiding action R turn to the B737 flight and then climb instruction to the A320 flight. The B737 crew were already aware of the A320's presence from their TCAS display and visually acquired the ac well above and descending whilst crossing obliquely from R to L. A TCAS TA was generated and they watched it pass clear on their LHS. The A320 crew also received a TA alert and saw the B737 passing well clear down their LHS. The radar recording revealed the A320 commencing a descent after crossing through the B737's projected track and passing 2nm clear with vertical separation of 400ft with tracks diverging. This geometry when combined with the visual sightings were enough to allow the Board to conclude that no risk of collision existed during this encounter.

Members noted that the use of incorrect phraseology by aircrew about TCAS traffic alerts could lead ATCOs to believe that a flight was reacting to an RA. SOPs only require aircrew to announce an RA warning; the TA is the heads-up alert to crews of a potential confliction and a warning to be prepared for a possible RA shortly thereafter. Any additional non-essential RT could block the frequency at a crucial time when avoiding action may be issued by ATC. However, pilot Members added that although TA warnings are rare whilst flying within CAS, should crews become aware of conflicting or unusually proximate traffic, they should not hesitate to inform ATC of its presence.

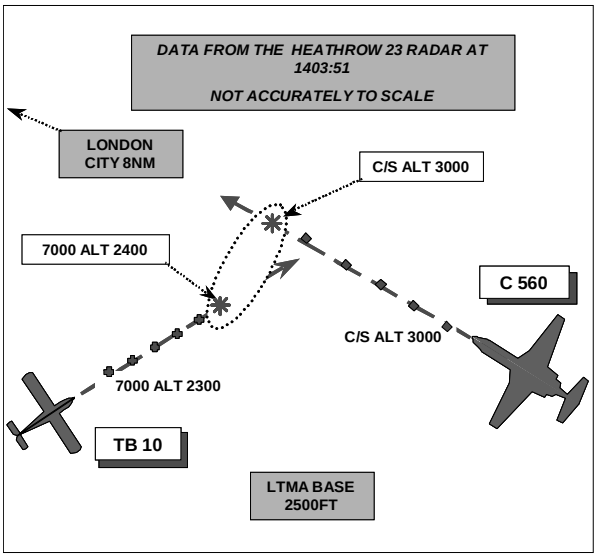
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LAC S1/24T controller descended the A320 into conflict with the B737.

Degree of Risk: C.

AIRPROX REPORT NO 2009-095

Date/Time:	27 August 1404	
Position:	5125N 00010E	(8nm NE Biggin Hill)
Airspace:	London CTA/FIR	(Class: A/G)
	Reporting Ac	*Reported Ac*
Type:	C560 XLS	Socata TB10
Operator:	Civ Comm	Civ Pte
Alt/FL:	3000ft	2300ft
	(QNH 1013mb)	(QNH 1013mb)
Weather	IMC (CLBC)	VMC
Visibility:	>10km	>10km
Reported Separation:		
	NR	NR
Recorded Separation:		
	600ft V/0.5nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C560 PILOT provided a brief report stating that while flying an IFR executive flight inbound Biggin Hill squawking as directed with Mode C. Having broken cloud but still technically IMC, at about 8DME at 3000ft QNH in the final descent and in receipt of a RCS from Thames Radar he received a TCAS RA Climb, which he followed, on traffic about 500ft below him. He did not see [see ATSI report/transcript] the other ac or assess the risk but reported the incident to Thames Radar.

THE SOCATA TB10 PILOT reports flying a VFR private flight from Redhill to Southend with one pilot and one passenger (non-pilot) on board in a blue and white ac with strobes selected on. He was squawking 7000 with Mode C and S and was in contact with Biggin Hill APP. He departed RW18 to the E from Redhill at 1354 and his initial alt was below 1500ft in order to remain below Gatwick airspace. Once clear of Gatwick he climbed to 2300ft QNH (to remain below the London TMA). The route was S and E of Biggin Hill to remain outside their ATZ. The track was then to the N (E of Swanley) to the Thames and then after making one orbit (E of the Dartford crossing and S of the Thames) was direct to Southend.

Shortly after having cleared the Redhill ATZ he changed frequency to Biggin APR but by the time he managed to contact them he had passed their ATZ so no flight service was given. Shortly after that frequency was changed again to Southend APR.

He saw only one ac in the Biggin area and that was a light single piston ac.

ATSI reports that at 1358:35, Thames Radar instructed the C560 to leave DET on a radar heading of 295°. The flight was descending to 4000ft and being vectored from DET for an ILS approach to RW21 at Biggin Hill. Thames Radar issued further descent to 3000ft on the Biggin QNH 1013mb at 1401:29 since by then the ac was in an area of the LTMA where the base of CAS is 2500ft amsl.

MATS Part 1, Section 1 Chapter 6 Page 4 Paragraph 9, 'Use of Levels by Controllers' states, in part:

'*Except when ac are leaving controlled airspace by descent, controllers should not normally allocate a level to an ac which provides less than 500 feet vertical separation above the base of a control area or airway. This will provide some vertical separation from ac operating beneath the base of controlled airspace'*

After a heading change to 305° and a speed reduction to 180kts, at 1403:19 the C560 was alerted to observed unknown traffic (the subject TB10) *"…there is traffic er below you believed to be outside controlled airspace in er eleven o'clock range two miles heading north eastbound indicating two thousand three hundred feet unverified",* the pilot responding immediately *"Yeah we have him in sight (callsign)".* Within 15sec the pilot announced, "

(callsign) we have a TCAS er conflict", the controller responding with *"Roger advise me when back under my control".* At 1404:07, the C560 pilot reported, *" (callsign) we're now descending altitude 3000ft it was a TCAS climb",* which was acknowledged by the controller.

An examination of the radar recording shows that when first alerted to the traffic the C560 was indicating level at 3000ft, with the unknown ac converging in its eleven o'clock from a range of 2.7nm at 2300ft Mode C and squawking 7000. The unknown's Mode C briefly indicates 2400ft when it reached the C560's 09:30 position. At the time of the next sweep, the C560 pilot had announced the *"TCAS conflict"* and the unknown was passing 0.5nm to the S, once more indicating 2300ft. Thereafter the tracks diverge while the C560 is responding to the TCAS climb, reaching 3400ft before returning to its cleared alt of 3000ft.

The RTF recording reveals that the TB10 established communications with Biggin Hill APR at 1359:38, the pilot reporting en-route from Redhill to Southend at 2400ft on the QNH 1013mb and requested to route overhead. The controller instructed the flight to report overhead *'not below 2000ft'* under a BS. Ultimately the ac did not pass overhead, but routed to the S and E of Biggin Hill. At 1401:55,the flight was advised to QSY to Southend.

UKAB Note (1): An analysis of the Heathrow 23cm and Debden Radars confirmed the analysis in the ATSI report above and indicated a CPA of 600ft V and 0.5nm H.

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.

Although both ac were operating legitimately the C560 in Class A CAS and the TB10 in the Class G below the CTA, Members considered the latter's routing through the Biggin Hill FAT ill-advised, particularly as he was based close to Biggin Hill and would most likely have been familiar with its procedures and traffic intensity.

It was unclear to Members whether the C560 had seen the TB10 visually (as he reported on the RT but contrary to the written report he provided) or whether he had only seen it only as a TCAS contact; Members agreed that the latter had been the most likely. That being the case, although neither pilot had seen the other ac, probably due to the cloud structure, the radar data showed that the ac were separated by 600ft, were legitimately in their respective classes of airspace and TCAS had functioned as expected in the circumstances. There had, therefore, been no risk of collision.

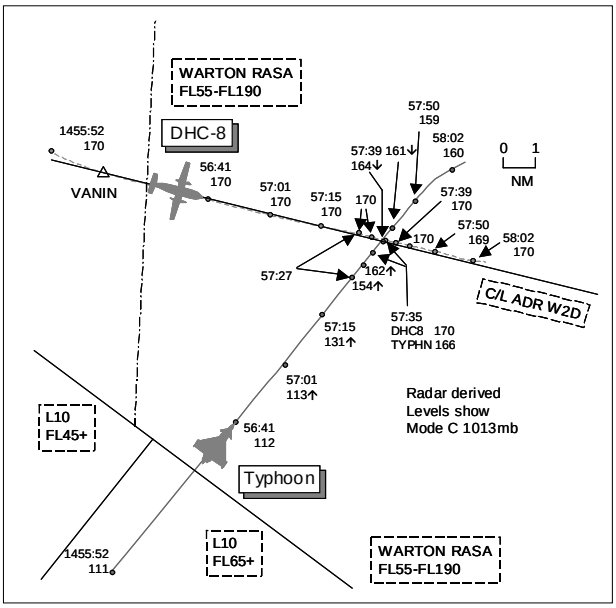
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report (TCAS).

Degree of Risk: C.

AIRPROX REPORT NO 2009-096

Date/Time:	27 Aug 1458	
Position:	5357N 00348W (30nm NW Blackpool)	
Airspace:	ADR W2D/FIR	(Class: F/G)
	Reporting Ac	*Reported Ac*
Type:	DHC-8	Typhoon
Operator:	CAT	MOD FTR
Alt/FL:	FL170	↑FL160
Weather:	VMC CLAC	VMC CLAC
Visibility:	40km	>10km
Reported Separation:	Nil V/Nil H	500ft V/1-2nm H
Recorded Separation:	600ft V/0·4nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DHC-8 PILOT reports enroute to Leeds IFR on ADR W2D at FL170 and in receipt of a PS and TS from MACC squawking 1405 with Modes S and C. They were given TI on a military fast jet climbing to 1000ft below their level in their 2 o'clock range 10nm, which was coordinated. Heading 100° at 250kt they 'saw' other traffic matching the location on TCAS at 5900ft below. The visibility was 40km but owing to a layer of cloud some 2500ft below they were unable to establish visual contact. The traffic began to climb at a rapid rate as ATC notified them again of its position. The ac changed from 'other' to 'proximate' and then a TA alert was received when it was 1300ft below. It went through 1000ft below as they were replying to ATC so they were able to call out the separation "700, 600, 500, 400ft". At this point it was in their 3 o'clock at approximately 0·5nm and closing rapidly as an RA 'descend' was annunciated and actioned immediately. The lateral separation on the TCAS display was negligible with the other traffic indicating in their position and 00 difference in altitude. The RA lasted <2sec however, there was no 'clear of conflict' call so after the vertical target bars of the RA disappeared they undertook a smooth recovery from FL167 back to FL170. By now the other ac was displayed 1000ft below and tracking away in their 8 o'clock. ATC were informed of their TCAS descent and recovery to FL170. At no time did they have the other ac visual. He assessed the risk as high.

THE TYPHOON PILOT reports flying a local sortie from Warton and in receipt of a TS from Warton on 341·775MHz squawking 3677 with Mode C. This Airprox occurred following a poorly executed level-off from a rapid (15° flightpath) climb from FL110 to FL160. Heading 040° at 450kt GS the ac ballooned through FL160 to FL165 before rapidly regaining the cleared level; the total time above FL160 was 10sec. Radar contact with the other ac was established at >15nm during transit and this track was monitored during the climb. It was backed up with a radio call at 8nm split range from ATC with a 'tally' established during the climb. The other ac, a DHC-8, passed above and to the R with separation at the CPA of 500ft and 1-2nm. He assessed the risk as low.

ATSI reports that the DHC-8 was routeing from Belfast City to Leeds, via ADR W2D, at FL170. The MACC WALSY and IOM Sectors were combined, the traffic loading being described as moderate.

On first contact with the sector, at 1452, the pilot was informed *"it is a Procedural and Traffic Service on Whiskey Two Delta"*. The pilot read back *"Traffic Service Whiskey Two Delta"*. At the time, the ac was over the IOM, routeing to VANIN. Approximately 2min later, at 1454:44, Warton ATC telephoned the WALSY Planner, to coordinate the subject Typhoon against the DHC-8. Warton advised the Planner about traffic on a Warton squawk (3677), which was S of the DHC-8. The Planner confirmed contact and then Warton asked if the Typhoon could be climbed 1000ft below the DHC-8 to FL160 and then above it when 5nm clear. The Planner agreed, reading back the coordination as stated and Warton confirmed the flight was coordinated. The radar timed at 1454:44

shows the Typhoon, at FL110 and tracking NE, 22nm S of the DHC-8. At 1455:50, information was issued to the DHC-8 *"...traffic information currently in your half past one range of ten miles crossing from right to left will be climbing to a thousand feet below your level coordinated military fast jet"*. The pilot responded *"Okay got????? on TCAS."* [UKAB Note (1): Separation measured at 13nm.]

At 1457:25, the WALSY Tactical Controller advised the pilot of the DHC-8 *"...if you haven't seen that traffic it's in your three o'clock range of about a mile and a half two thousand feet below you"*. The radar timed at 1457:27 shows the two ac on conflicting tracks, 1·3nm apart. The Typhoon is passing FL154. There was no reason for the MACC Controller to believe that the Typhoon was going to climb above FL160, the level coordinated. The Typhoon was not equipped with Mode S. The pilot of the DHC-8 replied to the TI transmission *"...yeah he's now a thousand below eight hundred below six hundred below – five hundred below"*. There were then part simultaneous transmissions. The controller initially acknowledged the call, continuing *"avoiding action then turn right to avoid he seems to have passed just below you"*. The pilot replied *"TCAS RA descending"*.

In the period leading up to the Airprox, Warton was providing the Typhoon with a Radar Service as it crossed airways to the N of Anglesey at FL110. The pilot requested to climb to FL180, when clear of the airways and then to descend into low level in the Lakes. At 1456:40, after the coordination had been completed between Warton and the WALSY Sector, the pilot of the Typhoon was informed *"...left controlled airspace it's a Traffic Service you're cleared in a block surface to One Six Zero initially traffic north of you eight miles One Seven Zero on the Advisory Route"*. The pilot replied *"Copied climbing to One????? Zero"*. The controller confirmed with the pilot that he was climbing to FL160. The pilot reported level at FL160 at 1457:37. The radar recording, timed at 1457:35, shows the Typhoon at FL166, 0·5nm SW of the DHC-8. It was at this time that the WALSY Controller issued the avoiding action turn to the DHC-8. In the event, the Typhoon, at FL164, passed 0·4nm behind and 600ft below the DHC-8 on the next radar sweep at 1457:39, the CPA. The DHC-8 was still maintaining FL170, though shortly afterwards it descended in response to its TCAS RA. [UKAB Note (2): At 1457:50 the St Annes recorded radar shows the DHC-8 descending 100ft to FL169 which is maintained for 8sec before returning to FL170 at 1458:02.]

The pilot of the DHC-8 subsequently reported on the frequency that he did not sight the Typhoon. He added that he had descended about 300ft in response to the RA. The pilot of the Typhoon reported to Warton *"it was a flawed excursion up to plus four hundred feet till it got to Sixteen Four straight down to Sixteen"*.

As a result of this Airprox, the use of W2D was suspended during the hours of Warton Operation, pending a longer-term review of the utilisation and activities. A NOTAM (B1590/09) was issued, effective 2359 on 8/09/09: 'ADVISORY ROUTE W2D IS NOT AVBL FOR FLT PLANNING BTN IOM AND FIWUD BTN 1000-1800 (WINTER) 0900-1700 (SUMMER) MON-FRI'.

The UK AIP, Page ENR 3-1-2-5, describes ADR W2D. The levels of the Class F route, between IOM-VANIN-MORBY-FIWUD, are a base of FL55 and an upper limit of FL185.

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'*.

The MATS Part 1, Section 1, Paragraph 4, defines a Traffic Service: *'A Traffic Service is a surveillance based ATS, where in addition to the provisions of a Basic Service, the controller provides specific surveillance derived traffic information to assist the pilot in avoiding other traffic. Controllers may provide headings and/or levels for the purposes of positioning and/or sequencing; however, the controller is not required to achieve deconfliction minima, and the avoidance of other traffic is ultimately the pilot's responsibility'*.

MOD FLIGHT TEST REGULATOR (DE&S) comments that, in a frank and honest report, the pilot of the Typhoon admits that this was a poorly executed level-off which negated the correctly applied service by Warton Radar and the associated coordination agreement. As a result the Typhoon pilot broke that coordination and flew sufficiently close to the DHC-8 to cause a TCAS RA. The Head of the MFTR has spoken to the pilot concerned during which the seriousness of this issue was re-iterated. Consequently, an assurance has been obtained that procedures will be thoroughly reviewed to ensure that, as far as is practical, this situation does not arise again.

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 the reports submitted above. It was clear that following Warton APR's coordination with MACC WALSY/IOM and subsequent acknowledgement by the Typhoon pilot, neither controller had reason to doubt that the Typhoon would not level at FL160. The Typhoon pilot had established radar then visual contact with the DHC-8 but, whilst avoiding it, he had climbed above his assigned and coordinated level and into conflict with the DHC-8, which had caused the Airprox.

Understandably the DHC-8 crew were concerned when, having received TI on the Typhoon from MACC, they were unable to acquire it visually and TCAS indicated a close call with an RA 'descent' command, which they actioned. MACC had issued avoiding action, as the RA was being followed, but by this time the ac were passing and the avoiding action would have been ineffective. Pilot Members thought that the extended previous transmission made by the DHC-8 crew (counting down the height difference) had been inappropriate as it had blocked the frequency unnecessarily and had denied MACC the chance to issue earlier avoiding action. That said, the Typhoon pilot had kept the DHC-8 in sight and was taking visual separation on it when he climbed through FL160. These actions taken by the Typhoon pilot allowed the Board to conclude that any risk of collision had been effectively removed during this encounter.

Although MACC and Warton had subsequently agreed to suspend use of W2D during Warton operating hour, the DAP Advisor added that the long-term review of Class F airspace is still ongoing, with a likely completion by Spring 2011.

PART C: ASSESSMENT OF CAUSE AND RISK

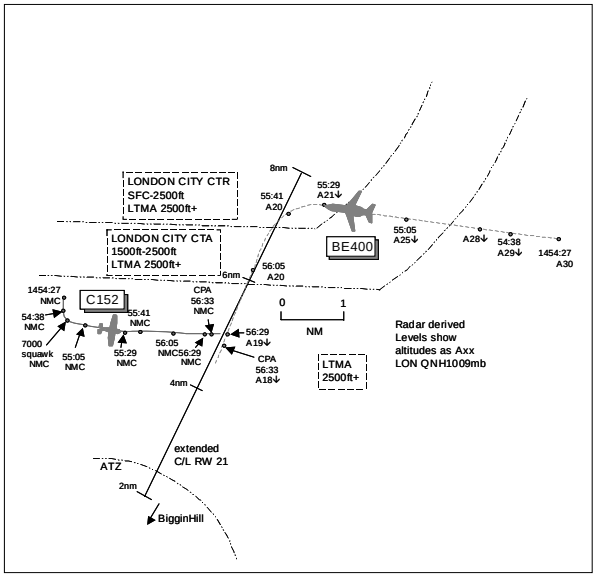
Cause: The Typhoon pilot climbed above his assigned and coordinated level into conflict with the DHC-8.

Degree of Risk: C.

AIRPROX REPORT No 2009-097

AIRPROX REPORT NO 2009-097

Date/Time:	31 Aug 1457	
Position:	5124N 00005E (5nm NNE Biggin Hill - elev 599ft)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	BE400A	C152
Operator:	Civ Comm	Civ Trg
Alt/FL:	1800ft↓ (QNH)	2000ft (QNH 1010mb)
Weather:	VMC NR	VMC CLOC
Visibility:	>10km	30km
Reported Separation:	Nil V/200m H	Nil V/75m H
Recorded Separation:	200ft V/0·3nm H	



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BE400A PILOT reports inbound to Biggin Hill IFR and in receipt of a RCS from Thames on 132·7MHz squawking with Modes S and C. The visibility was >10km in VMC and the ac was coloured white with dark red, black and silver stripes; no lighting was mentioned but TCAS was fitted. Whilst under radar control they were cleared for an ILS to RW21 at Biggin under a speed restriction of 180kt. Shortly before GP intercept at 2000ft, Thames advised them of C152 traffic 1nm crossing R to L (heading E). They saw nothing on TCAS and after a few seconds acquired the ac visually. Since the TI was so detailed they assumed the C152 was under Thames control but this was not the case. The C152 made an evasive manoeuvre (L towards the N), he thought, where the lateral distance was estimated to be 200m with nil vertical separation. As they were at GP intercept they continued the approach, descending through 1800ft away from the much slower C152, assessing the risk as high.

After speaking to the Biggin Hill ADC he found out that the C152 was not in RT contact with any controller. Also the LOC/GP intercept and first portion of the ILS approach is conducted in uncontrolled Class G airspace before entering the 2·5nm radius ATZ; normally no warning is given by Thames Radar on leaving CAS. Apparently Thames Radar had not spotted the confliction and the Biggin ADC had relayed the traffic conflict via telephone after visually acquiring the C152 through binoculars. As the TMA starts at 2400ft [actually 2500ft], he wondered why the ILS is not intercepted from 2400ft so as to provide a truly controlled area. He felt that this incident illustrates the false sense of security when operating under a perceived RCS with Thames Radar. The gap between leaving TMA and reaching the ATZ boundary is of such magnitude that the event is very likely to re-occur in the near future.

THE C152 PILOT reports flying a local dual training sortie from Biggin VFR and listening out with Biggin Approach on 129·4MHZ squawking 7000 with NMC. The visibility was 30km in VMC and the ac was coloured white with red/ grey stripes; the anti-collision, nav and landing lights were all switched on. They had previously been under a RCS squawking 7050 from Thames Radar on 132·7MHz in the City CTR/CTA heading 170° at 90kt at 2000ft before leaving CAS to the N of BIG VOR. When 5nm N of BIG VOR, he turned towards Swanley [E'ly track] remaining 5nm distant from BIG and Thames told him to 'squawk 7000 and freecall Biggin Approach on 129·4'. He changed his squawk and selected frequency 129·4MHz; however, his call to Biggin was delayed as his trial lesson student informed him that she felt nauseous. He became distracted as he opened the student's window and then found a sick bag. Shortly afterwards he saw a white coloured twin engine 'bizjet' with low, swept wings very late through the windscreen at the same height about 75m away as it descended on long final for RW21; previously it was obscured by his ac's L wing. Immediately he closed the throttle, more out of surprise than as avoiding action because by the time he had seen the ac it was too late. He realised that during the time from when he turned L

until reaching the extended C/L (about 1min 40sec) he should have called on the frequency before crossing through the C/L. He continued to monitor 129.4MHz and waited to hear if anything was mentioned on the frequency; however, he decided not to discuss it over the radio but to talk to Tower after landing. After completing his GH part of the exercise near Brands Hatch, he routed towards Sevenoaks and then heard Biggin Approach asking another pilot to identify his ac. He told Approach that it would not be necessary and he identified himself to the controller. After this he joined the cct and landed before telephoning the Tower. He assessed the risk as high.

He listed lessons that he had learnt from the incident: -

1. Even outside CAS, always obtain some sort of service when crossing an extended C/L – he already knew this but it had been reinforced by this encounter.

2. Do not get distracted by student.

3. When Biggin Hill are operating on 2 frequencies (Approach and Tower not bandboxed), ILS traffic is handed direct to Tower from Thames Radar so he would not hear any calls from the flight on the Approach frequency.

THE BIGGIN HILL APP reports he received a 10nm check from Thames Radar on the BE400, which was being vectored by them for an ILS approach to RW21. As he looked up the approach he saw what seemed to be a C152 crossing the FAT from W to E and this was confirmed by checking the ATM, which showed a radar return at about 4nm N of Biggin tracking E. He telephoned Thames Radar and passed them TI giving type, direction of flight and approximate altitude; neither the BE400 nor the C152 were on his frequency at the time. The BE400 was transferred by Thames Radar to the Biggin Tower frequency 134·8MHz (as per MATS Pt2) at a range of about 2-3nm. The C152 pilot eventually called inbound VFR from the Sevenoaks area some 15min later. On landing the pilot of the BE400 advised that he would be filing an Airprox and these intentions were passed on to Thames Radar.

The Biggin METAR shows EGKB 311450 20016KT CAVOK 24/06 Q1010=

THE THAMES RADAR CONTROLLER reports mentoring a trainee and he assessed the workload as medium to high owing to a RW change occurring at London/City. He had just intervened on behalf of his trainee as the complexity of the situation was rising. The C152 was on a local trip from Biggin and had been transiting the London/City CTR on a VFR clearance; its pilot had reported that after overflying the 02 arena he would be routeing direct to Biggin. On leaving the City CTA the C152 was seen tracking direct to Biggin, positioned 4nm W of the RW21 FAT and not in confliction with the BE400, which was on R base [actually L base] for the ILS RW21. He told the C152 flight to squawk 7000 and freecall Biggin Approach on 129·4MHz. As the BE400 was establishing on final approach a 7000 squawk pointed out to him in the vicinity of it. He immediately passed TI to the BE400 crew and realised that the 7000 squawk was probably the C152 which had not routed direct to Biggin but had turned E instead without informing him or Biggin Approach. After receiving TI the BE400 crew reported they were visual with the unknown traffic and he transferred the flight to Biggin Tower. On landing the BE400 crew declared they would be filing an Airprox.

ATSI reports that following departure from Biggin Hill on a local flight VFR, the C152 flight established communications with Thames Radar at 1437:45. The pilot reported passing Swanley enroute to the QE2 Bridge and requested to route along the Thames (W'bound) to the O2 Arena and then to turn S. This route would take the ac within the London City CTA and CTR, Class D airspace. The Thames Radar controller (TMSR) instructed the flight to squawk 7050 and issued the London QNH 1009mb. No level of service was agreed and the ac was not transponding Mode C level reporting. At 1439:40, the C152 was cleared to enter London City's airspace, on the requested route, VFR not above 2000ft. Two minutes later as the ac entered the London City CTA, the flight was placed under a RCS.

At 1449:00, the BE400 flight made its first call to Thames Radar, reporting descending to 4000ft on the radar heading of 320°. The LTC MATS Part 2, Thames Radar, Page THS-33, Paragraph 7.7 Biggin Hill Airport Inbound Procedures, Via Airways states *'The flight will be transferred from TC to Thames in accordance with the Silent Handover Procedure and will then be provided with a radar control service whilst inside CAS and a Deconfliction or Traffic Service as appropriate when outside CAS. The flight should be kept inside CAS for as long as*

practicable, and should not be descended below CAS into confliction with any observed radar contacts unless the pilot reports he has the traffic in sight and can maintain visual separation from it'.

The TMSR informed the BE400 crew that vectors would be provided to an ILS approach at Biggin Hill, and placed it on a new heading of 295°. Biggin Hill Airport is situated in Class G airspace, below the LTMA, Class A airspace. It has no ATS Surveillance capability. At this point, the radar recording shows the BE400 is about 28 miles ESE of the Airport. At 1450:00, the C152 reported turning S from the O2 Arena, in accordance with its clearance to leave London City's CAS to the S.

The BE400 flight was subsequently cleared to 3000ft on the Biggin QNH 1010mb, followed later by a heading change onto 270° for base-leg RW21. The ac would shortly enter London City's Class D airspace and at 1454:18, it was cleared to 2000ft, with a speed reduction to 180kt or less.

At 1454:27, the TMSR transmitted to the C152 flight *" (C152 c/s) you've left the zone now squawk seven thousand free call Biggin one two nine decimal four"* (Biggin Approach). At this point, the C152 appears to be on a direct track to Biggin Hill. Meanwhile the TMSR telephoned the Biggin Approach controller with a 10 mile range check on the BE400, as required by local procedures. The Thames Radar MATS Part 2 also states at THS-34 VFR Flights *"It is not necessary to prenote VFR traffic to Biggin Hill Approach Control. Traffic will be transferred to Biggin Hill Approach at least 10nm away from Biggin Hill if outside regulated airspace, or as soon as possible if leaving regulated airspace. VFR traffic from the north-west must be coordinated with Biggin Approach whilst any ac is making an instrument approach to Biggin."* Clearly, the C152 was transferred promptly by the TMSR; however, it was not coordinated with Biggin Approach (Note: While there was no requirement for the C152 to be co-ordinated, it would, nevertheless, seem prudent to have done so).

In his written report, the Biggin Approach Controller states that after receiving the 10 mile check from Thames Radar, he looked up the approach and *"I saw, what seemed to be, a C152 crossing the final approach from west to east. This was confirmed by checking the ATM which showed a return at about 4nm north of EGKB tracking east. I immediately telephoned Thames Radar and passed traffic information……".* During the call, timed at 1455:40, the Approach Controller asked if the traffic 4nm N of Biggin was 'working' them, adding that it looked like a Cessna 152. The recipient (not the TMSR) replied that the traffic was not known, but would pass the information to the radar controller. Meanwhile the BE400 had been issued a closing heading for the ILS LOC, with instructions to descend on the GP, when established on the LOC.

At 1456:04, following the information from Biggin Hill, the TMSR issued TI to the BE400 *"(BE400 c/s) there's traffic right one o'clock two miles crossing right to left is believed to be a Cessna one five two".* The radar recording shows the subject C152, with no Mode C, tracking E'bound in the BE400's 1:30 position at 1·7nm. The BE400 is now on the final approach C/L at 2000ft Mode C and will shortly leave CAS of the London City CTA. Initially, the BE400 pilot did not respond but then replied *"Yeah we copy we have traffic in sight (BE400 c/s)".* By 1456:29, the BE400 is about 1nm outside CAS descending through altitude 1900ft QNH with the C152 is now in its 0230 position range 0·4nm still showing NMC. The next sweep at 1456:33, the CPA, shows the BE400 indicating 1800ft Mode C and the C152 is in its 4 o'clock at 0·3nm. The latter subsequently passes astern of the BE400 by 0·5nm. No further mention was made about encounter by either the BE400 pilot or the TMSR. At 1457, the BE400 was transferred to Biggin Tower, 134.8MHz. It was not until 1508:40, when the C152 called in the vicinity of Sevenoaks. The pilot had overheard enquiries by Approach Control about traffic crossing through the final approach track and said *"……I didn't see er the Citation until a bit late on".*

While it is recognised the TMSR was prioritising his tasks by first issuing TI to the BE400 on the 'unknown' traffic, he did not notify a change of service to the pilot when leaving CAS. Achieving this is particularly important in these circumstances where the pilot may not be aware that the ac will enter Class G airspace at 6nm from touchdown during the ILS approach.

Since this incident, LTC has issued 1 Temporary Operating Instruction (TOI) and 3 Supplementary Instructions (SI) to both re-enforce current procedures and address some of the issues raised during the investigation. They are: -

TOI 126/09, outlines an LTC initiative that the Biggin Hill approach plates are amended to make the classification of airspace in the vicinity more apparent to pilots. This is currently being processed. The TOI also emphasises that Thames Radar shall ensure all IFR inbound flights are notified when they are leaving CAS, the radar service is changed upon leaving and the radar service is terminated upon transfer to Biggin Tower.

SI 002/10, announces the installation of 2 direct telephone lines between LTC Thames and Biggin Hill, one of which is a priority line for calls of an urgent operational nature.

SI 007/10, introduces a new procedure for TC Thames and TC SVFR and states *'In the event of an ac leaving the London City Control Zone to the south, the pilot should be requested to remain west of the Biggin Hill runway 21 final approach track if traffic is being vectored by TC Thames for a runway 21 instrument approach. The pilot should be given the reason for the request.'*

SI 12/10 (Effective from 01/02/2010) is an amendment to THS-34 VFR Flights (above), in particular, the final paragraph, which now states '*VFR traffic in communication with TC Thames/TC SVFR approaching from a direction ranging between north-west through to north-east of Biggin Hill must be coordinated with Biggin Hill Approach whilst any ac is making an instrument approach to runway 21.'*

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.

A controller Member familiar with TMSR informed the Board that there were important background issues associated with this incident. The airspace and integration of traffic patterns are complicated by the requirement to separate Biggin Hill inbound IFR traffic from Heathrow and London City traffic while remaining in CAS until it becomes necessary to begin an approach. Therefore the profile followed by the BE400 was quite normal. However, irrespective of whether the Biggin ILS was intercepted at 2500ft or 2000ft, flights would always leave CAS as they crossed the London City CTA boundary into Class G airspace at 6nm from touchdown. The protocol of changing ATS from RCS to an ATSOCAS was good in principle, however, in reality once an ac was established on the ILS the service was terminated and the flight transferred to Biggin Tower. Thereafter the onus was placed firmly on pilots, even though flying IFR on an instrument approach, to maintain their own separation from other traffic through 'see and avoid'. This can lead to a situation where the IFR traffic on the ILS is obliged to 'give way' to traffic crossing from R to L, under the Rules of the Air Regulation. Members considered that the lack of a formal declaration that the radar service had been terminated could have led the BE400 pilot to consider that he was still under a RCS.

The controller Member also opined that 'best practice' at the time of the incident, now mandated in SI 007/10, would have been for the TMSR to remind the C152 pilot to remain clear of the FAT but on this occasion the trainee/ mentor team did not do so. TMSR could have passed generic TI to the C152 pilot about the BE400 but TMSR believed the C152 pilot had reported his routeing from the O2 arena direct to BIG, a track that is W of the FAT; however, the RT transcript reveals the C152 pilot reporting routeing S'bound from the O2 before the flight was transferred to Biggin Hill Approach as it exited the London City CTA. The C152 pilot had then become distracted by his student and had turned E'bound, flying through the FAT without communicating with an ATSU, which Members agreed had been a contributory factor to the incident. The C152 pilot's track and altitude had resulted in the ac crossing the FAT at the same level as traffic intercepting the ILS GP. Pilots planning to cross a published approach track, as depicted by an arrow 'feather' on 1:500 000 and 1:250 000 topographical charts, should chose a range/height combination which does not coincide with the instrument approach profile.

Another controller Member noted that the subject ac were both on the TMSR frequency at the same time so that the C152 pilot could have improved his SA about the inbound BE400 inbound from the exchange of transmissions between the controller and the BE400 pilot. Members commended the good 'controllership' exhibited by Biggin Approach when he contacted TMSR after he saw the C152 in potential confliction. Some Members thought that, notwithstanding his misunderstanding of the C152 pilot's intentions, the TMSR controller should have seen that the C152 had turned E'ly when he vectored the BE400 towards the ILS LOC. One Member believed that the cause of the Airprox was that the TMSR controller had vectored the BE400 into conflict with the C152. However, this was not the majority view. Eventually the BE400 crew were given TI on the C152 whilst they were still within CAS, which led them to see it. However, without TMSR informing the BE400 pilot when the ATS changed or was terminated, Members understood the BE400 crew's uncertainty over their responsibilities regarding other traffic; the BE400 crew were required to 'give way' and elected to descend on the ILS GP to increase separation. For his part, even though the C152 pilot did not call Biggin Approach for a service and so was unaware of the BE400's presence, he had a responsibility for maintaining separation from all traffic through 'see and avoid'. The BE400 should have been within the C152 pilot's field of view for some time but he only saw it late as it passed in front.

Although recognising that the BE400 may have been obscured to the C152 pilot by his ac's L wing, Members agreed this impediment to maintaining a good lookout should have been mitigated by others means, primarily by moving the ac (lifting the wing) or moving his head. Taking all of these factors into account, the Members agreed that the cause of this Airprox had been that, whilst completing an ILS approach, the BE400 flew into conflict with the C152, whose pilot did not see it until late.

The C152 pilot had right of way but he only saw the BE400 as it crossed ahead, he thought by 75m. The BE400 crew were given the 'heads-up' on the Cessna at 2nm range and quickly saw it and watched it, as they commenced descent, pass 200m away to their R. The recorded radar shows the BE400 commencing descent with the C152 in its 0230 position, separation 0·4nm. The CPA, 0·3nm, occurs after the ac have passed with 200ft vertical separation. This visual sighting and action taken was enough to persuade the Board that any risk of collision had been quickly and effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

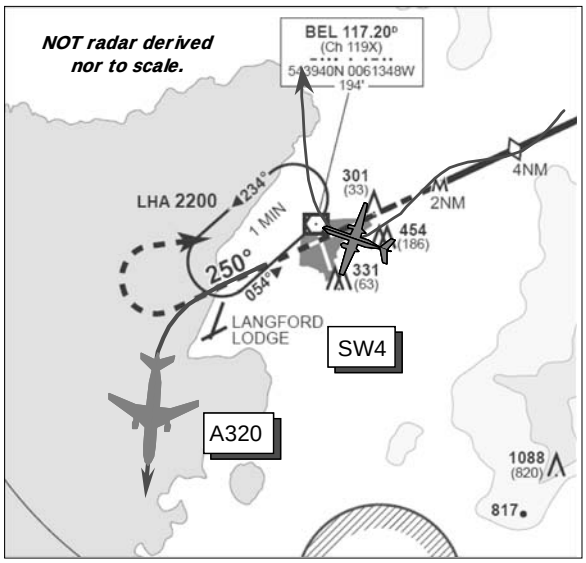
Cause: Whilst completing an ILS approach in Class G airspace, the BE400 flew into conflict with the C152, whose pilot did not see it until late.

Degree of Risk: C.

Contributory Factors: The C152 flew through the Biggin Hill FAT without its pilot communicating with an ATSU.

AIRPROX REPORT NO 2009-098

Date/Time:	2 Sep 0730	
Position:	5439N 00614W (Vicinity of Belfast/ Aldergrove Airport - elev 268ft)	
Reporter	Belfast/Aldergrove ATC	
Airspace:	Belfast ATZ/CTR	(Class: D)
	Aircraft 1	*Aircraft 2*
Type:	SW4	A320-214
Operator:	Civ Comm	CAT
Alt/FL:	1100ft	2000ft
	QNH (1003mb)	QNH (1003mb)
Weather:	IMC In Cloud	VMC
Visibility:	10km	10km+
Reported Separation:		
	NR	600ft V
ATC	200ftV/2nmH	
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BELFAST RADAR 1 CONTROLLER (APR) reports that the SW4 was inbound to Aldergrove from the IOM. The crew had requested FL80 inbound but the ac was still climbing 25nm SE of Aldergrove when the crew was asked to report ready for descent. At 20nm from touchdown, although the SW4 crew had still not asked for descent, he cleared the ac to descend to an altitude of 4000ft Belfast QNH (1003mb). At 14nm from touchdown the ac was given a range check as it was only passing 5700ft, which the crew acknowledged. Further clearance to an altitude 2400ft was given together with a closing heading for the LLZ. Seeing the SW4 fly through the LLZ centre-line, the controller told the crew to continue the L turn to close the LLZ from the R and gave a further descent

to an altitude of 1700ft. The SW4 went through the LLZ again and was seen to self-correct. At approximately 4nm from touchdown the crew were asked whether they wished to continue the approach or break-off, as the ac was still high and fast. The pilot reported that he wished to continue and then several seconds later stated either that he was going around or wished to go around. Because of the A320 departing off RW25, the SW4 crew was instructed to turn R heading 360° and climb to altitude 3000ft, to which there was no reply. As the SW4 was now at 2nm from touchdown and the A320 was just airborne, he gave the SW4 an avoiding action turn to the R, which the pilot did not reply to. When it appeared that the SW4 had started to turn L, he gave the SW4 crew avoiding action again. The SW4 eventually started to turn R but by this stage he had lost its primary return as the ac was close to the Aldergrove radar overhead. The A320 crew was issued with avoiding action, through the ADC, to turn L to keep it clear of the SW4.

THE SW4 PILOT reports that he was inbound to Belfast/Aldergrove under IFR, IMC in cloud, whilst in receipt of a "full" ATS from Aldergrove TOWER on 118·30MHz. Established on the ILS to RW25 heading 250° at 160kt, at 3nm final the Captain initiated a missed approach. At 1100ft QNH (1003mb), whilst executing the missed approach procedure, the TOWER called them to turn onto a heading of 360°, but the radio was unreadable and they could not comprehend the instruction before a third call was made to them when they were at 600ft over the runway. No other ac was seen.

A squawk of A5412 was selected with Mode C.

The ac has a white & blue livery; the HISLs and landing light were on.

THE AIRBUS 320-214 PILOT reports he was outbound from Belfast/Aldergrove under IFR and in communication with TOWER on 118·30MHz. Heading 250° at 210kt, during their initial climb from RW25 in VMC, they were instructed by TOWER to turn onto a heading of 185° for traffic avoidance. About 3-4nm SW of the airport during the turn he noticed a TCAS contact - about 600ft below his ac at the closest point - that drew around into their 9 o'clock position as the turn was completed. Neither a TA nor RA was enunciated by TCAS and the remainder of the flight was completed normally.

On arrival at their destination they were called on their SAT phone by the company dispatcher; a phonepatch was provided through to the Belfast/Aldergrove ATC Supervisor who informed them of the reason for the traffic avoidance. He assessed the Risk as *"low".*

ATSI reports that the 0740 Belfast/Aldergrove weather was: Surface wind 190/08; Visibility >10km; Cloud: FEW006 BKN008; QNH 1003mb.

The SW4 was inbound to Belfast/Aldergrove from the IOM. The SW4 crew contacted Belfast APPROACH at 0720 climbing to FL80, inbound to RINGA [28nm SE of the airport]. The flight was instructed to maintain FL80 on reaching and to head 315°; 3min later the heading was changed to 325°. The pilot was advised he was No2 in traffic for RW25 and although the pilot was asked to report ready for descent, no such call was received by the controller. Consequently, at 0725:08, when the flight reached 20nm from touchdown, the controller decided to issue a descent clearance to 4000ft QNH (1003mb). Further descent to 2400ft was issued and the pilot was advised he was now 14nm from touchdown. The SW4 was passing 5700ft at the time. Subsequently, the SW4 was turned onto a closing heading for the ILS, but it flew though the LLZ and was given a L turn to join from the R. Descent to 1700ft was then passed, with further descent on the ILS. The SW4 was seen to go through the LLZ again but self corrected. Shortly afterwards, the controller asked *"confirm established Sir you are 5 miles from touchdown"*. The pilot replied *"er we will establish in a sec"*. The controller continued *"you're inside 3 miles from touchdown Sir are you happy to continue the approach or do you wish to reposition"*. The pilot responded *"We'd like to continue er we are go around er er"*. After the pilot confirmed he was going around the controller instructed the pilot *"Roger Sir turn right heading 3-6-0 degrees climb to altitude 3 Thousand"*. The following transmissions were then made:

SW4*"Say again* [C/S]".

ATC*"There's one just airborne ahead of you off* [RW] *2-5 Sir turn right now heading 3-6-0 degrees"*.

ATC*"*[C/S] *turn right Sir heading 3-6-0 degrees"*.

SW4*"Right 3-6-0* [C/S]*"*.

ATC*"*[C/S] *avoiding action continue the right turn heading 3-0-5 degrees"*.

ATC*"*[C/S] *confirm climb to altitude 3 Thousand feet QNH 1-0-0-3"*.

SW4*"3 Thousand feet 1-0-0-3* [C/S]*"*.

The radar controller reported that he gave an avoiding action turn because the SW4 had appeared to start turning L. He added that *"the pilot eventually started to turn R but by this stage I had lost his primary return as he was close to the EGAA overhead"*.

The departing traffic mentioned above, was the subject A320. At 0728, the flight was cleared for take off from RW25, with a left turn direct MONTY [30nm S of WALLASEY]. The A320 pilot reported rolling at 0729:50. At the time, the inbound SW4 was over 4nm from touchdown. Some 20sec later the Approach Radar Controller (APR) informed the Aerodrome Controller (ADC), via intercom, that the SW4 was *"still not established"*. When the A320 was airborne, the APR instructed the ADC, by telephone, to issue avoiding action instructions to the flight because the SW4 had not commenced its R turn, as instructed. The following transmissions took place between the ADC and the A320 crew:

ATC*"*[C/S] *turn left now heading 1-8-5 degrees"*.

A320*"*[C/S] *1-8-0 on the heading"*.

ATC*"*[C/S] *sorry turn left heading 1-8-5 degrees"*.

A320*"One Eight Five degrees* [C/S]*"*.

ATC*"*[C/S] *avoiding action now turn left heading 1-8-5 degrees traffic east of you by 2 miles at 2 Thousand 1 Hundred feet"*.

A320*"[C/S] we're leaving er 2 Thousand 5 Hundred"*.

ATC*"Thank you"*.

ATC*"[C/S] that traffic is passing clear behind you now"*.

The A320 was transferred to the radar frequency when it was clear of the SW4. ATC reported the minimum separation was 2nm/200ft.

The Missed Approach procedure for an ILS approach to Belfast's RW25 is:

"Climb straight ahead to **2500** (2232) then climbing turn right and proceed to **VOR BEL** to join the 059° hold at 3000 or as directed".

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

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 controller involved and a report from the appropriate ATC authority.

The absence of recorded radar data hampered assessment of this Airprox somewhat, as the actual geometry of the incident was not entirely clear. It was emphasised that the diagram within this report was only an approximation based on the various reports provided and information from the RT transcript. What was readily apparent was that the SW4 crew had experienced some difficulty establishing their ac on the LLZ, and ended up too high and too close on final approach resulting in the go-around. A CAT pilot Member opined that the APR had evidently detected this at an early stage in the procedure and had done his best to highlight this to the crew before

they got into further difficulty. A military controller Member opined that he would have expected the controller to instruct the SW4's crew to break-off the approach earlier if he was concerned about the safety of the approach. The Board agreed that, whilst during the early stages the responsibility for deciding to go-around was more appropriately that of the SW4 crew, it was evident that the APR was paying close attention to the flight and he was correct to ask if the crew wanted to re-position when they were just inside 3nm from touchdown. Members agreed that the SW4 Captain had 'pressed on', perhaps unwisely, when all was apparently not well, but hopeful of correcting the situation. Clearly the A320 had to vacate the RW for the arriving SW4 and some Members were concerned that there was insufficient spacing between the A320 on the runway and the approaching SW4. However, the Board was advised that this was not the case since the SW4 was at 4nm range when the A320 began its take off roll and once the SW4 crew had initiated their missed approach the APR had taken steps to ensure the 2 ac did not conflict. It was stressed that a standard MAP will not routinely provide standard separation between arriving and departing traffic; a controller must intervene and take action to restore the situation, which was exactly what the APR accomplished by turning the SW4 R onto N immediately the crew informed him they were going around. The complicating factor here was the apparent L turn by the SW4 - towards the departing A320 - before the turboprop twin was seen to start turning to the R. This prompted the controller to reiterate the R turn as avoiding action whilst co-ordinating with the ADC a complementary avoiding action L turn for the departing A320 away from the RW centreline, where plainly a modification to the A320 crew's departure instructions of a left turn direct MONTY were necessary. All this just before the inevitable loss of radar contact on the SW4 as it flew into the radar overhead. The NATS Ltd Advisor stressed that the slow reaction of the SW4 crew to the APR's instructions had caused him great concern, and undoubtedly the ADC would also have been alarmed if he had detected the SW4's 'snaked' approach on the Aerodrome Traffic Monitor - clearly a difficult moment for both controllers at the time. A controller Member stressed that a missed approach could be initiated at any stage throughout the procedure and controllers must be prepared to react accordingly. A CAT pilot Member commended ATC for their prompt action, which provided the maximum separation between the 2 ac.

The A320 crew had little effect on the outcome of this Airprox apart from prompt compliance with the avoiding action turn relayed to them by the ADC. Minimum vertical separation was reported to be 600ft from the A320 pilot's TCAS display, which was somewhat more than suggested by the APR's report. Furthermore, safety margins were not eroded to the point that TCAS warnings were generated. Mindful that when assessing Airprox the Board could only consider what actually happened and not what might have occurred if circumstances had been slightly different, Members could not conceive that a hazardous conflict had actually developed between these 2 ac to the point that a collision might have ensued. In the Board's view, the A320's higher speed of 210kt – some 50kt faster than the SW4 at 160kt – as it accelerated away, coupled with the SW4's eventual turn away to the N had prevented the situation from deteriorating further. Whilst one area controller Member reiterated that any uncertainty over the SW4 crews' actions would have been of understandable concern to both controllers, the overwhelming majority of the Members were content that the prompt action taken by the APR had effectively prevented any close quarters situation from developing. This ensured that no less than 2nm horizontal separation (as reported by the APR) was maintained as the controller succeeded in turning the SW4 clear of the departing A320. The Board concluded that this was effectively a controller perceived conflict in which the actions taken had effectively forestalled any Risk of a collision.

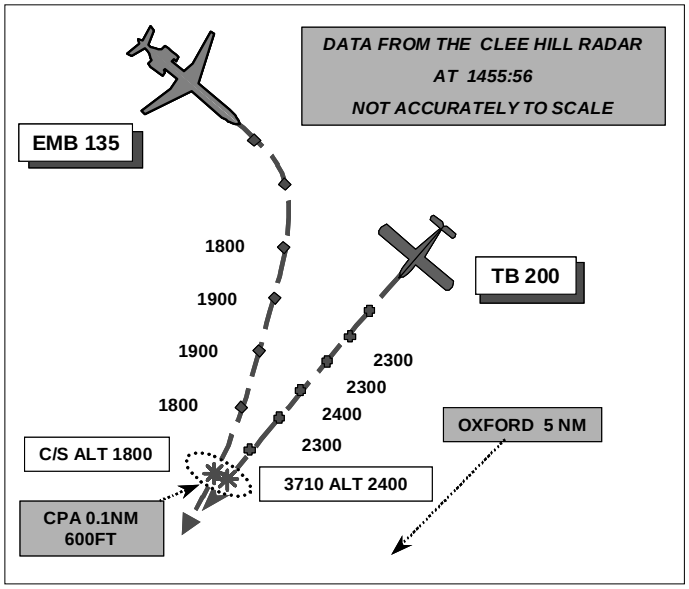
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Controller perceived conflict.

Degree of Risk: C.

AIRPROX REPORT NO 2009-099

Date/Time:	31 Aug 1455	
Position:	5155N 00118W (4.5nm Finals RW 19 Oxford elev 246ft)	
Airspace:	Oxford AIAA	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	EMB135	TB200
Operator:	Civ Comm	Civ Club
Alt/FL:	1800ft (QNH 1007)	3500ft (N/K)
Weather:	VMC CLOC	VMC
Visibility:	>10km	>5km
Reported Separation:	150ft V/200m H	NS
Recorded Separation:	600ft V/ 0.1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EMB135 PILOT reports flying an IFR flight inbound Oxford in receipt of a procedural service from TWR, following a handover from Northolt, and squawking as directed with Mode C. They were heading 190° at 180kt on an ILS for RW19 having been informed that there was '*No circuit traffic'* (or words to that effect) and no other ILS traffic. While descending through 1800ft a TB10 ac [he thought – the TB200 is similar] suddenly appeared directly in front of them, flying from left to right, about 150ft above. He immediately commenced a dive to below the glidepath in response to a TCAS RA. He assessed the risk as being medium.

THE TB200 PILOT reports flying a private pleasure flight to the S of Banbury in receipt of a TS from Brize Radar, squawking as directed with Mode C. He decided to route just N of Upper Heyford toward Blenheim Palace, heading 220° at 110kt. Due to the proximity of the Oxford ATZ he decided to contact Oxford APP but when trying to inform Brize Radar of the frequency change no response was received; a further three attempts were also unsuccessful. Only on the fourth attempt was communication established and the Brize Controller informed them of the reported Airprox. He did not see the other ac at any time. It was subsequently agreed that they would remain on the Brize frequency until landing at Enstone.

ATSI reports that after leaving controlled airspace by descent, the EMB135 first called Oxford APP at 1450, the pilot reporting descending to 3500ft to the '*Oscar Foxtrot'* and in receipt of Information Kilo with the QNH 1009mb (Note: the NDB is 'OX'). The controller, who was operating as ADC/APC, cleared the ac to the Oscar Xray descending to 3500ft on the Oxford QNH 1007mb and then updated the reported cloud as Few at 3200ft Broken at 3700ft.

Oxford Airport is situated in Class G airspace and is not equipped with any ATS Surveillance equipment. The pilot requested a procedural ILS (to RW19) and, at 1451:48, reported outbound in the procedure. The controller then cleared the ac for an ILS approach and to report established on the localiser. The outbound track for the RW19 ILS/DME/NDB(L) is 354° from the beacon descending from 3500ft to 1800ft before turning right to establish on the localiser for RW19; descent from 1800ft, on a 3° glidepath, commences at 4.7DME.

At 1455:01, the EMB135 pilot reported established on the localiser and was instructed to descend on the procedure and report at 4nm DME. Ten seconds later, the ac was cleared to land RW19 and the wind passed as 170/16. The EMB135 pilot reported 3nm on final and then at 1457 stated '*Tower be advised (callsign) we've just had a hard RA off a PA28 wandering over the top of the airfield'.* The controller acknowledged, advising that he had no knowledge of this traffic. Meanwhile, Brize Norton called to pass details of another inbound ac and the telephone recording shows that the subject TB200 was on the Brize Norton frequency and TI regarding the EMB135 was being passed; however, communications with the TB200 appeared difficult.

An examination of the radar recording shows, the EMB135 in a right turn inbound towards the ILS localiser at an alt (London QNH 1009) of 1800ft Mode C at 1454:39. At that time the TB200 is in its 12 o'clock, tracking SW at 2300ft Mode C and is displaying a Brize Norton squawk. As the EMB135 approaches the localiser, the range between the two ac reduces. By 1455:16 the EMB135 has passed through the centreline, its Mode C is indicating 1900ft with the TB200, still at 2300ft, in its 11 o'clock, range 0.7nm. At 1455:48, as the EMB135 continues the right turn to close the centreline from the left, the TB200 is now in its 10 o'clock at 0.1nm and 600ft above (the EMB135 at 1800ft Mode C and the TB200 at 2400ft Mode C). By the next sweep, the two ac have passed, although the EMB135 is now indicating at 1700ft Mode C. Thereafter tracks diverge and the EMB135 completed a successful approach and landing.

The Oxford Aerodrome Manager provided a report stating that SATCO had consulted the Senior Instructor at Enstone and it was agreed that he would re-emphasise best practice for ac operating in the vicinity of Oxford and its final approaches.

DAATM reports that the TB200 pilot called Brize Norton LARS at 1447:14, passing his routeing and requesting a TS; he was assigned a squawk, identified and provided with a TS shortly after.

The controller's report acknowledged that he saw the confliction late, and therefore the subsequent warning was also late. As he received no acknowledgment from the TB200 pilot, he asked the pilot twice if the TI was copied; however, he received no reply so he continued trying to re-establish radio contact.

Although the transcript of the LARS position does not show land line calls, the controller's report states that he passed Oxford the TB200's position but they replied by saying that the EMB135 had received a TCAS RA against it.

At 1455:57 the TB200 pilot asked LARS '*are you calling?',* 15sec later they replied requesting a radio check and a further 45sec later the pilot transmitted '*Brize Radar C/S we are just north of the Oxford ATZ so I think it's probably best that we let them know where we are so we'll go over to them now on 125.325 thanks for your help'.* LARS replied '*Roger that's copied they do have inbound traffic which is just north of your position by half a mile indicating 1500 feet below and I did try to call that to you but you weren't listening'.* [UKAB Note (1). At 1455:56 the TB200 was 600ft above the EMB135 and 500ft above on the previous radar sweep as shown on the diagram above.] At 1457:24 the pilot conducted a radio check with LARS, suggesting that their last transmission had not been received; LARS then transmitted 2 radio checks to the TB200 until 1457:36 when the pilot again transmitted their position and intention to call Oxford However, LARS replied immediately that he should remain clear of Oxford ac and informed him that Oxford traffic had already received a TCAS RA against him. The pilot replied '*apologies, for some reason we seem to be transmitting alright but I'm not sure if you were receiving so apologies for that'.* LARS reiterated that Oxford traffic had been called to him but he responded that due to radio problems the TI was not received. The TB200 then flew an orbit over Blenheim Palace, remaining with LARS who advised the pilot that Oxford was busy, before returning to Enstone. LARS then asked the TB200 pilot to squawk 7000 and freecall Enstone and after more radio problems he transferred at 1510:11.

UKAB Note (2): The Brize Norton Controller and Supervisor provided reports but since they are substantially the same as the DAATM report, for brevity, they have not been included.

UKAB Note (3): An analysis of the Radar recording was conducted by both the UKAB and DAATM but have not been included as they show the same detail as that reported by ATSI above.

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.

This was one of several occurrences discussed at the Mar 2010 Board meeting (2009 095, 097 and 104) involving commercial ac flying instrument approaches through, and to airfields located in, Class G airspace.

Although not applicable to all of the above incidents, Members agreed that it is prudent for all pilots to be aware of how busy these approach paths can be, the height of the glideslope at various ranges from the airfield and, if possible, to avoid these areas; if it is not possible to avoid them laterally then cross the approach expeditiously at

an alt well above or below that where instrument traffic operates. Members also agreed that it is most unwise to follow the ground track of an instrument approach track, even well above the glide path, as most ac using that approach are TCAS equipped and, as in this case, RAs will result.

A GA Member familiar with the area observed that Blenheim Palace is located within the Oxford ATZ and even if flying outside the ATZ (above it), it would have been prudent for the TB200 pilot to call them and convey his intentions or request an ATZ penetration. Although legal, flying just above an ATZ, not in contact with the parent ATC, is almost always inadvisable.

Notwithstanding the inadvisability of the track selected by the TB200 pilot, he had the same right to operate there (in Class G airspace) as the EMB135 and, notwithstanding that the EMB135 was IFR and the TB200 VFR, the 'see and avoid principle' applied. A specialist Member opined that it is imperative that crews flying such IFR approaches understand that they do not have any priority or protection and maintain a continuous and conscientious lookout. The EMB135 was following the instrument approach procedure and turning onto the FAT at about 5nm; the radar showed that it was never less than 500ft below the TB200 and the EMB135 pilot initially saw it on TCAS. Had both ac remained level separated by 500ft, specialist Members thought it unlikely that an RA would have been generated; however, the temporary descent of 100ft shown on the TB200's Mode C readout, indicated a short downward flight vector which would have triggered the RA. The EMB135 pilot had reacted accordingly by descending. Members agreed that the TB200 was far enough above the EMB135 to make it almost impossible for its pilot to see because of his airframe/wing.

The Board considered the role of the LARS in this occurrence and was concerned that pilots might, mistakenly, get the impression that it is not worth requesting a LARS as in this case it did not seem to have been any benefit to the TB200 pilot. However, ATC and pilot Members agreed that the service being provided by Brize had been less than optimum, even allowing for the apparent radio problems.

Notwithstanding the issues discussed above, the Board agreed that the (vertical) separation between the ac had been such that there had been no risk of collision. Further, this separation although quite adequate to satisfy the requirements of the 'see and avoid principle', was not enough to prevent the EMB135's TCAS generating an RA.

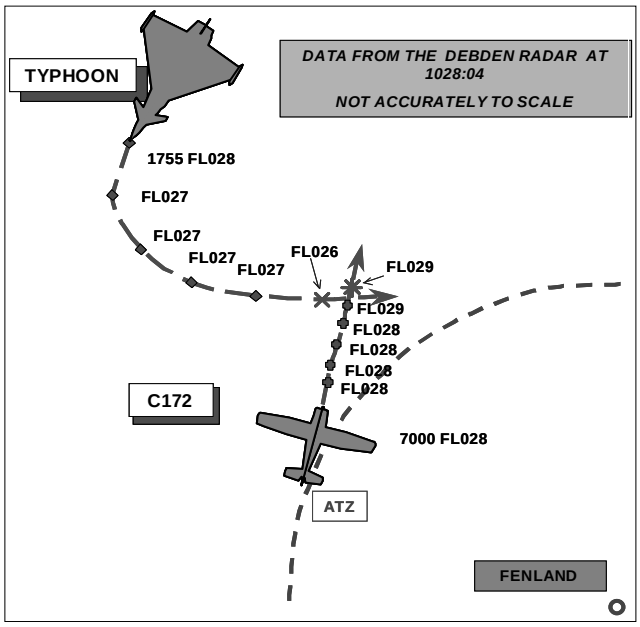
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting Report (TCAS).

Degree of Risk: C.

AIRPROX REPORT NO 2009-100

Date/Time:	4 September 1028	
Position:	5246N 00003W (2nm NNW Fenland - elev 6ft)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Typhoon T Mk3	Cessna 172M
Operator:	HQ AIR (Ops)	Civ Pte
Alt/FL:	2200ft (RPS 994mb)	1700ft (QFE 1004mb)
Weather	VMC CLBC	VMC CLBC
Visibility:	>20nm	>10km
Reported Separation:	300ft V/1800ft H (0.3nm)	100ft V/500m H (0.4nm)
Recorded Separation:	300ft V /0.2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TYPHOON PILOT reports flying a grey ac [Typhoon 1 in DAATM report] with HISLs and Nav lights switched on, leading a 2 - ship formation performing practice intercepts on a Tutor light ac. They were in receipt of a TS from Coningsby APP and were squawking 1755 with Mode C but TCAS was not fitted. The front seat pilot was under instruction and in control of the ac and was resetting to the E after attempting an intercept on the Tutor. He had rolled out of a turn at 2200ft and was heading 094° when he saw a Cessna with Orange markings 2000ft away in his 1 o'clock and slightly above them so he immediately bunted then rolled right to increase lateral separation. Prior to the manoeuvre they were not on a collision course, as the flight path of the Typhoon would have placed it slightly below and behind the Cessna so he assessed the risk of collision as being low.

He reported the incident to Coningsby ATC immediately on the frequency in use.

THE CESSNA 172 PILOT reports that he was flying a private flight from Fenland to Beverley with a passenger, in a yellow and white ac with the beacon switched on, squawking 7000 with Mode C and in receipt of an AGS from Fenland Radio. Prior to start up he was aware of a Typhoon ac orbiting around the Fenland ATZ; he presumed that it was waiting to enter Wainfleet bombing range as, in his experience, they frequently do. During his power checks he continued to monitor the Typhoon, which was [apparently] still holding close to the ATZ. After departing from RW26 and climbing to the overhead, he positioned the ac on his first heading of 347° towards Boston. He could still see the Typhoon, which continued to orbit with a tight turn to the left. He initially thought that Typhoon pilot was aware of his position since he had been orbiting around the ATZ for over 20min. The Typhoon then flew West before backtracking to the East flying directly towards him. As the ac continued to approach him from his 10 o'clock, it banked steeply to the right then left and it passed about 500m behind his ac. At the time he thought that he was passing about 1700ft in his initial climb to 2500ft and he was still within Fenland's ATZ. He continued to climb during the incident as he was on the Typhoon's right and had right of way, but was always ready to take evasive action, as he was aware that the Typhoon was on a converging course. After changing frequency to Coningsby at about 1040 he passed his details and received a TS. The controller then informed him that he had a message relating to the Airprox and he replied that he had been visual with the Typhoon throughout.

He assessed the risk as being Medium.

UKAB Note (1): Fenland is published in the UKAIP (AD 2 EGCL) as a civil licensed aerodrome with an ATZ of 2nm radius up to 2000ft aal.

UKAB Note (2): The Typhoon reported that he was flying at 2200ft on the (Barnsley) RPS of 994mb. Met Office Archival data shows the Wittering (nearest recorded met data) QNH to be 1004mb; since Fenland is 6ft amsl this would also have been the Fenland QFE/QNH. That being the case the Typhoon would have been flying at 2500ft agl when it indicated FL028.

UKAB Note (3). The Wittering METAR for 1050Z was:

EGXT 041050Z 27024G34KT 9999 FEW035 BKN250 16/06 Q1004 BLU NOSIG

The 1000 Barnsley RPS was 994mb, the 1100 995mb.

UKAB Note (4): The Coningsby controller also provided a report. Since it is essentially the same as the DAATM report below, for brevity it has not been included.

DAATM reports that the Typhoon formation was in receipt of a Traffic Service (TS) from Coningsby Departures/Zone (RAD). RAD passed the first TI on the C172M to Typhoon 2 at 1020:36, *'C/S 2 Traffic South, 4 miles, tracking North, no height information'.* This was followed 5min later at 1025:41, *'C/S 1 [Typhoon 1] Traffic South West, 3 miles tracking North indicating 200 feet below'.* The pilot of Typhoon 1 asked for confirmation that the TI was for him, and RAD responded 13 sec later with updated TI, *'Affirm, eh, traffic is, eh believed to be operating around Fenland'.* This was again acknowledged before further TI on the subject C172M was passed at 1027:19, *'C/S 1, traffic south 3 miles tracking North indicating similar level'.* Shortly after at 1028:42 the pilot of Typhoon 1 reported an Airprox on freq, '*Just had an Airprox with an orange Cessna approximately one minute ah, one minute ago'.*

UKAB Note (5): The recording of the Debden Radar shows the incident. The Typhoons were operating in a racetrack pattern with one at each end of the pattern. The C172, squawking 7000 is tracking 010° and is initially FL028 (2500ft agl/amsl) as the Typhoon, in its 12 o'clock at just over 4nm, commences a left turn from a NNW track onto 220° for 30sec. When in the C172's 11 o'clock at 2.5nm and at the same level it commences a further left turn towards the C172, rolling out on 100° and descending 300ft to pass below and 0.2nm behind the C172; it then departs to the E while the C172 continues to the N. The incident takes place 2.2nm NW of Fenland at 2500ft amsl and the Typhoon remained 500ft above top of the ATZ when it crossed the lateral boundary just after the CPA.

HQ AIR (OPS) comments that this is another confliction in busy class G airspace, it is unwise to assume that the other aircraft is visual and even though the Cessna has right of way it could have altered its flight path or altitude to maximise separation as it claimed to be visual throughout.

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 controller involved and reports from the Typhoon operating authority.

In this incident the Board noted that both ac had been operating legitimately in Class G airspace; that being the case they had an equal and shared responsibility to see and avoid other ac. Albeit not as early as optimum, both pilots had seen the opposing ac and, in accordance with his responsibility under the Rules of the Air, the Typhoon pilot did take sufficient avoiding action to increase the extant separation to, what was in the Board's view, a reasonable margin.

Having agreed the cause, specialist Members noted the accurate and timely TI provided to the Typhoon crew, which should have enabled then to react earlier to the presence of the C172; further they also opined that this demanding exercise should have been conducted well clear of the Fenland ATZ and any other congested airspace.

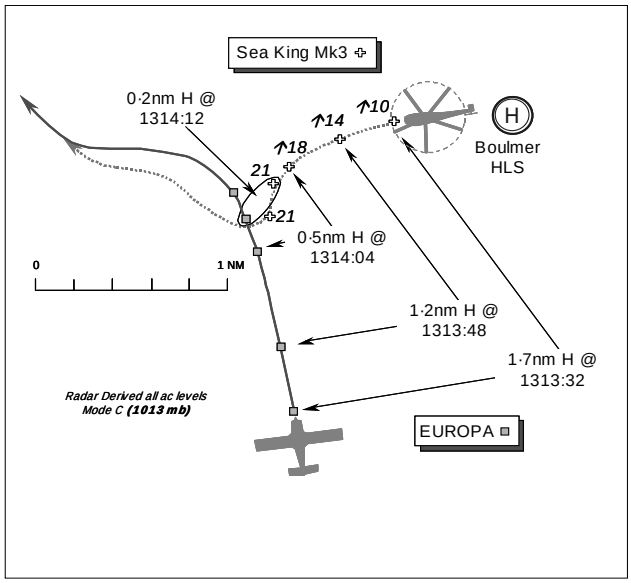
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace.

Degree of Risk: C.

AIRPROX REPORT NO 2009-101

Date/Time:	5 Sep 1314 (Saturday)	
Position:	5525N 00137W (1½nm WSW of Boulmer HLS elev: 75ft)	
Airspace:	Scottish FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Sea King Mk3	Europa
Operator:	HQ Air (Ops)	Civ Pte
Alt/FL:	1750ft↑	1700ft
	QFE (1011mb)	Tyne RPS
Weather:	VMC CLBC	VMC CLBC
Visibility:	>10km	NR
Reported Separation:		
	Nil V/200m H	50ft V
Recorded Separation:		
	0·2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE WESTLAND SEA KING Mk3 HELICOPTER PILOT reports that he was the PF from the RHS whilst executing the initial climb-out from Boulmer HLS under VFR, in VMC. The ac was crewed with two pilots only. He levelled his helicopter about 150ft below cloud and commenced a L turn from their westerly heading to remain in the Boulmer overhead whilst a BS was being established with Newcastle ATC on 123·375MHz; a squawk of A7000 was selected with Mode C on. His co-pilot, seated in the LHS, then saw another ac – a low wing single engine tricycle undercarriage monoplane coloured white with blue lettering [the Europa whose registration was given] - about 500m away to port at the same height 'on a collision trajectory'. The co-pilot called for a "break left" because if he had rolled out of the L turn into a break R it would have placed his helicopter directly in the path of the other ac which seemed to be in level flight or turning to port. The L turn was tightened to avoid the Europa which was heading N and he placed his helicopter to fly astern of the aeroplane, before reversing into a R turn to maintain visual contact with it. If he had not taken avoiding action he firmly believes a collision would have occurred; the minimum horizontal separation was estimated to be 200m at the same height and the Risk *"very high".* He tried to raise the Europa pilot on 123·1MHz [VHF SAR Channel], 121·5MHz and the Newcastle RADAR frequency [124·375MHz]. Although Newcastle RADAR had radar contact on the Europa, they were not in RT communication with it's pilot and all attempts to contact him were unsuccessful. The Europa departed to the N and, after he had informed London and Newcastle of his intention to file an Airprox, the Sea King pilot resumed his training sortie.

The Airprox occurred overhead the main railway line [W of Boulmer]. The helicopter is coloured yellow; the upper & lower white HISLs, navigation lights and 2 forward facing main spot lights were all on.

THE EUROPA PILOT reports that he had departed from a farm strip at Ewesley bound for another farm strip some 8·7nm NW of Boulmer HLS. Flying under VFR in VMC, some 500ft clear below cloud, he was not in communication with an ATSU but monitoring the 'Safety Com' frequency of 135·475MHz [See UKAB Note (1)]. A squawk of A7000 was selected; neither Mode S nor Mode C are fitted.

Whilst in transit at 1700ft TYNE RPS, heading 350° at 100kt, approaching a position, he thought on the 005° radial of the NEWCASTLE VOR at 30nm [the Airprox occurred at about 23nm DME from NEW], a yellow helicopter was seen. It was a *'late contact'* and no avoiding action was taken. Estimating the minimum vertical separation to be 50ft he assessed the Risk as '*high'.*

HQ AIR (Ops) comments that it is difficult to see how much more conspicuous it is possible to make a SAR helicopter, yet the Europa pilot flying in the vicinity of an active and well established HLS managed not to see it until very late. This incident highlights the importance of maintaining a good lookout when flying in Class G airspace.

UKAB Note (1): SAFETY COM - a common frequency (135·475MHz) made available for use at aerodromes where no other frequency is allocated, to enable pilots to broadcast their intentions to other aircraft that may be operating on, or in the vicinity of, the aerodrome (CAP 413 Chap1 Pg4).

UKAB Note (2): The HLS at Boulmer is shown on CAA VFR charts – located at 55°25·23'N 001° 35·92'W – an ATZ is not established.

UKAB Note (3): This Airprox is replicated on the Great Dun Fell radar recording, albeit that some of the radar returns from the small Europa are SSR only without the supporting primary contact. Moreover, with no Mode C fitted to the Europa it is not feasible to verify the vertical separation. Nevertheless, the Sea King is shown climbing into radar coverage through 1000ft Mode C (1013mb) from the vicinity of Boulmer HLS on a WSW'ly course at 1313:32, with the Europa closing from its 10 o'clock at a range of 1·7nm. The range decreases to 0·5nm as the helicopter climbs steadily, passing 1800ft Mode C at 1314:04 when the Sea King pilot's reported L turn then becomes more evident with the Europa starting to cross ahead from L – R. At the next update, the helicopter indicates 2100ft Mode C and the radius of turn has tightened, consistent with the reported "break left"; on the sweep timed at 1314:12, the minimum horizontal separation is 0·2nm as the Europa starts to draw R of the helicopter's nose. This horizontal distance is maintained as the Europa clears NW of the Sea King, which has levelled at 2100ft Mode C, before it reverses into a R turn, as reported, onto a NW'ly course astern of the Europa.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

In the absence of any form of ATS being provided to either flight at the moment the Airprox occurred it was clear to the Board that the crux of this encounter in Class G airspace was that of lookout. It was unfortunate that the two Sea King pilots had not seen the Europa earlier, which should have been visible in their L turn and above them as the helicopter climbed. However, the small size of the other ac, on a relatively constant bearing with little crossing motion to draw attention to it until the last moment, might have made it difficult to detect. The Board concluded that a late sighting by the Sea King pilots was part of the Cause. Nonetheless, the bright yellow Sea King helicopter should have been visible to the Europa pilot who had a responsibility under the Rules of the Air to give-way to ac approaching from his R. However, the Board was keenly aware that the 'Rules' can only work if the other ac is seen in sufficient time to take appropriate action. Here, Members considered that the helicopter might not have been in the Europa pilot's field-of-view, to starboard cross-cockpit and climbing–up from under the nose, until the last moment when it was co-altitude about ½nm away. The Europa pilot had himself reported that this was a *'late contact'* and that no avoiding action was taken, which convinced the Board that he was unable to affect the outcome in the short time available. Members agreed unanimously that this was, effectively, a non-sighting by the Europa pilot and the other part of the Cause of this Airprox.

In the Board's view, the Europa pilot gained no benefit from listening out on the Safety Com frequency whilst in transit. Indeed, this frequency was of more specific use when joining the cct at uncontrolled aerodromes and it might have been more helpful if the Europa pilot had called Boulmer on the promulgated VHF frequency as he was passing so close. However, the Sea King pilot had reported that he was in the process of establishing an ATS with Newcastle when the close quarter's situation developed. It was unfortunate that the Europa pilot was not working Newcastle ATC at the time – the nearest appropriate ATSU – as he might have been forewarned about the Sea King's departure from Boulmer by hearing the helicopter pilot's transmissions. Thus, on balance, the Members saw obtaining an ATS from Newcastle as being more beneficial to the Europa pilot whilst in transit through this vicinity.

The Sea King pilot reports that if he had not taken avoiding action a collision would have occurred; he estimated that the minimum horizontal separation was 200m at the same height and the Risk *"very high".* However, the Board could only base their assessment of the Risk on what actually happened, not what might have occurred if the circumstances had been slightly different. With the Europa pilot unaware of the proximity of the helicopter until a late stage, one controller Member considered that the safety of the ac involved could have been compromised. Nonetheless, pilot Members recognised that the helicopter pilots had seen the Europa about 500m away to port. The Board agreed this had enabled the Sea King PF to take effective avoiding action by tightening the helicopter's L turn away from the Europa. The Sea King pilot's prompt action, coupled with the minimum horizontal separation

recorded by the radar of 0·2nm, led the Board to conclude that any Risk of a collision had been effectively removed.

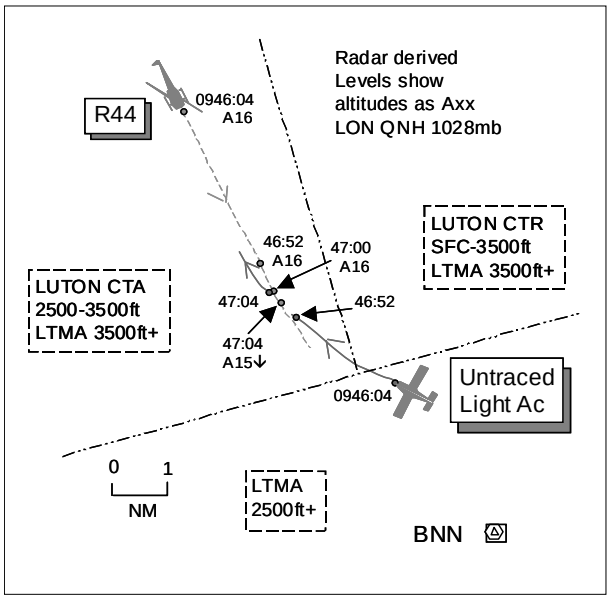
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively, a non-sighting by the Europa pilot and a late sighting by the Sea King pilots.

Degree of Risk: C.

AIRPROX REPORT NO 2009-102

Date/Time:	13 Sep 0947 (Sunday)	
Position:	5146N 00036W (3nm NW BNN)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	R44	Untraced
		Light Ac
Operator:	Civ Pte	N/K
Alt/FL:	1500ft	NK
	(QNH)	(N/K)
Weather:	VMC CLBC	NK
Visibility:	>30km	
Reported Separation:		
	50-100ft V & H	
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE R44 PILOT reports flying enroute to a private site near Elstree, VFR and in receipt of a BS from Farnborough, squawking an assigned code with Modes S and C. The visibility was >30km flying 500ft below cloud in VMC and the helicopter was coloured black with anti-collision light switched on. Cruising at 1500ft and 110kt about 2nm before BNN he suddenly saw a white-coloured low-wing single-engine ac with a large canopy and thin rear fuselage appear in his 1230 position; it was flying directly towards him, possibly in a climb, range 200ft at the same level. He immediately undertook a severe autorotation to port to avoid, the other ac passing above and to the R of his helicopter by 50-100ft. He assessed the risk as high.

RAC MIL reports that despite extensive tracing action the identity of the reported ac remains unknown. The unknown ac first appears on radar as an intermittent primary only return about 9nm SE of the Airprox position and routes W and then NNW'y eventually fading completely 4min post Airprox. Procedural tracing action through adjacent airfields and light ac airstrips also did not reveal any possible clues to the other ac's identity, which therefore remains untraced.

THE FARNBOROUGH N LARS CONTROLLER reports the R44 pilot called at 0930 reporting routeing from near Tatenhill to a private site near Elstree at 1700ft; the pilot was instructed to squawk 4655 and was given the QNH and a BS, which was what he requested. At 0947 the R44 pilot reported on RT that would like to file an Airprox as he had had to 'autorotate' to avoid a light ac flying very close to him. At the time the R44 was in Class G airspace between Halton ATZ and BNN. The other ac was not seen on radar and had not called Farnborough N.

ATSI reports that at 0930, the R44 was placed under a BS by Farnborough LARS North controller, at the pilot's request. The pilot had reported passing DTY at 1700ft en-route to a site near Elstree and was assigned the

squawk 4655 and issued the QNH 1008mb. At 0936, the pilot reported climbing to 1900ft as the RT transmissions from Farnborough were 'breaking up'. The R44 pilot did not call again until 0947, when he reported *"(R44 c/s) should report a near miss er I think we've just had a little light aircraft low wing just come straight er at us I've had to just er do an emergency er autorotation to get out of the way".* The controller acknowledged the message and invited the pilot to telephone after landing with the details. The pilot then added that he was 2nm N of BNN and about to turn towards Elstree.

In his written report, the controller stated that the other traffic was not seen on the radar and the Unit confirms it was not possible to correlate this unknown traffic with an ac working LARS N.

MATS Part 1, Section 1 defines a BS as *"…an ATS provided for the purposes of giving advice and information useful for the safe and efficient conduct of flights. This may include weather information, changes of serviceability of facilities, conditions at aerodromes, general airspace activity information, and any other information likely to affect safety. The avoidance of other traffic is solely the pilot's responsibility."*

UKAB Note (1): Recorded radar does not capture the CPA. Analysis of the Heathrow 23 and 10cm, Debden and Stansted radars at 0946:04 shows the R44 9·75nm NW of BNN VOR tracking 155° indicating altitude 1600ft London QNH 1028mb with a primary only return, the untraced light ac, in its 1130 position range 6·6nm tracking 300°. Thereafter both ac continue on almost steady opposite and converging tracks. The untraced light ac disappears after the radar sweep at 0946:52 when it is in the R44's 12 o'clock range 1·1nm. The untraced light ac reappears at 0947:04 after the ac have passed; it is tracking 320° and 0·25nm in the R44's 6 o'clock with the R44 indicating altitude 1500ft QNH and descending, which accords with the pilot's reported avoiding action descent.

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, both pilots were responsible for maintaining separation from other ac through 'see and avoid'. The R44 pilot was supplementing his SA under a BS service from Farnborough. Whilst there was no obligation for Farnborough to pass specific TI, unless the controller had identified a definite risk of collision, in this incident the untraced ac was not showing on the Farnborough radar display, so the controller was not aware of the impending confliction. The radar recording shows both ac on steady conflicting tracks prior to Airprox. The untraced ac should have been in the R44 pilot's field of view for some time, although it was on a line of constant bearing; in this situation a target appears in a fixed position to the sighting pilot with no relative movement in his field of view to attract his attention. The R44 pilot saw other ac very late and this was part of the cause of the Airprox. When the R44 pilot saw the other ac it was at the same level but climbing, so the R44 may have been obscured below the ac's nose. Also, the R44 nose-on aspect makes the helicopter particularly difficult to see. Without a report from the other ac's pilot, Members could not be aware of his viewpoint. However, from the information available it was thought that the R44 had probably passed unsighted to the light ac's pilot, which was a part cause of the Airprox.

Looking at risk, following the late sighting the R44 pilot took abrupt avoiding action, estimating the light ac passed about 50-100ft vertically clear above; no avoiding action was seen to be taken by the untraced ac. Although this had been undoubtedly a very close call, the Board believed that the autorotation action taken had been enough to remove the actual collision risk but safety had not been assured during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Probable non-sighting by the untraced light ac pilot and a late sighting by the R44 pilot.

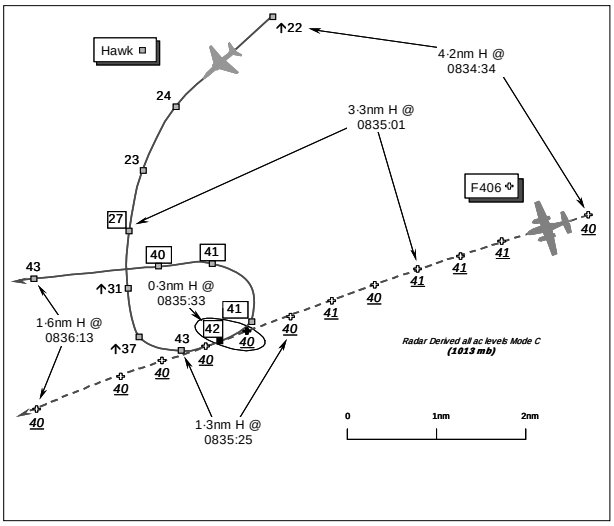
Degree of Risk: B.

AIRPROX REPORT NO 2009-103

Date/Time: 16 Sep 0835
Position: 5207N 00400W (20nm E of Aberporth)
Airspace: London FIR (Class: G)

	Reporting Ac	*Reported Ac*
Type:	F406	Hawk T Mk1
Operator:	Civ Comm	HQ Air (Trg)
Alt/FL:	FL40	NR
Weather:	VMC CLAC	VMC NR
Visibility:	20km	NR

Reported Separation:
50-100ft V/100-200m H NK
Recorded Separation:
1-200ftV/Nil H - see UKAB Note (1)



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE F406 PILOT reports that he was operating single pilot under VFR whilst in receipt of a Basic Service (BS) from London INFORMATION on 124·75MHz.

Established in the cruise, level at FL40 in VMC – some 1500ft clear above cloud - approaching a position 085° STU 38nm and tracking towards the VOR on a heading of 255° at 200kt, he glanced down to check the engine instruments but when he looked back up he saw another ac at right 1 o'clock – about ½nm away, slightly high. The other ac – a low-wing black ac with military markings, possibly a Hawk - was flying in the opposite direction and passed down the starboard side about 100-200m away some 50-100ft above his aeroplane with a *"medium"* risk of a collision. No avoiding action was taken as there was too little time to react; the other ac was visible for around 1-2 secs but appeared to start banking away before it went out of sight.

His ac has a purple and white colour scheme and the HISLs were on. Mode S is fitted and a squawk of A1177 was selected with Mode C; TCAS is not fitted.

THE HAWK T Mk1 PILOT reports his ac was crewed by two pilots and he was operating VFR on a low-level evasion sortie from 250ft MSD up to 5000ft amsl in the speed range of 200-450kt. He was acting as the singleton aggressor for two other Hawk ac and squawking A7001 with Mode C whilst listening out on 318·175MHz. His ac is coloured black; the nose light and HISL were on. Neither Mode S nor any CWS are fitted.

He was unaware that he had been involved in an Airprox until he was informed by his Unit FSO, hence the sparseness of his report.

ATSI reports that the F406 pilot was in communication with London INFORMATION and had been requested to squawk A1177, the LAC Swanwick FIS code. The flight, estimating Strumble at 0844, was not identified and was in receipt of a BS from the LAC FISO. Traffic information was passed about other traffic on the frequency but the presence of the subject Hawk was not known, neither was any comment about an encounter with this ac made on the frequency by the F406 pilot.

UKAB Note (1): The Clee Hill Radar recording shows the F406 and the Hawk during the period of the Airprox, however, this close quarters encounter occurred at a range of 55nm from the Clee Hill Radar head and below the base of theoretical primary cover. Moreover, when the two contacts merge some of the Hawk's Mode C indications are not displayed on the recording. Therefore NATS Ltd helpfully provided the 'raw' Clee Hill SSR source data to assist in this analysis. In broad terms the SSR interrogators had sensed the Hawk's Mode C but when the radar system's software compared the various returns, it 'deemed' them to be anomalous and erroneous data [invalid] and thus did not display this 'low confidence' information. NATS single source radar parameters are optimised for civil traffic and are set to different threshold values which are radar head specific due to the different range and

rotation rates of the different radar heads. Nevertheless, the source Mode C data does give a level indication for the Hawk. Whilst these Mode C indications were not considered sufficiently accurate to be displayed within the parameters set, the levels from the Hawks 'raw' SSR data are consistent with those 'good' returns that have been displayed; hence they have been included on the diagram, albeit boxed to indicate the reduced level of confidence.

The F406 is shown squawking A1177, maintaining a WSW course level at FL40-41 unverified Mode C (1013mb). The subject Hawk singleton is shown squawking A7001 climbing through FL22 unverified Mode C (1013mb) in the F406's 2 o'clock at a range of 4·2nm drawing ahead on a course that will cross obliquely from R – L. The jet then commences a wide L turn and, after levelling momentarily for two sweeps, continues to climb. The Hawk's L turn would place the jet potentially directly ahead of the F406 at a range of about 2nm. Climbing through FL31 – 900ft below the F406 at range of 2·7nm - the Hawk's L turn subsequently tightens directly towards the twin as it draws into the latter's 12 o'clock at a range of 1·3nm having climbed through the level of the F406; the Hawk still with a good indication of FL43 and situated some 300ft above the twin. Subsequent SSR data from the Hawk is less robust; the next sweep at 0835:33 shows the 2 ac 0·3nm apart just before they cross in azimuth with vertical separation potentially reducing to 200ft and then 100ft on the next sweep. The Hawk then pulls astern of the F406 whilst turning about, apparently levelling at FL40/41 before steadying on a westerly course and overtaking on the F406's starboard side in excess of 1·6nm away. The vertical separation shown is consistent with that reported by the F406 pilot.

HQ AIR (TRG) comments that although the supporting radar evidence cannot conclusively confirm the miss distances it does indicate that the 2 ac did get close supporting the F406 pilot's general assessment which on balance is most probably fairly accurate. The Hawk crew would have been working hard as a singleton aggressor against 2 other Hawk ac but it is disappointing that the crew did not see the F406 either before or after the Airprox.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear that the F406 pilot was in receipt of a BS from London INFORMATION and the FISO was unaware of the presence of the subject Hawk. This Airprox occurred at the extremity of coverage from the nearest suitable LARS Unit so there was little likelihood of a radar service in this area at these levels to supplement the pilot's lookout. Therefore, in the 'see & avoid' environment of Class G airspace, without the benefit of radar assistance, the pilots in both aircraft were responsible for detecting other ac in the vicinity and affording appropriate separation.

Pilot Members recognised that, while the F406 was being operated quite legitimately 'single pilot', it might have been difficult for him to detect the small training ac. The radar recording suggested that the Hawk might not have been in the F406 pilot's field-of-view - cross-cockpit beneath the windshield, climbing from under the nose - until the last moment when the Hawk was shown just above the F406. Indeed this was broadly in accord with the reporting pilot's account who states that the Hawk was first spotted at right 1 o'clock about ½nm away, slightly high. Thus the Board agreed that, although he was not best placed to see it, part of the Cause was the F406 pilot's late sighting of the Hawk.

The Board was surprised that the Hawk crew had not detected the F406 within their lookout scan regimen. The F406 should have been visible to them through their canopy as the Hawk climbed up in the L turn towards the twin that the radar recording shows flying on a steady course in a level cruise above them. The nature of the Hawk crew's task – as the 'Bounce' to 2 other similar jets operating at low-level – might have focused their attention at the critical moment. However, the F406 – some 1500ft above cloud it is reported - should have been plainly visible to them on the inside of their L turn. It was indeed fortunate that the Hawk had climbed to 4300ft, some 300ft above the F406, although from this position the F406 might well have been masked underneath the jet's nose. It was apparent that the Hawk crew had not seen the F406 at all during this manoeuvre and the Board concluded that the other part of the Cause was a non-sighting by the Hawk crew.

Once the Hawk had climbed above the F406, the radar recording suggests that the jet had over flown the F406 by 100-200ft on a reciprocal heading, before turning L again and clearing ahead. Controller Members agreed that the Mode C levels from the Hawks 'raw' SSR data were consistent with the displayed returns and those 'invalid' returns which had been included on the diagram were not only closely consistent but also in general accord with

the F406 pilot's account. In the Board's view, the Hawk crew would not have flown so close to the twin if they had been aware of its proximity. Furthermore, the F406 pilot had reported that he was unable to effect avoiding action in the short time available. Therefore, any vertical separation that existed between these ac was purely fortuitous. Recognising that the F406 pilot had assessed the Risk as *"medium"* and reported that the jet had passed 100-200m to starboard, one Member considered this was sufficient to prevent an actual collision. However, the majority of the Members agreed with the fast-jet pilot Member's opinion that, as the Hawk crew were unaware of the proximity of the F406 a few hundred feet below them, and given the high closing speed, an actual risk of collision had existed in these circumstances.

The Board noted that although the F406 was fitted with a Mode S transponder, the ac was not equipped with any form of ACAS. Although the fitting of such equipment is not mandated for ac such as the F406 here, such a device could have made a difference by alerting the pilot to the presence of the Hawk. The Board has for many years advocated the fitment of such collision warning systems, therefore, Members were reassured to learn that the replacement Hawk T Mk2 training ac has a TCAS II system fitted, which will reduce the potential for Airprox of this nature.

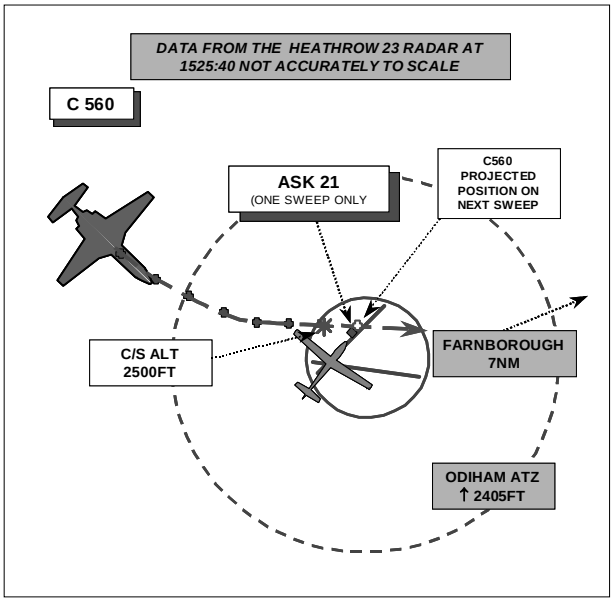
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the Hawk crew and a late sighting by the F406 pilot.

Degree of Risk: A.

AIRPROX REPORT NO 2009-104

Date/Time:	13 Sep 1526 (Sunday)	
Position:	5114N 00056W (Odiham - elev 405ft)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	ASK21	C560XL
Operator:	Civ Club	Civ Pte
Alt/FL:	1300ft	NR
	(QFE)	(N/K)
Weather:	VMC	NR
Visibility:	>10nm	NR
Reported Separation:		
	200ft V/0m H	NR
Recorded Separation:		
	NR (see UKAB Note: (4))	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ASK21 PILOT reports that he was on his third winch launch of the day but since the lift was marginal, he was flying circuits to maintain currency. The RAF Gliding School was operating Grob 109s on the main RW adjacent to their North Easterly launch run, so pre-launch lookout for other ac in the vicinity were necessarily thorough.

The winch launch was normal until he reached 1300ft at about 70kt, when he was suddenly aware of a business jet with a white underside, straight wings, no tip tanks and with its undercarriage retracted directly in front and 200-300ft above him, passing from his left to right at about 200 to 300kts, and in the airspace where he expected his launch to take him in the next few seconds. Before he had time to take any avoiding action, the ac had passed, heading in the direction of Farnborough.

He released from the winch at 1500ft but found very little lift so he landed after 8min.

On returning to his launch point, he was informed that the person manning the log in the launch point caravan and a pilot from the RAF Gliding School (also operating Odiham Radio), who was watching from a point about 250m to their NW, had telephoned Farnborough ATC to report the incident. The winch driver also expressed concern at the sudden appearance of the other ac and its closeness to the glider. The ground observers agreed that the other ac had been flying at an estimated height of 1500ft and, given their relative positions on the ground, its ground track had been accurately triangulated.

He assessed the risk as being High.

THE C560XL PILOT reports flying a private flight inbound Farnborough under IFR, in a white and brown ac, squawking as directed with Modes C and S; at the time of the Airprox he was in receipt of a TS and radar vectors from Farnborough. He saw no other ac and knew nothing about the incident but suspects that the other ac was not squawking as he saw nothing on TCAS.

UKAB Note (1): The UKAIP (ENR 2-2-2-4) promulgates the Odiham ATZ as a circle of 2nm centred on the centre of the longest notified RW (09/27) up to 2000ft aal (2405ft amsl) and is active H24. It also states that Farnborough may carry out the task of ATZ clearance. At ENR 5-5-1-4 it is also promulgated as a glider launch site (winch/ ground tow and tug aircraft/motor glider) up to 2500ft agl [2905ft amsl], Hours HJ.

UKAB Note (2): There is a LoA between Farnborough and Odiham (see ATSI comments below) regarding operations when Odiham ATC is closed.

UKAB Note (3): The Farnborough METAR for 1520 was:

EGLF 131520Z 03010KT 350V070 9999 FEW034 BKN040 17/09 Q1027

UKAB Note (4): An analysis of the Heathrow 23cm radar shows the C560 tracking SE towards Odiham. At 1525:30 when it was about 2nm NW of Odiham and level at 2500ft (London QNH 1027mb) it commenced a slow turn left onto E tracking ½nm N of the ARP at Odiham [i.e. over the N side of the airfield which is approximately 1.2NM in diameter] at 1525:46, while remaining at 2500ft. As it approached a position ½nm N of Odiham ARP, a primary-only contact appears for one sweep only in its 1 o'clock at 0.1nm but its track cannot be determined; that being the case the CPA cannot be measured, but it was less than 0.1nm H. If the Glider was, as reported, at 1300ft agl, which equates to 1700ft amsl, then the vertical separation would have been about 800ft with the C550 about 100ft above the top of the Odiham ATZ but below the top of the promulgated winch launch height.

ATSI reports that, while in descent to leave controlled airspace S of CPT, the C560 made its first call to Farnborough Radar at 1521:30. The controller responded *"… Information is Quebec QNH is one zero two seven vectoring for the visual approach to runway zero six what type of service outside Controlled airspace".* The pilot replied *" Er we've got Quebec one zero two six request traffic information service".* This was acknowledged, but the controller did not challenge the incorrect readback of the QNH. The flight was then cleared to 3000ft.

The ac had earlier been instructed to track towards ODIMI, a reporting point co-located with RAF Odiham (Note: This is a published alternative to standard IFR arrival routes when Farnborough Radar is available – see UK AIP AD 2-EGLF-1-9, Paragraph 2 d, Note 1). At 1522:30, the controller informed the flight it was now leaving CAS and was under a TS.

A Traffic Service is defined in MATS Part 1, Section 1, Chapter 11, pages 5-7, as:

*"…*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 guidance adds under the sub paragraph entitled Traffic Information:

*"*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".

Odiham is located 7nm WSW of Farnborough and both airfields lie outside CAS. Odiham has an ATZ as defined at UKAB Note (1) and the final approach centreline for RW06 at Farnborough passes about 1nm to the SE of Odiham. Farnborough MATS Part 2, APR Chapter 5, RAF Odiham, Paragraph 22. states:

"Gliding operations may take place at Odiham at any time. The approved maximum launch height from winch or auto-tow is 2500ft AGL at Odiham (i.e. 2905ft Farnborough QNH). There is no agreed limit for aero-tows. Approach Radar Controllers must bear this in mind when vectoring ac on to final approach to Runway 06 and for departing ac on Runway 24."

It was subsequently reported that the controller had not been aware of the maximum launch height as described in this paragraph.

The unit has reminded controllers of the requirement to understand and comply with MATS Part 2 procedures.

On the day of the incident, Odiham ATC was closed; however, gliding was taking place and responsibility for the ATZ and glider/model flying on the airfield was delegated to the Duty Instructor from one of the two resident gliding clubs. Farnborough was notified and the controller was aware of the activity. Although not required to do so, it may have been prudent for the controller to issue a general warning of this activity to the pilot of the C560 pilot.

A Letter of Agreement (LoA) is in place between Farnborough ATC and the gliding/model clubs. A copy of this LoA is in the Farnborough MATS Part 2, Annex E.3 and Paragraph 2.1, defines procedures and responsibilities *"…that will permit the safe flight of both the Gliders and IFR inbound traffic to RW 06 at Farnborough Airport when RAF Odiham ATC is closed"*. Paragraph 7 details the Farnborough ATC Responsibilities and Procedures and sub-paragraph 7.3.1 states *"All Farnborough inbound traffic for RW 06 will be vectored clear of the Odiham ATZ when the Duty Instructor (DI)* (gliding club A/gliding club B) *has notified the Farnborough Approach Controller* (telephone number) *that 'Gliding has commenced'".*

(Note: Subsequent sub-paragraphs describe the procedures for IFR traffic requiring an ILS approach to RW06. These include providing the DI with a 20min notice of an ac requiring an ILS, so that arrangements can be made to ensure gliders are on the ground or below a specific level within the ATZ. Once in place, IFR traffic may then be vectored through the Odiham ATZ for an ILS approach.)

On this occasion the controller decided to vector the C560 clear above Odiham's ATZ and then release it for further decent on the visual approach once it was beyond the lateral boundary of the ATZ. At 1524, the C560 was cleared to 2500ft. Once the pilot's readback was complete, the controller added *"(callsign) thank you just above the Odiham ATZ then you'll be able to descend at about four and a quarter miles is that sufficient,* the pilot replying *"affirm".* The radar recording used by ATSI was the Heathrow 23cm. At this time it indicates the C560 was about 6.5nm from ODIMI, with no ac operating within the Odiham ATZ showing on the radar recording.

The C560 was subsequently instructed to turn left onto a radar heading 105°and then at 1525:12, further left on to 090°. After correctly reading back the instruction, the pilot immediately reported *"visual".* The controller then cleared the ac for a visual approach "…*and to descend in accordance with noise abatement but if you can leave your descent till er four point er two miles".* Once the pilot's readback was completed, the ac was transferred to Farnborough Tower, after which, the controller later reported, he handed over the position to an incoming controller. Immediately after the pilot had readback the frequency change, a pop-up primary contact appears in the C560's 1 o'clock position at 0.2nm, on the radar recording. This occurred when the C560 was 0.4nm NW of Odiham. By the next sweep, the contact has disappeared. It reappears in the subsequent sweep at a similar distance, but now astern of the C560. Thereafter, the contact is intermittent, but appears to be tracking slowly NE. The C560 maintained 2500ft Mode C until beyond Odiham's ATZ boundary, whereupon it descended in accordance with the visual approach.

Over the next few minutes, representatives of both Odiham gliding clubs telephoned Farnborough APR to enquire of the identity of the jet ac that had recently passed 'overhead'. The initial response confirmed that the ac was almost certainly inbound to Farnborough and receiving a service from them. Later the controller involved

telephoned back one of the gliding clubs and explained that the traffic had passed overhead, but above the ATZ and was instructed not to leave 2500ft until it was 4.2nm from Farnborough, by which time it would also be outside the lateral boundary ATZ. Neither club representative made any reference to an incident taking place or reported.

Farnborough ATS have followed up an action in their Unit report that asked for a review of the procedures relating to the Odiham glider activity and visual approaches to RW06 at Farnborough. This resulted in a revised LoA and SI (Supplementary Instruction) aimed at clarifying for the glider operation that "clear of Odiham ATZ" can mean vertically or laterally. Before being signed-off by all parties, the new document was then subjected to an independent hazard analysis. Initial results have challenged the wisdom of vectoring clear in the vertical plane. Consequently, the likely outcome will be that vectoring clear of the Odiham ATZ is only conducted in the lateral plane. Procedures are currently being formulated by Farnborough ATS to resolve the practical challenges of vectoring clear of the ATZ boundary, while at the same time placing ac in a position from which they can achieve a safe visual approach and landing on RW06 at Farnborough.

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.

Controller Members stressed that it is essential for controllers to be aware of local procedures as promulgated in their MATS Part 2. Notwithstanding that, the LoA between Farnborough and RAF Odiham regarding out-of-hours glider operations was inadequate in that it did not address the gliding activity that occurred above the ATZ. However, the Board noted the remedial action being taken by both units and welcomed the external audit of the draft replacement LoA. The Gliding Member also pointed out that when gliders are launching to the NE, ac approaching Farnborough could mitigate the risk significantly by routeing/being directed to the S of Odiham, the opposite applying when the gliders are launching to the SW.

A controller Member asked if the Odiham ATZ was marked on the Farnborough radar overlay; neither the NATS nor ATSI Advisors knew but agreed to report back.

Post Meeting Note: ATSI inform that the Odiham ATZ is marked on the Farnborough radar display system.

The NATS Advisor stated that he had been informed that the maximum launch altitude of gliders with existing winch equipment at Odiham was 1500ft agl and that the NATS unit was in contact with with the gliding operator to confirm this. The Gliding Member cautioned that equipment can change and techniques exist to launch above 1500ft agl; however both agreed that the AIP entry should be reviewed.

Despite the apparent confusion regarding the ATZ and the promulgated 'Glider Launch Site', all Members agreed that flying over such a site below the published maximum launch altitude is at best unwise and potentially dangerous. The Board therefore welcomed the proposal for Farnborough traffic to avoid Odiham laterally when gliding is taking place.

Notwithstanding the inadvisability of flying over Odiham at just above ATZ height, in this Airprox the best information available indicated that the C560 was at an alt of 2500ft (radar) and the glider was at 1300ft agl/1705ft amsl (pilot's report); that being the case the ac had been separated vertically by about 800ft, even though the lateral separation had been minimal. Consequently Members agreed that there had been no risk of collision. In coming to this conclusion the Members fully understood how difficult it would have been for the glider pilot to assess the separation when the C560 appeared suddenly, but for a short time, in his full view, apparently crossing through his projected flightpath while he was in a high nose-up attitude with no other visual references to assist his estimation.

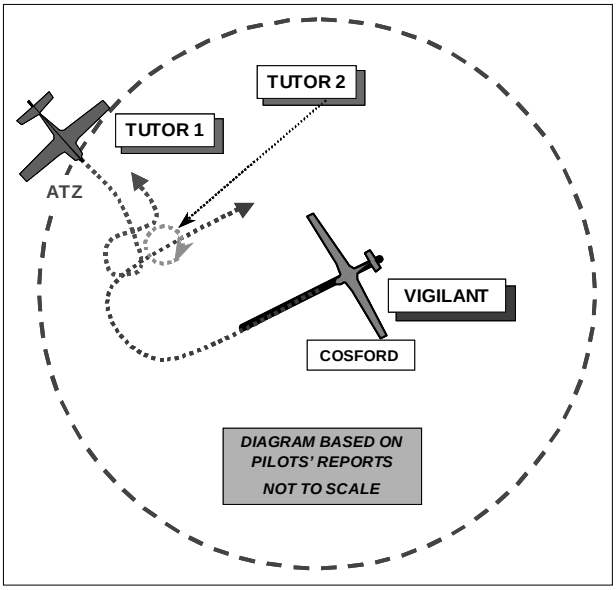
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A mistaken impression of vertical separation from the C560XL by the ASK21 pilot, overhead a promulgated and active glider site.

Degree of Risk: C.

AIRPROX REPORT NO 2009-105

Date/Time:	19 Sep 0949 (Saturday)	
Position:	5240N 00219W (Cosford CCT - elev 272ft)	
Airspace:	Cosford ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Vigilant T1	Grob Tutor
Operator:	HQ AIR (TRG)	HQ AIR (TRG)
Alt/FL:	800ft (QFE)	800ft (QFE)
Weather:	VMC CLOC	VMC CAVOK
Visibility:	15km	>10km
Reported Separation:	0ft V/200m H	Not seen
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VIGILANT T1 PILOT reports that his sortie profile was an assessment and pre-solo check of a Gliding Scholarship student, which consisted of a sequence of standard take-offs, conventional ccts and full-stop landings. As they turned upwind and while a minor teaching point was being made, ATC asked for confirmation of their position and this was passed as '*Turning upwind*'. As the turn was completed ATC was heard advising a Tutor on frequency that a Vigilant, presumably them, was '*early downwind'* and shortly afterwards they asked for further confirmation of their position; he responded '*early downwind'.* As they approached the normal downwind point heading 060° at 60kt he was looking out for other ac and suddenly became aware of a landing lamp pointing towards them. He was about to take control and carry out any necessary avoiding action, when he saw that the on-coming ac was a Tutor about 200m away and it was in a hard right turn away from them. At about the same time he heard the pilot (callsign C/S) advising ATC that he was unsighted to other ac in the cct and was turning away. The student was startled enough to ask what the oncoming ac was. He assessed the risk as being Medium and reported the incident on landing.

THE GROB TUTOR PILOT reports that, since no RT report of an Airprox was made (despite both ac being on the same frequency) and since he did not see the reporting ac, his report is based solely on the reported Airprox position and time.

He was conducting a cadet air experience flight in a white ac with strobes, nav lights and the landing light switched on, squawking 7000 with modes C and S, and was in communication with Cosford TWR.

Due to his assigned operating area and the short sortie length, he elected to rejoin the Cosford cct via the downwind position and this was approved by TWR. Despite the visibility being reported as greater then 10km, it was a tricky day for visually acquiring other ac, particularly looking into sun, as the sky was uniformly white and the horizon was poorly defined.

He positioned his ac to join at about the normal start of the Tutor downwind leg aiming to make a 90° LH joining turn onto downwind at 800ft QFE and between 80 and 100kt. ATC had advised him of one other Tutor joining and two Vigilants in the cct. He was visual with a Tutor (Tutor 2) on an extended downwind leg and made some heading adjustments to fit behind him with normal cct spacing. Based on the reported positions of the Vigilants in the cct, he thought that one was in front of the Tutor ahead of him and the other had reported '*Turning upwind*'. Whilst his attention was focused on the Tutor in front of him, he checked to the right for the upwind Vigilant but, although he did not see it, he was content that, given their reported positions, he could follow the preceding Tutor into the cct.

As the Tutor (Tutor 2) ahead established on the downwind leg, he was aware that it was quite close to a Vigilant ahead of it and it appeared to be turning to the right, back towards him, when its pilot then transmitted that he would fly an orbit downwind to achieve spacing. As he was now unsure of the exact position of following traffic, and with the preceding Tutor orbiting in front of him, he decided to leave the cct and informed Cosford Tower of his intention. He made the turn to depart to the right to aid his lookout in the turn, as turning to the left would have limited his lookout given the lack of experience of the cadet in the LH seat. The reporting ac was not seen during this turn or during his departure from the cct so he could not assess the risk. He then rejoined the cct uneventfully and was informed of the incident by telephone after landing.

DAATM reports that RAF Cosford was operating from RW24 RH cct in weather colour code Blue. The cct was active with 4 Vigilant Gliders and 4 Tutors were departing and rejoining the cct to land. The local gliding club was also operating on the S side of the airfield with winch and aero-tow launches. The Vigilant concerned was flying training ccts while the reported Tutor was rejoining the cct downwind.

The Vigilant pilot called TWR at 0945:43 reporting ready for departure; he was given a line-up clearance, which he acknowledged. Four seconds later the pilot of the Tutor involved (Tutor 1) called TWR requesting a visual recovery from the N and TWR replied '*C/S roger re-join with Charlie, downwind join approved, with 2 Vigilants in the circuit';* the pilot acknowledged. A number of non-related ATC/ac transmissions occurred before the Vigilant was cleared for take off at 0946:28. At 0946:37 another Tutor (Tutor 2) pilot called TWR reporting '*turning 4½ nm West for rejoin with Charlie',* he was given joining instructions and the cct state passed as two Vigilants in and a Tutor joining [UKAB Note (1): Tutor 1 behind him]; he acknowledged saying '*Clear to join extended downwind'.* Multiple, non-related transmissions were made until 0949:22 when Tutor 2 pilot reported 'C/S *orbiting at the beginning of the downwind leg – Vigilant ahead of me'.* It would seem that Tutor 1 pilot was visual with Tutor 2 but not with either of the Vigilants in the cct and he positioned his ac behind Tutor 2 at normal spacing and was content that he could continue to follow Tutor 2 in the cct without conflicting with either of the Vigilants. Tutor 1 pilot also stated in his report that as he saw Tutor 2 establish position in the downwind leg, that he was aware that Tutor 2 was close to one of the Vigilants and that he saw Tutor 2 turning to the right back towards him and transmitting the reason for his orbit. Since Tutor 1 pilot was unsure of the position of traffic behind he decided to leave the cct and transmitted at 0949:30 'C/S *departing the circuit to the North'* which TWR acknowledged. TWR then asked Tutor 2 if he was orbiting downwind but the response was unclear on the tape transcript.

In the Vigilant instructor's report he refers to ATC requesting and confirming his cct position to update Tutor 1 pilot however, the tape transcript reveals that the references occurred after the Airprox and during the Tutor's subsequent approach and therefore, have no bearing on the Airprox.

Cosford TWR passed accurate TI regarding the visual cct state in good time to Tutor 1 pilot and he joined the cct without being visual with all cct traffic. On becoming unhappy with the situation he initiated a right, (long-way round) turn to leave the cct and flew into confliction with the Vigilant.

This incident was discussed in detail at a Station Flight Safety Meeting and the Flying Order Book procedures have been revised to reduce the possibility of a recurrence of such a situation.

UKAB Note (2): Both Tutor ac show on the recording of the Clee Hill radar throughout. Neither the Vigilant involved nor the one ahead of Tutor 2 in the cct however, show at any time so the CPA cannot be determined.

HQ AIR (TRG) comments that both Tutor pilots had been given timely TI about cct traffic but they had not visually identify all the gliders before attempting to join. Consequently, the pilot of Tutor 2 realised on joining downwind that his spacing was too close to the glider ahead and decided to fly an announced RH orbit to increase his spacing. This orbit caused problems for the pilot of Tutor 1 being behind the orbiting Tutor 2 and unsure of the position of the other glider he decided to depart the circuit and rejoin. By flying a RH turn to depart Tutor 1 was turned in conflict with the glider behind him that he had not seen causing the Vigilant crew concern.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

While noting the reduced visibility, specialist Members observed that it is still the responsibility of pilots to integrate safely into the circuit pattern being flown by other ac. It appeared to Members that, while Tutor 2 was not involved in the Airprox per se, neither Tutor ac had integrated safely into the circuit, Tutor 2 getting too close to the slightly slower Vigilant ahead (also not involved), and Tutor 1 joining without seeing the Vigilant behind him. While understanding the necessity for short efficient flights to maximise the number of cadets flown Members considered that this imperative might in this instance have taken priority over normal safety procedures. Specialists also observed that, should pilots find themselves, for whatever reason, inadequately spaced in a busy circuit, then the best way to resolve the situation is to depart the circuit by turning away and climbing immediately in order to ensure clearance from other ac, then rejoin with proper separation allowing for any ac speed differences; an RT call should be made simultaneously to inform both ac and the TWR of the pilot's action and further intentions. Further, if joining and **all** other circuit traffic cannot be sighted immediately, an RT call asking for more information will often assist the sighting of the ac. Finally, even Members familiar with Tutor operations with the handling pilot in the RH seat, considered that it would have been safer for Tutor (1) to have turned left away from the circuit pattern rather than right and potentially back into conflict.

There was discussion about the TI passed by Cosford TWR, which appeared to some Members not to have been fully accurate because it counted an ac 'on for take off' as being in the circuit. However, a majority agreed with the DAATM report that this was in accordance with military procedures and therefore correct. All Members agreed that better phraseology could have made this clearer. It was pointed out by the DAATM Advisor that at Military airfields, unlike their civilian counterparts, controllers do not 'control' the traffic sequence, but pass information to allow pilots to sequence themselves safely. A GA Member noted that the phraseology *'turning upwind'* is non-standard and, although moderately clear, it did not give the other pilots in the circuit an accurate picture of the reporting Vigilant's position.

Notwithstanding the incorrect decisions (in the Board's view) made by the two Tutor pilots involved and that the Tutor (1) pilot did not see the Vigilant, the Vigilant pilot saw the Tutor throughout and the separation was such that he considered that no further avoidance was required; that being the case, the Board determined that there had been no risk of collision.

The Board again noted the effectiveness of the landing light in assisting the visual acquisition of other ac in conditions of reduced visibility.

Although the HQ Air (Trg) Member was not able to attend due to illness, he passed a telephone report to the Secretariat who briefed the Board on a range of follow up measures taken at RAF Cosford; the Board welcomed these measures.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Tutor pilot (Tutor 1) flew his aircraft into conflict with the Vigilant, which he did not see, as he left the circuit.

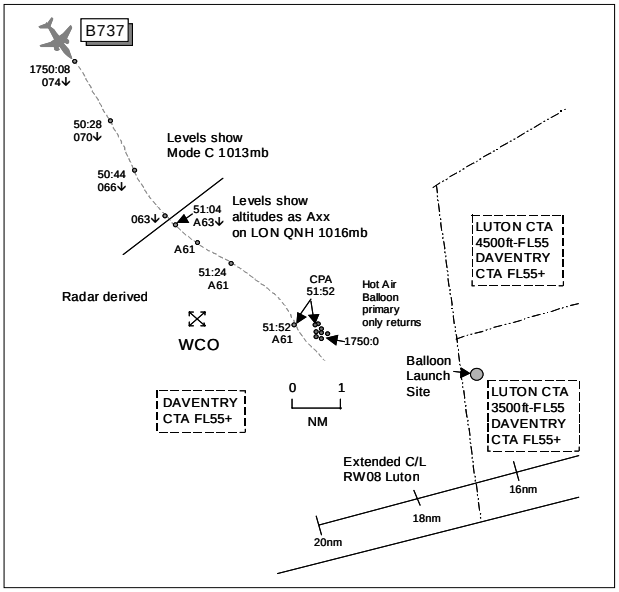
Degree of Risk: C.

Contributory Factors: A second Tutor (Tutor 2) flew an orbit downwind in the circuit ahead of Tutor 1.

AIRPROX REPORT No 2009-106

AIRPROX REPORT NO 2009-106

Date/Time:	18 Sep 1752	
Position:	5151N 00054W (2nm E WCO)	
Airspace:	DAV CTA/LFIR	(Class: A/G)
	Reporting Ac	*Reported Ac*
Type:	B737-800	Balloon
Operator:	CAT	Civ Comm
Alt/FL:	FL60	5000ft (QNH 1016mb)
Weather:	VMC CLOC	VMC CAVOK
Visibility:	10km	20km
Reported Separation:	3-400ft V/0·5nm H	500-1000ft V/ 1000ft H
Recorded Separation:	0·4nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports inbound to Luton IFR level at FL60 on radar heading approaching WCO for an ILS to RW08. He noticed a black 'spot' on the windscreen and, as they were in level flight at 250kt, this spot rapidly grew and quickly became recognisable as a hot air balloon. It was in their 12 o'clock about 3nm away and slightly lower than their assigned altitude. He quickly scanned the NAV display for a TCAS return but saw none. He decided to take evasive action and turned the ac R using HDG SEL. He felt the ac was slow to react, considering the proximity of the balloon, so he considered disconnecting the A/P but then saw that they were moving away from the balloon at a rate sufficient to avoid and he wanted to concentrate his attention outside the ac to ensure separation. The FO immediately advised ATC that they were turning R to avoid a hot air balloon and they replied 'OK' and that they had no returns on their radar display indicating conflicting traffic. As they were in a high workload portion of the flight with monitoring their descent for RW08, energy management etc as they were always high for RW08 approach, this distraction happened very fast: high rate of closure and need for immediate action. They were in daylight VMC but very close to dusk and a darkening sky. The balloon passed off their L wing by about 0·5nm and slightly lower than their assigned altitude, 300-400ft lower. The balloon was thought to be dark blue in colour with large white lettering visible. He assessed the risk as significant.

THE BALLOON PILOT reports flying a blue balloon with large logo from Aylesbury and in communication with his support vehicle. The visibility was 20km in CAVOK VMC and he was tracking 280° at 5kt and 5000ft QNH 1016mb near to WCO in free airspace when he was overflown by an airliner with adequate separation (500-1000ft V/1000ft H). He did not consider this as a near miss.

THE LUTON INTERMEDIATE DIRECTOR (INT) reports the B737 was inbound and he was about to vector the flight for the ILS RW08. Just after coming on frequency the pilot reported taking avoiding action on a hot air balloon – position given as 4nm S of WCO at 5000ft – which placed it outside CAS. The pilot was advised that there was nothing displayed on radar and to report when able to turn back E'bound towards the ILS.

ATSI comments that at 1750:07, the B737 flight established communications with Luton Approach, reporting descending to FL60, heading 155°, copied Information 'Whiskey' and the QNH 1016mb. The Luton INT acknowledged the message and advised that the ac was 22nm from touchdown and No 2 for an ILS approach to RW08 (at Luton). The radar recording shows the B737 was about 6nm NW of WCO at this time. The base of Class A CAS of the Daventry CTA in the vicinity of WCO is FL55.

The guidance in MATS Part 1, Section 1, Chapter 6, Page 4, Use of Levels by Controllers states: *Except when aircraft are leaving controlled airspace by descent, 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. Similarly, controllers should exercise caution when operating close to the upper vertical limit of a control zone or area where it is not contiguous with further controlled airspace.

At 1750:44, the B737 flight was instructed to turn L onto 130°. Less than a minute later, at 1751:25, the B737 pilot transmitted, *"(B737 c/s) be advised er there's a balloon at approximately 5000ft er four miles to the south of Westcott we are taking avoiding action turning right heading one eight five degrees",* the Luton INT responding, *"(B737 c/s) roger that's understood nothing showing on the radar report when you can turn back to the east".* Within 5sec the B737 pilot transmitted *"Clear of conflict and we are returning to heading one two five degrees".* The B737 is FL61 Mode C, throughout the manoeuvre. Luton INT acknowledged the pilot's transmission and then placed the ac onto a heading of 110° to establish on the ILS LOC for RW08. The B737 pilot made no further mention about the encounter and the ac subsequently established on the ILS and landed without further incident.

The recording of Debden radar, the source used by Luton INT, does not show any primary radar returns that could be correlated to the hot air balloon. Even if a radar return had been detected, the controller need not have taken it into account, as there was no information to indicate that an unauthorised penetration of the airspace had taken place (MATS Part 1, Section 1, Chapter 5 Pages 12/13 Unknown Aircraft, refers).

UKAB Note (1): The Heathrow 23cm radar at 1750:08 shows the B737 6nm NNW of WCO tracking 150° descending through FL074 with a primary only return, believed to be the Hot Air Balloon, just L of its 12 o'clock range 7·5nm. The Hot Air Balloon return exhibits severe track jitter for the duration of the recording, although a WNW'ly track is discernible. By 1751:04, the B737 rolls out of the turn onto heading 130° issued by the Luton INT, the Hot air Balloon moves to just R of the B737's 12 o'clock range 3·7nm, the B737 is descending through altitude 6300ft QNH 1016mb. Shortly after this the B737 levels at altitude 6100ft (FL60) and then commences a R turn in accordance with the pilot's reported avoiding action. The CPA is timed at 1751:52 as the B737 turns through 150° and passes 0·4nm W of the Hot Air Balloon before the B737 then commences a L turn towards the RW08 FAT.

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.

ATCO Members agreed that the positioning of the B737 onto base leg for RW08 at Luton descending to FL60 to remain 500ft above the base level of CAS was quite normal. The Hot Air Balloon pilot had reported flying at 5000ft in Class G airspace near to WCO, 500ft below the CAS base level. There was no doubt that the Balloon sighted was correctly traced since the distinctive colour, logo and signage were all unmistakeable. Without the benefit of a transponder, it was not possible to measure the vertical separation during the encounter. The RT transcript shows the B737 crew reporting on frequency their visual sighting of the Balloon, at approximately 5000ft altitude; in their written report the B737 crew estimated that the Balloon had passed 300-400ft below. Both flights were quite entitled to fly in that area legitimately with separation margins reduced to about 500ft with 'deemed' separation existing (the Balloon up to the CTA base level with the B737 500ft above). This led Members to opine that on this occasion there was almost certainly a mistaken impression of loss of vertical separation by the B737 crew. The large dark coloured Balloon envelope - approximately 30m in height – was seen at about 3nm distance against a darkening sky and had, for whatever reason, appeared in confliction. The B737 crew was concerned by its presence and had turned their ac away and informed ATC. Taking all of these elements into account the Board concluded that this incident had been a sighting report where no risk of collision existed.

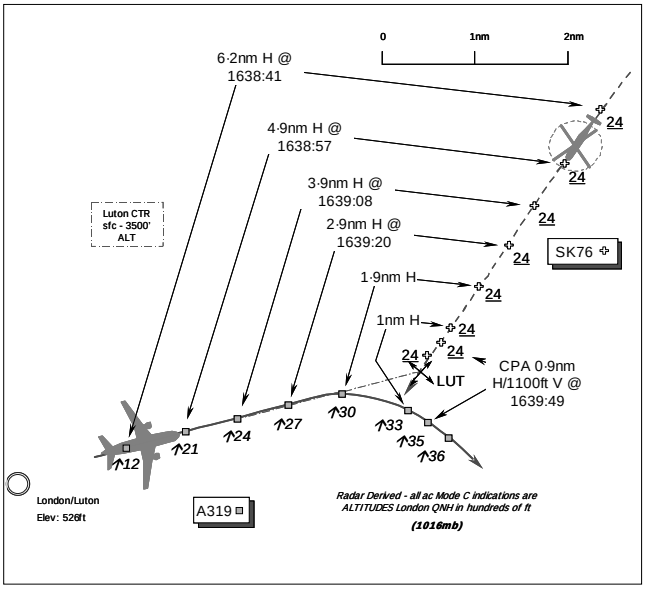
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A sighting report.

Degree of Risk: C.

AIRPROX REPORT NO 2009-107

Date/Time:	18 Sep 1639	
Position:	5153N 00015W (Vicinity of the LUTON (LUT) NDB)	
Airspace:	Luton CTR	(Class: D)
	Reporting Ac	*Reported Ac*
Type:	A319	SK76
Operator:	CAT	Civ Pte
Alt/FL:	2000ft	2400ft
	QNH (1016mb)	QNH (1016mb)
Weather:	VMC CAVOK	VMC
Visibility:	10km+	30km+
Reported Separation:		
	600ft V/2½-3nm H	900ft V/2·0nm H
Recorded Separation:		
	0·9nm/1100ft	



PART A: SUMMARY OF INFORMATION REPORTED TO UKABv

THE A319 PILOT reports he was departing Luton under IFR in CAVOK conditions and was in communication with Luton TOWER on 132·55MHz. A squawk of A1157 was selected with Mode C; Mode S and TCAS are fitted.

Shortly after takeoff heading 080° at 190kt on a DVR 7C SID, Luton TOWER advised them of helicopter traffic in their 11 o'clock at 2000ft, he thought [actually at 2400ft QNH (1016mb)]. Almost immediately the traffic appeared as a TCAS contact at a range of 4nm in the correct position; as they accelerated and climbed, it became clear to both pilots that, as it was still about 1000ft above them, the contact would pass very close with little separation. About 3nm E of the airport before reaching the LUT NDB, climbing through 2000ft QNH (1016mb), with both pilots expecting a TCAS RA if they continued on the same heading, the A/P was disconnected and a R turn away from the contact was initiated off the SID. At this point the Captain visually acquired the dark coloured helicopter and TCAS gave a TA during the turn. Minimum horizontal separation was estimated to be 2½-3nm as the helicopter passed about 600ft below his ac during the turn with a *"medium"* Risk of collision. Separation would have been less if they had continued on the SID.

THE SK76 HELICOPTER PILOT reports the ac was crewed with two pilots whilst in transit under VFR through the Luton CTR and in receipt of a RCS from Luton APPROACH (APR) [situated at Swanwick within LTC] on 129·55MHz. Mode S and TCAS I is fitted (with no RA capability) and the assigned squawk was selected with Mode C on. The ac lighting was 'on' including upper, lower and 'tip' HISLs and the 'search' light.

In a level cruise at 2000ft Luton QNH (1016mb), he thought [actually at 2400ft QNH (1016mb)], heading 217° at 150kt, VMC in a clear sky, Luton had informed them of the departing A319. No TA was enunciated but they had acquired and maintained visual contact with it from when it was in their 2 o'clock at 5nm and 1000ft below to when it passed through their 12 o'clock at a minimum range of 2nm some 900ft above them [from their TCAS]. At no time was it apparent that they might need to take avoiding action and they did not do so. From his perspective there was no risk whatsoever.

THE LUTON AERODROME CONTROLLER (ADC) reports that, having been alerted by the APR to the position and routeing of the VFR SK76, traffic information on it was passed to the A319 shortly after it took off; the A319 crew acknowledged. The SK76 was tracking SW'ly and traffic information was updated when the helicopter had closed to 2nm 11 o'clock and now below the A319. The latter's crew commented that they had turned early to avoid the helicopter and estimated the separation to be 2nm/600-700ft.

The 1620 Luton METAR was reported as: 09008kt 050v110 CAVOK 19/11 Q1016.

THE LTC LUTON APPROACH RADAR CONTROLLER (APR) reports that when the SK76 crew called for, and was issued with, a Zone transit clearance the helicopter was NE of Luton. He advised Luton TOWER about the SK76 so that traffic information could be passed to departing traffic and he advised the helicopter crew about traffic departing from RW08. Another controller, accompanied by a trainee, then took over the position and passed updated traffic information on the A319, whereupon the SK76 crew reported visual.

ATSI reports that at 1634, the SK76 crew established communication with Luton APR. The pilot requested Zone entry to the Luton CTR [sfc to 3500ft amsl]. The controller passed the QNH of 1016mb, saying she would call back shortly for the details. The pilot was then instructed to squawk 'ident' and report his level. The pilot responded *"Ident climbing altitude 2 Thousand 4 Hundred in fact achieving 2 Thousand 4 Hundred 1-0-1-6"*. The pilot requested to route from a position to the NE of Luton to the SW, through the CTR via the LUT NDB, which is situated approximately 5nm E of the airport. The SK76 crew was cleared at 1635:40, *"…to transit the Luton Control Zone VFR initially..not above 2 thousand 4 hundred feet"*. The clearance was read back correctly by the SK76 pilot, who was advised by the APR just before 1636:00, that *"…we might need you to route a little more to*

Meanwhile, the A319 was taxying for departure from RW08 at Luton. The flight was departing on a DVR7C SID, the initial routeing is:

'Climb straight ahead to **LUT NDB**. At LUT NDB turn right to intercept **BPK VOR** R337 to **BPK VOR.** Crossing **BPK** D5 at **3000** or above (4.4%). Crossing **BPK** D3 at 4000 (5.1%).'

The ADC, obtaining a departure release from the LTC N Co-ordinator at 1636, instructed the A319 crew to line up RW08. Shortly afterwards at 1637:10, a departure release was obtained from the Luton Approach Radar (APR) Controller. During this telephone co-ordination between the two controllers, the APR passed traffic information to the ADC about the SK76, which was at Baldock [6nm NNE of the LUT], VFR, at 2400ft and would be continuing on its current track. The A319 was cleared for take off at 1637:35. The radar photograph shows the SK76 was outside CAS 10nm NE of Luton Airport at the time, some 2nm from the boundary of the Class D airspace of the Luton CTR. The ADC considered it was not necessary to issue traffic information about the helicopter to the A319 crew at the time. Traffic information was, subsequently, passed to both flights. At 1638:20, the APR advised the SK76 crew *"Radar Control Service in the Luton Zone look out for an Airbus A 3-1-9 about to depart runway 0-8 climbing to altitude 4 thousand feet"*. At 1638:40, when the subject flights were approximately 6nm apart, the ADC informed the A319 crew *"traffic you may see in your 11 o'clock helicopter altitude 2 thousand 4 hundred feet".* The two controllers commented that the helicopter had progressed quicker than they had expected. The pilots of both ac said they were looking for the traffic. The SK76 pilot reported visual with the A319 at 1638:59 [at a range of just under 4·9nm]. By now the APR position had been handed over and the oncoming controller, aware of the situation, replied *"he's Two Thousand 2 Hundred and climbing now"*. Shortly after this, the ADC, who had not been advised that the SK76 was visual with the A319, informed the latter's crew just before 1639:40, *"..that traffic is now below you in your 11 o'clock 2 miles contact London 1-1-8 decimal 8-2-5 bye bye"*. Before leaving the frequency, the A319 pilot commented *"we did get a TCAS RA* [sic] *off that but I think that would have been very close on the separation we we've turned early to avoid it"*. The ADC had not realised that the A319 had turned early.

The radar recordings of the event show that when the A319 climbed through the level of the SK76, at 1639:08, the two ac were 3·9nm apart, on conflicting tracks. As the A319 continued to climb the horizontal distance between the ac reduced. At 1639:20, they were 2·9nm apart and the A319 was 300ft above the SK76. Ten seconds later the separation was 1·9nm/600ft. Shortly after this the A319 is seen to commence a R turn. By the time they were 1nm apart the ac were separated vertically by 900ft. The CPA was 0·9nm/1100ft, by which time the A319 was south of the SK76 and tracking away from it.

This Airprox occurred within Class D CAS. The MATS Part 1, Section 1, Chapter 2, Page 1, states the minimum services to be provided by ATC for aircraft in Class D airspace:

'(a) Separate IFR flights from other IFR flights; (b) Pass traffic information to IFR flights on VFR flights and give traffic avoidance if requested; (c) Pass traffic information to VFR flights on IFR flights and other VFR flights'.

Additionally, Section 3, Chapter 4, Page 1 provides advice and guidance to controllers on the safe integration of VFR flights with the IFR traffic flow within Class D CTA/CTR/TMA. These include:

'Separation standards are not prescribed for application by ATC between VFR flights or between VFR and IFR flights in Class D airspace. However, ATC has a responsibility to prevent collisions between known flights and to maintain a safe, orderly and expeditious flow of traffic. This objective is met by passing sufficient traffic information and instructions to assist pilots to 'see and avoid' each other. Instructions issued to VFR flights in Class D airspace are mandatory. Routeing instructions may be issued which will reduce or eliminate points of conflict with other flights'.

On this occasion, traffic information was issued to both flights.

The ADC believed that if the pilot of the A319 had not been content with the separation, he would have requested avoiding action. As he had made no comment until after the event, the controller assumed there was not a problem. However, with hindsight, in view of the higher speed than expected of the SK76 [UKAB Note: the radar recording shows a radar ground speed of about 160kt before the CPA], it would have been prudent to pass traffic information to the A319 prior to its departure. The oncoming controller, who was operating the APR position with a high-hours trainee, considered that after the SK76 crew had reported visual with the A319, its crew would take any action necessary to remain clear of the airliner.

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 a report from the appropriate ATC authority.

The Flight Ops Advisor to the Board who operates regularly from Luton noted that, in his experience, it was unusual for a helicopter transiting the CTR VFR to cross through the RW departure track. A CAT pilot Member also commented that it would have been unusual for the crew to see a helicopter in such proximity. He understood entirely the A319 pilot's concern when the presence of the SK76 was detected on TCAS as proximate traffic shortly after being passed TI by the ADC. Furthermore, the Member stressed that the A319 crew would have been coping with a high workload during the take-off and departure phase and the added pressure of the proximate traffic on TCAS would have been a significant distraction for them. The A319 Captain had articulated both pilots' concerns that a TCAS RA had been expected if they continued on the same heading toward the LUT NDB – and the helicopter. Consequently, the A/P was disconnected and a R turn away from the contact was initiated off the SID, but it was also clear from his report that he was manoeuvring based on proximate traffic and it was only after the turn was initiated that he saw the helicopter and a TA was generated. Pilot Members opined that in this situation shortly after take off, it was not unreasonable for the crew to take the action they did to attempt to increase the lateral separation if they were sufficiently concerned. Although the A319 pilot commented later on RT *"we did get a TCAS RA off that..",* it was clear from his report that only a TA was enunciated and no RA ensued.

Although it was evident that the SK76's crossing of the CTR was in accordance with National ATC procedures for dealing with VFR flights crossing Class D CAS, controller Members expressed concern that the A319 crew had to take such unilateral action themselves to increase the separation against the SK76. A CAT pilot Member opined that a commonly held misconception amongst commercial pilots was that IFR flights were afforded standard separation over all other traffic. However, the ATSI report had made plain that no minimum separation standards are stipulated between IFR and VFR flights. Therefore, in Class D CAS separation is not normally engineered by ATC between IFR and VFR flights; rather sufficient traffic information must be passed together with instructions to assist VFR pilots to see and avoid the IFR flights. The ATSI report made it clear that the ADC had not considered it necessary to issue TI to the A319 crew before take-off and the Board discussed the provision of TI to the A319 crew at length. Controller and pilot Members agreed with the ATSI view that it would have been prudent if the ADC had issued TI about the SK76 before the A319 crew was given take-off clearance. Earlier information would have given the A319 crew more time to assimilate the information, better SA and the option of delaying their take-off until the SK76 was clear of the climb-out if they so wished. As it was, TI was issued about a minute after take-off when the crew were cleaning-up the ac after take-off and establishing themselves on their outbound course. A CAT pilot member opined that it was the combination of relatively late TI about unexpected and potentially conflicting traffic during the high workload stage of flight that led the A319 crew to react as they did, taking the initiative to increase separation. As it was, the radar recording had shown that the A319's RoC was such that it had indeed climbed through the SK76's altitude at a range of 3·9nm and was 600ft above the latter when the range had closed to 1·9nm. A controller Member explained that the A319 crew could have requested avoidance advice from ATC; however, in this instance there would likely have been a delay because the flight was still under the

control of TOWER and was not yet in receipt of a radar service. In the Board's view late traffic information to the A319 crew was a Contributory Factor.

The VFR SK76 crew, despite being in receipt of a RCS in Class D airspace, was responsible for affording the separation they deemed appropriate against the IFR A319. It was evident that the SK76 crew had been given TI by the APR in good time as they entered the CTR and had promptly acquired the A319 visually at 1638:59, which the radar recording showed was at a range of just under 4·9nm. A controller Member suggested that when the off-going APR advised the SK76 pilot just before 1636:00, that *"…we might need you to route a little more to the south and the east of the Lima Uniform Tango*.." after issuing the Zone entry clearance, the controller was indicating that he might subsequently need to take more positive steps by modifying the SK76's clearance. An area controller Member suggested that it seemed the rapid transit of the CTR had taken the ADC somewhat unaware, although the Members agreed the groundspeed of the SK76 flying downwind was not unduly excessive. Nevertheless, instructing the SK76 crew to route clear behind the departing airliner would have taken care of the situation. A controller Member familiar with operations at Luton pointed out that it might have been preferable to instruct the SK76 crew to follow a course along the A1(M) - taking the helicopter E of the LUT NDB - until the A319 was seen to be above it. However, when the SK76 crew reported that they were visual with the departing A319 a controller Member suggested it would have reassured the oncoming APR who, subsequently, had not elected to place any further restriction on the VFR flight or modify the CTR crossing clearance. From the ATC perspective, with the clarity of hindsight, Members agreed that it was unwise to route the SK76 across the climb-out at this altitude and there were better alternatives available to ensure the helicopter's safe transit of the CTR in opposition to departing IFR traffic.

Having discussed the incident at length, the Board was divided over identifying a specific Cause. The Board could not assess the occurrence on the basis of what might have happened if the A319 had maintained its course to the LUT NDB; it was necessary to assess what had actually happened. In the event the A319 crew had reacted to a combination of TI and their TCAS indications; they then saw the helicopter and received a TA warning, making it possible to identify the cause as a Sighting Report or a Sighting Report (TCAS). However, in Class D airspace the onus was on the VFR helicopter to see and avoid the IFR airliner by an appropriate but unspecified margin. The SK76 crew received timely TI on the A319 and saw it in good time. They saw no requirement to deviate from their clearance or take avoiding action, even before the A319 turned away and from their perspective there was no Risk. On balance, and supported by the radar recording showing that the A319 climbed through the SK76's altitude at a range of 3·9nm, the Board determined by a narrow majority that the Cause was a perceived conflict in Class D airspace and, unanimously, that there had been no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A perceived conflict in Class D airspace.

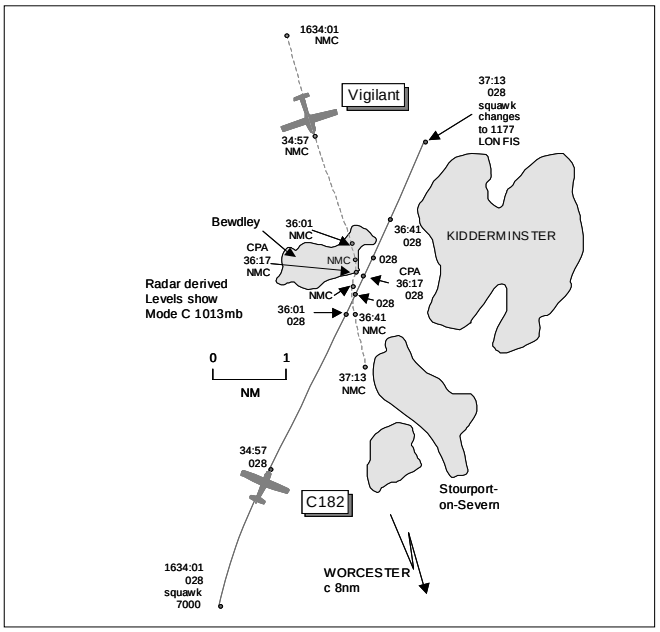
Degree of Risk: C.

Contributory Factor: Late traffic information to the A319 crew.

AIRPROX REPORT No 2009-108

AIRPROX REPORT NO 2009-108

Date/Time:	20 Sep 1636 (Sunday)	
Position:	5222N 00218W (2nm W Kidderminster)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Vigilant	C182
	M/Glider	
Operator:	HQ AIR (TRG)	Civ Pte
Alt/FL:	2600ft	NR
	(QFE 1014mb)	(N/K)
Weather:	VMC CLBC	VMC NR
Visibility:	>30km	NR
Reported Separation:		
	Nil V/50m H	Not seen
Recorded Separation:		
	0·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VIGILANT PILOT reports flying a dual navigational training sortie from Ternhill VFR, listening out with Ternhill Radio on 122·1MHz and squawking 7000 with NMC. The visibility was >30km flying 1500ft below cloud in VMC and the ac was coloured white/red with nav, landing and strobe lights all switched on. The incident occurred on the first leg towards Worcester, overhead Bewdley, whilst approaching a waypoint of Stourport-on-Severn; the trainee instructor was completing the navigational tasks as he maintained the lookout. Heading 170° at 90kt and 2600ft Ternhill QFE 1014mb, he first sighted another ac 300-400m ahead and 30° to the R, crossing obliquely from R to L on a steady relative bearing at the same level. He immediately took control and initiated a R turn to avoid, with approximately 30° AoB, passing port to port with no more than 50m separation before passing behind. The other ac, a high-wing single-engine Cessna type coloured white/red with retractable gear continued without deviating from track, estimated between 360° and 020°. He thought that this had been a late sighting owing to instructional requirements of the task at that particular moment and possibly that the Cessna was obscured by the arch of the canopy frame for some time prior to being seen. He assessed the risk as very high.

THE C182 PILOT reports being unaware of being involved in an Airprox until being contacted by RAC Mil. The flight was under VFR from a private strip near Ledbury to another private strip near Barnard Castle and in receipt of a BS from London Information on 124·75MHz squawking with Modes S and C. The Wx was VMC and the ac was coloured cream/red with strobe lights switched on. He did not see the reporting ac so was unable to provide any further information to the investigation.

DAATM reports that as the Vigilant pilot was monitoring the Ternhill frequency on a Sunday, with ATC closed, the RT would have been operated by the Glider Ops personnel, unrecorded.

ATSI comments that although the C182 pilot's report was received over 1 month post Airprox, the RT recordings were available from NATS. The C182 pilot called on the London FIS frequency at 1634 but was told to standby, No 2. A change of FISO took place and at 1636:38 the C182 flight was called and its pilot reported abeam Kidderminster at 3000ft 1021mb, heading 021° routeing from a private site near Ledbury to a private site near Barnard Castle via Buxton, squawking 7000 requesting a BS. The London FIS conspicuity squawk of 1177 was issued (1637:01) and the flight was placed under a BS. No further calls were exchanged until the flight left the frequency at 1652.

HQ AIR (TRG) comments that the instructor involved has been very open in his reporting of this Airprox and has discussed the lessons he learnt with the rest of his unit and with the ACO Flight Safety staff. In future a Basic

Service will be sought for all Navigation sorties conducted from this unit. In addition, the topic of effective lookout will again be broadcast to all ACO gliding units.

UKAB Note (1): Met Office archive data shows the Cotswold RPS 1600-1700 as 1020mb and the Barnsley RPS 1600-1700 as 1019mb; the dividing line runs W to E approximately 10nm S of Stourport-on-Severn. The actual QNH for the Worcester area was calculated to be 1023mb)

UKAB Note (2): The Clee Hill recorded radar clearly shows the Airprox occurring very close to Bewdley, as reported by the Vigilant pilot. At 1634:01 the Vigilant is seen squawking 7000 3·4nm N of Bewdley tracking 165° GS 90kt with another 7000 squawk, the C182, in its 1 o'clock range 8·25nm tracking 025° GS 140kt indicating unverified FL028 (3100ft QNH 1023mb). The ac continue on steady converging tracks (line of constant bearing), the ac closing to 1nm at 1636:01. The next sweep at 1636:09 shows the separation reducing to 0·5nm. Eight sec later (1636:17) the CPA occurs after the C182 has crossed ahead of the Vigilant, which has by now executed a R turn, with separation reduced to 0·1nm. Thereafter the Vigilant commences a L turn towards Stourport-on-Severn whilst the C182 continues on a steady NNE'ly track passing NW abeam Kidderminster before displaying the London FIS squawk at 1637:13. The vertical separation is not recorded. Although the Vigilant pilot reported seeing the C182 at the same level, he had also reported cruising at 2600ft Ternhill QFE (Ternhill elev 272ft), which equates to 2872ft QNH, and the C182 pilot reported on RT at 3000ft 1021mb (3060ft QNH 1023mb) which should have resulted in 188ft of vertical 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.

It was clear that with both flights operating in Class G airspace, the pilots were responsible for their separation from other ac through see and avoid. The Vigilant pilot was instructing another pilot on a Navex and his lookout for other ac may have been degraded by the training task of looking for geographical features/turning points etc. Members noted and acknowledged the instructor's comment that the conflicting ac may have been obscured by cockpit canopy frame. Even so, any known deficiencies that degrade lookout should be taken into account and mitigated by other means – changing the ac's flightpath slightly, leaning forward and/or moving one's head.

The C182 flight attempted to establish a BS with London Info 2min before the Airprox but had been told to standby; by the time London Info asked the C182 pilot to pass flight details, it was 20sec after CPA. That said, even if a service had been established earlier, the FISO was not aware of Vigilant flight as its pilot was not working an ATSU; if, however, the Vigilant pilot had called London Info, this would have broadcast his flight details to other pilots on frequency.

The radar recording shows both ac on steady conflicting tracks prior to the Airprox. Both ac would have been within the other pilot's field of view for some time, although on a line of constant bearing with no relative movement in either pilot's field of view to attract his attention. Members agreed that the cause of this Airprox was a non-sighting by the C182 pilot and a late sighting by the Vigilant instructor.

Turning to the risk, the Vigilant instructor saw the C182 in his 1 o'clock, range 300-400m at the same level, took control and executed a R turn to avoid, estimating separation at 50m. Notwithstanding that the C182 pilot had right of way under the Rules of the Air, his non-sighting meant he was unable to mitigate the risk. Nevertheless, Board Members agreed that the Vigilant instructor's prompt and robust avoiding action had been enough to remove the actual collision risk, but that safety had not been assured during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

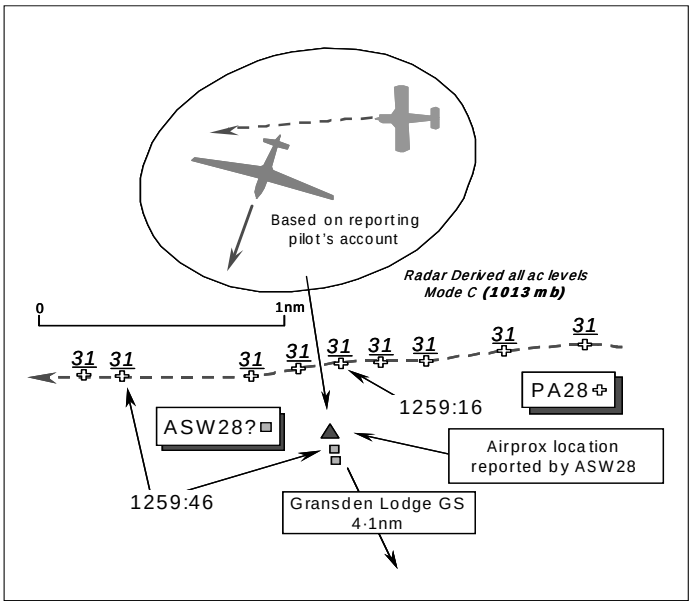
Cause: A non-sighting by C182 pilot and a late sighting by the Vigilant instructor.

Degree of Risk: B.

AIRPROX REPORT No 2009-109

AIRPROX REPORT NO 2009-109

Date/Time:	5 Sep 1300 (Saturday)	
Position:	5214N 00009W (4nm NNW of Gransden Lodge GS)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	ASW28-18E	PA28
Operator:	Civ Pte	Civ Pte
Alt/FL:	3550ft QNH	2500ft QNH
Weather:	VMC	VMC
Visibility:	>20nm	20nm+
Reported Separation:	20ft V/Nil H	100m V/300m H
Recorded Separation:	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SCHLIECHER ASW28-18E GLIDER PILOT reports departing from Gransden Lodge glider launching site whilst operating on the gliding common frequency of 130·4MHz. At the co-ordinates given [52°14'31"N 000°09'22"W] - about 342°(M) Gransden Lodge 4·1nm - heading 195° at 40kt some 700ft below cloud in a level cruise at 3550ft amsl, a powered aeroplane was heard, so lookout was intensified whilst trying to locate it. A single engine aeroplane was spotted as it passed some 20ft below the glider - flying in from 8 o'clock before clearing away at 2 o'clock - with a 'high' risk of collision. The blue and white aeroplane appeared to be flying straight and level or possibly climbing; no avoiding action was taken.

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

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

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

UKAB Note (2): An analysis of the Debden, Stansted and Heathrow radar recordings was inconclusive as the Airprox is not shown. The PA28 is evident as both a primary and secondary contact on the Debden recording, squawking A1177 – London AC Swanwick – whilst maintaining a westerly course. The PA28 is shown in a level cruise at 3100ft unverified Mode C (1013mb) – about 3370ft QNH (1022mb) and broadly 180ft below the ASW28 pilot's reported altitude of 3550ft amsl. At 1259:16, the PA28 approaches a point 0·33nm N abeam the location reported by the ASW28 pilot, albeit 46sec before the reported Airprox time. The PA28 turns slightly L as reported, however, no descent is apparent from its Mode C. No other contacts that could be associated with the ASW28 glider are evident until 1259:46, when a primary contact is shown marginally to the S of the reported location. One further primary contact is shown on the next sweep that might be the subject ASW28 glider, before the contact fades. It is not possible to resolve the apparent anomaly of the reported geometry of this encounter: the PA28 pilot

reported sighting a glider crossing ahead from port to starboard, whereas the ASW28 pilot reports heading 195° as the reported aeroplane passed underneath from 8 o'clock to 2 o'clock.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

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

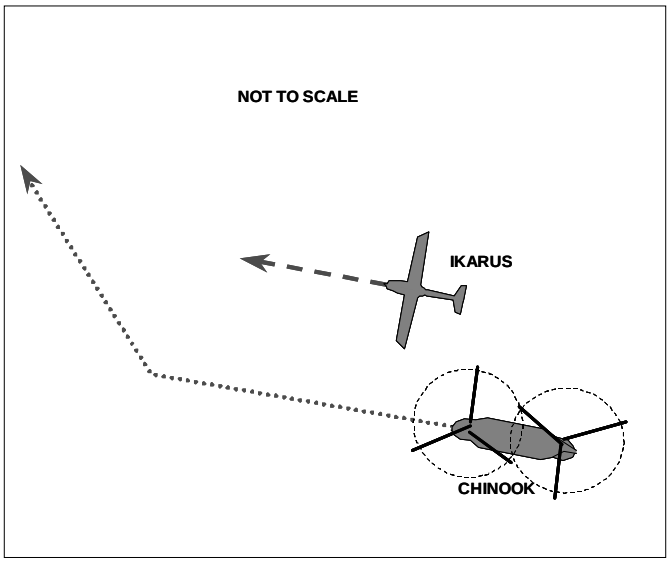
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: A.

AIRPROX REPORT NO 2009-110

Date/Time:	10 September 1500	
Position:	5059N 00221W (Henstridge elev 184ft)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	C42 Ikarus	Chinook
Operator:	Civ Pte	N/K
Alt/FL:	2000ft (N/K)	2000ft (QNH)
Weather:	NK	VMC
Visibility:	10km	>10km
Reported Separation:	0ft V/20ft H	0ft V/0.3-0.5nm H
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C42 IKARUS PILOT reports flying a white and red ac with no lights or SSR fitted on a solo private flight. While climbing out of Henstridge Airfield at about 2000ft, heading 260° at 80kt en-route to Dunkeswell, he was just about to change frequency (Yeovil 127.35) when he was 'undertaken' at very close proximity (estimated as 20ft) on his left by a Chinook helicopter. The helicopter then crossed from his left to right and climbed slightly. He was unable to take any avoiding action and the wake turbulence encountered rocked his ac from 45° left bank to 45° right bank. He assessed the risk as being high.

THE CHINOOK PILOT reports flying a camouflaged green ac with HISLs selected on, on a MOD contracted flight trial from RAF Waddington landing at Yeovil airfield. Since he was not contacted for some time after the incident, some detail of the otherwise unnoteworthy incident might have been forgotten. Nevertheless, at the time his Chinook was recovering to Yeovil, in contact with Westland APP, squawking with Mode C while heading 260° at 2000ft and 120kt in good VMC conditions and in a steady cruise when the non-handling pilot in the left-hand seat saw, and warned the crew about, a light ac in their 2 o'clock position at about 2nm. The handling pilot (in the right-hand cockpit seat) and crewman (in the starboard side of cabin) acknowledged the sighting. Initially they maintained track to pass to port of the light ac, as it was not felt necessary to manoeuvre to the starboard side prior to overtaking, as sufficient lateral separation existed between them. This action also ensured that the light ac was in the handling pilot's best field of view and also probably the best field of view for the fixed wing pilot. Once clear of the ac, as called by the crewman, he made a right turn to position the ac for an approach to Yeovil. From the Chinook crew's perspective, the event was unremarkable as they passed between 0.3 and 0.5nm from the ac and so he assessed the risk as being low.

UKAB Note (1): Initially it was assumed that the Chinook was operated by the RAF; only when it was positively established that it was not, was the operator and pilot contacted resulting in a delay of just over a month.

UKAB Note (2): Neither ac was seen on any recorded radar.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac.

The Board noted that the sudden and unexpected appearance of large ac in fairly close proximity can understandably cause pilots of a small ac great concern. Further it is not unusual for pilots to underestimate their proximity to very small ac (or other unexpectedly small objects) since the eye can assimilate them as being similar to more familiar slightly larger ac (a C150/172 is similar to but about 25% bigger that an Ikarus).

Members agreed, however, that it is always wise for large helicopters to give light ac a wide berth, to be predictable and to fly below them if possible to reduce significantly any wake turbulence risk. The Board considered that the Chinook crew, having spotted the Ikarus at range and knowing that they would need to cross its track, would have been better advised to have turned to pass behind it. That said, Members agreed unanimously that the Ikarus pilot had significantly underestimated the horizontal separation of the Chinook (he reported 20ft). Although with no radar data to assist them it was not possible to determine with any degree of accuracy the actual separation, it was thought likely to be at least 100m to the port as it overtook. At that distance the Ikarus would not have encountered any wake turbulence from the Chinook but it was more likely that this was felt after the Chinook had turned across the Ikarus's track (at the same height) as it turned inbound to Yeovil.

Although the risk from wake turbulence may have been significant, the Board only assesses the risk of collision and not any risk resulting from other factors; in this instance Members were satisfied that there was no risk that the ac could have collided since the Chinook pilots and crewman were visual with the Ikarus throughout their overtaking manoeuvre.

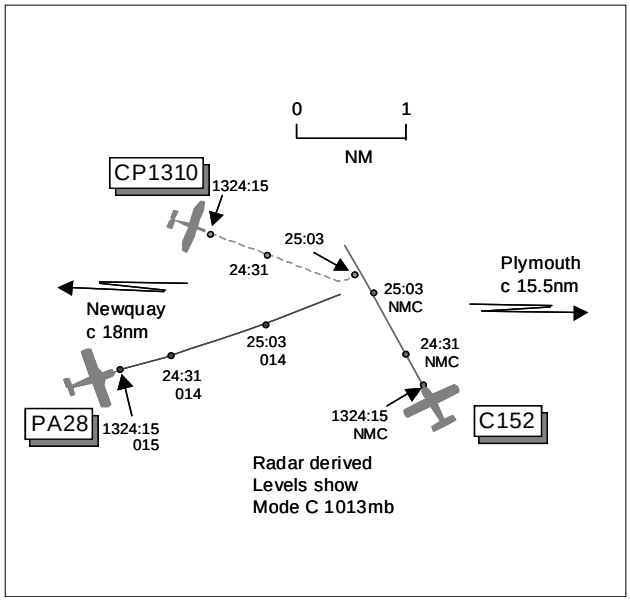
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Chinook crew flew close enough to the Ikarus to cause its pilot concern.

Degree of Risk: C.

AIRPROX REPORT NO 2009-111

Date/Time:	25 Sep 1325	
Position:	5026N 00431W (18nm E Newquay)	
Airspace:	FIR	(Class: G)
	Reporting Ac	*Reporting Ac*
Type:	CP1310	C152
	Super Emeraude	
Operator:	Civ Pte	Civ Club
Alt/FL:	1900ft	1700ft
	(RPS 1025mb)	(QNH 1029mb)
Weather:	VMC CLBC	VMC CLBC
Visibility:	>10km	10km
Reported Separation:		
	Nil V/<50m	80ft V
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CP1310 SUPER EMERAUDE PILOT reports en route to Compton Abbas VFR and in receipt of a BS from Newquay on 133·4MHz; no transponder was fitted. The visibility was >10km flying 100ft below cloud in VMC and the ac was coloured yellow/white; no lighting was fitted. Heading 090° at 90kt and 1900ft RPS 1025mb he was alerted by ATC to PA28 traffic in his 4 o'clock position, which he acquired visually on a converging course and overtaking his ac fairly rapidly at a similar level, or slightly higher. The PA28 kept disappearing behind clouds so it was difficult to track and it was taking up a lot of his attention as he decided whether or not to alter his flightpath to deconflict. As he watched this ac, ATC called possible pop-up traffic, a Cessna, in his vicinity. He looked forward and the front RHS of the windscreen was filled with Cessna, about 100m away at the same level, crossing obliquely (towards) from R to L. He instinctively rolled hard L (almost inverted - 150° AOB) and pulled to establish a rapid descent and turn away, estimating separation of <50m as he lost sight of it during the manoeuvre. Shortly

after this he reported the Airprox to Newquay. He assessed the risk as very high. Having undertaken his initial flying training in the RAF he was disappointed that he had not spotted the Cessna earlier, having concentrated on the PA28 which had led to a breakdown in his scan for other traffic. He commended the Newquay APR, for had the controller not called the Cessna (not required under a BS) he would not have looked forward and believed he would have collided with it.

THE C152 PILOT reports a student first solo Navex away from the Bodmin cct VFR routeing to Fowey, Looe, Boscastle and Wadebridge at 1700ft QNH 1029mb and in receipt of a BS from Newquay Approach on 133·4MHz squawking 1743. The visibility was 10km flying 100ft below cloud in VMC and the ac was coloured white/blue with anti-collision light switched on. The frequency was quite busy with frequent calls from numerous flights. The Airprox occurring on the Looe to Boscastle leg about 5nm N of Looe. Heading 340° at 90kt he was concentrating on flying straight and level when he saw a flash of something in his 10 o'clock at the same height. He glanced to see an Emeraude ac about 80-100ft away invert and dive underneath his ac by about 80ft, watching it then through the RH door window in his 4 o'clock as it dived towards the ground, turned and pulled out level. There was then a call on the radio from a pilot stating he was going to file an Airprox. Shortly after this Newquay requested his height, which was 1700ft, and was told that there were 2 other ac in the vicinity at 2000ft. He assessed the risk as high. Later he spoke to the Radar controller by telephone and was told that his ac could not be seen on radar at the time and it was 25nm from the radar head. He also spoke to the other pilot post flight who told him that he had been looking over his shoulder for a known converging ac and on looking ahead he had seen his C152 and taken avoiding action. This experience had taught him that when there is a low cloudbase, light ac will generally fly just under it, hence the possibility of an encounter. Also, this likelihood is increased by a pilot's visibility being affected by bright sunlight under certain conditions. The lesson seems to be for everyone to keep a good lookout at all times, all around, and not to fixate on any known ac that may be converging and listening out on the radio and understanding what is around. He believed that in the open FIR it would be a good idea to make regular calls advising position, height and heading to let other traffic know your flightpath. Owing to terrain, there are significant areas where radar coverage is affected, so that ac will not be displayed below certain heights. Lastly, the overall vision from the C152 cockpit is obscured by 2 x 6" wide portions of ac structure either side of and just ahead of the pilot's field of view.

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

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

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

ATSI reports that the incident took place about 18nm E of Newquay Airport in Class G airspace. At 1310:48, the C152 flight established communications with Newquay Radar. The student pilot reported he was, *"…on a nav exercise from Bodmin to Bodmin via Fowey Looe Boscastle Wadebridge not above two thousand feet request Basic Service please (C152 c/s)".* The Newquay Radar controller instructed the flight to squawk 1743 and confirmed the provision of a BS, which was read back. When the squawk was selected, the Burrington radar recording shows the ac about 2·5nm S of Bodmin aerodrome, with NMC being displayed. It was already on the first leg, S to Fowey after which it would route E to Looe and then turn NNW to Boscastle, SW to Wadebridge and thence to Bodmin.

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

Details of a BS appear in MATS Part 1, Section 1 and is defined as *'…an ATS provided for the purposes of giving advice and information useful for the safe and efficient conduct of flights. This may include weather information, changes of serviceability of facilities, conditions at aerodromes, general airspace activity information, and any other information likely to affect safety. The avoidance of other traffic is solely the pilot's responsibility.'* Also, *'A controller may identify an aircraft to facilitate co-ordination or to assist in the provision of generic navigational assistance, but is not required to inform the pilot that identification has taken place' and 'Pilot's should not expect any form of traffic information from a controller, as there is no such obligation placed on the controller under a Basic Service outside an Aerodrome Traffic Zone (ATZ), and the pilot remains responsible for collision avoidance at all times. However, on initial contact the controller may provide traffic information in general terms to assist with the pilot's situational awareness. This will not normally be updated by the controller unless the situation has changed markedly, or the pilot requests an update. A controller with access to surveillance derived information shall avoid the routine provision of traffic information on specific aircraft, and a pilot who considers that he requires such a regular flow of traffic information shall request a Traffic Service. However, if a controller considers that a definite risk of collision exists, a warning may be issued to the pilot.'*

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

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

The Burrington radar recording shows that when the Emeraude flight was given TI on the PA28 (1324:30) it had adopted a SE'ly track with the C152 in its 12:30 position range 1·6nm. Thereafter the Emeraude's primary return becomes intermittent and the track irregular. However, by the time Radar issued the first, and unanswered, transmission of TI to the Emeraude flight on the C152, the former appears to have adopted a NE'ly track. The transmission started at 1325:02 and the radar picture at 1325:03 shows the C152 converging with the Emeraude from 3 o'clock at 0·3nm. By the next sweep, 8sec later, the primary return of the Emeraude has disappeared. It does not reappear until almost 2min later.

AIRPROX REPORT No 2009-111

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

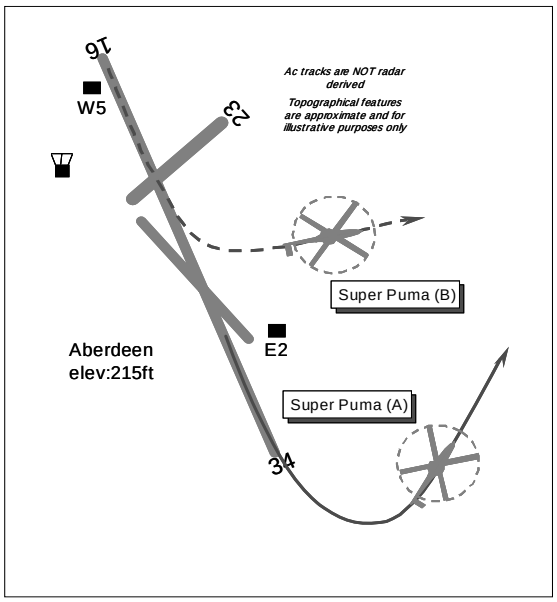
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: B.

AIRPROX REPORT NO 2009-112

Date/Time:	25 Sep 0703	
Position:	5712N 00212W (2nm E of Aberdeen Airport. elev: 215ft.)	
Airspace:	Aberdeen ATZ/CTR (Class: D)	
	Reporting Ac	*Reported Ac*
Type:	EC225	AS332L2
Operator:	CAT	CAT
Alt/FL:	1400ft↑ QNH (1018mb)	NR
Weather:	VMC CAVOK	VMC
Visibility:	>10km	10+km
Reported Separation:	300ft V/500m H	500ft V
Recorded Separation:	500ft V (Aberdeen recording)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EUROCOPTER EC225 LP SUPER PUMA (A) HELICOPTER PILOT reports he was departing from Aberdeen bound for Sumburgh under IFR in CAVOK conditions. They were cleared to take-off from RW16 from abeam E2 by Aberdeen TOWER, with a left turn onto a heading of 030° climbing to 3000ft QNH (1018mb). Whilst in the climb at 100kt, ATC informed them of other traffic, but did not specify a direction and on looking out to their right they could see no other ac. The controller then said the ac was at 10 o'clock. On looking L they saw a red, white and blue Super Puma, at 10 o'clock 100ft above his helicopter about 800m away, on a track that was crossing their path from L-R. He instructed his co-pilot to stop the climb and informed ATC. At an altitude of 1400ft QNH (1018mb) minimum separation was about 300ft vertically and 500m horizontally. He believed that the other helicopter pilot had been cleared to turn behind them onto an easterly heading but had in fact turned in front of them. He assessed the Risk as *"medium"* and added that if they had not stopped the climb it would have been a very close encounter. His helicopter has a red livery. A squawk of A7067 was selected with Mode C; TCAS is not fitted.

THE EUROCOPTER AS332L2 SUPER PUMA (B) HELICOPTER PILOT reports he was departing from Aberdeen for an oil rig and was in receipt of an Aerodrome Control Service from Aberdeen TOWER on 118·1MHz. ATC instructed them to line up at W5 as No2 to another helicopter [the company was specified] on RW16 –Super Puma (A). TOWER asked if they could lift into the hover and be ready to depart on a radar heading of 080° keeping the Super Puma (A) ahead in sight. He checked the clearance and asked his 1st Officer if they were cleared to depart and turn inside Super Puma (A) ahead to which his colleague said yes. After they departed heading 080° at 70kt, he expected Super Puma (A) to turn onto a southerly heading but it continued to turn L. To avoid (A) he reduced his airspeed to 70kt and increased the rate of climb as Super Puma (A) passed clear below, the other helicopter's pilot having stopped his climb until clear. Super Puma (A) was in sight at all times and he maintained at least 500ft separation vertically.

He added that as the ac commander he was happy with the reduced separation in the CTR and felt that at no time was there any risk of a collision. In future if he has any doubts he will check his clearance with ATC. His helicopter has a red, white and blue livery.

UKAB Note (1): The 0650 Aberdeen weather was: 150/06; CAVOK; +13/+10; Q1018.

UKAB Note (2): The UK AIP at AD2-EGPD AD2.17, promulgates the Aberdeen ATZ as a circle radius 2nm centred on RW16/34, extending from the surface to 2000ft above the aerodrome elevation of 215ft amsl and active H24.

AIRPROX REPORT No 2009-112

THE ABERDEEN AERODROME CONTROLLER (ADC) provided a comprehensive account the essential elements of which are contained in the ATSI report and thus omitted here to avoid duplication.

ATSI reports that Aberdeen Airport is situated within Class D airspace (CTR). Both helicopters were operating IFR.

The crew of Super Puma (B) reported holding at W5 - a holding point to the W of the threshold of RW16 - on the Tower frequency at 0658. The crew was instructed to hold, due to departing and landing traffic. Shortly afterwards Super Puma (A) reported holding at E2. This is also a holding point for RW16, which is situated on the eastern side approximately 2/3rds of the way down the runway. The crew of Super Puma (A) was instructed to hold.

The ADC requested departure releases from the Approach Radar Initial Director (INT) for the two helicopters, with Super Puma (A) departing ahead. Super Puma (A) was issued a L turn heading 030° and Super Puma (B) a L turn heading 080°. The headings were read back correctly.

At 0701:16, Super Puma (A) was instructed to line up and wait RW16. After receiving the pilot's response, Super Puma (B) was instructed to *"line up and wait 1-6 lift into the hover when you can please wind 1-9-0 at 7 knots"*. The controller was preparing the helicopter for imminent take off, due to landing traffic. Thereafter the following transmissions took place between the subject helicopters and ATC:

ADC "[C/S (A)] *after departure left turn heading 0-3-0 degrees"*.

Super Puma (A) "*After departure left turn heading 0-3-0* [C/S (A)]".

ADC "[C/S (A)]..*wind is..1-4-0 less than 5* [RW] *1-6 clear take off if you can expedite your take off please traffic behind you"*.

Super Puma (A) *"..clear take off* [RW] *1-6 expedite* [C/S (A)]...*wilco"*.

At this point the arriving ac reported turning final and was instructed to continue its approach, with a helicopter to depart.

ADC "[C/S (B)] *continue in the hover but after departure left turn heading 0-8-0 degrees"*.

Super Puma (B) *"..hold in the hover after departure..left turn heading 0-8-0 degrees* [C/S (B)]".

ADC "[C/S (B)] *departing* [Operator of C/S (A)] *will be turning left onto a northeasterly track with the traffic in sight* [RW] *1-6 clear take off wind 1-9-0 6 knots".*

Super Puma (B) *"Clear take off* [RW] *1-6 with the* [Operator of C/S (A)] *in sight C/S (B)"*.

Super Puma (B) was cleared for takeoff approximately 30sec after Super Puma (A). The departure points were about 1000/1200m apart.

The ADC reported that Super Puma (B) turned hard L on reaching the RW16/23 intersection. Consequently, at 0703:28, [UKAB Note: the ADC reports 'concerned that the crew of (A) may not be aware of (B) inside them'] he asked the crew of Super Puma (A) *"can you see this Mark 2 that's just turned left"*. Initially, the pilot said he could not see the traffic. However, after traffic information was issued *"11 o'clock left to right"*, he reported visual, adding he would stop the climb. The pilot of Super Puma (B) asked if he should have turned outside or inside the traffic. He apologised that he did not understand it should have been outside.

The radar recordings are reported to show that when Super Puma (A) reported visual contact with Super Puma (B), it was 0·6nm S of it and 100ft below. When Super Puma (A) passed directly behind and below Super Puma (B) vertical separation was 500ft. [UKAB Note: The Aberdeen recording was not available to ATSI or the UKAB at the time of writing.]

Within Class D airspace, IFR aircraft are provided with standard vertical or horizontal separation of 1000ft or 3nm respectively. However, in accordance with MATS Part 1, Section 1, Chapter 3, Page 1:

"In the vicinity of aerodromes, the standard separation minima may be reduced if;

a) adequate separation can be provided by the aerodrome controller when each aircraft is continuously visible to this controller;

or

b) each aircraft is continuously visible to the pilots of other aircraft concerned and the pilots report that they can maintain their own separation;

or

c) when one aircraft is following another, the pilot of the succeeding aircraft reports that he has the other aircraft in sight and can maintain own separation".

On this occasion, both helicopters were visible to the ADC and the crew of the following Super Puma (B) reported visual with the preceding Super Puma (A).

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, together with reports from the air traffic controller involved and the appropriate ATC authority.

This Airprox stemmed from a conflict that developed between 2 helicopters whose crews were following ATC clearances that included departure profiles that crossed one another. Super Puma (A) was issued take-off clearance first with a L turn through 130° onto a heading of 030°, whereas the succeeding helicopter - Super Puma (B) – taking off from a position to the N of the first ac, was required to turn L through only 80° and fly an outbound departure heading of 080°. Members suggested that the ADC was probably under some pressure to get both helicopters airborne and away from the airport because of the landing traffic, as he had requested that the pilot of Super Puma (A) expedite his take-off. An element of confusion was also apparent as the pilot of Super Puma (B) reported that he thought that (A) would be departing to the S, despite being told by the ADC that it would be turning left on to a northeasterly track. Therefore, in the mistaken belief that (A) was clearing to the S, the pilot of Super Puma (B) turned at the RW intersection onto his assigned outbound heading. Members recognised that he complied with the instructions issued, but it brought him into conflict with Super Puma (A) departing on a heading of 030°. The pilot of Super Puma (A) was clearly not aware of the conflict until the ADC drew his attention to the presence of Super Puma (B) out to port, whereupon he saw it slightly above his altitude. Consequently, he reduced his ROC to ensure separation beneath it. In the other cockpit, (B) had sight of (A) throughout and was content to climb above it. The combined result of the increased ROC of (B) and the reduced ROC of (A) was that Super Puma (A) passed clear below (B).

Clearly these two IFR flights had to be separated by ATC and the ATSI report indicated how this was accomplished in the busy environment of the Aberdeen Class D CTR. It was clear that the crew of Super Puma (B) had confirmed that they were visual with Super Puma (A) before they received their take-off clearance from the ADC but the Board noted that they had not reported that they could maintain their own separation against the one ahead. Whilst technically this should have been stipulated, the NATS Ltd Advisor pointed out that this was not always practicable, which led some Members to suggest that the Airprox had resulted from a lack of positive control by the ADC. The controller had indeed expected Super Puma (B) to turn outside Super Puma (A) and the Board was briefed that it was the controller's normal practice to stipulate this on the RT. In this case, however, it was unfortunate that he omitted to do so. Notwithstanding this, the ATSI Advisor explained that, because both helicopters were continuously visible to the ADC as they departed, the ADC had complied with his responsibilities in respect of the requirements for reduced separation in the vicinity of the aerodrome. Taking all these factors into consideration, the Board concluded that the Cause of this Airprox was that while following departure instructions, the aircraft flew into conflict.

Whereas the pilot of Super Puma (A) had opined that if he had not stopped the climb it would have been a very close encounter, the Board assesses Risk on the basis of what actually occurred, not what might have happened in different circumstances. Here, the pilot of Super Puma (B) was visual with Super Puma (A) throughout, maintained a good ROC to ensure vertical separation above it and was therefore always in a position to afford

greater separation if required. Although the reporting pilot was unaware of the presence of Super Puma (B) crossing ahead until alerted to it by the ADC, he saw it in time to take effective action and stopped his climb. In the Board's view, all these actions ensured there was no Risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

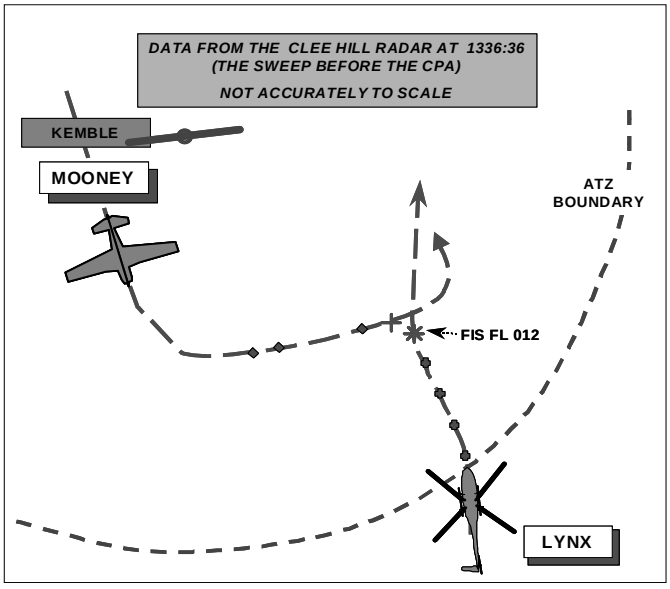
Cause: While following departure instructions, the aircraft flew into conflict.

Degree of Risk: C.

AIRPROX REPORT NO 2009-113

Date/Time: 25 September 1337
Position: 5138N 00204W (DW RW26 Kemble - elev 433ft)
Airspace: Kemble ATZ (Class: G)

	Reporting Ac	*Reported Ac*
Type:	Mooney M20C	Lynx MK8
Operator:	Civ Pte	HQ Navy Cmd
Alt/FL:	900ft (QFE)	1500ft (RPS)
Weather:	VMC CLBC	VMC NR
Visibility:	>25nm	>25km
Reported Separation:	300ft V/2-300m H	100ft V/0.5nm H
Recorded Separation:	NR (See UKAB Note (2))	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MOONEY M20C PILOT reports that he had flown a cross-country nav ex from Swansea to Kemble in an orange and white ac with nav and landing lights on and squawking 7000 with Mode C and S, he thought. He had spoken with Kemble Radio and had joined the circuit at 1000ft QFE on the Crosswind leg for RW26 directly over 'the numbers' at about 110kts. The downwind leg was uneventful and as he positioned onto the base leg at 900ft QFE and 90kt he was immediately aware of a grey Lynx Helicopter in his 'inside' at 9 o'clock approximately 300ft above and 300ft away horizontally and on a similar heading. He continued to track the ac visually and continued his descent. As he turned onto final approach the Lynx had now passed to his right so was no longer above the final approach to RW26. He continued the circuit and assessed the risk as being low to medium and reported the incident to Kemble TWR after he had landed.

THE LYNX MK8 PILOT reports flying a grey ac with all lights on squawking London FIS having just transferred from Lyneham Zone. They were near Kemble airfield when they saw an ac ½nm away initially in their 9:30/10 o'clock position slightly lower, tracking to pass behind and below. As the ac was on his left and they were VFR they elected to 'stand on' by maintaining their height, course and speed. After passing astern and below, the other ac reappeared in his 4/4:30 position, appearing to have altered course away from them slightly and descended a small amount. At no time did he deem a risk of collision existed as they estimated the ac to remain at least ½nm away throughout.

UKAB Note (1): Although the geometry of the incident as reported by the Lynx crew would seem to agree with that reported by the Mooney pilot, they described the ac that they saw as a 'white high winged single engined Cessna' whereas the Mooney is predominantly Orange and is low winged.

UKAB Note (2): The Lynx paints on the recording of the Clee Hill radar throughout the incident transiting the Lyneham Zone on a track of about 340° at an indicated Level of FL016 (2000ft amsl). At 1334 Lyneham ATC warned the Lynx crew that South Cerney was active and cleared them to change frequency; shortly after the ac descended to FL012 (1600ft amsl) and continued to the NNW towards Kemble, passing 1.25nm to the E of the centre of the airfield. There is a very intermittent primary only contact that, on the limited information available, appears to be the Mooney following the track reported by its pilot, flying downwind just under 1nm S of the RW; the contact disappears as it turns base and on the sweep before the CPA. From the reports and by projection it appears that the Lynx (indicating FL012 – 1620ft amsl – 1200ft agl) crossed from S to N almost directly above the Mooney as the latter turned onto base leg at a reported height of 900ft agl.

UKAB Note (3): After descending from 2000ft amsl the Lynx was required to operate in accordance with the rules promulgated in the UK Low Flying Handbook at 01.02.04. This states that:

'Light Propeller Driven and RW ac are to comply with the airspace reservations listed in this document when operating between the Surface and 2000ft agl/amsl'.

Further at Part 1-2-2-4 (LFA2) Kemble is listed as Civil Aerodrome to be avoided by 2nm 0800-1700 Summer. Although the wording of the entry is very slightly ambiguous, the 2nm avoidance is clearly marked on UK Low Flying Charts.

The Lynx Detachment Commander comments that the student front-seat crew were on a sortie from a ship to Stafford HLS, under the supervision of an experienced Qualified Observer Instructor who was in the rear of the ac. The student crew believed themselves to be clear of all controlled airspace and airfield boundaries throughout the sortie and were speaking to ATC agencies throughout; the aircraft commander, although disadvantaged by his seating position aft and facing to starboard, had no obvious reason to doubt this assertion. The light fixed wing traffic concerned was spotted at relatively close range but no risk of collision was deemed to exist. Additionally, as the other ac was approaching from the helicopter's port side, action was taken iaw the RoA i.e. the crew elected to maintain heading, height and speed, and monitor the traffic carefully. It was considered by the crew that the other ac had passed at a safe distance and no risk of collision had existed at any stage. No further action was deemed appropriate but all crews have been re-briefed on the importance of maintaining a good lookout, especially in the vicinity of other airfields of likely air activity.

The Lynx Squadron Commanding Officer comments that it is possible the student crew may have either been temporarily uncertain of their position or had misinterpreted their map, and had strayed into reserved airspace; as a consequence, their application of rules of the air was based on an incorrect assumption that they were in unreserved, Class G airspace. Nevertheless, they had seen the other aircraft in time to take avoiding action, which was not deemed necessary. This incident will be used to highlight to all crews the potential hazards of navigating through the airspace to the north of Lyneham.

HQ Navy Command has nothing further to add to the Squadron Commanding Officers comments.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, a radar video recording, reports from the air traffic controllers involved and reports from the Lynx operating authority.

The Low Flying Advisor informed the Board that, in order to remove any ambiguity, in the Military Low Flying Handbook all references to height/altitudes have been standardised as height agl.

Although there was some discussion regarding the Kemble ATZ it was pointed out that the Lynx had been operating in accordance with the Military Low Flying Handbook in which Kemble is promulgated as a 'Civil Aerodrome to be avoided' by a mandatory 2nm in Summer (i.e. up to 30 Sep); this (military) avoidance coincides with the ATZ as promulgated in the Civil AIP. The Board agreed, therefore, that there was no doubt that the Lynx was required to avoid Kemble by 2nm and that the student crew had inadvertently penetrated this avoidance area, most likely because they had been uncertain of their precise position. Although some Members were surprised that the ac commander did not sit on the flight deck, the Board accepted that the seating location of the QOI in the rear makes it impossible for him to monitor visually and continuously the ac's position. Accepting that they were not aware that they were flying through the circuit of an active airfield, the Lynx crew's subsequent action on seeing

the Mooney was reasonable. Although there was no radar verification, it was the Board's opinion that since the pilots of both ac were visual with each other, there was no risk of collision.

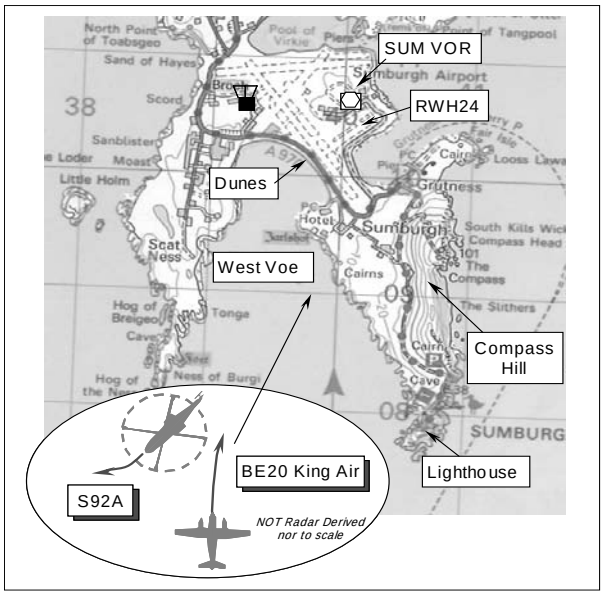
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Lynx entered the Kemble Civil Aerodrome Avoidance area and flew into conflict with the Mooney M20C.

Degree of Risk: C.

AIRPROX REPORT NO 2009-114

Date/Time:	25 Sep 0809	
Position:	5952N 00117W (1nm S of SUM VOR - elev 24ft)	
Airspace:	Sumburgh ATZ/CTR (Class: D)	
	Reporting Ac	*Reporting Ac*
Type:	Sikorsky S92A	BE200
Operator:	Civ Comm	Civ Comm
Alt/FL:	350ft	900ft
	QNH (1012mb)	QNH (1012mb)
Weather:	VMC	VMC
Visibility:	5nm	10+km
Reported Separation:		
	300ft V/100m H	400ft V/50m H
Recorded Separation:		
	300ft V/0·14nm [~260m] H	



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SIKORSKY S92A (S92) HELICOPTER PILOT reports he was operating VFR in VMC some 400ft below cloud with an in-flight visibility of 5nm, executing a full winch run-out in the vicinity of Sumburgh Airport and in communication with Sumburgh TOWER on 118·25MHz. The allocated squawk of A2630 was selected with Mode C; Mode S and TCAS are fitted. His helicopter has a red & white livery; HISLs and the twin landing lamps were on. The helicopter was crewed with 2 pilots and 1 crewman.

ATC informed them of an ac executing a cloud break flying inbound on the Sumburgh VOR 010 radial with the intention of breaking R to fly E of the airport when visual with the surface. In the hover at 350ft QNH (1012mb), heading 240°, just outside the airport boundary about 1nm S of the SUM VOR with a forward speed of 25kt, another ac had been seen on TCAS at a range of 8nm. Their next sighting was visually in their 9 o'clock at ½nm - higher - flying towards them with a 'high' risk of a collision. To avoid the other ac he descended forward and R as the BE200 passed 100m away and 300ft above his helicopter in a descent.

THE BEECH BE200 PILOT reports he was conducting an Air Ambulance flight from Aberdeen to Lerwick/Tingwall and in receipt of a RCS from Sumburgh RADAR on 131·3MHz. The allocated code of A5013 was selected with Mode C; TCAS I and Mode S are fitted. His ac has a black & silver livery and the wingtip HISLs were on.

Due to poor weather over Shetland – the Sumburgh ATIS at 0750 UTC reported 240/20G30 9km – DZ Few 900 SCT 1500 BKN 2200 +13/+12 QNH1012 - his intentions were to carry out the published Sumburgh VOR/DME

010° to aerodrome approach (MDA 800ft) to break cloud and then proceed VFR to Lerwick via the E coast of Shetland.

During the approach they were informed by Sumburgh RADAR that a helicopter - the S92 - would be operating at low-level in the vicinity of the airport. Just after breaking cloud at about 1000ft amsl heading 010° at 160kt about 1½ nm S of the SUM VOR, whilst establishing his aeroplane in level flight at 900ft QNH (1012mb), both he and his co-pilot became aware of the S92 ahead and below flying slowly in a level R turn. The S92 was first seen directly ahead about 400ft below his aeroplane but as their flight paths were already diverging at this point, he initiated a slight right turn to increase the rate of divergence. He estimated the minimum separation was 400ft vertically and 50m horizontally and assessed the Risk as 'medium'. He added that his workload was high whilst transitioning to VFR flight at the end of an IFR non-precision approach.

He spoke to the RADAR controller after landing to discuss the incident and subsequently elected to file an Airprox.

THE SUMBURGH AERODROME CONTROLLER (ADC) reports that the S92 had been booked out for winching in West Voe under VFR, a location that is frequently used for winching at very low level (50–100ft); the crew then started up and taxied out to RW Heli-24 (RWH24). RADAR called on the landline to advise that an EC225 was holding in an orbit 10nm S of the airport to allow a BE200 in ahead on an aerodrome approach, before it flew on towards Tingwall. He anticipated that the EC225 would land on Heli-24, so he told the S92 crew that it would be helpful if they could operate N of the extended centreline of RWH24 or further out to the W. The S92 crew replied that was copied.

RADAR phoned to inform him that the BE200 was now 10nm S on a cloud break, to break-off up the E coast and that they had passed TI to the BE200 crew about the S92, which RADAR did not believe would be a problem. He agreed that it wouldn't be an issue as the S92 would be operating very low-level VFR in West Voe. At that point the S92 was just crossing over the sand dunes, so he told RADAR that they would be able to see the helicopter on radar, albeit temporarily, as it crossed the dunes. Just as he was finishing his call to RADAR, the S92 crew called to say they would like to operate S of the RWH24 centre-line towards the lighthouse, if they were able, and queried traffic 7nm to the S. He had not had a chance to tell the S92 crew about the BE200 before this call and so advised them again about the previously mentioned EC225 holding about 10nm S, and that the traffic at 7nm that the S92 pilot was referring to was the BE200 on the cloud break that would be routeing up the E coast VFR. The S92 pilot replied he had an ac on TCAS about 6nm away at 2000ft. The ADC said that he thought that it was the BE200 as the EC225 was still orbiting VFR to let the BE200 in ahead, so he reiterated that the BE200 would be routeing up the E Coast to Tingwall VFR.

RADAR then called to inform him that the EC225 was leaving its orbit 8nm S of the airport and switching across to the TOWER frequency inbound direct to the airport; the RADAR controller thought the EC225 crew said to join on a L base-leg for RWH24. He then saw the BE200 appear over Compass Hill heading NE, possibly at about 500ft ALT, routeing through the overhead and up the E coast. At this point the S92 was heading into the SW'ly wind at about 300ft amsl.

The EC225 subsequently landed on RWH24. He thought the S92 had been in position to hold off to allow the EC225 traffic to land on RWH24, and so he thanked the S92 crew for their help and advised there was no further traffic. Believing that the S92 would continue further to the N, closer to the beach to carry out his winching, but the pilot reported he was complete and wished to land on RWH24.

Later, having spoken to the S92 pilots, they said that when they booked out they had told the Air Traffic Services Assistant (ATSA) that they would be doing a winch run-out in West Voe, operating at 300-400ft ALT. This information had not been passed on to him as the ADC and he had assumed they would be carrying out their usual low-level winching operations. For their part, the S92 crew thought the ADC would have known what they were planning and that there was no need to reiterate their flight details over the RT.

THE SUMBURGH RADAR CONTROLLER reported that he was mentoring a trainee at the time of the incident. The BE200 was approaching Sumburgh from the S to fly the VOR/DME010 procedure to break-off up the E coast of the Shetland Isles towards its destination of Lerwick/Tingwall. As the BE200 reached about 12nm S of Sumburgh airport, the Sumburgh ADC requested a departure for the S92, of which RADAR had no details, to lift to West Voe to the W (sic) of the airport not above 300ft, VFR. After considering this against the BE200, knowing the position and level he thought the helicopter would be at in relation to the route/level he believed the BE200

flight would take, he approved the S92's departure. Just preceding this approval of the S92's flight, his trainee had passed details of the BE200 to the ADC and explained the BE200 pilot's intentions. His trainee elected to keep the BE200 on their RADAR frequency and passed traffic information to the BE200 crew about the S92 helicopter to the West of the airport.

Another helicopter [the EC225] had to be held to enable the BE200 to descend on the instrument procedure. Whilst he and his trainee were discussing the merits of how that confliction was solved and concentrating on that, they did not see that the S92 had moved into a conflicting position with the BE200. The BE200 reported visual (with the surface, he believed) and continued to fly overhead Sumburgh and up the E coast. The 'normal' routeing would have taken the BE200 to the E of, and around, the high ground to the SE of Sumburgh airport, rather than routing overhead the airport. The weather was such that this could have been possible as it is a regular flight/ procedure. When he handed over the position to the next controller, the BE200 was clear and to the N of the Class D CTR and at no time did the crew mention a confliction with the S92.

Subsequently the BE200 Captain reported to the next controller that the S92 had been close and that he would telephone when he was on the ground. The BE200 Captain called and asked him to advise the ADC that the S92 was higher than expected, with 'no blame on RADAR', and just to 'pass on the message to TOWER'. This confliction should not have happened as the S92 should have always been to the West of Sumburgh, at such a level that would put terrain between the helicopter and the BE200, with a minimum of 500ft separation if the BE200 crew descended to their minima and the S92 went to its maximum cleared altitude. Furthermore, the normal route for the BE200 would have kept it clear, and even taking into account its actual route, it still should not have crossed paths with the helicopter.

ATSI reports that the BE200 was operating an ambulance flight to Lerwick/Tingwall, an aerodrome situated 19nm N of Sumburgh Airport. It was carrying out a cloud break procedure to Sumburgh Airport before continuing visually to Lerwick/Tingwall. The flight was under the control of the Sumburgh RADAR Controller, situated at Aberdeen. The S92 was on a local flight, operating VFR on the Sumburgh TOWER frequency. The Sumburgh ADC described his workload as light; the Sumburgh RADAR Controller considered his workload as moderate. At the time, he was monitoring a trainee, who was approaching Certificate of Competence standard.

The BE200 was carrying out a Direct Arrival Approach VOR/DME to Sumburgh, preparatory to the cloud break. The final approach track (FAT) for this approach is 010° to the Sumburgh (SUM) VOR.

The Sumburgh 0750 weather was: 24020G30kt; 9000; DZ FEW009; SCT015; BKN 022; 13/12; Q1012. Shetland RPS 1003.

At 0730, the S92 pilot's unit telephoned Sumburgh ATC to pass details about a local flight. The call was answered by the ATSA; the S92 crew's intentions were to carry out a 'winch run-out' sortie, departing at about 0800UTC. The S92 would be operating in West Voe, up to 300-400ft ALT. West Voe is situated S of the airport boundary. The ATSA produced a fps for the flight but did not annotate its intended altitude or type of operation. A 'winch run-out' is a reasonably common evolution performed at Sumburgh, whereby up to 300ft of winch cable, with a weight at the end, is let out from the helicopter. The ADC commented that helicopters often carry out practice winching flights, which take place at very low level i.e. about 50-100ft. With no other information annotated on the S92's fps the controller assumed, when the S92 crew requested to start at 0757, that this was what the S92 crew wished to carry out.

The Sumburgh ADC was aware that the S92 crew wished to operate over West Voe but no details about its flight were passed on the frequency at the time or, subsequently, as it taxied. Some 5min later the S92 was cleared to taxi, via RW15, to line up on RWH24. At 0804, whilst the S92 was taxiing, the Sumburgh RADAR Controller telephoned the ADC to pass details about an EC225 helicopter, which was orbiting 10nm S of the airport, to allow the BE200 to proceed ahead to Tingwall. This was the first time that the Sumburgh ADC was aware of the BE200's flight. The Sumburgh ADC then took the opportunity to inform RADAR about the S92. RADAR was advised that it would be departing RWH24, to operate at 'very low level' in West Voe. Because the trainee RADAR controller seemed to be unsure of this location, the Sumburgh ADC explained it, initially, as being W of RW15 and then added that it was SW. Although the RADAR trainee may have been unsure of its location, his mentor confirmed he was aware of West Voe, as he had previously held a validation at Sumburgh Airport. It was decided by the trainee that the S92 would remain on the TOWER frequency.

The S92 crew's local clearance was issued at 0805: *"after departure you can operate in West Voe maintain VFR Squawk 2-6-3-0"*. The pilot read back the clearance and squawk correctly. A2630 is an Aberdeen squawk, allocated to Sumburgh APPROACH/RADAR. Prior to departure, the pilot of the S92 was informed about the EC225 by the ADC, *"just to let you know I will shortly have helicopter traffic inbound to Heli 2-4 so if you could either be kind of north of the extended centreline of 2-4 or a bit further out to the west that would be helpful"*. The pilot reported copying the information and was cleared, at 0806:10, for take off from Heli-24.

Sumburgh RADAR telephoned the Sumburgh ADC, at 0807, to update the details on the BE200. The ac was reported as 10nm S of the airport carrying out a cloud break, to break off to the E coast. [UKAB Note (1): When asked just after 0801:00 by RADAR for their intentions, the BE200 crew replied *"descend er cloud break procedure and then hopefully to route the east coast er Tingwall* [C/S]". The RADAR Controller said that, although not anticipating an issue, he would advise the BE200 about the S92. The ADC commented that, as the S92 was climbing to cross the sand dunes (situated just at the western end of RWH24) at the moment, it might show up on the RADAR Controller's display, albeit temporarily, higher than expected. The ADC stated his belief that it would be operating 'just to the west of the field locally'. Shortly after this telephone call had finished, the pilot of the S92 transmitted, *"we'll go south of the centreline if we may towards the lighthouse and that traffic is it about 7 miles away from the south"*. (The lighthouse is situated at the southern most part of the Mainland Island i.e. at the SE end of West Voe.) The ADC replied, *"The last I was told he was holding at 10 miles out possibly if you can see ……at about 7 miles is a..Beech 2 Hundred on the cloud break he's gonna route up the East coast VFR"*. The pilot responded *"Okay just TCAS we've got 6 miles away at 2 thousand feet"*. The controller explained, *"Yeah I think that'll be the* [BE200] *the* [EC225] *was just orbiting VFR to let the* [BE200] *go ahead he's routeing up the east coast VFR to Tingwall is the* [BE200]*"*. After the pilot had acknowledged the message, *"Okay"*, no further comments were made on the frequency by the controller, or the pilot of the S92, about the proximity of the BE200. The ADC did not register that the S92 was operating higher than he anticipated. Additionally, the controller believed that the BE200 would be routeing on its company cloud break procedure (see below), which would route it to the E of West Voe and, consequently, away from the S92. The view from the VCR towards West Voe is restricted by a large chimney, which is part of the buildings around the Tower. The controller, not expecting the BE200 to route towards the airport, had not made a conscious effort to sight the ac behind the chimney. Of more concern to the controller was the position of the EC225, which might, subsequently, present a confliction with the S92. The controller first sighted the BE200 after it had passed the S92. By then it was heading NE, over land to the SE of the airport. Although the Sumburgh Area Radar head is situated on a hill overlooking the airport, the VCR is not equipped with an Aerodrome Traffic Monitor (ATM).

The BE200 crew established communication with Sumburgh RADAR at 0800, reporting passing FL150, descending to FL110. The pilot was informed that the flight was identified and was being provided with a DS. At the controller's request, the pilot of the BE200 stated his transit intentions to Tingwall; *"Descend cloud break procedure and then hopefully to route the east coast* [to] *Tingwall"*. The flight was instructed to descend to 3000ft, on its present heading of 005°. Shortly afterwards, the inbound EC225 crew was instructed to orbit not above 1000ft, to allow the BE200 to proceed ahead. At 0803:42, as the BE200 entered the Sumburgh CTA (Class D airspace) the pilot was informed *"Radar Control Service descend to altitude 2 Thousand 1 Hundred feet and report established on the 1-9-0 radial for the cloud break procedure"*. The pilot read back the service and the cleared altitude correctly, adding, *"we are now at this time established on the 1-9-0 radial"*. Traffic information was passed to the BE200 and the EC225 about each other's flight.

At about the time the pilot of the S92 reported on the TOWER frequency wishing to route towards the lighthouse, the RADAR Controller cleared the BE200 crew for the cloud break procedure, *"to break off East coast report when visual"*. The pilot was passed information about the S92 at 0807:30, *"traffic information there'll be a...helicopter Sikorsky 92 working low level just to the west of the field with the TOWER"*. He reported copying the information. No further transmissions were made by the BE200 until 0808:58, when the pilot reported, *"happy to continue visually we're routeing East coast"*. The radar photograph, timed at 0809:08, shows the S92, at 400ft, in the BE200's 12 o'clock, 1·5nm away. The latter aircraft is descending through 1000ft. Thereafter, the BE200 continues to track N towards the S92, descending to 700ft. The RADAR Mentor commented that he had not watched the progress of the BE200 as he had been busy discussing the traffic situation, which had recently occurred between the BE200 and the EC225, with his trainee. He agreed that the conflict, between the subject flights, would have shown on his radar display but, at the time, he did not believe that the two ac would come close to each other. No further RTF contact was made with the BE200 until the radar service was terminated and it was transferred to Tingwall at 0814, which was just after the position had been handed over to another controller. The closest point of approach between the two ac - 0·14nm/300ft - occurred at 0809:39. The BE200 passed virtually

overhead the S92 at a distance of 0·9nm, on bearing 189°, from the SUM VOR i.e. both flights were within the Sumburgh CTR/ATZ.

The Airprox occurred within Class D airspace. The MATS Part 1, Section 1, Chapter 2, Page 1, states the Minimum Services to be provided by ATC Units for Class D airspace:

(a) Separate IFR flights from other IFR flights;

(b) Pass traffic information to IFR flights on VFR flights and give traffic avoidance if requested; (c) Pass traffic information to VFR flights on IFR flights and other VFR flights.

On this occasion, traffic information was passed to both flights. However, the information did not reflect correctly the operation of the 2 ac, as the two controllers concerned were not aware of the correct intentions of the other ac. The S92 crew was informed the BE200 would be routeing up the East Coast, after the cloud break, rather than overhead the airport as actually occurred. The BE200 was advised that the S92 was operating low-level to the W of the airport, when it was actually to the S, up to 400ft.

The BE200 pilots' Company Operations Manual, as supplied to Sumburgh Airport ATC, concerning cloud breaks to Tingwall states:

'Flight Plans are routed via Sumburgh airfield, where RAD, ILS and VOR are available. The most expeditious method is to descend with Sumburgh Radar to MSA 2100ft and, if necessary, continue descent with the VOR/DME010° Cloud-Break. Transit from IFR let down at Sumburgh requires a minimum visibility of 5km and an 1100ft cloud-base along the defined routes as depicted (a map is included). When transiting the Sumburgh CTR (Class D) the IAS must be 135kts when the visibility is 5km. During cruise the appropriate route and FMS waypoints must be carefully input and cross-checked. It is vital that a thorough briefing takes place checking the FMS route against available charts. The published VOR/DME 010° cloudbreak has MDA at 820ft at SUM VOR. This must not be used. **The Company VFR routes commence at an MDA SUM190°/3.5D at 1000ft min.**' The initial routeing from SUM 190°/3.5 is to 'route to SUM035°/20. This routeing passes the VRP MOUSA [8nm NNE of the airport] and turns to the NW passing the island of NOSS [about 19nm NNE of the airport]'.

The route tracks NE, passing just to the S of the Mainland, in the vicinity of the lighthouse mentioned previously. It does not show it entering West Voe. It is understood that the BE200 did not carry out this company procedure as the flight was being operated by a back-up ac, which was not equipped with suitable navigation equipment.

The Sumburgh Radar Mentor stated that, if he had been operating without a trainee, he would probably have transferred the BE200 to the TOWER frequency. This, he believed, would have allowed the ADC to pass the relevant traffic information. However, his trainee decided to keep the BE200 on the RADAR frequency and he did not challenge this plan. Following this incident, a Safety Notice was issued by Aberdeen ATC, stating that it was 'good practice' to transfer traffic to the Sumburgh TOWER frequency if it was considered necessary to issue traffic information to flights in or close to the cct. This notice was replaced by a Temporary Operating Instruction (TOI 45/09), which stated: 'Sumburgh RADAR will transfer to Sumburgh ADC any inbound or overflying traffic which is likely to conflict with traffic which Sumburgh ADC is working. The exception to this is when, after co-ordination, it is agreed that the more appropriate resolution is for both aircraft to be on the Sumburgh Radar frequency. In this instance, ADC will transfer their aircraft to Sumburgh Radar'.

The MATS Part 1 requires traffic information to be issued to IFR/VFR flights within Class D airspace. On this occasion, both the Sumburgh ADC and RADAR Controllers passed what they believed to be the correct information. However, for a number of reasons, but mainly due to incorrect assumptions by both controllers, this information was inaccurate. Initially, the Sumburgh ATSA, having been advised of the S92's flight details, did not pass this information to the ADC. The latter then made an erroneous assumption about the proposed operation of the helicopter. Subsequently, the ADC and the RADAR Controllers assumed that the two flights would not conflict as the BE200 would carry out the 'normal' company procedure and route away from the airport. Consequently, neither the Sumburgh ADC, nor the RADAR Controllers, monitored the progress of the two ac and were not aware of the potential confliction.

The provision of an ATM in the Sumburgh VCR would have assisted the ADC in monitoring the progress of the BE200 when it was hidden behind the chimney, and establishing that the S92 was flying higher than expected.

UKAB Note (2): The radar recording provided to ATSI utilised a recording system not available to the UKAB. However, radar photographs of the final moments of the encounter were provided, which showed that minimum vertical separation was 300ft as the BE200, indicating 700ft Mode C (1013mb), passed just to the E of the S92 indicating 400ft Mode C (1013mb) at 0809:39. The next frame shows that the S92 had descended to 300ft Mode C (1013mb) after the BE200 drew astern maintaining 700ft Mode C (1013mb).

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

This was a very complex Airprox, which had its roots in a number of assumptions made by those involved. Consequently, there were some salutary lessons for all concerned within this close quarters encounter within the Sumburgh ATZ/CTR. No separation is mandated in Class D CAS between IFR and VFR flights. ATC discharges its responsibility to prevent collisions between known traffic in Class D airspace by passing TI. VFR flights are then required to avoid IFR flights; IFR flights may request traffic avoidance. In this Airprox the BE200 was under IFR and the S92 VFR. Both the Sumburgh ADC and RADAR controllers passed what they believed to be the correct information about their respective ac. However, as a result of incorrect assumptions by both controllers, the TI given was inaccurate.

The catalyst to this Airprox lay in the transfer of information within the Control Tower at Sumburgh Airport where the ATSA had not made plain to the ADC the details of the S92 flight, as notified by the company to ATC. The FPS did not specify a 'winch run-out' or the planned ALT of 300-400ft. The ADC did not check the flight details with the S92 crew over the RT when they taxied out and the helicopter crew did not volunteer the information. As it turned out the ADC assumed the S92 would be operating at 50-100ft amsl, and advised Sumburgh RADAR to this effect during the initial co-ordination call. It was also unfortunate that fate also played a hand here when the S92 crew legitimately decided to operate in an area not easily visible to the controller where, ATSI had reported, the chimney partially obscured the view from the VCR to the S. Therefore, it seemed to the Members that the ADC was not able to monitor the S92 visually. Controller Members were concerned that the VCR was not provided with an ATM, especially with radar data being readily available, so the Board was reassured to learn from the ATSI Advisor that its fitment was being considered.

RADAR was told by the ADC that the helicopter would be departing RWH24, to operate at 'very low level' in West Voe. Although the ADC had attempted to explain to the trainee RADAR controller the location of West Voe it was evident that the Mentor was also confused over its position relative to the airport and therefore the operating location of the S92. The Mentor's account made reference to a request from the ADC for the S92 to lift to West Voe 'to the W of the airport' not above 300ft. The inlet of West Voe is plainly immediately S of the airport, moreover, no reference was made to any actual operating altitude by the ADC. It seemed to the Board that if RADAR believed that the S92 would be operating to the W of the airport at very low-level then it was understandable they would not perceive any confliction with the BE200. Furthermore, it was evident from the ATSI report that both the ADC and the RADAR controllers assumed that the BE200 crew would follow their standard company procedures (notified to ATC) that would have them follow the VOR/DME 010° before breaking off to the E before entering West Voe. However, it was evident, after the event, that the BE200 crew did not intend to do that. When RADAR advised the ADC about the BE200 inbound from the S on a 'cloud-break', the ADC had passed TI to the S92 crew who were left with the impression that the BE200 would fly E of the airport. Meanwhile the BE200 crew was told that the S92 would be operating low-level to the W of the airport and thus there was no reason for the BE200 crew to believe that any avoiding action might be required against it. It was plain that the TI given to the respective pilots did not correctly reflect what the 2 crews were doing as the controllers concerned were not aware of their actual intentions. If the BE200 crew had been aware that the S92 was actually operating to the S, up to 400ft amsl, this might have affected his decision to follow, unbeknownst to RADAR, the VOR/DME 010° aerodrome approach all the way direct to the SUM VOR. Therefore, the Board concluded that the inaccurate TI passed to the BE200 crew was the first part of the Cause.

The S92 crew was informed the BE200 would be routeing up the East Coast, after the cloud break, rather than overhead the airport as actually occurred so they had little reason to perceive the BE200 would fly in close proximity. Neither the Sumburgh ADC, nor the RADAR Controllers, monitored the progress of the two ac and were not aware of the potential confliction until after the event. Controller Members agreed that it would have been

preferable to switch the BE200 to TOWER to fly through the cct area. Indeed, the Sumburgh Radar Mentor stated that, if he had been operating without a trainee, he would probably have transferred the BE200 to the TOWER frequency. The Board was reassured that a TOI had been issued giving further guidance to controllers on this topic.

CAT Pilot Members were concerned that assumptions were made both by RADAR and the BE200 about what procedure would be followed. A Member familiar with operations in this locale emphasised that the Company VFR routes commenced from a point at 190° SUM 3.5D at a minimum of 1000ft. He stressed that the company procedure specifically prohibited flight below this minima to the promulgated MDA of 820ft at the SUM VOR, whereas the GA member added that it was clear from the radar photographs that the BE200 crew descended to 700ft Mode C (1013mb) - broadly 670ft QNH (1012mb), after achieving VMC below. Notwithstanding the tolerances applicable to Mode C of +/-200ft, the GA pilot Member pointed out this was somewhat below the specified company minima of 1000ft QNH. Furthermore, the subsequent routeing from 190° SUM 3.5D is direct to 035° SUM 20D, thereby skirting West Voe and flying E of the Lighthouse and the SE'ly headland of Sumburgh Head. It was understandable that if the ADC and the RADAR Controllers perceived that the BE200 crew would follow this the 'normal company procedure' and route away from the airport that no confliction would ensue. However, on this occasion it seemed an alternative ac was being used which might not have had a FMS that would have permitted the BE200 crew to utilise this route and so they followed the VOR/DME 010° aerodrome approach toward the VOR, but had not specified to RADAR that they would be doing so. It was unfortunate, that the BE200 crew had not specified their intentions more precisely to RADAR, which if they had, might have made the controllers more circumspect. Consequently the Board concluded that the other part of the Cause was that the BE200 crew did not follow the company procedures notified to ATC and did not notify Sumburgh RADAR of their actual intentions for the 'cloud break'.

Whilst it was not feasible to replicate exactly what RADAR's display showed, and the controllers would have been operating on a different scale than that used for the replay, the recording of the Sumburgh Radar plainly showed the Airprox. However, the Mentor was distracted by a teaching point, had not continued to track the aeroplane or the developing conflict with the very slow moving helicopter. No action was taken by RADAR under the RCS provided to the BE200 crew to provide any warning or effect avoiding action against the S92, which was clearly indicating 400ft Mode C (1013mb) on the recording, some 300ft below the BE200 at the CPA, as the aeroplane closed rapidly from the S. ATSI reports the BE200 was hidden behind the chimney, so the ADC was not cognisant of the twin approaching from the S or that the S92 was flying higher than expected. Therefore, as none of the controllers were aware of the situation they took no action to forestall the subsequent close quarters situation as it unfolded. The winch run-out probably focused all the S92 crews' attention, as it seemed that after the TCAS provided a warning at a range of 8nm, the BE200 was not spotted visually until it had closed to ½nm off their port beam. Once seen the helicopter crew descended forward and R as the BE200 passed astern. Given that they were told the helicopter was to the W of the airport, the BE200 crew might have been somewhat surprised when they broke out of the base of cloud at 1000ft and were confronted with the S92. From the BE200 pilot's perspective he reports sighting the helicopter 1½nm directly ahead, some 400ft below his aeroplane, and in a R turn on a diverging flight path. This suggested to some that the BE200 crew might have seen the helicopter after the S92 crew had initiated their avoiding action. Notwithstanding this discrepancy in the 2 crew's range estimates, it was clear that the helicopter crew had spotted the BE200 in time to take action and all the BE200 pilot needed to do was make a slight right turn to increase the rate of divergence. With this geometry it seemed likely that the BE200 was always going to pass astern of the S92 and the radar recording evinced 300ft of vertical separation – exactly what the S92 pilot had estimated. Weighing all these factors for relevance at length, the Members agreed unanimously that no Risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

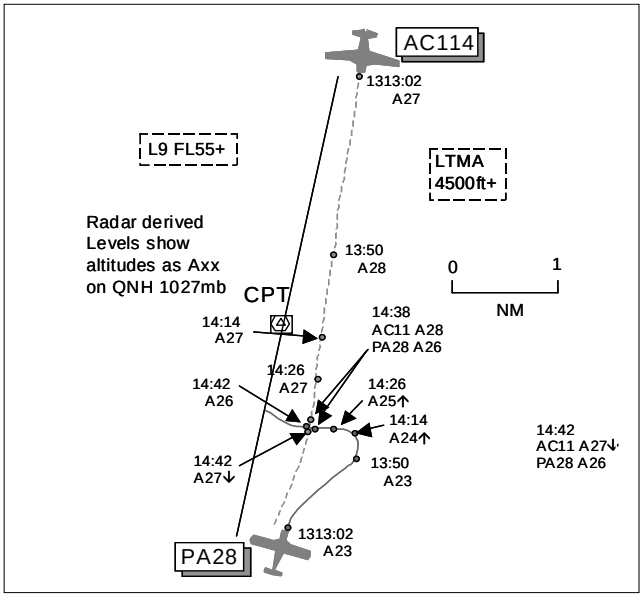
Cause: (1) Inaccurate TI passed to the BE200 crew.

(2) The BE200 crew did not follow the company procedures notified to ATC and did not notify Sumburgh RADAR of their actual intentions.

Degree of Risk: C.

AIRPROX REPORT NO 2009-115

Date/Time:	25 Sep 1315	
Position:	5128N 00113W (1nm SE CPT)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	AC114	PA28
Operator:	Civ Pte	Civ Club
Alt/FL:	3000ft	2000-4000ft
	(RPS)	(QNH)
Weather:	VMC CLBC	VMC NK
Visibility:	10km	NR
Reported Separation:		
	20m V/50m H	Not seen
Recorded Separation:		
	100ft V*/<0·1nm H	
	*see UKAB Note (1)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AC114 PILOT reports flying with 2 other experienced pilots enroute to Jersey VFR via CPT and SAM and in receipt of a BS from Brize Norton on 124·27MHz, squawking an assigned code with Modes S and C; PCAS was fitted but was u/s. The visibility was 10km flying 2000ft below cloud in VMC and the ac was coloured grey/black/white. Just S of CPT and anticipating a change of frequency to Farnborough Radar he was happy to stay with Brize, as there was often a radio black-spot with Farnborough in the area. A good lookout was being kept as this was a busy area and he had minutes earlier diverted to avoid a glider operating close to CPT. Heading 192° at 3000ft Cotswold RPS, he thought, and 130kt he first saw a white coloured PA28 when it appeared directly in front 100m away crossing L to R at 90° to his track at the same level. He took immediate avoiding action, a high negative g bunt into a dive; the PA28 pilot took no action, although legally required to do so, and was probably unaware of the incident. He estimated separation at CPA was 20m vertically and 50m horizontally, assessing the risk as high. He immediately informed Brize of the incident and was advised that he was under a BS. He believed that the PA28 had probably been on a constant bearing within the blind arc produced by the A pillar which is rather wide and probably covers a 15° arc. Later he telephoned Brize and was told that the radar had shown the subject ac within 200ft of each other.

Since the changes in ATSOCAS were introduced he believed that obtaining and sustaining a TS has become very difficult which he thought was having a negative effect on safety. This comment was not directed at Brize with this incident but as a result of his experience flying a number of sorties under the new regime.

THE PA28 PILOT reports flying VFR on a dual general handling training sortie with a student. He was unaware of being involved in an Airprox until contacted after tracing action. He had been operating in the CPT area between 2000ft and 4000ft QNH under a BS service from Farnborough Radar on 125·25MHz, squawking 0461 with Mode C. The Wx was VMC and the ac was coloured white/blue and strobe lights switched on. He had not seen the other ac at all.

THE BRIZE LARS CONTROLLER reports taking over the position at approximately 1300 and being aware from the large number of pre-noted flights that he could expect to be busy should all the flights require a service at the same time. The AC114 was on frequency when he took over and the workload increased from moderate to high as he was working a number of flights under a TS in complex situations and high traffic density. The AC114 pilot reported coming close to another ac in the CPT area when his workload was very high. The flight was under a BS so he did not actively search for any conflicting tracks but looked occasionally at the subject ac's radar return to keep track identification and to ensure that it did not infringe CAS. Immediately prior to the Airprox being reported,

he did not see any conflicting traffic as his attention was focussed on other higher priority tasks associated with traffic under a radar service.

DAATM reports that the LARS controller's reported workload of moderate to high is supported by the tape transcript and the ATC Supervisor's report.

The AC114 flight first made contact with LARS on frequency 124·275MHz at 1255:54. At 1256:14 the pilot passed, *"Er c/s is an AC11 out of Coventry inbound Jersey er climbing to two thousand five hundred feet squawking 7000 and routeing er overhead Oxford er to Compton".* This was acknowledged by LARS some 4sec later, *"c/s roger what type of service do you require?"* At 1256:20 the pilot responded, *"Er basic service".* This was acknowledged by LARS, *"c/s basic service Cotswold QNH 1024 squawk 3716".* The pilot acknowledged the squawk and pressure. LARS then passed TI at 1257:17, *"c/s traffic in your vicinity south two miles tracking south no height information".* The TI was repeated with no acknowledgement from the pilot despite 4 further radio checks. Contact was regained at 1301:43 when the pilot acknowledged a new Cotswold QNH of 1023mb. LARS then negotiated a clearance for the AC114 through the Oxford overhead. At 1308:59 the AC114 pilot was advised, *"c/s transit Benson MATZ approved".* The pilot questioned the requirement to call Benson but the LARS controller invited the flight to stay with LARS. LARS was informed on RT of the incident at 1315:09, *"Er we've just had a close encounter with a Cherokee um there was no warning".* LARS replied, *"c/s basic service I'm working (garbled) hard".* The AC114 pilot transferred to the Southampton frequency at 1316:35. Throughout the period LARS had 9 speaking units on frequency and provided a TS to 4 ac and a BS to 5 whilst also making liaison calls to Benson, Oxford and LACC.

The AC114 pilot requested a BS and the controller initially had the capacity to provide TI under the BS when a definite risk of collision was evident although the initial passing of TI may have led the AC114 pilot to believe he was receiving TS. However, the pilot still remained responsible for his own collision avoidance, the LARS controller operated iaw CAP776.

UKAB Note (1): The radar replay using the London Heathrow 23cm radar clearly captured both ac as the AC114 transits S through the CPT area. At 1314:02 the AC114 is 2·6nm NNE of CPT tracking 190°, GS 130kt and indicating altitude 2700ft on London QNH 1027mb (2580ft RPS 1023mb) with the PA28 in its 12 o'clock range 4·7nm in a R turn passing through 010° level at altitude 2300ft QNH. The AC114 continues on a steady track as the PA28 rolls out on a NE'ly heading, GS 60kt. At 1313:50 the PA28 is seen to commence a L turn in the AC114's 1130 position range 2·1nm. By 1314:14 separation has reduced to 1nm with the PA28 turning through 280° indicating a climb through 2400ft. Twelve seconds later with lateral separation at 0·5nm the PA28 is seen at 2500ft QNH steadying on a W'ly track and on a line of constant bearing. The CPA occurs between 2 sweeps. The sweep before at 1314:38 shows separation at 0·1nm as the PA28, now level at 2600ft QNH, is about to cross just ahead of the AC114 which is showing altitude 2800ft. The next sweep 4 sec later shows the subject ac having crossed, the PA28 still showing level at 2600ft with the AC114 <0·1nm to its SE and now indicating 2700ft. This geometry, with the PA28 200ft below the AC114, does not accord with the AC114 pilot's report of both ac being at the same level, with his avoiding action bunt to pass just below the PA28, however, Mode C height readout tolerance is ±200ft.

ATSI comments that at 1252:30, the PA28 flight made its first call on the Farnborough LARS W frequency. The pilot reported *"…a PA28 from White Waltham to White Waltham general handling to the west of Reading currently approaching Reading at two thousand feet on one zero two seven request Basic Service".* The Farnborough LARS W controller issued the flight a squawk, 0461, confirmed a BS and provided the Farnborough QNH 1027mb, which was read back correctly. No further communication with the flight occurred until 1326:30, when the pilot requested to transfer to White Waltham, frequency 122·6MHz. The flight was instructed to squawk 7000 and the frequency change acknowledged at 1327. At no point while the flight was on the Farnborough frequency did the pilot report being involved in an incident. It was not until over 2 weeks later that the PA28 was revealed to be the reported ac. By this time, the Farnborough controller concerned could not recall the flight and consequently, did not raise a report.

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 this incident occurring in Class G airspace, both pilots were responsible for maintaining their own separation from other ac through 'see and avoid'. Both flights were under a BS from ATSUs, the PA28 from Farnborough and the AC114 from Brize LARS. The AC114 flight had earlier been passed radar-derived TI when LARS was not so busy but when the Airprox occurred, the Brize controller did not see the confliction owing to higher priority tasks. Nor did the Farnborough controller. Members were acutely aware of the possible blurring of services, which could lead to pilots under a BS working a radar equipped ATSU believing that they may be getting a 'better' service than they actually are. The PA28 had been manoeuvring immediately prior to Airprox, initially tracking NE'ly before turning W'ly and commencing a climb to cross the AC114's projected track, only being on a line of constant bearing for some 25sec before the CPA. The AC114 pilot had the opportunity to see the PA28 ahead and below for some time but he only saw it late as it crossed in front from L to R having climbed to a similar altitude. Similarly, there was an equal opportunity for the PA28 instructor to see the approaching AC114 when he visually cleared the airspace into which he was turning and climbing. Under the Rules of the Air, the PA28 pilot should have given way; however, this was not possible owing his non-sighting of the conflicting AC114.

Turning to risk, it was fortunate the AC114 pilot saw the PA28, albeit late, and took robust avoiding action, bunting his ac to pass just behind and below it. The Board agreed that this action had been enough to remove the actual risk of collision but that safety had not been assured during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

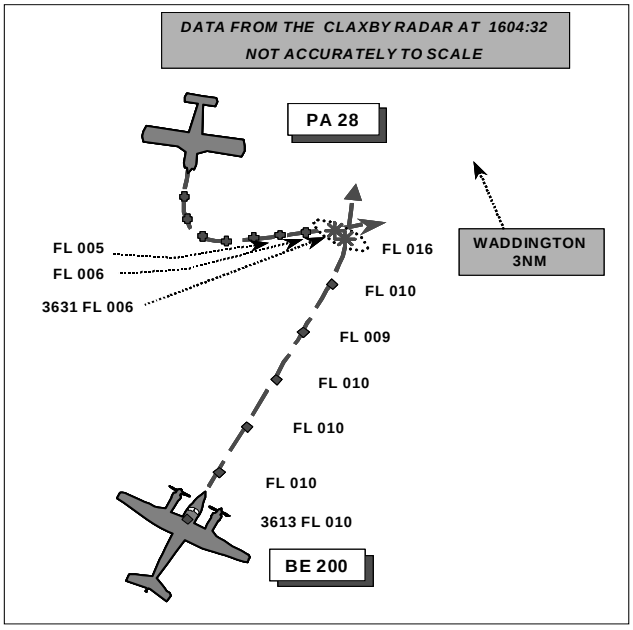
Cause: Non-sighting by PA28 pilot and late sighting by AC114 pilot.

Degree of Risk: B.

AIRPROX REPORT NO 2009-117

Date/Time: 23 Sep 1605
Position: 5308N 00031W (Waddington CCT - elev 218ft)

Airspace:	Waddington ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	BE200	PA28
Operator:	HQ AIR (TRG)	Civ Pte
Alt/FL:	1000ft (QFE 1016mb)	600ft (N/K)
Weather:	VMC CLBC	VMC
Visibility:	>10km	10km
Reported Separation:	150ft V/10m H	400ft V/200m H
Recorded Separation:	400ft V/0.4nmH (min H after RA 1000ft V/<0.1nm H)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B200 PILOT reports flying a training flight from RAF Cranwell, in the Waddington visual cct, with a student who was an experienced ex-FJ Navigator, as PF in the LH seat; the instructor who was also the ac commander and PNF was in the RH seat. They were squawking as directed with modes C and S, had all lights switched on and were in contact with TWR on a UHF frequency.

They were passed TI on a civilian light single-engined piston ac positioning for left base that would be ahead of them in the pattern. They offered to switch to a VHF tower frequency so that the other pilot would have improved SA but they were directed to remain on the UHF frequency in use as the other ac was intending to land. They continued their cct and were given clearance to roll after the other ac had vacated the RW.

During climb-out from the roll they carried out a practice engine failure after take off (EFATO), continuing straight ahead to about 4.5nm DME to complete checks before turning left to rejoin the cct downwind. They made RT calls *'C/S, extending upwind, simulated asymmetric'* and later *'C/S, re-joining downwind"*. They were in a high workload situation and neither pilot recalls being passed any further information on a departing ac by TWR and no RT communication was heard from the other ac on the UHF frequency.

A further Cranwell based ac, (a Dominie departing the cct from end of downwind leg) was about 3nm ahead of them.

As they approached the downwind position, at 1000ft QFE, tracking 020° at 183kt, with one engine at flight idle, a TCAS TA warning was received displaying a contact in their 10 o'clock at about 1nm, 300ft below them and climbing. The crew looked into the 10 o'clock to try to acquire the ac visually but nothing was seen; after a further 5-8sec a TCAS RA "CLIMB CLIMB" was received. Both engines were brought up to max performance and simultaneously the ac was pitched into a max performance climb.

Once fully established in the climb, the left-seat pilot looked into the 10 o'clock to see a white coloured light ac pass about 150ft directly below. They assessed the risk as being high and reported the incident immediately to TWR.

THE PA28 PILOT reports flying a local private flight in a blue and white flying club ac, squawking as directed with Mode C, and, at the time in communication with TWR. He was cleared to take-off on RW20 with the King Air in sight. Although he was not made aware of the King Air's intentions he saw that it had just overshot from its approach and was maintaining RW heading. As he climbed out on RW heading he was aware that the King Air was still maintaining RW heading and had extended upwind, so at that stage he assumed that it was returning back to RAF Cranwell, which is due South of RAF Waddington, as the ac was not flying a normal cct pattern. He therefore elected to begin a left turn onto his departure heading away from the cct as he felt there was sufficient separation between the King Air and himself; however, during the turn he was 'blind' to the King Air. As he rolled out of the turn heading 090° at 85kt and reacquired the King Air he noticed that it was in the final part of a left turn to roll out long downwind; its higher speed and increased turn radius now put them in potential conflict so he reduced his rate of climb in order to provide a comfortable degree of separation between the ac. He lost sight of the King Air again in his 4.30 position as it passed above and slightly behind the roof structure of his ac, but picked it up again in his 7.30 position, estimating it to be 300-400ft vertically above his alt. At no time during this period did he believe there was any significant risk of collision.

He has since been informed that the King Air was conducting an engine failure after T/O drill following his overshoot, hence the reason for the upwind extension.

UKAB Note (1): The recording of the Clee Hill radar shows the incident clearly. The BE200 can be seen extending upwind in the Waddington cct and levelling indicating FL010 (Mode C) and commencing a turn onto downwind at 3.7nm DME, 30sec after the PA28 got airborne (it first shows on the recording indicating FL-001). The PA28 commences a LH turn at 1603:00 while climbing through FL002 just as the BE200 rolls out downwind at FL010 in its 11o'clock at 2.3nm. The PA28 continues the left turn rolling out on about 090°, closing with the BE200 until it (the BE200) commences a climb at 1604:25 passing 1000ft almost directly above the PA28. The ac then diverge. Although not shown on the diagram, the CPA was within the Waddington ATZ.

UKAB Note (2): There were 2 single-engined light ac involved; one was landing ahead of the BE200 then taxying in to park and the other was about to line up and take off. There was also a Dominie on an instrument approach to join the visual cct.

DAATM reports that the BE200 was operating in the RAF Waddington visual cct on TWR (UHF) conducting a training sortie including EFATO drills, while a PA28 was departing Waddington on TWR (VHF) to conduct a local flight. The Waddington ADC was transmitting on VHF and UHF simultaneously to control both cct and ground traffic.

The PA28 was given clearance to line-up on RW20 at 1601:20; immediately after the pilot acknowledged the line-up clearance, the APP controller notified the ADC that radar traffic (a Dominie not involved in the Airprox) was '*8 miles…to roll and join'*, followed by details of the Dominie's further intentions and departure instructions. At 1601:59 the ADC asked the PA28 pilot, '*C/S are you visual with the King Air [C/S] deadside?'* to which he replied '*Affirmative',* and was cleared for take off and passed the surface wind. At 1602:13 TWR made an all stations broadcast warning that the Dominie was at 7 miles to roll and join the cct. At this time the BE200 was upwind and responded [on UHF] '*C/S extending upwind for spacing on the…radar [traffic]';* they were also extending upwind to carry out a practice EFATO which requires them to complete the checks before turning left to rejoin the downwind leg of the cct. In his report the BE200 pilot stated that he also made RT calls for *'simulated asymmetric'* [on UHF] but the tape recording does not capture the transmission [it may have been blanked by VHF calls from an ac that had just landed]. The ADC was engaged with ground calls before instructing the PA28 to continue with Zone [VHF] at 1603:36; the pilot read back the frequency. The PA28 was not passed information with regard to the BE200's intention to extend upwind while conducting the EFATO.

At 1603:40 the ADC passed to the PAR controller a clearance for the Dominie to roll, with cct state as one in. At 1603:44 the BE200 reported *"CWL72 rejoining downwind",* the ADC acknowledged and then broadcast '*Dominie 4 miles to roll'.*

The ADC was engaged in ground calls until at 1604:20 the BE200 pilot transmitted *"C/S TCAS climb"* which the ADC acknowledged; the BE200 continued, *"Twr C/S we've just had a……TCAS climb in the circuit we weren't aware of another aircraft in the circuit apart from us."* The ADC dealt with a ground call before responding '*BE200 C/S affirm on VHF frequency, I'm also transmitting on both'* but the BE200 pilot replied '*We didn't get it';* the pilot continued on to say, '*And he cut straight across us on the down wind leg'.*

The Waddington Supervisor commented that the RT recording showed that all transmissions made by the ADC throughout the time of the incident were broadcast on both UHF and VHF frequencies.

The PA28 and the BE200 flew into conflict in the visual cct on the downwind leg to RW20 while the ac were operating on different frequencies. However all transmissions made by the ADC were on both frequencies simultaneously but it appears that the BE200 crew did not hear all the [VHF] transmissions made by the ADC. The PA28 was not passed the intention of the BE200 to extend upwind which would have enhanced the pilot's SA.

UKAB Note (3): Four short transmissions were made on VHF/UHF [although this cannot be determined from the transcript, SATCO reported that all transmissions were made on both frequencies] to/from the PA28 starting at 1601:22 and ending at 1602:06 clearing the PA28 to line up, asking if the pilot was visual with the BE200, and then clearing the ac to take off with it in sight. No TI was passed to the BE200 crew regarding the PA28 taking off or informing the PA28 pilot that the BE200 had extended upwind.

UKAB Note (4): The transcript provided did not show which transmissions were made or received on UHF and which were on VHF. Separate transcripts of the UHF TWR and VHF TWR frequencies were requested but, since the recording contained both frequencies, they could not be provided.

UKAB Note (5): A further transcript was requested and it shows that at 1558:08 [before the initial transcript commenced] the BE200 pilot transmitted:

'Confirm he is in VHF? Would you like me to chop to VHF'

to which TWR responded:

'C/S he's on VHF, he's landing on this approach' [this refers to another light ac landing ahead]

And the BE200 pilot responded:

'Roger C/S unintelligible' [the BE 200 did not change to a VHF frequency].

HQ AIR (TRG) comments that the simultaneous ATC transmissions on VHF/UHF do not seem to have worked as the PA28 pilot was unaware of what the King Air was intending to do and the King Air pilots were not aware that the PA28 was in the circuit area. It also appears that specific TI was not given to either crew, which might have

led to inaccurate SA. However, the fundamental rule of see and avoid still applies in the visual circuit and it was incumbent upon both crews to maintain a good look out to maintain accurate SA.

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 was hampered in its deliberations by the absence of separate transcripts of the UHF and VHF frequencies. Although there was no reason to doubt the Supervisor's report that the ADC's transmissions were made simultaneously on UHF and VHF, it was difficult to verify whether some critical calls were not transmitted, not heard or not assimilated; e.g. the PA28's line up/take off clearance was not heard on UHF by the BE200 crew (although they might have been transmitting their intention to conduct a practise EFATO, but this call is not captured on the RT recording nor apparently heard by the ADC). Nevertheless, Members agreed unanimously that the nub of the problem was the separate use of UHF and VHF frequencies simultaneously by the BE200 and the PA28. The Board noted that the BE200 pilot, apparently in anticipation of confusion, had volunteered to change to the VHF frequency but the ADC had, in their view unwisely, declined this offer. Members agreed that the pilots of both ac had conducted their respective actions in the circuit as correctly as the information available to them permitted; both, however, had incomplete information regarding the other's intentions. Only the ADC had full SA, and he apparently did not realise how little traffic information was being received or assimilated by the pilots.

The Board noted that the PA28 pilot had seen the BE200 extend upwind and, in the absence of TI, concluded incorrectly that it was departing the circuit. However, by keeping it in sight as much as possible, it soon became apparent to him that the BE200 was not only rejoining the circuit but was flying into conflict with his ac. Now correctly deducing the BE200 crew's intentions, he reacted appropriately by reducing his rate of climb to pass well below the BE200 (even before it commenced its RA climb). Although the BE200 crew could not see the PA28 climbing from below, probably due to its being obscured by the airframe, it was displayed on their TCAS initially as a TA; when it changed to an RA the crew reacted accordingly and commenced an RA climb. The combined actions of the PA28 pilot and BE200 crew ensured that there was no risk of collision, the BE200 crossing 1000ft above the PA28.

The Board agreed that, while it was not possible to determine who said what, and whether or not it was actually transmitted or received, best practice is to control all ac in the visual circuit using a single frequency where, as in this case, it is possible. The Board noted that this was not the first incident they had assessed where UHF/VHF confusion had been an avoidable factor, although not necessarily the direct cause of an incident. The DAATM Advisor said that some RAF bases had standardised, on their own initiative, on a single frequency (generally VHF as not all users are UHF equipped) but this is not mandated by DAATM. The Board was therefore minded to recommend that MoD considers regulating such procedures.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in the Waddington circuit resolved by the pilots of both aircraft.

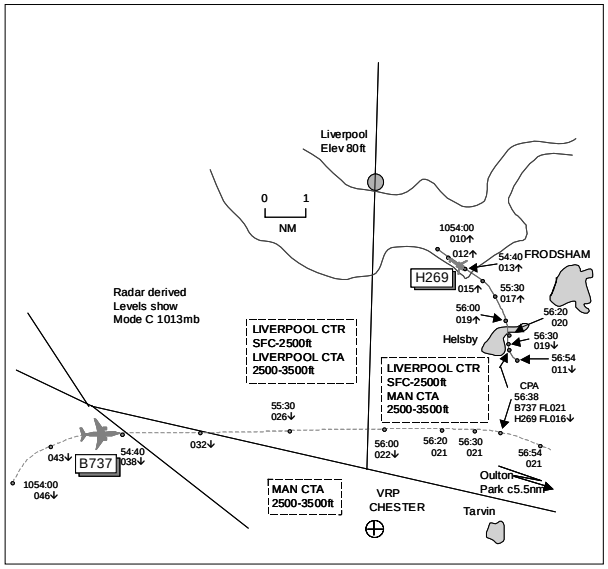
Degree of Risk: C.

Contributory Factors: Lack of Traffic Information from the ADC to aircraft in the circuit operating on different RT frequencies.

Recommendation: MoD is recommended to direct that, whenever it is possible to do so, aircraft in the visual circuit operate on the same frequency.

AIRPROX REPORT NO 2009-118

Date/Time:	25 Sep 1057	
Position:	5315N 00246W (6nm SSE Liverpool - elev 80ft)	
Airspace:	MAN CTA/LIV CTR (Class: D)	
	Reporting Ac	*Reported Ac*
Type:	B737-800	H269
Operator:	CAT	Civ Club
Alt/FL:	2500ft (QNH 1027mb)	1500-2000ft (QNH)
Weather:	VMC CLBC	VMC CLBC
Visibility:	10km	>10km
Reported Separation:	Nil V/2nm H	NR V/5-6nm H
Recorded Separation:	500ft V/2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports inbound to Liverpool IFR and in receipt of a RCS from Liverpool on 119·85MHz squawking 5043 with Modes S and C. Heading 080° downwind at 220kt and 2500ft they noticed on the NAV display proximate traffic 11 o'clock range 5nm within 1000ft but climbing towards them. ATC were in conversation with other traffic and by the time they were able to alert ATC to the situation the proximate traffic was 10 o'clock range 2nm at the same level ±100ft. ATC immediately issued an avoiding action instruction to turn onto heading 110°, which they followed; no TCAS 'traffic' warning was received. He assessed the risk as high as he believed the other ac's pilot was unaware of his 'level bust'.

THE H269 PILOT reports flying solo outbound from Liverpool, VFR and in communication with Liverpool Approach on 119·85MHz, squawking 0260 with Mode C. The visibility was >10km in VMC

and the helicopter was coloured white with strobe lights switched on. Prior to departure whilst hover taxying, GMC had issued a clearance from RW27 to exit the Zone via Chester and the QNH. However, Tower changed the Zone exit to Oulton Park once airborne which changed the track to 090° downwind and then 150° when positioned mid-river. After changing to Approach, the Zone exit was changed again to Tarvin, a track change to 180°, when crossing the S bank N of the M56 and Helsby. The helicopter was prone to the elevator rising causing a climb – slight friction could be applied but only in the cruise, not in the hover or during take-off. His workload had involved the Zone exit changing twice and an unfamiliar position of taking-off W'ly but then changing E'ly whilst in the cct before turning S'ly to Tarvin. During this period climbing at 55kt the helicopter climbed above 1500ft (2000ft for 1 min) but it was rectified very quickly. When Approach called to inform him of the B737 pilot's report of his helicopter's height, he was able to report that he was now at 1500ft. The B737 was in clear view some 5-6nm away whilst he was still some 5nm and 5min from Zone exit at Tarvin.

THE LIVERPOOL RADAR CONTROLLER reports that at 1056 the B737 crew reported a TCAS alert, he thought, 3nm N of their position, LH downwind for RW27. The H269 was observed on radar indicating 2400ft tracking S towards Tarvin on the S Zone boundary. The H269 was operating on a VFR clearance not above 1500ft whilst the B737 was level at 2500ft on an E'ly track. The B737 was given an avoiding action turn onto 120° away from the helicopter. The H269 flight was given an immediate descent instruction to 1500ft. When the helicopter pilot was asked to confirm his level, he stated 1500ft. When clear of the helicopter the B737 was vectored towards L base for a visual approach.

ATSI reports that the H269 helicopter was operating on a local VFR flight from Liverpool. At 1049:55, the ADC instructed it to line up and wait RW27. Shortly afterwards, a revised departure clearance was issued (the pilot reported his initial clearance, passed by GMC, had been to the S, via Chester) *"after departure it'll be Frodsham*

Whitegate VFR not above Fifteen Hundred feet" i.e. to the SE corner of the Liverpool CTR. The pilot read back the clearance *"Roger Whitegate not above Fifteen Hundred feet"*. The H269 was then cleared for take off from RW27, with a L turn out. Approximately 3min later (1054:40), the helicopter was transferred to Liverpool Radar.

Meanwhile, the B737 flight had contacted Liverpool Radar at 1050:30 and was being vectored downwind LH to RW27, on heading 090°. At 1054:37, the B737 crew was instructed to descend to 2500ft on QNH 1027mb. The radar recording shows that, at the time, it was 9nm SW of the H269, which was now at FL013, equivalent to an altitude of 1700ft QNH 1027mb. Shortly afterwards, the B737 flight was issued with TI about a PA28, which was routeing from the airport to Whitegate at 1500ft or below [3.5nm NW of the H269].

At 1055:30, the H269 pilot made his initial call to Liverpool Radar. The controller instructed the helicopter to *"turn towards Tarvin report leaving at Tarvin now"*. Tarvin is situated near the Liverpool CTR boundary, SSE of the airport. The radar recording, timed at 1055:30, shows the H269, squawking 0260, the Liverpool conspicuity code, passing FL017 (2100ft QNH), unverified, 5·8nm NE of the B737, which is passing FL026 (3000ft QNH). Shortly afterwards, the B737 was instructed to turn L heading 080°. The pilot commented (1056:00) *"Have have traffic on our TCAS at about two miles about Two Hundred below is that the Cherokee"*. The controller replied *"Er it's an aircraft climbing for avoiding action turn right heading One One Zero degrees B737 c/s it's a helicopter at two thousand four hundred feet should be below Fifteen Hundred feet now"*. The pilot acknowledged the turn and reported the traffic was showing 100ft below. The controller tried to establish the altitude of the H269 but after only receiving a position report he decided to instruct the helicopter (1056:30) to *"descend now there's traffic three miles south of you turning away from you a Seven Three Seven descend to Fifteen Hundred feet now H269 c/s"*. The pilot reported *"at Fifteen Hundred now"*.

The radar timed at 1056:20 shows the H269 at FL020 (2400ft QNH) and the B737 2·7nm SW of it, at FL021 (2500ft QNH). Thereafter, the helicopter descended and reached FL011 (1500ft QNH) at 1056:54. The B737, which maintained FL021 (2500ft QNH) throughout, passed ahead of it at a range 2nm at the CPA, the H269 500ft below, descending through FL016 (2000ft QNH). The H269 was above its cleared altitude for approximately 2·5min.

The Airprox occurred within Class D airspace. The minimum service to be provided by ATC to IFR/VFR traffic is basically to provide TI to both ac. On this occasion, ATC had placed the subject flights on clearances, which were intended to provide vertical separation of 1000ft, until they were clear of each 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.

Members could add little to this incident. The radar controller had elected to separate the subject ac by restricting the H269 to not above 1500ft whilst descending the B737 to 2500ft. In doing so, this removed the need to pass TI to either flight, the minimum requirement for Class D airspace. However, the H269 pilot did not comply with his clearance and climbed above his assigned altitude, which had caused the Airprox.

The Board discussed why the controller had not noticed the H269's 'level bust' earlier as the helicopter's Mode C had indicated above 1500ft for over 1min before its pilot checked-in on the radar frequency. Under SOPs, an ac's squawk code is validated and Mode C is verified on initial contact. However, the H269 had been allocated a Liverpool conspicuity code, which is deemed unvalidated and unverified, and, unfortunately, its Mode C indications appeared to have gone unnoticed by the controller.

Members commended the actions taken by the B737 crew on seeing the potential confliction on TCAS and pointing it out to ATC. This had led to the radar controller issuing an avoiding action R turn to the B737 flight and descent instructions to the H269 pilot, who saw the airliner as it crossed ahead from R to L as he commenced his descent. These elements when combined were enough to allow the Board to conclude that any risk of collision had been quickly and effectively removed

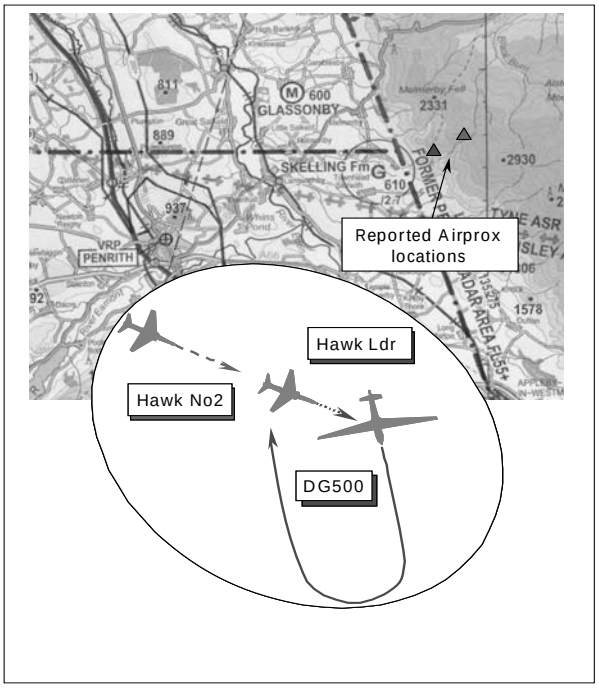
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The H269 pilot climbed above his assigned altitude and into conflict with the B737.

Degree of Risk: C.

AIRPROX REPORT NO 2009-119

Date/Time:	25 Sep 1113	
Position:	5443N 00233W (~2nm NE of Skelling Farm Glider Site elev: 610ft amsl)	
Airspace:	London FIR/LFA17 (Class: G)	
	Reporting Ac	*Reported Ac*
Type:	DG500 Glider	Hawk T Mk1 pr
Operator:	Civ Club	HQ Air (Ops)
Alt/FL:	1800ft QNH	250-500ft agl
Weather:	VMC CLBC	VMC CLBC
Visibility:	20km	10km+
Reported Separation:	150-200ft V	500ft V/0·1nm H
Recorded Separation:	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DG500 GLIDER PILOT reports that he had winch launched from the glider site at Skelling Farm with a passenger, to ridge soar the Cross Fell hills. He was in communication with the glider site on 129·975MHz and had been established on one of the foothills for just a few minutes, flying about 1300ft clear below cloud with an in-flight visibility of about 20km. Heading in a southerly direction (170°) approaching a position 54°42'33"N 002°32'26"W [1½nm ENE of Skelling Farm] at 55kt and climbing slowly through about 1800ft QNH (some 1200ft QFE), he heard a loud noise and a small fast jet ac passed 200ft below - directly underneath his glider - flying straight and level on a similar course. Expecting a second jet, he immediately turned R, away from the hillside, through 180° onto 350° and saw the No2 of the pair coming towards him on a reciprocal course, some 200ft above his glider and slightly to starboard. It seemed that the pilot of the No2 had seen his glider, or was aware of him, as the jet rolled inverted and the No2 Hawk passed about 200ft above him. No avoiding action was taken against the first jet – a Hawk – because it was approaching his glider from behind and had flown past almost before he was aware of it. Whereas he saw the No2 Hawk and could see that it was going to fly clear by a reasonable margin, it is difficult to assess the Risk with the first Hawk as it depends whether the pilot saw his white glider [the lead Hawk pilot did not see the glider] - he stressed that he did not see the first jet until it had passed. He assessed that there was little or no Risk of collision with the second Hawk.

The incident was observed by people on the ground at Skelling, who also identified the aircraft type. Adding that there were other gliders flying on the hills at the same time, although none was in the immediate vicinity at the time of the Airprox.

He stressed that the reason that he had filed the Airprox was to highlight that in suitable soaring conditions large numbers of gliders (plus hang gliders and para-gliders) soar on these hills, anywhere from Brampton to the Warcop Danger Area, from a few hundred feet above ground level to several thousand feet.

THE LEAD HAWK T Mk1 PILOT reports that he was leading a section of two black Hawk ac operating VFR on a low-level evasion training sortie against another singleton Hawk in the Lake District and Appleby Valley. The ac's white HISLs, navigation lights and the nose light were all on. Operating VFR without an ATS, a squawk of A7001 was selected with Mode C but neither Mode S nor any form of TCAS is fitted.

Approaching the Airprox position given by his wingman, heading 150°(T) at 420kt, some 1500ft below and 1½nm clear of cloud, a glider was spotted by his No2, who was 2nm in trail. He opined candidly that he had already passed by the glider without spotting it, but from its reported location he must have flown close to it. He did not assess the Risk.

THE HAWK T Mk1 WINGMAN reports that he was flying as No2 of the Section of 2 Hawk ac cruising at 250-500ft agl. After being bounced 3nm NNE of Penrith, both he and his leader were egressing to the E some 2000ft below a solid overcast and clear of cloud on high ground to the E with an in-flight visibility of >10km. He was aware of the glider site to the E [Skelling Farm Glider Site] and elected to flow to the Northern and Eastern sides whilst continuing to route to the S. This route was due to the proximity of the bounce and was the most tactical route to follow. Using his GPS display to keep clear of the glider site, he was prevented from going any further E by the low cloud on the high ground. Approaching a position 54°43'N 002°31'W [2½nm ENE of Skelling Farm], just as he cleared a ridgeline heading 135° at 420kt – as the 2nd aircraft in a 1½nm trail – he saw a glider half a mile ahead on the nose and slightly below his flight path. To avoid the glider he pulled up as high as the cloudbase would allow and rolled to maintain visual contact with it. He reported the presence of the glider to the other members of the formation and estimated that he passed above the glider with at least 500ft clearance about 0·1nm away and that there was no risk of collision. Stressing that he was aware of their proximity to the glider site, he does not believe it was infringed. Upon returning to the Unit he reported the incident to the Duty Authorising Officer, but did not deem it necessary to file an Airprox report.

HQ AIR (OPS) comments that the Hawk pilots' were aware of the glider site and gave it due regard and avoidance, the wider implications of the weather conditions as suitable for hill soaring are unlikely to be obvious to non-glider pilots, and in Class G airspace all users must maintain a good lookout. The Airprox reporting system should not be used to highlight that in suitable conditions large numbers of gliders soar on these hills - a NOTAM would be more appropriate. More in depth information regarding weather conditions and implications to the airspace near to promulgated glider sites should be incorporated into the UK Military Low Flying Handbook.

UKAB Note (1): The UK AIP at ENR 5-5-1-5 promulgates Skelling Farm Glider Launching Site situated at 54° 41' 52'' N 002° 35' 06''W as active from Sunrise to Sunset (HJ). Glider launching by winch may be encountered up to 2000ft above the Site elevation of 610ft amsl.

UKAB Note (2): The UK Military Low-Flying Handbook at Part 1-2-17-3, promulgates a mandatory avoidance of 2nm around Skelling Farm Glider Site below 2000ft msd (GS03) for crews of military ac.

UKAB Note (3): This Airprox is not shown on radar recordings.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The gliding Member briefed the Board that Skelling Farm Glider Launching Site was one of the first to be used by glider pilots keen to experience mountain wave soaring. He opined that sites that are close to suitable locations for ridge or mountain wave soaring such as Skelling Farm and Sutton Bank tend to be in areas that are suitable for military training flights. Furthermore, whilst the promulgated mandatory avoidance of 2nm around Skelling Farm for observance by military crews provides a degree of protection below 2000ft agl around the glider site itself, this is not where the majority of gliders will be operating once airborne from the site. Clearly, visiting glider pilots might fly cross-country to such localities from distant sites and there is always the potential for military fast-jet pilots to encounter gliders anywhere in the 'Open' FIR. The gliding Member stressed this was not just at low-level, but

further into the middle airspace, where gliders will be found operating above sites such as Sutton Bank and Aboyne in specifically designated areas - Temporary Reserved Areas (Gliding) [TRA (G)] - that are established from FL195 and extend above FL240 in various locations.

Here, the DG500 glider pilot reports that he was not very far away from the glider site at Skelling Farm and had been established on the foothills for just a few minutes before he encountered the 2 Hawk jets. It was clear to the Board that the lead Hawk pilot had not seen the DG500 glider before he flew beneath it. For his part, the glider pilot did not see the lead Hawk approaching from astern and it was only the noise of the first ac that alerted him before it passed an estimated 200ft below him. Having anticipated the possibility of a second Hawk and turned to face the potential threat, the glider pilot was not unduly concerned by the approach of the wingman, who he could see had taken robust action to increase separation and retain visual contact on his glider. The Board commended both the glider pilot for his presence of mind in suspecting the possibility of a second jet and also the No2 Hawk pilot for his robust avoiding action. The Board therefore decided to base the assessment of Cause and Risk on the close quarters encounter between the DG500 Glider and the leading Hawk. Although both pilots had a shared responsibility to see and avoid other ac within the constraints of the Rules of the Air that stipulate 'flying machines shall give way to gliders', after some discussion the Members decided that the glider pilot could not reasonably have been expected to see the Hawk approaching at high speed from below and astern. Therefore the Board concluded that the Airprox was the result of a non-sighting by the lead Hawk pilot. Moreover, as the lead Hawk pilot was not aware of the glider, and neither pilot was able to affect the outcome, the Board also concluded that there had been a Risk of collision.

Whereas TRA (G) have the advantage of being promulgated in the AIP for the information of all airspace users, localities used for soaring at low-level above mountains or ridges are not generally well known to military crews. Members wholeheartedly endorsed the Air Command view that more information regarding popular areas for ridge and mountain wave soaring should be promulgated to military crews in the Military Low-Flying Handbook. Clearly the actual weather conditions will dictate where the gliders will operate from day to day around the various sites and the gliding Member suggested it would be helpful if a more detailed brief on such activities was available for the benefit of military crews, which he offered to progress. The Board decided, therefore, to make a Safety Recommendation that the MoD and BGA, jointly, consider the promulgation of more in-depth information about gliding operations from sites that conduct ridge or mountain wave soaring for the benefit of military crews, along the lines suggested by Air Command.

The debate then turned to the possibility of introducing notifying arrangements whereby a gliding site might notify MoD Low-flying Ops about where their gliders were likely to be operating on a daily basis, which might then be promulgated to flying units either as a 'late warning' or as a 'Y' series NOTAM [issued to military flying units only]. It was clear that much good work had already been accomplished by those concerned and, although this might not be a 'catch all' because gliders travelling cross country to such locations would remain unknown, it might permit more closely focused warnings about potential concentrations of gliders on ridges and those soaring in mountain wave. The Board agreed, therefore, to make a second Safety Recommendation that the MOD and the BGA should consider formulating co-ordinating arrangements with the aim of forewarning military crews when gliding clubs are conducting ridge or mountain wave soaring.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the lead Hawk pilot.

Degree of Risk: A.

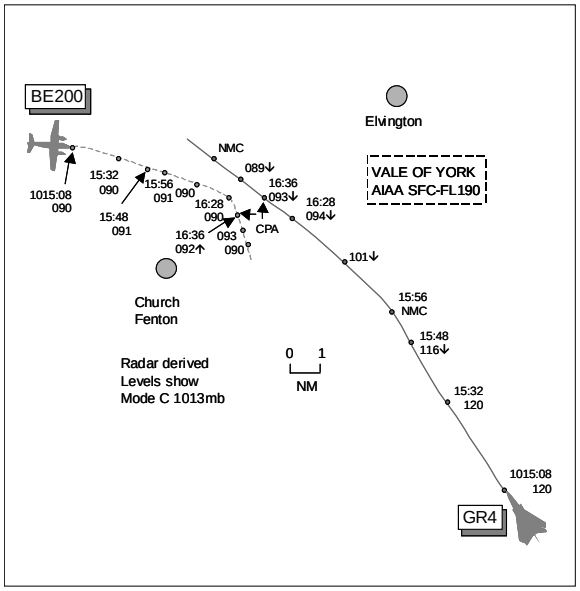
Safety Recommendation: (i) That the MoD and BGA jointly consider the promulgation of more information about gliding operations from sites that conduct ridge or mountain wave soaring, for the information of military crews.

(ii) That the MOD and the BGA should consider formulating notifying arrangements with the aim of forewarning military crews when gliding clubs are conducting ridge or mountain wave soaring.

AIRPROX REPORT No 2009-120

AIRPROX REPORT NO 2009-120

Date/Time:	28 Sep 1017	
Position:	5352N 00107W (19nm E Leeds/Bradford)	
Airspace:	AIAA	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	BE200	Tornado GR4
Operator:	HQ AIR (TRG)	HQ AIR (OPS)
Alt/FL:	FL90	FL90
Weather:	VMC CLAC	VMC CLNC
Visibility:	>40km	40km
Reported Separation:	NR	No problem
Recorded Separation:	100ft V/1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

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

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

DAATM reports that the GR4 was conducting a medium level descent to low-level under a TS with Linton Zone (Zone) on frequency 235·2 MHz, squawking 4534 with Mode C. The descent was stopped at 9500 ft QFE 1022mb due to unknown traffic indicating FL090. The unknown traffic was a BE200 squawking 7000 with Mode C. The BE200 subsequently reported the Airprox on the LARS VHF frequency 118·55MHz.

The GR4 was handed to Linton Zone by LATCC (Mil) for a low-level let down in the Harrogate lakes area to the W of Linton-on-Ouse at 1015:09, *'Linton Zone Good Morning GR4 c/s on handover'.* Zone replied, *'GR4 c/s Linton Zone Good Morning identified FL120 Traffic Service report ready for descent'.* The GR4 pilot replied, *'FL120 Traffic Service ready for descent c/s'.* Zone acknowledged and instructed the GR4 pilot to set the Linton QFE 1022mb, which was acknowledged correctly by the pilot. At 1015:28 Zone passed TI, *'GR4 c/s traffic left 11 o'clock one zero miles crossing left to right indicating FL090 descending (there is a brief pause) descend to height 9500ft report approaching, report Victor Mike Charlie below'.* The pilot replied *'9500ft wilco GR4 c/s'*. At 1015:43 the

GR4 is given a positioning turn, *'GR4 c/s for continuous descent and to remain clear of the Linton radar overhead turn left heading 300 degrees'.* The GR4 pilot acknowledged the heading change before Zone updated the TI at 1015:58, *'GR4 c/s previously reported traffic is left 11 o'clock 5 miles crossing left to right now indicating FL090'.* The TI was also acknowledged prior to the GR4 pilot reporting visual with the traffic at 1016:27, *'GR4 c/s visual with that traffic now we'd like further descent please'*. Zone replied at 1016:30 *'GR4 c/s roger descend to height 3000ft report Victor Mike Charlie below'* which was read back at 1016:36 as, *'3000ft wilco GR4 c/s'*.

[UKAB Note (1): The radar replay using the Claxby radar head captures the incident. When initial TI on the BE200 was passed to the GR4 pilot (1015:28) the radar range shows 12·9nm and this has reduced to 7nm when the second TI was given (1015:58). The GR4 pilot reported visual at a range of 2·1nm. The CPA occurs at 1016:36 as the ac pass port to port, the BE200 having executed a 30° R turn tracking 165° and climbing through FL092, passing 1nm SW of the GR4 which is descending through FL093.]

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

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

A military pilot Member informed the Board that the BE200 crew had elected to fly within the Vale of York AIAA without obtaining an ATSOCAS from an ATSU contrary to the recommendation in the Mil AIP [ENR 5-2-8]. Members thought that without the benefit of an ATS, the crew's SA was diminished and believed that their lookout responsibilities were probably degraded whilst carrying out a 'hot-debrief', a task which could have been completed after landing. Although the Board recognised the value of a 'hot-debrief', they considered that this value was outweighed by the risk associated with flying through the AIAA without ATSOCAS. In discussing the L turn instruction from Linton Zone to the GR4, the Mil ATC Advisor stated that the action taken by Linton Zone, turning the GR4 onto a radar heading to remain clear of the radar O/H and traffic in the Linton cct was SOP. However, the stop-off level issued was more than was required under a TS. Having asked the GR4 pilot to set QFE for his descent but then noticing the BE200 at FL90, Zone had endeavoured to provide some level of deconfliction by issuing descent to an intermediate level of 9500ft; it was unclear whether Zone had calculated that 9500ft QFE was just 230ft above the BE200 at FL90 as the controller may have arbitrarily picked 9500ft as, in the short time available, it 'appeared' to provide 500ft separation. Also, Members wondered whether the stop-off had exacerbated the situation, as had the GR4 been given a continuous descent it may have been already well below and clear of the BE200 as they became close laterally.

One pilot Member was keen to highlight 2 major aspects of this incident. First, the scenario of a non-TCAS equipped ac, the GR4, pointing towards the BE200, which is fitted with TCAS. The ACAS equipment is continuously calculating time to CPA and will issue alerts/warnings if safety margins/limits are breached. The GR4 was given a vector by Zone which pointed it towards the BE200, although the controller would have not been aware of the BE200's type and ACAS fit, the ac just appearing as a squawking radar return in potential confliction. Second, the BE200 crew was trying to comply with rapidly changing RA commands, their ac being a relatively low-

performance type compared with the high performance GR4, whose pilot was taking visual separation. This situation can produce RA demands that are very difficult and potentially hazardous for the BE200 crew to attempt to follow. The lesson identified here was the need for controllers and pilots to assume that conflicting traffic is TCAS-equipped and give it a sufficiently wide berth to avoid triggering a TCAS RA if the ac is so equipped.

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

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report (TCAS).

Degree of Risk: C.

AIRPROX REPORT NO 2009-121

Date/Time:	27 September 1310 (Sunday)	
Position:	5300N 00029W (1.5nm S of Cranwell Airfield Datum)	
Airspace:	Cranwell ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Grob Tutor	Model Ac
Operator:	HQ AIR (Trg)	Civ Pte
Alt/FL:	800ft	NR
	(QFE)	NR
Weather:	VMC	NK
Visibility:	25km	NR
Reported Separation:		
	20-40ft V/10m H	NR
Recorded Separation:		
	NR	

No Diagram possible

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GROB TUTOR PILOT reports flying a local Air Experience flight in a white ac with all lights switched on and with SSR selected to standby as he was within the MATZ. On recovery to Cranwell, he joined for RW01, heading 010° at 800ft and 120kt. Having previously reported radio-controlled model ac activity at 350ft whilst flying at 500ft at 1.5DME from Cranwell on the final approach to RW01 earlier in the day, he elected to stay high as he thought this would minimise the risk of collision with the radio-controlled ac that would be at a lower altitude. As he ran in on the deadside, he saw a radio-controlled ac 30m away in his 10 o'clock position and 50ft below him so he turned right to ensure adequate separation. Whilst looking out in the turn he noted a second radio-controlled ac 10m away in his 12 o'clock tracking directly towards him 20-40ft below. The height separation that currently existed was only due to his entering a slight climb on initial contact with the first model. On seeing the second radio-controlled ac he took more aggressive avoiding action by breaking the ac up and to the right on the light buffet.

Once clear of the second ac he continued a climbing right hand turn to note the position and activity level of the model ac and reported the position to Cranwell TWR before continuing to join the circuit. He assessed the risk of collision as being high and reported the Airprox to Cranwell TWR.

UKAB Note (1): Although the Grob shows on the recording of the Claxby radar throughout the period, the model ac do not show at any time.

UKAB Note (2): The Cranwell ATZ is promulgated in the UKAIP ENR 2-2-2-2. It is 2.5nm in radius, extends up to 2000ft aal and is active H24.

UKAB Note (3): The ANO Sect 1 Regulation 98 promulgates Regulations for small ac. A small ac is defined as one which weighs more than 7kg without fuel (and less than 20kg) and is required to gain the permission of ATC to operate inside an ATZ during its promulgated hours of operation. Ac that are less than 7kg are not regulated by the ANO.

The British Model Flying Association (BMFA) conducted a most thorough investigation into the incident including a report from the pilot of the model ac. Their report is summarised below.

The model was being flown at an event at a farm, about 1.5nm S of Cranwell. The weather was CAVOK and at the time only 2 ac were airborne, but they were not part of the competition. Although the site had been used for events for several years, usage was described as light.

The ac concerned were being flown in a circular pattern to remain within a thermal and the ac that came into conflict with the Grob, the higher of the two, had a 7ft wingspan.

The pilot reported that he was surprised that the incident was reported as an Airprox as he considered that the Grob had only changed course after it had passed both the ac. He also considered that there were no safety issues or concerns. He was aware that Cranwell was active with full size ac and at all times he flew his ac in a manner that ensured safe separation.

Two ground witnesses stated that a light ac had overflown the location several times that day but were unable to assess the miss distance during this incident.

There was an anecdotal report that there was an informal arrangement with Cranwell ATC whereby they were informed of significant model activity and they *'directed air traffic away from model flying activity';* Cranwell ATC, however, had no record or recollection of any such agreement and were not aware of the activity on the day concerned. It was thought likely that in the past, the activity had simply taken place when 01 was not the duty RW.

The BMFA made several recommendations including that large events or large ac flying will only take place with the agreement of Cranwell ATC. All flying during their normal operating hours will be notified to Cranwell.

DAATM commented that this Airprox was not notified to Cranwell ATC and therefore have no comment. There is no letter of agreement between the Lodge Farm and RAF Cranwell for notification of model ac activity and further there is no record of RAF Cranwell ATC or Ops ever having been advised of such activity either officially or unofficially. RAF Cranwell was therefore totally unaware that model ac operate in that vicinity.

HQ AIR (TRG) comments that had positive communication and agreement taken place between the model ac operators and Cranwell ATC prior to the model ac event this Airprox could have been avoided.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilot of the Grob, the BMFA, the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

The Board was disappointed to note that the model flying event was not notified to RAF Cranwell, who, had they been aware of it, could have agreed procedures ensuring the safe conduct of the respective flying activities. More disturbing, however, was that, even after this incident, there is no record of the operator of the model flying field having had any contact with RAF Cranwell.

The Board discussed whether a recommendation regarding the operation of model ac in ATZs was warranted but Members agreed that the guidance in CAP 658, 'Model Aircraft a Guide to Safe Flying', is adequate if it is adhered to; in the absence of a direct link with the model ac pilot or the site operator, the Board requested that the BMFA draw their attention to this guidance. Nevertheless, they urged the operator of the model ac flying field and RAF Cranwell to enter a dialogue to ensure the safe conduct of their respective activities.

Since the Grob pilot did not acquire the (closest) model ac until late and he was not able to manoeuvre to avoid it, Members unanimously agreed that Safety had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict with a model ac in the Cranwell ATZ.

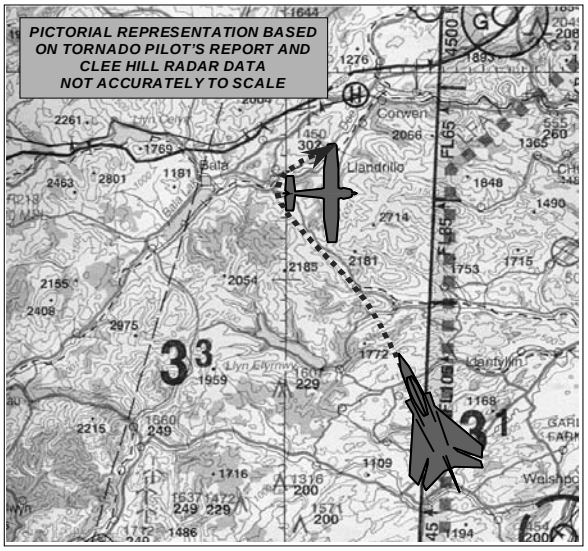
Degree of Risk: B.

AIRPROX REPORT NO 2009-122

Date/Time: 17 Sep 1326
Position: 5255N 00333W (2nm E of Bala)
Airspace: UKDLFS/LON FIR (Class: G)

	Reporting Ac	*Reported Ac*
Type:	Tornado GR4	Untraced Light ac
Operator:	HQ AIR (OPS)	
Alt/FL:	880ft (RPS 1016mb)	
Weather:	VMC CLBC	
Visibility:	20km	

Reported Separation: 100-200ft V/50-100m H
Recorded Separation: NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO GR4 PILOT reports flying a grey ac with nav and strobe lights switched on, squawking 7001 with Mode C, on a low-level tactical training flight in LFA7 in good weather and visibility. Shortly after rolling out of a turn onto a heading of 333° at 430kt, with the ac in a gentle descent after clearing some high ground, the pilot saw a high wing Cessna type light ac ¼ nm away just to the right of their 12 o'clock position, and slightly above them. It was immediately apparent that the ac was not on a conflicting flightpath and therefore only a gentle bunt was performed to increase separation between them; however, the late spotting and relatively close separation was such that it caused considerable alarm to both crew members.

While he understands that light civilian ac are quite entitled to operate in Class G airspace at such levels, he would suggest that operating at around 500ft agl in an area busy with military fast-jets is ill-advised.

UKAB Note (1): An ac squawking 7001, tracking NW, believed to be the Tornado involved, shows intermittently on the recording of the Clee Hill radar in the period leading up to the incident. However, since no other ac can be seen in the vicinity, the incident does not show on any recorded radars. There is a very intermittent slow moving primary only contact 4nm to the E of the incident position. Despite extensive procedural tracing action the light ac involved could not be identified.

HQ AIR (OPS) comments that this is another example to illustrate the importance of maintaining a good lookout at all times. The GR4 pilot questions the wisdom of flying a light ac at 500ft in a busy area; the GA pilot, if traced, may have questioned what the Tornado was doing up at 500ft. Both ac had a right to be where they were and open and honest reporting such as this should serve to highlight to all airspace users the importance of keeping their eyes out of the cockpit.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board observed that, without a report from the Cessna pilot it was difficult to reconstruct an accurate picture of the incident and therefore not possible to determine accurately any flight safety lessons.

While some Members agreed with the Tornado pilot that it was inadvisable for GA ac to fly in a publicised and busy low flying area at relatively low altitudes and below a ridgeline, it is legal providing that appropriate regulations/ rules are complied with. Further, remaining slightly higher ensures better radio performance should any safety call be required.

Based on his reported position and track, the Tornado pilot saw the Cessna (type ac) as early as the circumstances and terrain permitted, although at ¼nm this was less than optimal but still within his capability to react and manoeuvre the ac. Further, although the opposing ac was not directly in his flightpath, the Tornado pilot wisely decided to increase the separation extant. That being the case, the Board agreed that there was no risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

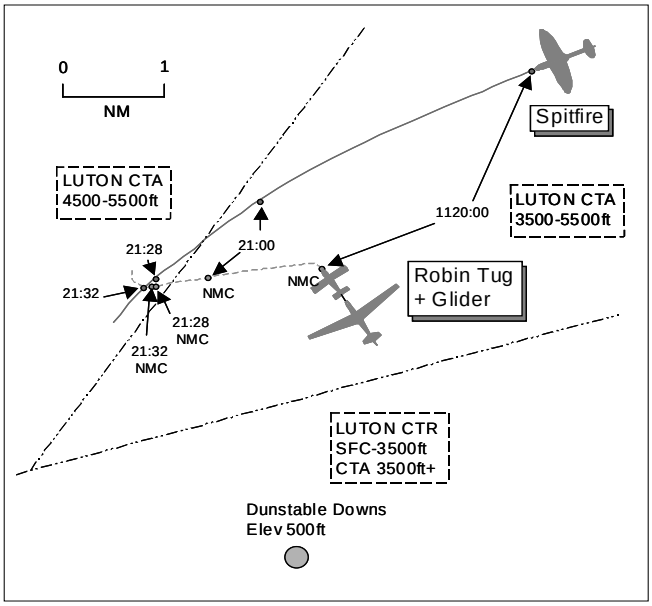
Cause: A conflict in the FIR/LFS resolved by the Tornado crew.

Degree of Risk: C.

AIRPROX REPORT NO 2009-123

Date/Time: 1 Oct 1121
Position: 5155N 00035W (3·25nm NW Dunstable Downs - elev 500ft)

	Reporting Ac	*Reported Ac*
Airspace:	LFIR (Class: G)	
Type:	Robin DR300 + Glider Combination	Spitfire
Operator:	Civ Club	Civ Pte
Alt/FL:	3000ft (QFE 1000mb)	NR (QNH)
Weather:	VMC CLBC	VMC CLBC
Visibility:	'Unltd	'>10km
Reported Separation:	200ft V/50yd H	Nil V/NR H
Recorded Separation:	<0·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ROBIN DR300 PILOT reports departing Dunstable as a tug/glider combination, VFR and in communication with Dunstable Radio on 119·9MHz, squawking 7010 with NMC. The visibility was unlimited below scattered/ broken cloud in VMC and the ac was coloured grey with strobe lights switched on. He had climbed initially NW'ly into wind following a briefing from the glider pilot who wished to climb to 3000ft above Dunstable Gliding site (3500ft amsl). During this climb at 65kt he flew a series of headings (NW, W and then WSW) in an area no more than 2-3nm W of Dunstable. As they achieved 3000ft the glider released (broke L) and he, having determined the glider was off tow looked R and started a R turn in level flight. Suddenly a Spitfire emerged from his 4 o'clock, about 200ft below, before passing rapidly across his ac's nose from R to L at 60° AoB 20° nose-up whilst climbing. The incident was over very quickly, owing to the relatively higher speed of the Spitfire, with no avoiding action needed as the Spitfire pilot was doing it all. At the time his workload had been high, ensuring the glider was safely away and establishing level flight before commencing a standard engine cooling descent profile whilst looking out for other traffic, in particular gliders. The incident occurred just SE of Hockliffe town. After landing he spoke to the glider pilot who had seen the Spitfire and estimated the separation as 50yd at the CPA. He assessed the risk as high.

THE SPITFIRE PILOT reports flying VFR enroute from Duxford to Chichester/Goodwood via Leighton Buzzard to keep clear of Luton CAS and not in communication with any ATSU; the transponder with Mode C was switched off. The Wx was VMC flying <1000ft below cloud and the ac was painted camouflage top half and green/blue underside. Being a current glider pilot, and given the excellent soaring conditions, he was expecting a degree of glider activity along the planned route in the vicinity of Dunstable, Booker and Lasham. Approaching Dunstable heading 250° at 190kt, he 'picked-up' a Robin Tug/glider combo about 4nm away about 200ft above in a shallow climb. Although relative motion was present and therefore no collision risk existed, the dynamics of the situation were likely to change should the glider release and the tug commence a descending R turn. Also, given the likelihood that the tug could not see his ac owing to his camouflage paint scheme he opted to climb to his level and pass in front of it. He did not want to turn R, doing so would have taken him away from the 'blue street' [river] he was following and under another potentially excellent cloud where gliders were likely to be congregating. Shortly before their tracks intersected he rolled on approximately 20° of L bank in order to present a reasonable plan-form of his ac to the tug pilot as well as to acknowledge his sighting of the tug by means of a wing-rock. He thought that shortly after passing the Robin the glider released and the tug commenced a descending turn to the R, thereby confirming his tactical analysis of the situation.

UKAB Note (1): The UK AIP at ENR 1-6-2-3 SSR Operating Procedures Para 2.2.2 Other Conspicuity Codes, not specific to particular locations or ATSUs, states that 7010 code is 'For use by aircraft operating in an aerodrome

traffic pattern, when instructed to do so by an ATS unit or local operating instructions. Shall only be selected with ATC direction or in accordance with local aerodrome procedures'. The use of 7010 squawk is approved under the LoA between NATS LTC and Dunstable.

UKAB Note (2): The Heathrow 23cm recorded radar clearly shows the Airprox. At 1120:00 a 7010 squawk, believed to be the Robin Tug and Glider Combination, is seen 3nm N of Dunstable Downs turning through a NW'ly heading indicating NMC with a primary only return, believed to the Spitfire, 3nm to its NE tracking 245°. Shortly afterwards the Robin/Glider combination steadies on a W'ly track. Just under 1min later the subject ac have closed to 1nm and the Spitfire has started a slow L turn with the Robin/Glider combination in its 11 o'clock. The CPA occurs between sweeps at 1121:28 and 1121:32 as the Spitfire passes the Robin/Glider combination on its R and then crosses ahead, on a SW'ly track, separation <0·1nm. Immediately after this, the 7010 radar return is seen to turn sharply R onto N which accords with the Robin pilot's report of him executing a R turn following the Glider pilot releasing from the aerotow.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were disappointed that the Spitfire pilot had elected to leave his transponder switched off. Use of a conspicuity code with Mode C selected is recommended in the UK AIP in order to facilitate detection of ac by collision avoidance systems (ACAS and STCA) and ATC radar. It was clear that the Spitfire pilot had seen the DR300/Glider combination in good time and maintained visual contact with them but his chosen flightpath had caused concern to the tug and glider pilots. This was understandable, for the Spitfire appeared suddenly from their R rear quarter just below their level and then climbed to cross ahead, just as the glider released from the aerotow. Although this had been a relatively close encounter, the Spitfire pilot was always in a position to manoeuvre his ac to increase the separation if necessary, which was enough to allow the Board to conclude that there was no risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

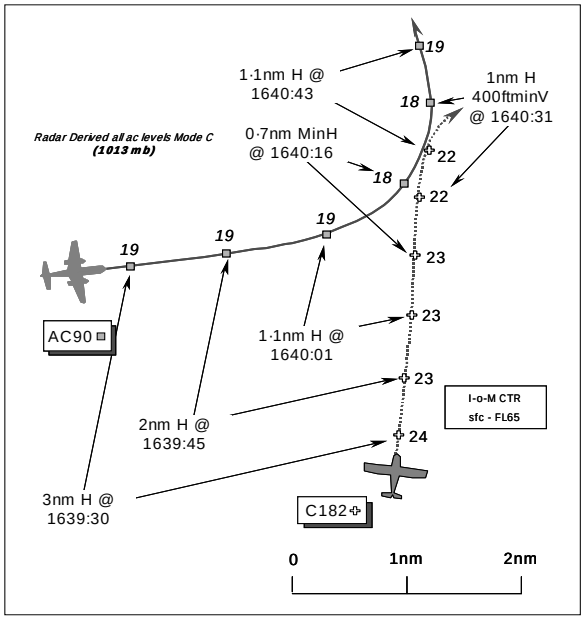
Cause: The Spitfire pilot flew close enough to the DR300/Glider combination to cause their pilots concern.

Degree of Risk: C.

AIRPROX REPORT No 2009-124

AIRPROX REPORT NO 2009-124

Date/Time:	2 Oct 1640	
Position:	5402N 00418W (11½nm ESE of I-o-M Ronaldsway)	
Airspace:	Isle-of-Man CTR	(Class: D)
	Reporting Ac	*Reported Ac*
Type:	AC90	C182
Operator:	Civ Pte	Civ Pte
Alt/FL:	2000ft	3000ft
	QNH (1014mb)	QNH (1014mb)
Weather:	NR	VMC
Visibility:	NR	30km
Reported Separation:		
	300ft V	500ft V/1½nm H
APR	200ft V/1nm H	
Recorded Separation:		
	400ft min V at 1nm H	
	0·7nm Min H at 500ft V	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GULFSTREAM AC90 PILOT reports that he was inbound to Isle-of-Man/Ronaldsway under IFR and was being vectored downwind at 180kt and about 2000ft for an ILS to RW26. He was not aware from RT calls of any other traffic nearby since his first call on the frequency to RADAR. He then noticed a warning on his basic TCAS system and expanded the scale. The conflicting traffic appeared to be close but his immediate reaction was that it had to be a false warning as his mental air picture of what was going on did not include another ac close by. Almost immediately he heard ATC call an evasive manoeuvre on an ac that had descended below its assigned level. His co-pilot gained visual contact with the conflicting ac momentarily before it disappeared into cloud 300ft above the level of the AC90.

THE C182 PILOT reports that he was inbound to Ronaldsway and had obtained the ATIS weather, which was good for VFR flight but he decided to practice the VOR/DME approach as the ILS GP was reported to be out of action. His ac is coloured white with blue markings and the allocated squawk was selected with Mode C. Mode S is fitted.

Upon first contact with Ronaldsway RADAR on 120·85MHz, he was flying in IMC at 4000ft (1019mb) and requested an IFR clearance. RADAR cleared him to enter the CTR at FL40 to route to the IOM VOR, but did not specify VFR or IFR, so he assumed it to be under IFR. RADAR was advised that they would adjust to fly at FL40, but the controller replied that it was not necessary as their level was OK, so he selected 1013mb on the altimeter but left the A/P selected to 1019mb. RADAR then advised that he had descended below his cleared level so he selected 1013mb on the A/P and readjusted to fly at FL40. RADAR then cleared him to descend to 3000ft on a QNH of 1014mb, whereupon 1014mb was selected on both his altimeter and the A/P. He broke cloud at about 3800ft into good VMC with an in-flight visibility of 30km and levelled off at 3000ft QNH. Heading 010° at 145kt about 160° IOM 10, the AC90 was visible to them approaching from L – R about 2nm away and some 500ft below his ac, before it turned towards the airfield. He commented to his wife how 'unusual not to have been told about the traffic by ATC', but about 30sec later ATC instructed them to take avoiding action by turning R onto 090°, which he did. The AC90 passed about 1½nm ahead 500ft below his ac as it turned away to the N with a 'low' Risk. Thinking that there must be another ac that they had not seen the controller reminded him that the cleared altitude was 3000ft QNH. They had descended to 2500ft QNH. Following the incident their DI failed and they asked ATC to downgrade them to a VFR flight. He cited a faulty A/P as a possible factor.

UKAB Note (1): The I-O-M/RONALDSWAY 1620 Weather: Surface wind 250°/15kt; Vis 15km nil Wx; Cloud: FEW t 1200ft, SCT at 2000ft, BKN at 3000ft; Temp +14 QNH 1014mb.

I-O-M/RONALDSWAY ATC provided a report and an RT transcript, but time injects are only on the whole and half minute; the following narrative is a compilation of the two. At the time of the incident both flights were flying IFR and in receipt of a RCS within the Class D I-o-M CTR; both were being vectored for LLZ/DME approaches for RW26 as the glide path element had been withdrawn from service as part of a runway improvement project.

A VFR flight plan had been received for the inbound C182 and upon first contact with Ronaldsway APPROACH at 1621:00, the C182 pilot reported inbound to I-o-M some 45nm to the SE at 4000ft ALT requesting a TS, *"..and Zone clearance I think probably I-F-R.."*. As the C182 was outside the displayed radar range (40nm) the APR provided a BS initially and subsequently passed the Ronaldsway 1620 weather. A squawk of A4551 was issued and just after 1625:00, the C182 aircraft was identified on radar. As the pilot reported flying in IMC, the flight was placed under a DS just before 1625:30 and cleared to enter the I-O-M, "*..zone on track to the INDIA OSCAR MIKE at flight level 4-0".* The C182 pilot read back the clearance, *"..on..track the INDIA OSCAR MIKE flight level 4-0* [C/S] *we'll readjust".* The APR advised that the C182's Mode C was shown at FL40 *"you can expect radar vectors for a localiser D-M-E approach runway 2-6",* which the C182 pilot acknowledged. Prior to entering CAS the pilot of the C182 was instructed after 1628:00, "[C/S] *you can descend when ready to altitude 3 thousand feet Q-N-H 1-0-1-4".* This instruction was read back by the C182 pilot, *"descend 3 thousand feet when ready 1-0-1-4 we'll do that now".* Once inside CAS the pilot of the C182 was instructed to fly a radar heading of 320° for sequencing for a LLZ/DME approach to RW26, which the pilot acknowledged at 1628:30. [UKAB Note (2): However, a review of the RT transcript reveals that the C182 pilot was not advised that the ATS would be a RCS inside CAS].

The AC90 was inbound from BOYNE, subject to a standard release in accordance with agreed procedures with ScACC, routeing to the IOM VOR. At 1630:00 the crew called the APR outside CAS reporting in the descent to FL70 and requesting a visual recovery. After placing the flight under a DS initially, the APR instructed the AC90 crew to continue under their own navigation for the IOM and to descend to FL50. As the AC90 was considerably faster than the C182, the APR planned to vector the AC90 downwind for a LH pattern to RW26, No2 to an inbound DHC8-400 from the SE, with the C182 being positioned as No3. After being given the weather, the AC90 was vectored onto 065°. The APR then noticed the C182's Mode C read-out indicated an altitude of 2700ft and just after 1633:00, the pilot was requested to *"…confirm maintaining 3 thousand feet Q-N-H 1-0-1-4"*. The C182 pilot apologised, *"..we just dropped a bit yep 3 thousand 1-0-?-4 climbing back up",* to the assigned altitude.

After the AC90 entered Class D CAS, the APR placed the flight under a RCS and issued descent instructions to FL40 to ensure vertical separation from the C182, which were read back correctly by the AC90 pilot. Once the APR was confident that he could maintain either vertical or lateral separation between the 2 ac, he gave the AC90 pilot further vectors onto 080° and descent to an altitude of 2000ft (1014mb) to place the AC90 below the level of the C182. Monitoring the relevant positions and levels of the 2 ac until the level change had been achieved; the APR then directed his attention towards further traffic, a second DHC8-400 approaching from the SE that would be sequenced as No 4 in the inbound pattern. At this stage the AC90 was downwind No2 for the LLZ/DME, with the C182 on a wide L base as No3 and now converging on a heading of 350° with the AC90. After 1639:30, the AC90 crew was instructed to turn L heading 340° onto base-leg but the SSR labels of the AC90 and C182 subsequently merged. On rotating the SSR label of the C182 the APR noticed that C182's Mode C was now indicating an altitude of 2300ft. Avoiding action was issued by the APR to the C182 pilot at 1640:30, "[C182 C/S]*..turn right immediately avoiding action heading 0-9-0",* which was read-back by the C182 pilot. TI was then issued by the APR to the AC90 crew, *"..traffic information for you is a Cessna 1-8-2 about a mile behind you..descended below his cleared level so he's only about a hundred feet above you at the moment".* Acknowledging this transmission the AC90 crew added, *"..we had him on TCAS right above 4 hundred feet*". The APR then called the C182 pilot and instructed him to, *"..maintain your present level your cleared level* (sic) *was at 3 thousand feet..".* At 1641:00, the C182 pilot replied, *"that's er copied yeah sorry about that"* adding that he had, *"got him visual".* The AC90 was subsequently vectored onto a closing heading for the LLZ of 295°.

The C182 pilot reported that he was *"good victor mike"* and requested to continue VFR, which was approved by the APR who advised the C182 pilot that he was now well spaced against the AC90. Following a period of holding to the E, to allow the second DHC8-400 in ahead on a LLZ/DME approach, the C182 pilot was cleared to continue his approach VFR.

The APR estimated that at the closest point the horizontal separation was less than 1nm and the vertical separation 200ft on Mode C.

The Unit identified the following contributory factors and recommendations:

Contributory Factors

The SSR labels of the 2 ac involved had merged on the controller's radar display and the subsequent overlap of the data labels meant that the APR was not alerted to the situation as soon as he may have otherwise been.

There may have been some confusion in the mind of the pilot of the C182 regarding what pressure setting he should set on his altimeter.

Recommendations

The Unit Training Manager is to ensure that:

Controllers are aware of the potential for SSR data labels to merge and the corrective action to be taken to help reduce the risk of a loss of separation.

The controller involved is fully debriefed and the content of the report promulgated throughout ATC to provide learning opportunities for all.

UKAB Note (3): The St Anne's Radar recording illustrates this Airprox. The AC90 is shown established downwind level at 1900ft Mode C (1013mb) – broadly 1930ft QNH (1014mb). The C182 is shown at 1639:30, tracking about 010° at 2400ft (1013mb) – about 2430ft QNH (1014mb) 3nm SE of the AC90. As the ac converge the C182's shallow descent is evident, the ac indicating 2300ft Mode C at a range of 1·1nm as the AC90 turns L in compliance with the vector issued by the APR. The point of minimum horizontal separation of 0·7nm is reached at 1640:16, as the AC90 turns L through NE 500ft below the C182; thereafter the range increases as the faster twin draws ahead. Some 30sec later the C182 is shown at 2200ft turning R in compliance with the avoiding action issued by the APR; at this point the AC90 is shown at 1800ft and 1nm N of the C182. Thereafter separation increases.

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 ATSU. The investigation of incidents involving ATSUs located in Crown Dependencies lies outwith the purview of ATSI.

It was apparent that the C182 pilot had been issued with the I-o-M QNH of 1014mb on his first contact with APR. This value had not changed and had been correctly transmitted by the APR twice when passing descent instructions to the C182 pilot. Moreover, the C182 pilot had read-back correctly his assigned altitude with the QNH, when he was instructed to descend to 3000ft just after 1628:00, before the ac entered the Class D CTR and some 12min before the Airprox occurred. Therefore, the Board had no reason to doubt that the C182 pilot had correctly set 1014mb on his altimeter as the QNH. However, it was evident that the C182 had descended below its assigned altitude, some 7min before the Airprox, just after 1633:00. The APR had challenged the pilot on this occasion who confirmed that his ac's altitude had, *"..just dropped a bit.."*, and that he was now climbing back up to *"..3 thousand 1-0-?-4",* albeit that the transcript was unclear on the 3rd figure. Inaccurate height keeping seemed to be a factor here, clearly unnoticed by the C182 pilot, possibly distracted by a faulty A/P, until prompted by the APR.

The APR had issued instructions to these two IFR flights that should have ensured 1000ft vertical separation between them. However, it was clear from the radar recording that the C182 had again descended below the assigned altitude on base-leg, unnoticed by the pilot once more. This time it was more crucial as the AC90 at 2000ft QNH had been turned in ahead in the pattern onto base-leg by the APR and was now a mere 3nm NW of the C182 – the minimum permissible horizontal separation if vertical separation had been eroded. At this point the AC90 was maintaining level flight at 1930ft QNH (1014mb), well within the applicable Mode C tolerances of +/-200ft for the ac's assigned altitude of 2000ft. Whereas the C182 was now indicating 2430ft QNH (1014mb) - a mere 400ft above the AC90 – showing that the C182 had descended more than 500ft below the ac's assigned altitude – the stipulated separation being eroded still further to a minimum of 300ft just as the APR finally realised what had occurred. The ATSU had cited SSR label overlap as a contributory factor to the APR's late recognition of the true situation. Undoubtedly, the benefits of modern ATC radar systems sometimes come with drawbacks and SSR label overlap and screen clutter is an unfortunate result of displaying ac altitude information directly on the screen. Most systems allow controllers to manipulate individual, or all, displayed SSR labels so that critical

data is not obscured at close ranges, but this requires continual interaction by the controller with the display controls, which is labour intensive and distracting. Continual SSR label manipulation will be a lower priority to control instructions and it seems that in this busy scenario the APR was unable to detect the C182's descent toward the AC90 any earlier than he did. This occurred at or about 1640:30, which was when the APR issued the avoiding action turn to the C182 pilot and the two ac had closed to a range of 1nm with vertical separation of 400ft. The St Annes Radar recording could not replicate exactly what was shown on the controller's display at the time and Members acceded to the Unit's view that overlapping SSR labels had forestalled earlier intervention by the APR and was a contributory factor within this Airprox. Balancing all these different facets, it was the C182 pilot's responsibility to ensure that he maintained his assigned altitude of 3000ft accurately, with or without an A/P. The Board agreed unanimously that the Cause of this Airprox was that the C182 pilot descended below his assigned altitude into conflict with the AC90.

Turning to the inherent Risk, the AC90 pilot was unaware of the proximity of the C182 as he flew downwind and it was not until just before the Airprox occurred, when he received a warning from his basic TCAS system, that he might have realised there was another ac close by, but initially took it to be a 'false alarm'. This illustrated the inherent usefulness of TI about other ac in the pattern, which was evidently not provided here. However, the APR was busy with four ac in the instrument pattern; having achieved the vertical cross between the AC90 and the C182 and probably content that they were separated the APR had transferred his attention to the second DHC-8 at what transpired to be a critical moment. When the APR subsequently detected the C182's deviation below 3000ft, he immediately responded by issuing avoiding action. The radar recording coupled with the RT transcript shows this instruction was promptly complied with by the C182 pilot. This instruction was followed by TI to the AC90 crew who had glimpsed the other ac moments beforehand in the turn. However, the C182 pilot had the AC90 in sight from 2nm away, some 500ft below his ac and he watched it turn to the N ahead in the pattern. It was unfortunate that the C182 pilot had not queried this reduced separation at the time. Nevertheless, the visual sighting ensured that C182 pilot was aware of the proximity of the AC90 beforehand and could have effected more robust action if the situation had deteriorated. With 500ft separation evident at the point of minimum horizontal separation of 0·7nm, Members agreed unanimously that no Risk of a collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

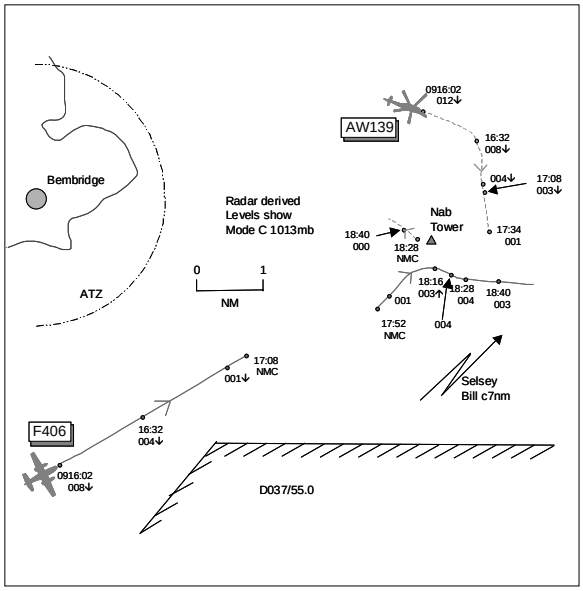
Cause: The C182 pilot descended below his assigned altitude into conflict with the AC90.

Degree of Risk: C.

Contributory Factors: SSR label overlap forestalled earlier intervention by the APR.

AIRPROX REPORT NO 2009-125

Date/Time:	30 Sep 0918	
Position:	5040N 00057W (NAB Tower - 6nm E Bembridge)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	AW139	F406
Operator:	Civ Comm	Civ Comm
Alt/FL:	200ft (QNH 1021mb)	250ft (amsl)
Weather:	VMC CLBC	VMC CLBC
Visibility:	>10km	15nm
Reported Separation:	100ft V/0·25nm H	100ft V/0·5nm H
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AW139 PILOT reports flying a local sortie from Lee on Solent VFR, listening out on Lee on Solent A/G frequency 118·925MHZ and squawking 7000 with Modes S and C. The visibility was >10km in VMC and the helicopter was coloured white/red with HISLs, nav and sponson landing lights all switched on. At the time of the Airprox they were heading 270° at 200ft QNH 1021mb and 80kt passing S abeam Nab Tower engaged in a SAR automatic 'Transition Down' procedure. The PF noticed a TCAS 'traffic' caption on the PFD but there was no aural warning (ac systems manual shows TCAS annunciations are inhibited below 400ft). PF looked to their 11 o'clock and saw the other ac at the same height heading directly towards them range 0·4nm. The other ac, a low-wing twin-engine type coloured white/blue, possibly an F406, banked slightly L before levelling. PF took avoiding action by banking sharply to the R and descending whilst the F406 also banked R and climbed towards the E. At the CPA they passed 100ft vertically and 0·25nm horizontally and he assessed the risk as medium.

THE F406 PILOT reports flying a local fisheries protection sortie from Exeter VFR, in communication with Dover Coastguard on UHF and HF, squawking 7400 (fisheries protection conspicuity) with Modes S and C; TCAS is not fitted. The visibility was 15nm in VMC and the ac was coloured blue/white/orange with nav and HISLs switched on. Near to Selsey Bill flying at about 250ft amsl heading 100° and 158kt they saw a helicopter coloured red/silver in their 11 o'clock range 1nm so they turned R and climbed to avoid simultaneously as the helicopter also turned R. They watched it pass about 100ft below and 0·5nm clear on their LHS with a low risk of collision.

UKAB Note (1): Both ac are seen on Pease Pottage recorded radar approaching Nab Tower but, as they descend to low level, both ac fade at different times and the CPA is not captured. At 0916:02 the AW139 is seen 6nm ENE of Bembridge tracking 110° squawking 7000 and indicating FL012 (1440ft QNH 1021mb) descending with the F406 4nm S of Bembridge tracking 060° towards Nab Tower squawking 7400 and indicating FL008 (1040ft QNH), and also descending. Thirty seconds later the AW139 is seen to be turning R through a SSE'ly heading 1·7nm NNE of Nab Tower descending through FL008 (1040ft QNH) as the F406 descends through FL004 (640ft QNH) 6·5nm to its SW. The F406 continues its descent with Mode C showing FL001 (340ft QNH) on the radar sweep before it shows NMC at 0917:08 after which it fades from radar. At this time the AW139 is descending through FL003 (540ft QNH) and is crossing through the F406's 12 o'clock from L to R range 4·3nm on a steady S'ly track. The AW139 is last seen at 0917:34 0·9nm E of Nab Tower still tracking S and descending through FL001 (340ft QNH). The F406 reappears on radar at 0917:52 1·25nm SW of Nab Tower tracking NE showing NMC before showing FL001 (340ft QNH) on the next sweep 6sec later. Thereafter the F406 commences a R turn and at 0918:16 is seen turning through E and passing 0·4nm S of Nab Tower, climbing through FL003 (540ft QNH). The F406 R turn is stopped on the next sweep with the ac showing FL004 (640ft QNH) before it steadies on a track of

100° at 0918:28. Simultaneously the AW139 reappears on radar 0·25nm W of Nab Tower tracking 300° and showing NMC, 0·8nm NW of the F406, with both ac diverging.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Post Meeting Note: No NOTAM was issued for the F406 operation so the AW139 crew were not made aware of the F406 by the daily Pre-flight Information Bulletin during the flight planning stage.

Both crews were undoubtedly surprised to encounter each other whilst flying low-level offshore. Both flights were operating legitimately in this Class G airspace, discharging their responsibilities for maintaining separation through 'see and avoid'. Prior to the Airprox there was opportunity for both crews to see the other ac – the F406 was descending to low-level to commence operations with opportunity to see the AW139 ahead, which was also descending following a 'let-down' procedure near to Nab Tower. The AW139 crew was alerted to F406's presence by TCAS which enabled visual acquisition, albeit late, whilst the F406 pilot saw the helicopter at about the same time after rolling out on E'ly track. Members agreed that these late sightings had caused the Airprox.

With both crews taking appropriate avoiding action, the F406 pilot turning R and climbing with the AW139 crew also turning R but descending, the Board concluded that these timely and complementary actions had quickly removed any risk of collision.

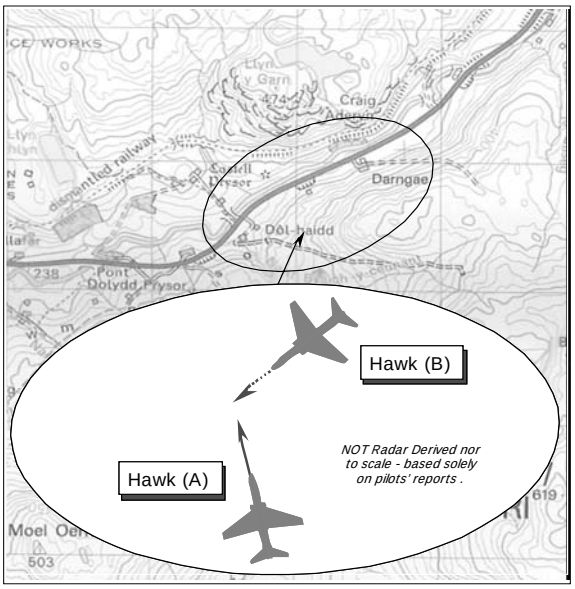
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by the pilots of both ac.

Degree of Risk: C.

AIRPROX REPORT NO 2009-126

Date/Time:	18 Aug 1548	
Position:	5254N 00351W (River Prysor Valley - 6nm SE Blaenau Ffestiniog)	
Airspace:	UKDLFS- LFA7	(Class: G)
	Reporting Ac1	*Reporting Ac2*
Type:	Hawk T Mk1	Hawk T Mk1
Operator:	HQ Air (Trg)	HQ Air (Trg)
Alt/FL:	350ft msd	250ft msd
Weather:	VMC CLOC	VMC CLOC
Visibility:	Good	Good
Reported Separation:	600ft H	250ft V
Recorded Separation:	Not recorded	



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PILOT OF HAWK T Mk1 (A), a QFI, reports that he was flying an instructional sortie at low level towards the A5 pass for recovery to Valley at 420kt, but was not in receipt of an ATS. Operating on the UHF LFS frequency

of 278·0MHz [whilst also monitoring 142·775 MHz, a Valley private frequency] they were flying in VMC under VFR with a good horizon and in good visibility. Heading 350° pitched 5° nose-down at 350ft msd, another Hawk was seen late in their R 1 o'clock about 900ft away crossing from R – L flying in a westerly direction and some 50ft below his ac. Minimum horizontal separation was about 600ft. Surprised to see another ac at that range, subsequently, he learned that the crew of the other Hawk was visual with his ac so, with hindsight, no danger was present and he assessed the Risk as 'low'. An Airprox report was subsequently filed with the Station Flight Safety Officer.

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

THE PILOT OF HAWK T Mk1 (B), a QFI, reports that he was operating VFR in VMC, not in receipt of an ATS, but listening-out on 300·8MHz and 142·775 MHz [both Valley private frequencies] whilst in a low-level cruise at 250ft msd heading 230° at 420kt. The PNF spotted a Hawk [Hawk (A)] in their 10 o'clock position about 1nm away crossing over a valley ridge - the valley in which he was flying. This resulted in both his ac and Hawk (A) flying on crossing tracks approximately 90° apart. The pilot-in-command – the PNF - informed the PF of Hawk (A)'s presence and the conflict. To avoid a collision the PF reduced their height but maintained their heading to pass vertically clear beneath Hawk (A) by 250ft. He called the pilot-in-command of Hawk (A) after landing and a report was submitted through the Station Flight Safety Officer.

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

THE HAWK PILOTS' UNIT commented that this situation occurred because the internal Station de-confliction notification from each of these squadrons was not sent to the other. Therefore, neither crew was alerted to the routeing of the other ac through the area beforehand. All Station aircrew have been re-briefed on internal de-confliction routines to ensure de-confliction notification is communicated before each sortie and de-confliction documentation checked prior to warning-out.

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

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

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

PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

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

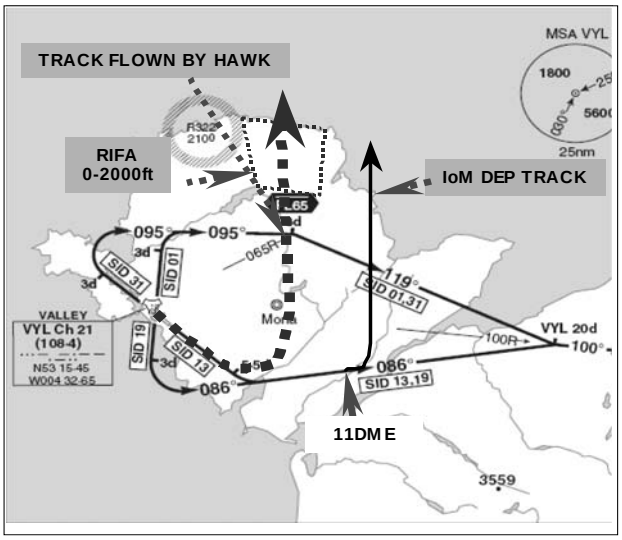
AIRPROX REPORT NO 2009-127

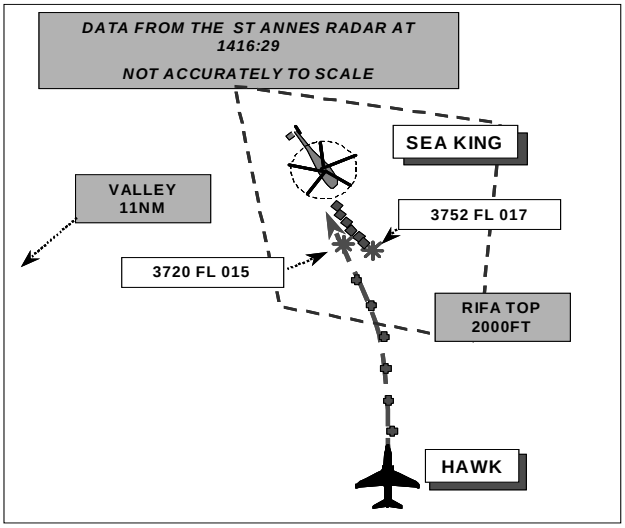
Date/Time: 14 Sep 1420
Position: 5322N 00420W (11nm NE Valley - elev 37ft)
Airspace: Valley MATZ (Class: G)

	Reporting Ac	*Reported Ac*
Type:	Sea King MK3	Hawk TMK1
Operator:	HQ AIR (Trg)	HQ AIR (Trg)
Alt/FL:	2000ft (QFE)	2000ft (RPS 1025mb)
Weather:	VMC CAVOK	VMC CLBC
Visibility:	30km	>10km

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

Recorded Separation:
200ft V/0.3nm H





PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

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

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

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

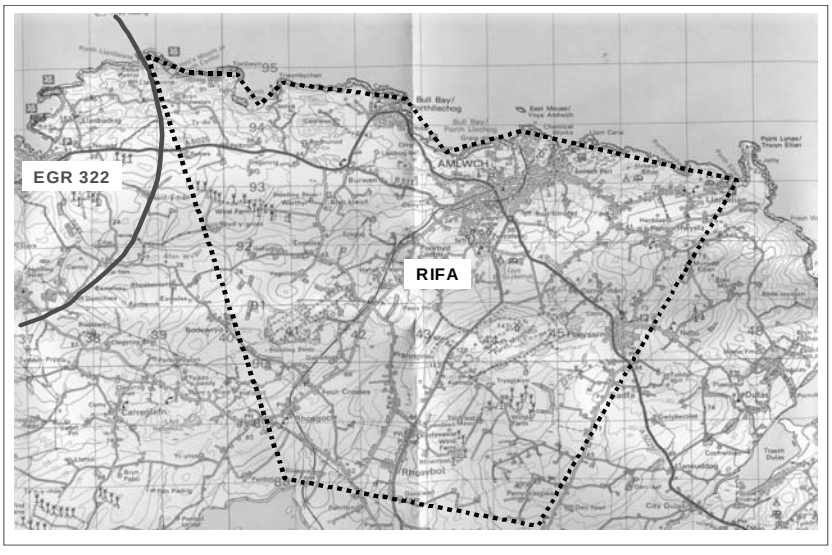
UKAB Note (1): The Secretariat contacted the Hawk Instructor for further information. He stated that he was flying a standard Isle of Man Departure, as cleared by RAD, at 2000ft QFE, which he called to ATC. He was not informed by ATC that the RIFA was active. He saw the Sea King at a distance of about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

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

ROTARY INSTRUMENT FLYING AREA

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

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



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

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

Ronaldsway (Isle of Man).

AIRPROX REPORT No 2009-127

Routeing. Initially follow the SID East

N/A

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

N/A

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

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

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

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

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

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

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

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

HQ AIR (TRG) comments that had the extant procedures in the FOB been followed this incident would have been avoided. It is disappointing that the standard of TS provided fell below what would normally be expected. It is understandable that inexperienced trainees have to learn, but screen controllers need to be proactive and act swiftly when undesirable situations start to develop. The lack of notification to the Hawk crew that the RIFA was active and lack of TI to both crews were the major contributing factors to this Airprox. Fortunately, both crews were

operating under VFR and maintaining a good lookout, which enabled them to see each other thereby allowing effective avoiding actions to be flown much reducing the risk of an actual collision.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

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

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Having not been informed that the RIFA was active, the Hawk crew flew into conflict with the Sea King.

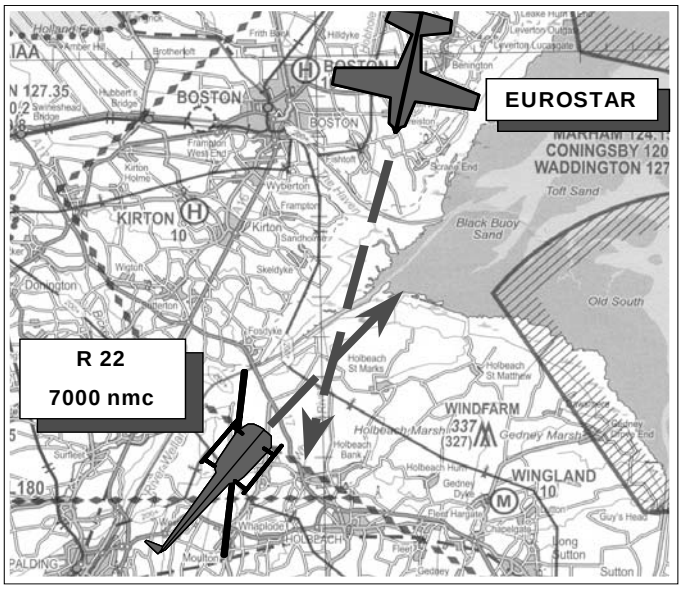
Degree of Risk: C.

Recommendation: RAF Valley procedures for the notification of the RIFA status should be reviewed.

AIRPROX REPORT No 2009-128

AIRPROX REPORT NO 2009-128

Date/Time:	4 Oct 1445 (Sunday)	
Position:	5251N 00001E (5nm NE Spalding)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	EV97 Eurostar	R22
Operator:	Civ Pte	Civ Pte
Alt/FL:	1000ft (QNH 1011mb)	1000ft (QNH)
Weather:	VMC CLBC	VMC NR
Visibility:	>50nm	999km
Reported Separation:	20ft V/50m H	200ft V/0m H
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EV97 EUROSTAR PILOT reports flying from Skegness aerodrome to Fenland under VFR in a dark blue and silver ac with no SSR transponder, TCAS or lights fitted; he was not in receipt of an ATC service. He was flying straight, level tracking 194° at 1000ft on Fenlands QFE/QNH of 1011mb; this was lower than usual to keep out of the unfavourable winds above. He knew the cloud base to be about 4000ft as he had flown above the cloud earlier that day but the sun was still above the cloud line, in about their 2 o'clock position. He has a 'skymap' fitted to his ac and the terrain matched closely with the 'Google Earth' image of his selected route. Although he considers himself good at spotting other ac, the opposing R22 helicopter was first spotted by his passenger, who was also a pilot, but he immediately also saw it about 400m away dead ahead and it appeared as a black pea shaped object; within a very short time they had passed it. He knew it was going to be close so he instantly dived and cut the throttle, but in reflection he doubted that it had made much difference as the whole incident lasted about 2sec. The helicopter seemed to be exactly head-on to them and was black with a gold registration mark and was about 10ft above them.

He reported the incident to the UKAB on landing, assessing the risk as being very high.

THE R22 PILOT reports he was flying solo on a private local navigation exercise from Peterborough routeing over west Pinchbeck turning NE to the Wash in a black ac with strobe lights and SSR fitted and listening out with Peterborough Conington.

He did not see any other ac and was tracking up the RHS of the inlet (presumed to be the river Welland estuary) heading 045° at 1000ft QNH. He was busy navigating as he had not been out to this area before and he is a relatively inexperienced pilot. All he noticed was a sun flash which had reflected off something below him about 200ft away. He was very concerned that it could have been another ac so he made a 90° right turn to see if he could see anything but he could not so he continued with his exercise. He was unaware it had been an ac until he received a telephone call from Radar Analysis Cell. He assessed the risk as being low.

UKAB Note (1): The recording of the Claxby Radar shows a contact squawking 7000 with no Mode C tracking about 045° about 2nm to the E of the Welland River and it passes about ½nm to the W of the reported position of the Airprox; it is assumed that this is the R22. The Eurostar does not show at any time.

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 pilots had been operating legitimately in Class G airspace in good visibility and had an equal and shared responsibility to see and avoid other ac. Both had apparently been following different line features correctly iaw the Rules of the Air (Rule 16 - The Right-hand traffic rule reproduced below:

16 (1) Subject to paragraph (2), an aircraft which is flying within the United Kingdom with the surface in sight and following a road, railway, canal or coastline, or any other line of landmarks, shall keep them on its left.

Also under the Rules of the Air (Rule 10 – Aircraft Approaching head-on) both ac were required to alter course to the right. However, both ac had a very small cross-section (head-on) and were therefore difficult to acquire visually. In the event neither pilot saw the other ac, in one case at all, and the in the other too late to take any avoiding action. That being so and accepting that there was no radar verification of the separation, the Board had very little information on which to base their deliberation regarding the degree of risk. They had, however, no reason to doubt the EV97 pilot's account and, bearing in mind the reported closeness of the ac and the lack of avoidance by both pilots, Members agreed that chance had been a significant factor in determining the separation achieved; that being the case they agreed unanimously that there had been an actual risk of collision.

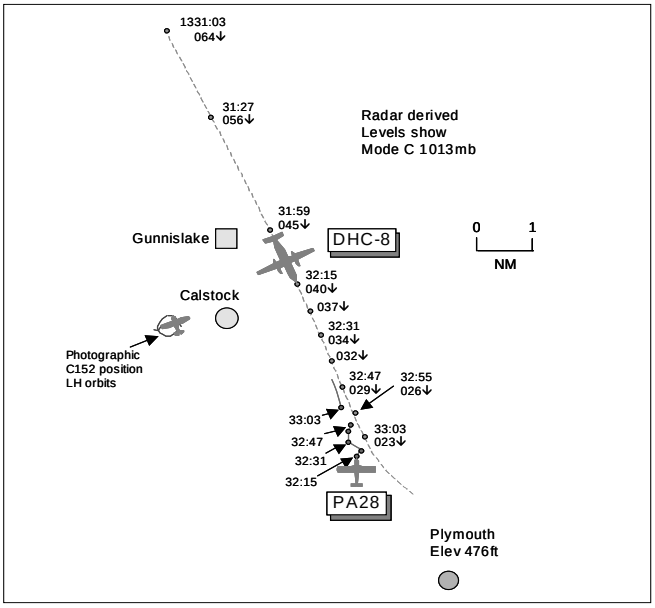
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the R22 pilot and, effectively, a non-sighting by the EV97 pilot.

Degree of Risk: A.

AIRPROX REPORT NO 2009-129

Date/Time:	8 Oct 1333	
Position:	5028N 00410W (3·5nm NW Plymouth - elev 476ft)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	DHC-8	PA28
Operator:	CAT	Civ Trg
Alt/FL:	2800ft↓ (QNH 1018mb)	NR (QNH)
Weather:	VMC CAVOK	VMC NR
Visibility:	40km	NR
Reported Separation:	400-1000ft V 200m H	500-1000ft V NR H
Recorded Separation:	c0·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DHC-8 PILOT reports inbound to Plymouth IFR and in receipt of an ATS from Plymouth, squawking with Modes S and C. The visibility was 40km in CAVOK VMC and they were descending heading 140° at 180kt into a downwind RH cct for RW31 when the Airprox occurred close to Calstock [6nm NW Plymouth]. The RT was very busy at the time with Tower and Approach split. There were several TCAS contacts in the area ahead all showing more than 1000ft below their level. ATC gave TI on an ac, a C152, in the Gunnislake area [7nm NW of Plymouth] which was not seen visually at the time. Whilst descending through 2800ft QNH 1018mb and trying to locate 2 other ac visually to their E, he, the Capt and PNF, saw a PA28 coloured navy/white pass down their RHS, to the W of their track, about 200m away and between 400ft and 1000ft below their level on a reciprocal heading.

Following a conversation with ATC after landing, they believed the ac in question was not working their unit but was receiving a service from Plymouth Military. He assessed the risk as high.

THE PA28 PILOT reports, 4·5 months post incident (See UKAB Note 1), departing from Plymouth on a dual training sortie VFR and in communication with Plymouth on 118·15MHz, she thought, and squawking 7000 with Mode C, she thought. In the climb out RW31 heading NW'ly at 80kt when lowering the nose in the climb to check for traffic, she became aware of a DHC-8 in their 2 o'clock high. Owing to the time delay, she could not be accurate with the horizontal separation but estimated the DHC-8 was 500-1000ft above and that it was not necessary to take any avoiding action. She had not been made aware by ATC of the inbound DHC-8 traffic. She assessed the risk as none.

UKAB Note (1): The ac identified by Plymouth ATC as being involved in the Airprox were the DHC-8, a C152 and a different PA28 (AC3), which departed Plymouth 2min ahead of the subject PA28. However, during the course of the investigation it became apparent that another ac was involved and eventually the subject PA28 was identified as being the reported ac. This had led to the extensive delay in contacting the reported ac's pilot to complete a CA1094.

THE PLYMOUTH APPROACH CONTROLLER reports a C152 was orbiting in the vicinity of Gunnislake on a photographic survey and a PA28 was departing RW31 on a local flight to the N under a BS. The DHC-8 was inbound from the NW under a PS for a visual approach to join downwind RH for RW31. All TI was passed and acknowledged, he thought. The DHC-8 was transferred to Tower on 118·15MHz for cct integration but almost 1min later the pilot called on his frequency for TI on ATZ traffic. He reminded the pilot of the traffic which he had previously mentioned [a helicopter] and requested that he contact the Tower for a second time. Later the DHC-8 pilot telephoned to report being in close proximity to the photographic C152, he thought.

The Plymouth METAR was EGHD 1320Z 04007KT CAVOK 16/07 Q1018=

ATSI reports that the Airprox occurred in Class G airspace, just over 3nm NW of Plymouth Airport i.e. outside the ATZ (circle radius 2nm from centre of RW13/31). The weather was CAVOK. Plymouth Airport ATC is not equipped with any surveillance equipment.

The PA28 was outbound from Plymouth VFR, to operate on a general handling flight to the N of the airport. The flight was cleared for take off, from RW31, at 1328:44. Once airborne, its pilot was informed about helicopter traffic in the vicinity of the airport and was transferred to the Approach frequency at 1330:51. The radar recordings show the DHC-8, which was inbound on an IFR flight, 12nm NNW of the airport, descending through FL67, at the time. It was not in contact with Plymouth Approach, although it had contacted the frequency about 15min earlier to obtain the Wx. It had passed an estimate of O/H the airport at around 1332.

The DHC-8 flight, after release, established communication with Plymouth Approach at 1331 i.e. shortly after the subject PA28 had been transferred to the frequency (although it had not yet called). The pilot of the DHC-8 reported *"...with you visual at ten miles we're on your Three Three Five radial descending Flight Level Four Five requesting further for a visual approach"*. The controller replied *"DHC-8 c/s cleared visual approach Runway Three One QNH One Zero One Eight which side would you like to join"*. The pilot requested a RH join (1331:30) and was cleared *"...roger then join and report downwind right report er in fact traffic for you we have a Cessna in the Gunnislake area One Thousand Five Hundred feet a S a Twin Squirrel helicopter and I shall put it at One Thousand feet and he's same direction as your self shortly passing er north abeam and er a Cherokee's just recently departed routeing off to the north initially"*. (The Cherokee was the subject ac.) The pilot replied (1332:00) *"...we're look out for them and er join right hand then for er three one"* and following the controller's request for his range, he reported at 5nm. The flight was then transferred to the Tower frequency. Shortly afterwards (1332:30), the PA28 flight contacted the frequency (just over 1·5min after being transferred, albeit the approach frequency was busy in the period). Although its transmission was simultaneous with that of another flight, resulting in its c/s being cut out, the recording confirms the pilot stating *"????? er departing to the northeast with the Dash Eight in sight"*. The controller confirmed that the message did come from the PA28 flight and added *"I was just about to get round to you thank you very much".* In the event, the DHC-8 had not transferred to the Tower frequency at the time, as just over 1min later, the pilot reported sighting the helicopter and asked if that was the only traffic to his L. This was confirmed, the controller adding that the helicopter was operating on a low level task. The DHC-8 pilot confirmed changing to the Tower frequency. No comment was made by the DHC-8 pilot, on either frequency, about the close proximity of the PA28.

Although the DHC-8 had not requested the type of ATC service required, it was being provided with a PS. This is in accordance with the procedures stated in the MATS Part 1, Section 1, Chapter 11, Paragraph 2.7.1: *'Controllers at approved ATC Units that do not have surveillance equipment available will routinely apply a Procedural Service to aircraft carrying out IFR holding, approach and/or departure procedures'*. Paragraph 6 states the procedures for a PS. Paragraph 6.5.1 states: *'The controller shall provide traffic information, if it is considered that a confliction may exist, on aircraft being provided with a Basic Service and those where traffic information has been passed by another ATS unit; however, there is no requirement for deconfliction advice to be passed, and the pilot is wholly responsible for collision avoidance'*. The PA28 was between frequencies, at the time, although it had been provided with a BS initially. MATS Part 1, Section 1, Chapter 11, Paragraph 3.5.1 states for a BS: *'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'*.

The APP passed TI to the pilot of the DHC-8 about the PA28, albeit in a message concerning 2 other ac. The PA28 pilot was not informed about the DHC-8, although she did report sighting it on her first call on the Approach frequency.

UKAB Note (2): The Burrington radar recording at 1331:03 shows the DHC-8 11·5nm NNW of Plymouth tracking 155° descending through FL064 (6550ft QNH 1018mb) with the photographic C152 in a LH orbit 2nm SW of Gunnislake squawking 7000 with NMC. The DHC-8 continues on a steady track passing 2nm NE of the C152 at 1332:15 whilst descending through FL040 (4150ft QNH) as a primary only return first appears, believed to be the subject PA28, 2·8nm NW of Plymouth tracking NW'ly and 3·4nm ahead of the DHC-8. The PA28 return exhibits track jitter for just over 30sec until it fades from radar, the last return at 1332:47 places the PA28 just R of the DHC-8's 12 o'clock range 0·8nm, which is descending through FL029 (3050ft QNH). The next sweep 8sec later, which is believed to be the CPA, the DHC-8 is seen passing FL026 (2750ft QNH) before the PA28 reappears on the next sweep at 1333:03, 0·7nm to the NW of the DHC-8 descending through FL023 (2450ft QNH). The PA28 continues on a steady NNW'ly track thereafter and no squawk is observed for the remainder of the radar recording – 7min post Airprox. Owing to the track jitter and radar fade shown by the primary only return of the PA28, it is difficult to measure accurately the lateral separation at the CPA but it is estimated to be in the region of 0·1-0·2nm.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

With this incident occurring in Class G airspace, both crews were responsible for their own separation from other traffic under see and avoid. The DHC-8 crew were aware of several ac in the area from their TCAS display; however they were 'surprised' when they saw the PA28 pass down their RHS, as it was not showing on TCAS. The PA28 instructor believed the ac's transponder was on with 7000 code selected with Mode C but, for whatever reason, no SSR responses were received by the recorded radar ground interrogator. The DHC-8 flight was under a PS from Plymouth and had been informed of the subject outbound PA28, albeit in a lengthy transmission which included TI on 2 other ac, but this TI was apparently not assimilated; ATC were not under any obligation to pass deconfliction advice against the VFR traffic. The PA28 flight had not been informed of the inbound DHC-8 but the instructor saw the airliner during the climb out phase after lowering the ac's nose to check for traffic and she informed the controller. Members agreed that both crews had fulfilled their responsibilities and that this Airprox was the result of the IFR DHC-8 pilot sighting the departing VFR PA28. Both crews reported similar separation distances, broadly in line with those that would be afforded under the Quadrantal rule in Class G airspace. These visual sightings when combined with the separation that pertained were enough to allow the Board to conclude that any risk of collision had been removed during this encounter.

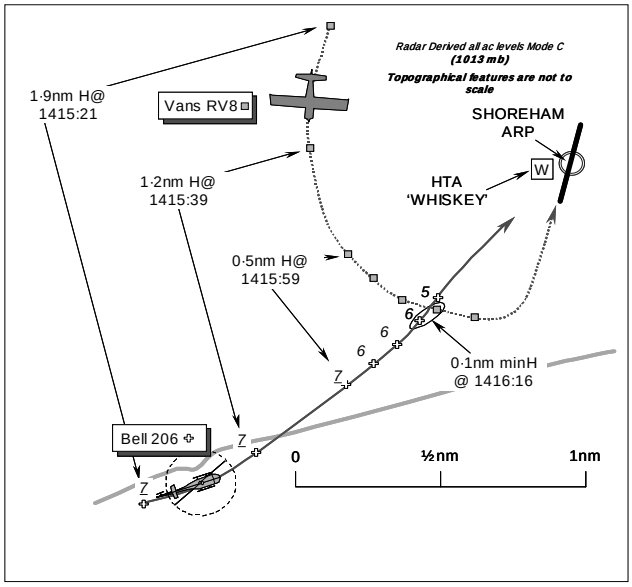
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT NO 2009-130

Date/Time:	8 Oct 1416	
Position:	5050N 00019W (Shoreham A/D cct elev: 7ft)	
Airspace:	Shoreham ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Bell 206	Vans RV8
Operator:	Civ Pte	Civ Pte
Alt/FL:	300ft amsl	NR (N/K)
Weather:	VMC CAVOK	VMC
Visibility:	>10km	10km+
Reported Separation:	50ft V/100m H	NR
Recorded Separation:	0·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BELL 206 (B206) JET RANGER HELICOPTER PILOT reports approaching Shoreham under VFR whilst in communication with Shoreham ATC on 123·15MHz [APPROACH & TOWER were combined]; fixed wing ac were circuiting to RW02 [in a LHC]. On final approach into Helicopter [Training] Area [HTA] 'WHISKEY', at 300ft amsl as instructed by Shoreham ATC heading 040° at 60kt, a Vans RV8 aeroplane [the registration was given] was first seen at 11 o'clock as it flew 100m directly in front from L – R at 350ft amsl - some 50ft above the helicopter.

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

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

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

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

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

THE SHOREHAM COMBINED APPROACH AND AERODROME CONTROLLER (ADC) provided a brief report with a sketch map of the occurrence stating that the Vans RV8 made a non-standard approach, which conflicted with the B206. The RV8 pilot was instructed to join downwind at 1600ft and the B206 pilot instructed to join for

HTA 'Whiskey' not above 600ft in the ATZ. When the RV8 pilot reported downwind he was instructed to descend and report 'final' as No1. The B206 pilot then reported that the RV8 had passed in front of his helicopter.

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

UKAB Note (1): The sketch map included with the ADC's report shows the RV8's track turning onto a very tight base-leg to the N of the railway line which passes broadly WSW - ENE immediately to the S of the aerodrome. The sketch suggests the flight path of the RV8 was much tighter than the ADC expected. However, the radar recording shows that the base leg of the RV8 was flown at a distance of about 0·62nm from the Shoreham ARP which would suggest that the final turn was made S of the railway line and thus wider than that reported by the ADC.

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

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

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

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

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

Neither of these pilots was informed about the details of the other ac by the controller. If the Vans pilot had been informed about the inbound helicopter, even only to the extent that Area 'W' was in use, it would have possibly allowed the pilot to sight the B206 earlier and thereby take appropriate action to avoid it. However, it is generally expected by ATC that fixed-wing ac, in the left-hand cct for RW02, will remain clear of the helicopter area at 'W'. Consequently, traffic information (TI) is not regularly issued to these flights.

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

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

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

UKAB Note (3): The Pease Pottage radar recording shows the Bell 206 following the mean line of the coast as it approaches Shoreham aerodrome from the W indicating 700ft Mode C (1013mb) – about 850ft QNH (1018mb). The Vans RV8 is shown on a downwind heading with Shoreham aerodrome starting to draw abeam at 1415:21, just moments before the pilot reported positioning downwind for RW02; the B206 is at 12 o'clock 1·9nm away. Thereafter the RV8 enters a wide L turn with NMC indicated (reported switched off) whilst the B206 maintains level and also turns slightly L towards HTA 'Whiskey'. As horizontal separation reduces from 0·5nm, the B206 indicates a slight descent to 600ft, which is maintained to the CPA, timed at 1416:16, just as the RV8 crosses ahead of the helicopter on a base-leg for RW02 – in between sweeps – and is shown in the B206's 1 o'clock - 0·1nm away. The RV8 clears to starboard of the B206 and turns onto final as the B206 descends further towards HTA 'Whiskey'.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

The B206 pilot had contended that the Vans pilot was not following the published fixed wing procedure for RW02. The Board noted that the Shoreham entry in the UK AIP stipulated that 'unless otherwise instructed' fixed-wing pilots will join overhead the aerodrome, descend to circuit height on the deadside of RW02 and join the circuit upwind. However, given the 'variable ccts' also stipulated, it was clear that the ADC was empowered, and had elected to provide, at his discretion, a more expeditious downwind join for the Vans pilot instead. A military helicopter pilot Member advised that he would have expected to join for point 'Whiskey' by approaching at 90° to the fixed-wing cct direction usually from the Deadside, but as the B206 was joining from the W this was impractical and would have necessitated crossing the RW. The radar recording reflected that the B206 pilot had followed the coast eastbound into the ATZ to a point 1½ nm SW of the aerodrome and then turned towards 'Whiskey', which seemed sensible to the Board. The B206 pilot's chosen flight path was then to approach broadly into wind at 600ft ALT onto final, thereby crossing underneath the base-leg to RW02. Despite the warning in the Shoreham AIP entry that "'Whiskey' is frequently below the fixed-wing 'deadside'", Members recognised that on this occasion, with RW02 LHD in use, the B206 was always on the Liveside of the fixed-wing cct. Therefore, despite the restriction of 600ft within the ATZ which afforded a 500ft separation below fixed-wing ccts, clearing two ac to positions in close proximity on the aerodrome - as the RW and the HTA are here – at the same juncture will potentially result in conflicting flight paths unless further action is taken. The Board agreed that it was essential, therefore, that each pilot knew about the other. An experienced CAT pilot Member noted that the Vans had flown into close quarters with the helicopter before the B206 pilot was aware of it, and from the individual pilots' accounts and the RT transcript provided with the ATSI report it was apparent that the Shoreham ADC had not passed any TI to either flight. In the provision of the aerodrome control service within the ATZ, the Board agreed with the ATSI view that both pilots should have been told about the presence and intentions of the other. The ATSI Advisor explained that the comment in his report that traffic information is not regularly issued to cct traffic about helicopters at 'Whiskey', concerned helicopters operating tight ccts inside the fixed-wing cct. However, the ATSI Advisor stressed that with the helicopter approaching the aerodrome TI should have been passed to both flights. The GA pilot Member did not perceive that the Vans pilot had done anything wrong and other pilot Members agreed. Whilst he might have flown a tighter cct than the norm, which kept him within gliding distance of the aerodrome, there was no reason why he should not do so as he had not been apprised of any other traffic in the ATZ that might conflict. Moreover, when he had reported positioning downwind he had been advised by the ADC that he was *"number 1 report final",* and could reasonably anticipate that no other ac were in his way. Without TI both pilots' situational awareness had been impaired and the Board concluded that the Cause of the Airprox was that the ADC did not provide TI to either pilot in the ATZ.

Turning to the Risk, the Vans pilot saw the helicopter, which was cross-cockpit off the starboard side, about 200-300m away as he made his descent on base-leg. Although he did not estimate the minimum separation, he stressed that he had not needed to take any avoiding action, but monitored the B206 as it passed below and

behind his aeroplane. From the other cockpit, the B206 pilot first saw the Vans at 11 o'clock as it flew 100m directly in front from L – R some 50ft above; similarly, no avoiding action was taken. Whereas the radar recording showed the minimum recorded horizontal separation was 0·1nm - ~185m - after the Vans had crossed ahead of the helicopter. Unfortunately, it was not possible to determine the vertical separation at this point because the Vans' Mode C was switched off. The Board perceived this to be unwise and recommended that Mode C should always be selected 'on', whether speaking to an ATSU or not, to assist radar equipped ATSUs and to ensure that TCAS equipped ac are provided with the altitude data necessary to prevent collisions. An experienced CAT pilot Member suggested that at the recorded separation and short sighting distances quoted here, coupled with the descent of the Vans onto Final, safety had not been assured. However, this was a solitary view. The majority of the Members agreed that even at these close quarters no avoiding action had proved necessary by either pilot; the B206 was in level flight just before descending on final and the Vans pilot was always in a position to climb further and increase the vertical clearance above the helicopter if need be. The Board agreed, therefore, that no risk of a collision had existed in these circumstances.

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

PART C: ASSESSMENT OF CAUSE AND RISK

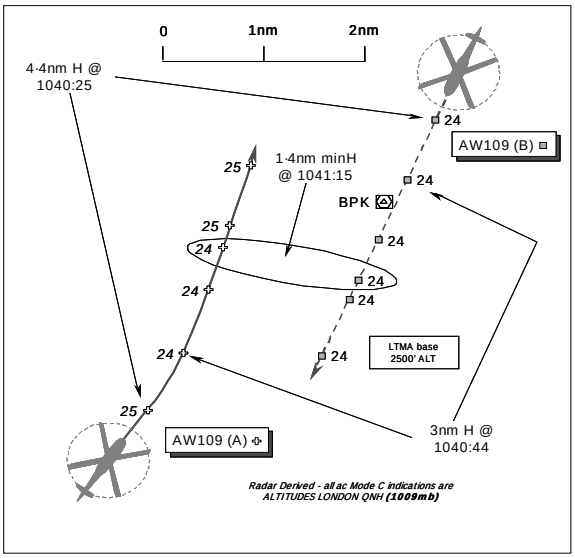
Cause: The ADC did not provide traffic information to either pilot in the ATZ.

Degree of Risk: C.

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

AIRPROX REPORT NO 2009-131

Date/Time:	5 Oct 1041	
Position:	5144N 00007W (1nm SW of BPK VOR)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	AW109E (A)	AW109E (B)
Operator:	HQ Air (Ops)	HQ Air (Trg)
Alt/FL:	2400ft	2400ft
	QNH (1009mb)	QNH (1009mb)
Weather:	IMC In Cloud	IMC In Cloud
Visibility:	NR	NR
Reported Separation:		
	Nil V/<1nm H	Nil V/1nm H
Recorded Separation:		
	Nil V @ 1·4nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CAPTAIN OF AGUSTA/WESTLAND AW109 (A), the PNF, reports he had departed from Northolt under IFR northbound for Digby on the 'Charlie' departure route. His helicopter has a white and red livery and the landing and taxying lights plus the red HISLS were all on; Mode S and TCAS I are fitted.

Flying in a level cruise at 2400ft London QNH (1009mb), IMC in cloud, during the radar handover process they were advised by Northolt APPROACH of a contact in their 10 o'clock at 5nm crossing from L – R at the same altitude. After switching to Luton RADAR on 129·55MHz, still under a TS, they heard RADAR advise another flight of the position of their helicopter. Approaching a position 220° BPK VOR 2nm [heading about 040°] at 140kt, the pilot of the other ac acknowledged the controller's transmission stating that he was 2nm from BPK. The pilot of AW 109 (A) recognised the callsign of the other helicopter, realised it was a similar type on a training flight inbound to Northolt and knew that the training syllabus required them to fly a Charlie STAR. As the Charlie SID and Charlie STAR follow reciprocal tracks and he was now within 2nm of the BPK, to avoid the other helicopter he instructed the PF to commence a turn to the N thereby deviating off the route. The other helicopter - A109 (B) - was seen on TCAS 3nm away, before it passed less than 1nm down their starboard side at the same altitude with TCAS enunciating Traffic Alerts. Both the PF and the passenger in the cabin - also a service helicopter pilot - expressed their concern at this situation. He assessed the Risk as 'very high'.

THE PILOT OF AGUSTA/WESTLAND AW109 (B), a QHI, reports he was conducting an instrument training flight from Shawbury to Northolt under IFR in IMC in cloud, following the published non-airways arrival. His helicopter is coloured grey and Dayglo orange; the HISLs were on. Mode S and TCAS I are fitted. He was in receipt of a TS from Luton RADAR on 129·55MHz, which was the best service available from them, squawking the allocated code with Mode C. Heading 205° in a level cruise at 2400ft London QNH at 140kt, they were advised by RADAR of opposite direction traffic departing Northolt, which was known to be following a reciprocal routeing. The reported traffic was first shown on their TCAS I display about 5nm ahead and the relative movement of the other ac – A109 (A) - was assessed. It looked likely that it was going to pass down the port side of his helicopter and that no action would be needed. However, the other helicopter turned onto N, before it passed down their starboard side at a range of about 1nm with a 'high' Risk of collision.

He explained that, although the two helicopters passed close to one another, each crew was aware of the other's presence because of the availability of a TCAS I 'warning'. It was very fortunate that both the ac involved were TCAS I equipped as the controllers were unable to provide a DS due to workload. Apart from the initial notification of opposite direction traffic no avoidance information was given.

ATSI reports that the Airprox occurred in Class G airspace 1nm SW of BPK VOR between the two A109 helicopters operating IFR; A109 (A) outbound and A109 (B) inbound using the Northolt non-airways instrument

'Charlie' route specified in the UK AIP. This requires flights to contact Luton RADAR on 129·550MHz when clear of the London CTR and aircraft are expected to fly at an altitude of 2400ft London QNH. LTC advise that Luton RADAR was only able to provide a TS due to the Luton Operational requirements.

The 1050UTC London (Luton) METAR: 07006KT 6000 RA SCT007 OVC011.

The crew of A109 (B) established two-way contact with RADAR and at 1027:55 advised, *"...Augusta 1-0-9 out of Shawbury IFR to Northolt..presently to..west of Barkway by 15 miles leaving flight level 3-5 for 2 thousand 4 hundred feet your yankee is copied 1-0-0-9 is set squawking 7 thousand and requesting a de-confliction service..."*. RADAR replied *"...for de-confliction service contact Farnborough RADAR on 1-3-2 decimal 8".* The crew of A109 (B) replied "...*we're looking to join the..Charlie arrival into..Northolt*". RADAR then advised A109 (B)*"..roger squawk 4-6-7-0 but it will only be a Traffic Service I'm afraid under my control*". The A109 (B) pilot advised *"..that's fine"*. Luton then identified the ac *"....you're identified 10 miles to the.. westnorthwest of BARKWAY you're under a Traffic Service outside controlled airspace* [London] *QNH 1-0-0-9 millibars".* This was acknowledged by the crew of A109 (B) and RADAR confirmed it was a standard 'Charlie' arrival into Northolt. The crew of A109 (B) reported level at 2400ft London QNH at 1031:50.

Northolt APPROACH had pre-noted the outbound A109 (A) to Luton RADAR previously and a squawk of A4671 allocated. At 1032:55, RADAR passed the inbound details of A109 (B) to Northolt APPROACH and an inbound squawk of A0260 was allocated.

At 1037:40, Northolt APPROACH called RADAR with a handover on the outbound A109 (A)*"... Brookmans Park south west by 9 miles tracking north squawking 4-6-7-1...climbing 2 thousand 4 hundred feet QNH 1-0-0-9 Traffic Service".* The identity and transfer of control was agreed. During the same telephone conversation Luton RADAR gave Northolt a radar handover on A109 (B), *"...currently squawking 4-6-7-0 position 5 miles northnortheast of BROOKMANS PARK he's level at 2 thousand 4 hundred feet on 1-0-0-9 millibars Traffic Service standard Charlie arrival".* The identity and transfer of control was agreed between the two units.

At 1039:05, the crew of A109 (A) called Luton RADAR who responded *"...identified on handover from Northolt you're under a traffic service you've got opposite direction traffic an Augusta 1-0-9 he's er in your 12 o'clock at about 8 miles tracking Brookman's Park 2 thousand 4 hundred feet".* The allocated squawk of A0260 was passed to A109 (B) at 1039:30 and RADAR included traffic information about A109 (A), "*...the opposite direction traffic for you is an Augusta 1-0-9 2 thousand 4 hundred feet..just right of your 12 o'clock at about 6 miles opposite direction".* The crew of A109 (B) responded *"looking...".* At 1040:24, the crew of A109 (A) requested from RADAR, "*...if you're happy direct Barkway it'll give us ?? separation on your opposite direction traffic".* RADAR approved A109 (A)'s request, *"...that's no problem the traffic now just right of your 12 o'clock at 2 miles 2 thousand 4 hundred feet just about overhead BROOKMANS PARK now"* and the crew responded *"....traffic copied.* RADAR then passed an update at 1040:40 to the crew of A109 (B), *"...that's the* [C/S A109 (A)] *just turning..slightly left now towards Barkway he's just off your right side 2 miles 2 thousand 4 hundred feet will pass down your right side on current track".* The crew of A109 (B) replied *"roger we have him on TCAS...".* RADAR then instructed the crew of A109 (B) to contact Northolt on 126·450MHz [which was acknowledged at 1041:00]. Radar recordings show that just after 1040:25, A109 (A) altered course to the L, direct to BARKWAY, and as the 2 ac passed abeam at 1041:15, minimum horizontal separation was 1·4nm.

Luton RADAR continued to provide a TS to A109 (A) until at 1102:00, the ATS was changed to a BS and the crew elected to switch to their en-route frequency.

MATS Pt1, Ch11, pg 5 4.1.1, states that:

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

HQ AIR (OPS) comments that both ac were operating with a TS and were made aware of each other. Local knowledge and a good level of awareness allowed the outbound ac crew assimilate the significance of the inbound traffic call and take appropriate avoiding action as required by operations under a TS.

HQ AIR (TRG) comments that the pilot of A109(B) opted to remain with Luton RADAR and accept a TS rather than call Farnborough for a DS. During the transfer of aircraft between Northolt APPROACH and Luton RADAR height coordination was not discussed which may have reduced the risk of this incident. The 'Charlie' STAR and departure procedures put aircraft on reciprocal tracks at the same altitude, which increases the chances of this type of Airprox occurring. Fortunately, both ac were fitted with TCAS and both crews were given good TI by ATC, which enabled the crew of A109 (A) to take positive avoiding action much reducing the risk of an actual collision.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was evident that the use of Standard Arrival & Departure routes by ac inbound and outbound to Northolt, did not imply that separation was automatically provided between IFR flights. However, to many Board Members it seemed anomalous that the 'Charlie' routes had been designed to follow the same track, to and from the BPK VOR, and at the same altitude for both inbound and outbound traffic from Northolt. A military controller Member who is familiar with this airspace briefed the Board that the procedures had been reviewed with the aim of providing separated inbound and outbound routes. However, the limited Class G airspace below the London TMA and around the Class D CAS associated with Luton and Stansted together with the profusion of GA airfield ATZs did not facilitate alternative routes. This surprised some Board Members who recognised the inherent potential for conflictions between ac following the prescribed non-airways routes, such as occurred here. A civilian controller Member stressed that IFR arrival & departure procedures via airways were available for those that choose to follow them, where standard IFR separation would intrinsically be afforded to such flights. However, it might not be feasible for some military flights to fly airways routes and the diverse nature of the tasks undertaken might preclude strict compliance with airways procedures. The question of the expediency of the 'Charlie' route was discussed at length and the problem here was plainly for those pilots wishing to operate in IMC outside CAS who were required to follow a promulgated route in Class G airspace where ATC did not seem able to provide a DS.

Whilst the controller would have been unaware they were operating in cloud at the time, the Board was concerned that Luton RADAR seemed reluctant to afford a DS to these IFR flights, which would have ensured safe separation between the two ac. Whilst the applicable LARS unit – Farnborough - might have been able to offer a DS, the P-i-C of A109 (B) accepted a TS; however, at that stage he would have been unaware of the outbound A109 (A). The provision of an ATS to Northolt traffic by LTC is agreed and contained in the Luton RADAR MATS Pt II. The ATSI report explained that Luton RADAR was only able to provide a TS due to the 'Luton Operational requirements' at the time; the ATSI Advisor explained further to the Members that Luton RADAR is not a LARS unit and its priority is to provide a service to Luton traffic inside CAS. Decisions on the level of service to other traffic are made by the controllers on the basis of workload and traffic density at the time, and the combination of these factors mostly probably prevented the controller from offering a DS. The Board was also briefed that Northolt ATC will provide a DS along the route when requested, to both inbound and outbound traffic to the N of the BPK VOR. As a review into procedures had already been undertaken, the Board accepted that the Station had explored and discounted all practical alternatives to the current routeings and procedures. Furthermore, as the Board had been assured that a DS was available from Northolt ATC itself, on balance, the Board was not minded to make a Safety Recommendation. Nevertheless, some military Members were of the view that something more should be done to provide 'procedural' de-confliction on these routes.

Whilst a TS may be provided to either IFR or VFR flights, its function is to enable pilots operating in VMC to see and avoid other ac - it remains the pilot's responsibility to effect suitable separation. Here the pilots involved had exploited the TCAS 1 fitted to their helicopters to assist their mental air picture and, whilst it had undoubtedly proved its worth, pilot members emphasised that TCAS1 is not as inherently accurate in azimuth as it is in range or the vertical plane.

From the comprehensive accounts provided it was clear that the Captain of A109 (A) had quickly recognised what A109 (B) was doing from the TI provided by Northolt APP and by hearing the crew on the RT after he had switched to Luton RADAR. Controller Members stressed that the Luton RADAR controller had provided a good service here, exceeding the normal bounds of a TS. He had provided accurate and pertinent TI to assist both pilots gain a sound appreciation of the situation and this had been updated by the controller to ensure that the pilots knew exactly where the other helicopter was in relation to their own, before A109 (B) was switched to Northolt. The

Captain of A109 (A) demonstrated good SA by electing to turn off the route and not press on in IMC all the way to the BPK, and thereby afford the opposite direction traffic a wider berth. Whilst the separation of 1·4nm was still less than half what might be expected if operating under a DS from a terminal ATSU, the pilot of A109 (B), also flying in cloud but with the other helicopter displayed to him on TCAS and in the knowledge that A109 (A) had altered course and was passing clear down his starboard side, did not initiate any avoiding action himself. The Board concluded, therefore, that this Airprox had resulted from a conflict in IMC in Class G airspace on the Northolt Standard Arrival and Departure Routes, but at these distances no risk of a collision had existed in the circumstances conscientiously reported here.

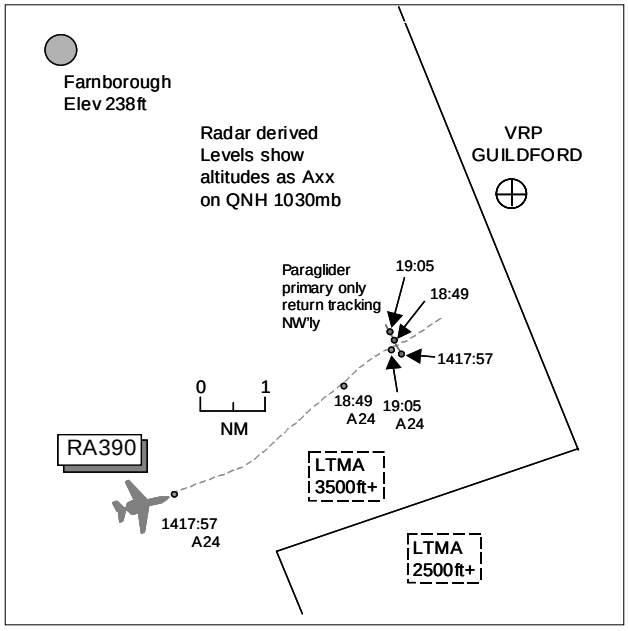
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in IMC in Class G airspace on the Northolt Standard Arrival and Departure Routes

Degree of Risk: C.

AIRPROX REPORT NO 2009-132

Date/Time:	13 Oct 1419	
Position:	5112N 00038W (3nm SW Guildford)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	RA390 Premier 1	Untraced Paraglider
Operator:	Civ Trg	N/K
Alt/FL:	2400ft (QNH 1030mb)	NK (N/K)
Weather:	VMC CLBC	NK
Visibility:	>10km	
Reported Separation:	Nil V/0·5nm H	NR
Recorded Separation:	0·3nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE RA390 PREMIER 1 PILOT reports inbound to Farnborough IFR and in receipt of a TS from Farnborough on 134·35MHz, squawking 7557 with Modes S and C; TCAS was fitted. The visibility was >10km clear below cloud in VMC and the ac was coloured white/maroon/brown/beige with anti-collision, nav, strobe and recognition lights all switched on. This was a training flight with an examiner PNF in the LH seat and PF in the RHS carrying out an Operator's Proficiency Check; both pilots were Capt on type. No abnormal procedures or drills were being conducted at the time and the ac was heading 050° at 220kt positioning downwind LH for the RW24 ILS. Previously they had been given TI for an ac on their RHS, which was sighted. About 1nm S of Guildford they obtained late visual contact with a powered paraglider about 1nm ahead in their 11 to 12 o'clock position at the same height. At this range the traffic appeared stationary but the orientation and movement were difficult to judge. Immediate avoiding action was taken by disengaging the AP and carrying out a steep turn to starboard, the paraglider passing 0·5nm to their L. At this time Farnborough Approach did not have radar contact on the paraglider and were in the process of issuing a L turn instruction. ATC were advised of their avoiding action and once the threat had passed they resumed vectoring for the ILS; they also advised them of their intention to file a report. After landing ATC advised that the paraglider had only presented intermittent primary returns after the incident. He assessed the risk as high.

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

THE FARNBOROUGH APPROACH CONTROLLER reports that his position was bandboxed with LARS W and he was vectoring the Premier 1 onto heading 050° at 2400ft for an ILS RW24. About 2nm S of Guildford he told the flight to turn L onto 360° as the pilot had requested a short pattern cct. The pilot reported that he could not accept the heading owing to a paraglider close to them at the same level. As the controller had not observed anything in the area before and at the time, he told the flight to continue own navigation as they could see the paraglider in close contact and to report when able to accept vectors. It was at this time a faint primary contact was seen, not showing any movement, behind the Premier 1. The Premier 1 pilot reported clear of conflict and resuming heading 360°. The primary contact was very intermittent and was lost shortly afterwards when separation had increased to 1·5nm. Later the pilot stated he was filing an Airprox.

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

A TS is defined in MATS Part 1, Section 1, Chapter 11, Page 5,

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

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

A very slow moving primary only target, with an irregular track, is detected by the Heathrow 23cm primary radar recording. At the time the APR issued the L turn onto 360° before the pilot reported sighting the paraglider (1418:49), this primary target is in the Premier 1's 12 o'clock range 1nm. Three sweeps later 1419:05, the radar records the Premier 1 altering course to the R and passing 0·3nm to the S of the target, maintaining 2400ft Mode C. Once clear, the ac returned to the previously assigned heading, 050°. Thereafter, it completed an event free approach and landing.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

turning R to pass behind it. This element was enough to allow the Board to conclude that this had been a conflict resolved by the Premier 1 pilot where any risk of collision had been effectively removed.

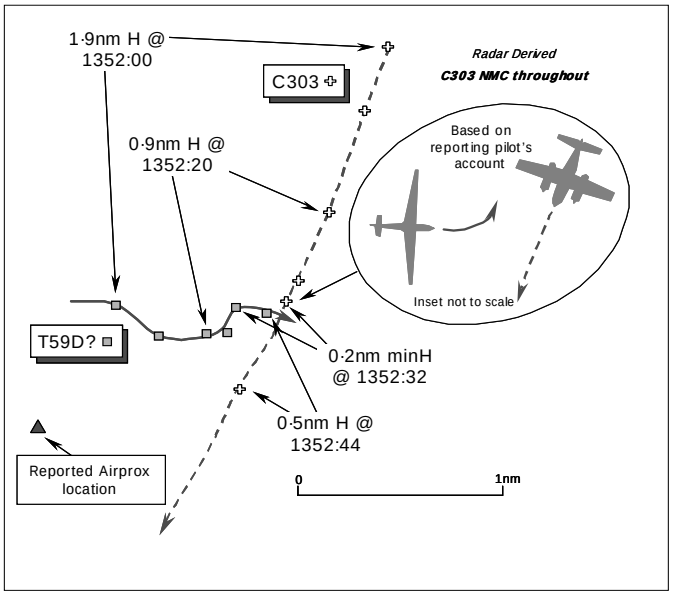
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT NO 2009-133

Date/Time:	10 Oct 1352 (Saturday)	
Position:	5112N 00125W (2nm E of Andover)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Slingsby T59D	Cessna C303
Operator:	Civ Pte	Civ Pte
Alt/FL:	3300ft amsl	NK
Weather:	VMC	VMC
Visibility:	20km	NR
Reported Separation:	200ft V/Nil H	NK
Recorded Separation:	0·2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

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

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

AIRPROX REPORT No 2009-133

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

On this route he would normally operate under VFR switching from Benson ATC after passing CPT - possibly to Boscombe Down - and then transfer to Bournemouth Approach after receiving their ATIS information, whilst ensuring that he was below the maximum required altitude for entry into CAS from Stoney Cross VRP. His route would take him to the E of Andover as he usually flies a track direct CPT to Stoney Cross VRP [which takes the C303 through the reported co-ordinates and the Airprox location evinced from the radar recording]. He avoids flying W of Andover as that would take him towards Middle Wallop parachuting drop zone. As always, he keeps a good look out; the area NE of Bournemouth is very busy with military ac and, as controllers cannot be relied upon to provide a warning or avoidance under a BS, a good look out is essential. As the glider pilot was in a descent and had to steer sharply to the L, it indicates that the glider was to the R of his C303 when the glider pilot saw his ac. He did not see the glider.

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

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

UKAB Note (2): Analysis of the Heathrow Radar recording shows the C303 squawking A7000 – but identified from the ac's individual Mode S identity (AID) – approaching the location of the Airprox at 1352:00 on a SW'ly track towards Bournemouth at a radar-derived ground speed of about 155kt. No Mode C is indicated by the C303 at all throughout the period that it passes the plotted location of the Airprox reported by the Slingsby glider pilot, thus the vertical geometry cannot be confirmed independently. An intermittent primary contact is shown flying in an easterly direction, which is probably the glider flown by the reporting pilot but its identity cannot be confirmed. As the two tracks converge on a position 2nm E of Andover – broadly 1nm NE of the reported Airprox location - the contact presumed to be the Slingsby glider turns sharply NE as the C303 closes from a range of 0·9nm. The two ac pass starboard-starboard at a range of about 0·2nm at 1352:32, the C303 maintaining a SW'ly course. The T59 then alters R onto an easterly course as the horizontal separation increases.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

A CAT pilot Member, who is also an experienced glider pilot, pointed out that in sinking air the T59 glider pilot would have been eager to keep to as direct a course as was possible for the return to Lasham. At the altitude he reported – 3300ft amsl – if he was not able to find additional lift it might have been difficult for him to achieve his destination, and the prospect of a remote field landing might have been looming large in his mind. However, it was evident to the Members that he had detected the C303 some 5km away - as it approached from the NNE. Members noted that the T59 glider pilot had stressed that if he had realised earlier that the vertical separation between his glider and the C303 was decreasing he might have turned L at an earlier stage. He believed that the twin might have been ascending, causing the vertical separation to reduce below that he had originally estimated. Unfortunately, despite being equipped with Mode C it was clear that this Mode within the C303's transponder was either not functioning or the pilot had not selected Mode C 'on'. Thus it was not possible to compare the glider pilot's reported altitude at the time with a Mode C indication from the C303 and assess the vertical separation that actually existed as the aeroplane passed by 0·2nm to starboard. Notwithstanding his right of way under the Rules of the Air, the glider pilot suspected that the C303 pilot had not seen his glider and wisely turned L to avoid the approaching twin-engine aeroplane. It was plain from his own report that, in retrospect, he should have taken action at an earlier stage and the Members agreed with his frank conclusion. The Board decided that this Airprox had resulted from a non-sighting by the C303 pilot and late avoiding action by the T59 pilot.

Turning to the inherent Risk, the glider pilot had spotted the C303 at a range of over 3nm and maintained a watchful eye on it as it approached, subsequently taking robust action to increase the separation by pulling up sharply and turning L whilst keeping the aeroplane in view. This resulted in horizontal separation of 0·2nm the radar recording reflected. Although the vertical separation that existed could not be determined independently, the Members had no reason to doubt the veracity of the gliders pilot's estimate of the resulting separation of 200ft, after he had climbed his glider. The Members agreed unanimously that due to his actions, no risk of a collision had existed in these circumstances.

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

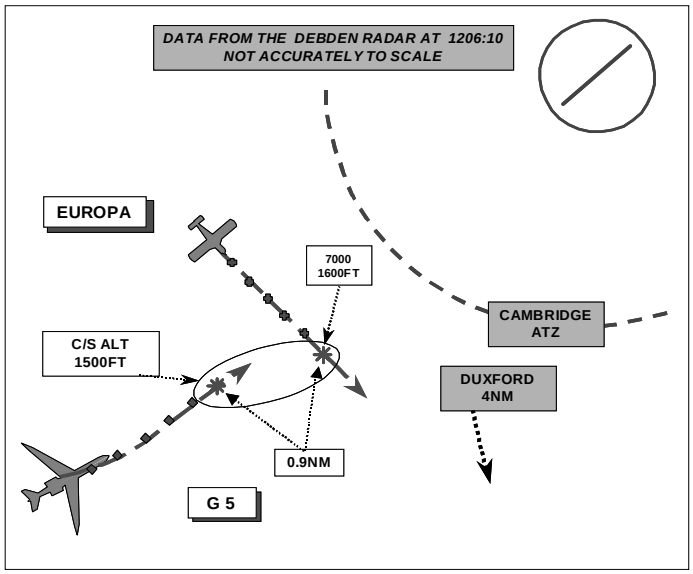
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT NO 2009-134

Date/Time:	17 Oct 1206 (Saturday)	
Position:	5208N 00003E (6nm SW Cambridge)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Gulfstream 5	Europa
Operator:	Civ Comm	Civ Pte
Alt/FL:	1600ft (QNH 1030mb)	2000ft (QNH 1030mb)
Weather:	NR CLOC	VMC NR
Visibility:	>10km	>10km
Reported Separation:	0ft V/1nm H	NR
Recorded Separation:	100ft V/ 0.9nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GULFSTREAM 5 (G5) PILOT reports flying a red and white ac, squawking with Modes C and S and in contact with Cambridge TWR, while on an NDB/DME approach to RW05 in good weather. They were established on the final approach at 1600ft just prior to the FAF when TWR advised that there was unknown traffic crossing overhead [he thought] the field. The ACAS was immediately checked and the traffic was displayed as being 2nm away and at their altitude, crossing from left to right; shortly after a TA was received. They saw a white, low-wing single-engine ac in their 2 o'clock position at about 2nm, just as they commenced their descent and reported the incident to TWR. He assessed the risk as being none. TWR advised that the unknown traffic was from Duxford and that it appeared to have entered Cambridge airspace without clearance [he thought].

THE EUROPA PILOT reports he took off from Sandtoft at 1120 for a private VFR flight to Duxford [7nm S of Cambridge] in a white ac with the strobe switched on, squawking 7000 with Mode C and at the time of the incident he was in contact with Duxford TWR. After initially being in contact with Doncaster Radar he then requested and was given a BS from Waddington LARS as he flew S past the Scampton, Waddington and Cranwell MATZs. Some distance S of Cranwell, Waddington told him that he was leaving their radar coverage so he set his transponder to 7000 with Mode C but continued a listening watch as he flew S past Conington and Wyton. At about 1200 when he had about 10nm to run to Duxford and was flying at between 2000 and 2500ft amsl, heading 160°, he contacted Duxford Information for joining instructions and they told him, as he expected, it was to be a RH cct for RW06. Since it was the first time he had visited the airfield, he had studied the inbound routes on the Duxford website and the airfield diagram on the AIS website.

He was also aware that there might be other traffic in the area so he was keeping a good lookout and was monitoring his Portable Collision Avoidance System (PCAS) device, which alerted him to a contact, at a range of about 2 or 3nm, he believed; it was showing the same alt but with a downward (descending) arrow (the type of PCAS he uses does not show the target heading). On looking out he immediately saw the ac with its landing lights on, on his starboard side between his 2 and 3 o'clock, slightly below his alt at a range of 1-2nm but he could not identify the ac type. At that point he thought he was still above 2000ft with a GPS groundspeed of 140kt.

On transferring his lookout to the port he could see Cambridge RW05 and, as he had crossed the extended centreline well out and the other ac was to his starboard side and was on a long final approach, he decided to not initiate any avoiding action but to continue at his current alt and heading, assuming the other ac would pass behind and below him. As it passed behind he could not maintain visual contact so he could not determine the separation or if it had taken avoiding action.

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

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

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

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

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

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

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

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

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were concerned that this was another conflict between IFR traffic on an instrument approach and a routine GA VFR flight, with both ac flying in Class G airspace. They also perceived that there is a widely held misapprehension that operating under IFR that affords some degree of protection or even priority over VFR flights. However, it is important to stress that for both these ac flying in Class G airspace, whether VFR or IFR, in transit or during an instrument approach, their pilots had an equal and shared responsibility under the Rules of the Air to see and avoid each other. Many busy airfields have instrument approaches through Class G airspace. Some of these, as in this case, have equally busy GA airfields in close proximity leading to local 'hotspots' or 'choke points'. Airfields with published instrument approaches have these 'approach lanes' clearly depicted on VFR charts

depicted by the 'feather' symbol; good practice, Members agreed, is to avoid the approach lanes or cross expeditiously at a height above or below the glidepath (300ft per mile out is a good guide for the glidepath) and call the ATC unit concerned.

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

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

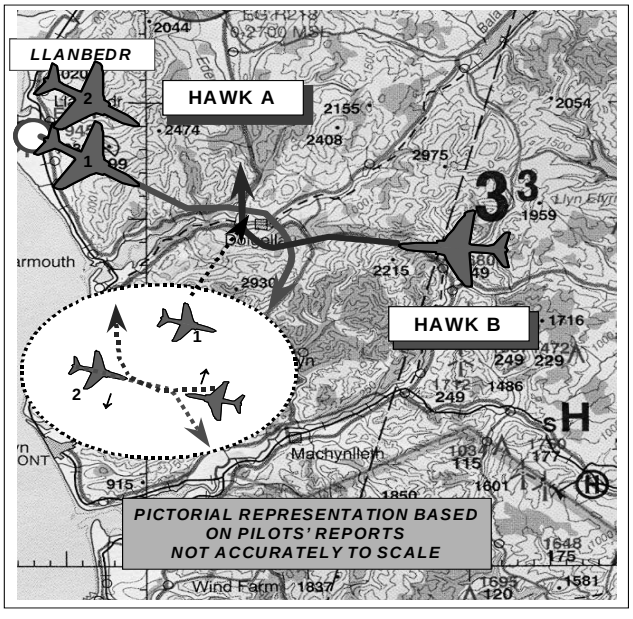
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT NO 2009-135

Date/Time:	14 October 1310	
Position:	5245N 00355W	(1nm E Dolgellau)
Airspace:	UKDLFS	(Class: G)
	Reporting Ac	Reporting Ac
Type:	Hawk T1	Hawk T1
Operator:	HQ AIR (TRG)	HQ AIR (TRG)
Alt/FL:	250ft	250ft
	(RPS 1017mb)	(RPS 1027mb)
Weather:	VMC HZBC	VMC CLBC
Visibility:	10km	>10km
Reported Separation:		
	500ft V/0m H	500ft V/0m H
Recorded Separation:		
	NR	



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK T1 (A) PILOT reports flying a black ac solo as a trainee, with HISLs and the nose light switched on, Squawking 7001 with Mode C but TCAS was not fitted. He was flying as No 2 in fighting wing (left) on his leader when they entered low level at 1300z. As they approached Dolgellau, heading 120° at 420kt, having passed over Llanbedr airfield, his leader transmitted on the VHF de-confliction frequency that they were entering low level and

heading for the Machynlleth Loop. As they approached Dolgellau from the W leader initially positioned to fly to the S of the town before changing to fly to the N; while the leader was moving to the N and he was crossing to the Southern side of his leader and separating to avoid flying over Dolgellau, he saw the nose light of another Hawk, about 500ft away, on a reciprocal heading, at the same level and in level flight. He immediately initiated a bunt and the other ac passed directly above him having initiated a climb. He reported the incident on the frequency in use, assessing the risk as being high. He noted that his lookout for other ac had been distracted while he was manoeuvring.

THE HAWK T1 (B) PILOT reports flying a black ac with a student in the front seat on a singleton low level training sortie, squawking 7001 with Mode C and listening out on the RAF Valley VHF deconfliction frequency; TCAS was not fitted. They planned to exit the Machynlleth Loop at 420kt, 2nm E of Dolgellau and were routeing towards Dolgellau with the intention of turning around the town to the right onto a track of 360°. Whilst looking to the right, out of sun, to clear the turn the front seat pilot became visual with another Hawk in their 2 o'clock at a distance of about 1nm and, simultaneously heard a transmission stating "XXX formation entering the loop at Dolgellau". They immediately started looking for the other formation member and, on looking to the front, the rear seat pilot saw the No2 ac a heading almost reciprocal to their own, slightly left of their nose, at the same height, with little horizontal separation and about 1000ft ahead. The rear seat pilot initiated a pull-up to avoid a collision but did not cross the flightpath of the other ac. The other ac had HISLs and its landing light switched on. They assessed the risk as being high and reported the incident on landing.

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

HQ AIR (TRG) comments that pilot of Hawk B had been flying a Free Navigation sortie in LFA 7 and had published his entry position/time and duration in the LFA. All the Hawk pilots were aware that other Hawk ac were operating in LFA 7. As part of the SOP the Hawk formation transmitted their entry intention and position into LFA 7 on the deconfliction frequency, which alerted the singleton Hawk and aided the sighting of the formation. Both pilots had sufficient time to take avoiding action.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots and a report from the Hawk operating authority.

The Board noted that both ac had been operating legitimately in the UKDLFS, Area 7, and in accordance with the Machynlleth Loop one-way procedures. One Member questioned, however, if the ac were adhering to the one way 'loop', why they had come into such close contact almost head-on. The Board Low Flying Advisor, while agreeing that at first sight the ac had been complying with the procedure, also agreed that, in this case the procedure had not prevented a head-on confliction on entry/exit to/from the loop. He informed the Board that Low Flying Squadron would review the procedure.

The Board also noted that both ac had been monitoring the RAF Valley local deconfliction frequency when Hawk (A) (Leader) made an 'entering low level' position report which had alerted Hawk (B) to the presence/proximity of the formation. Hawk (A) wingman, a solo student, was manoeuvring to avoid Dolgellau and had apparently allowed his lookout to be degraded slightly at a critical time, resulting in a late sighting of the opposing ac. A Military pilot Member pointed out that, despite being in a turn and possibly 'belly-up', the Lead pilot also had a lookout responsibility for his formation but apparently had also not seen Hawk (B) as it was not called to his wingman.

The Hawk (B) crew also saw the opposing Hawk late (300m away) while conducting free-nav, possibly due to the terrain and being distracted momentarily by their initial sighting of Hawk (A) Leader. With hindsight, the pilot might of considered responding to Hawk (A)'s RT transmission with his position (also near Dolgellau) or pulling up slightly to make his ac more visible to others. The Board noted that both crews initial sighting of the opposing ac had been by means of the nose light.

The Board noted the terrain in the incident area but were of the opinion that, even in the mountainous terrain, the pilots of both ac could have acquired the opposing ac earlier; had they done so and reacted promptly, a significantly greater safety margin would have existed. In the event, the lateness of sighting and resultant actions caused a reduction of normal safety standards.

AIRPROX REPORT No 2009-136

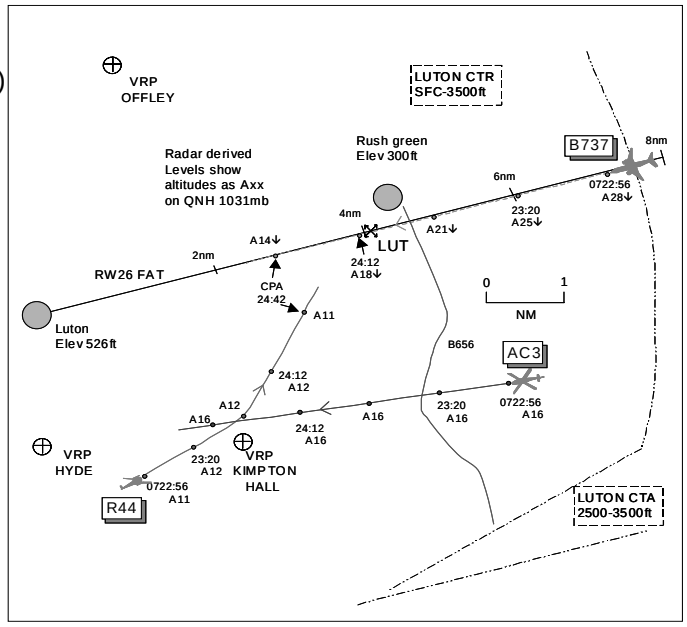
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by the pilots of Hawk (A) formation and the crew of Hawk (B).

Degree of Risk: B.

AIRPROX REPORT NO 2009-136

Date/Time:	13 Oct 0725	
Position:	5153N 00017W (3nm FIN APP RW26 Luton - elev 526ft)	
Airspace:	Luton CTR	(Class: D)
	Reporting Ac	*Reported Ac*
Type:	B737-700	R44
Operator:	CAT	Civ Pte
Alt/FL:	1000ft↓ (agl)	<1500ft (QNH)
Weather:	VMC CLBC	VMC NR
Visibility:	10km	NR
Reported Separation:	300ft V/1nm H	1nm H
Recorded Separation:	300ft V/0·9nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

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

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

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

ATSI reports that Air Traffic Services in and around London Luton airspace were being provided by a single controller on a combined Luton Intermediate and Director position at London Terminal Control, 'Luton Radar'. The

Luton CTR is Class D airspace. In accordance with the requirements of Class D airspace, Luton Radar has responsibility for separating IFR flights against other IFR flights and for passing TI to IFR flights on VFR flights operating in the CTR/CTA. In order to fly VFR in the Luton CTR, VFR ac are required to obtain a clearance from ATC and comply with ATC instructions (UK AIP ENR 1-4-5, 12 Feb 09).

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

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

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

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

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

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear that the R44 pilot was complying with the ATC route instruction and that the pilot was passed TI on the B737 in good time and saw it immediately. However, the reciprocal TI to the B737 crew was given late, the RT transcript revealing that the Luton Radar controller had apparently thought that he passed TI earlier when he transmitted *"...that er Robinson forty-four is..."* when this had been the first time that TI, on the R44, had been passed. Although the range given was 1nm, the actual separation was 2·2nm with the helicopter 600ft lower than the airliner. A commercial pilot Member commented that informing the IFR B737 crew that the R44 was routeing to Rush Green would be hard to assimilate, as the IFR flight would not be aware of the location of Rush Green unless the crew were locally based. When the B737 crew reported 'visual' it was unfortunate that they had sighted the A109, which was tracking SW'ly, S of, and parallel to, the ILS, not the R44. Following the pop-up TCAS TA

contact, the B737 crew were concerned as they appear to have thought the 'intruder' was unknown traffic passing close by, unaware that it was the R44 whose pilot was taking visual separation on their ac. The Luton controller had fulfilled his responsibilities with respect to Class D airspace, although earlier, more specific TI to the B737 crew would have given them more time to assimilate the relative positions and flight paths of the A109 and the R44. In the end the Board concluded that the TCAS TA 'sighting' had caused the B737 crew concern but that the TI, visual sighting and flightpath chosen by the R44 was enough to remove any risk of collision.

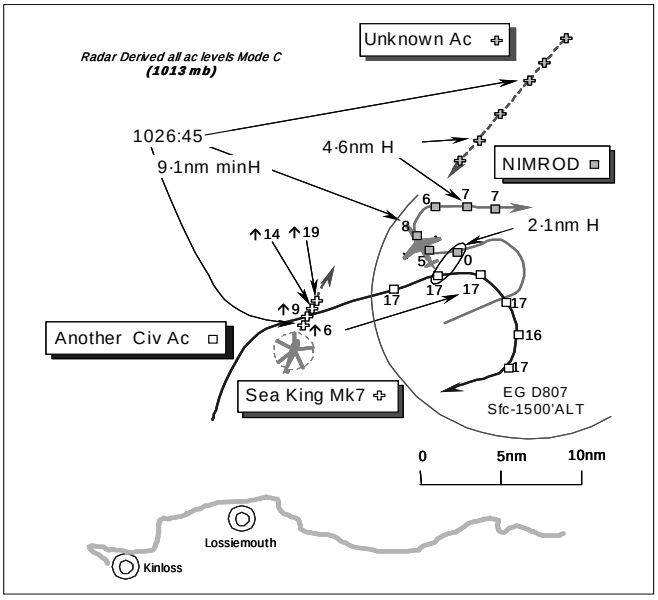
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report (TCAS).

Degree of Risk: C.

AIRPROX REPORT NO 2009-137

Date/Time:	13 Oct 1026	
Position:	5758N 00310W (18nm NNE of Lossiemouth - elev 22ft)	
Airspace:	EGD807/FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	BAe Nimrod MR2	Sea King
Operator:	HQ Air (Ops)	COS AV
Alt/FL:	500ft	2000ft
	QNH (1025mb)	(N/K)
Weather:	IMC In cloud	IMC In cloud
Visibility:	NR	NR
Reported Separation:		
	<2nm H	NK
Recorded Separation:		
	See text	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BAe NIMROD MR2 PILOT reports he was practising SAR procedures at low-level in EGD807 [Moray Firth sfc-1500ftALT]. The sortie was to culminate with the dropping of smoke and flame floats from the bomb bay. He was in communication with Lossiemouth ATC and HMS Illustrious, the latter providing a BS. A squawk of A3735 was selected with Mode C; neither Mode S nor any form of TCAS is fitted. The ac has a grey low-conspicuity colour scheme but the white HISLs and taxying lights were on.

Operating IFR in a level cruise at 500ft QNH (1025mb) in cloud, heading 270° at 220kt, the radar operator informed the flight deck of an airborne contact on a reciprocal track at a range of 5nm (i.e. within the lateral limits of D807). Radio contact was made with Lossiemouth ATC and Illustrious simultaneously, to ascertain information about the contact and its intentions. Lossiemouth ATC initially only held a contact on a civilian ac transiting overhead D807 at 2000ft. The Illustrious contacted a helicopter which had lifted from its deck 5min previously to ascertain the helicopter's position and course, believing it to have tracked N to avoid D807, and were told it had actually followed a track of 045° towards D807. The radar operator then informed the flight deck that the contact was now at 2nm so an avoiding action turn to the E was initiated and his ac climbed to an altitude of 1000ft. Lossiemouth ATC then informed them of a second contact within the bounds of D807. Due to the presence of this second unknown contact and the resulting lack of confidence in the protection that the Danger Area should have afforded, off-task procedures were initiated and they returned to base. The other ac was not seen and the Risk was assessed as 'very high'.

UKAB Note (1): The UK AIP at ENR 5-1-3-23 promulgates the limits of Danger Area EGD807 as a circle radius 10nm centred on 57°58'00''N 002°50'00''W, active Mon-Fri 0700-2359, surface to 1500ft amsl.

THE WESTLAND SEA KING Mk7 PILOT reports that he launched from Illustrious at 1020 for a training sortie. His helicopter has a grey low-conspicuity colour scheme but the white HISLs were on. He was in receipt of an ATS from Illustrious HOMER and a squawk of A0022 was selected with Mode C; neither Mode S nor any form of TCAS is fitted.

Heading N at 80kt under a BS, he commenced a climb but converted to a DS due to weather when he encountered IMC. He remained clear of D807 in the climb to 2000ft, whilst in transit to his operating area to the N. He remembers the Nimrod operating within D807, but that there was no confliction. After recovering to Illustrious at 1345, at no time in the de-brief was there any concern that there had been an Airprox or any infringement of the rules.

THE CONTROLLER MANNING HOMER reports that the ship was conducting flying operations outside and to the South of D807 to de-conflict with the promulgated activity of the Nimrod, whose crew called HOMER and was provided with a BS whilst operating within D807.

During the period the Nimrod was operating within D807, Illustrious launched a Sea King to conduct Air to Surface exercises some 70nm to the N. The Sea King was initially provided with a BS as it departed and climbed to the NNE. Prior to turning onto a track which would overfly D807, the Sea King crew confirmed that their helicopter was above 2000ft ALT – 500ft above the upper limit of D807 at 1500ft amsl. During the climb the Sea King crew requested a DS, which was provided following an avoiding action turn to the NW to remain 5nm/3000ft clear of the Nimrod. He then ascertained the Nimrod's altitude, which he believed was 800ft, and co-ordinated the 2 ac whilst they were on the HOMER frequency. The Sea King crew was then informed that they could resume their own navigation. Once the Sea King was 5nm clear to the N of D807, the Nimrod crew was informed that co-ordination was no longer required and that they were free to climb if required. The Nimrod conducted general handling for a further 10-15min before conducting a flypast of Illustrious and returning to Kinloss. At no time did the Nimrod pilot indicate that he wished to declare an Airprox.

SATCO ILLUSTRIOUS reports that no indication was given by the Nimrod pilot that an Airprox had occurred and it was several weeks later that the Nimrod pilot's report arrived onboard. In the intervening period the voice and radar recordings had been reused.

Consequently, the only evidence available was the report submitted by the controller manning HOMER, which was filed on receipt of the Nimrod pilot's report. On the available data, his investigation concluded that standard separation was applied where necessary. When the Nimrod crew finished their sortie some time after the Sea King had departed, they requested a fly past of Illustrious to conduct a photographic run and this was duly approved because of the benign cct state at the time. The Nimrod returned to Kinloss after this flypast and the crew did not, at any point, declare that they intended to file an Airprox.

In this instance the controller manning HOMER had been closed up for about 3hrs, having had a break around the midpoint of his watch. He had been working a Defence Watch routine (8 hours on 8 hours off) and was undoubtedly suffering from some fatigue, but no more so than would be expected from anybody else onboard. Prior to the occurrence a 4-ship formation of Harriers had launched and recovered with no complications in Visual recovery conditions.

The actions that the controller reports that he took were correct for the scenario described and there are no lessons identified or remedial actions required from this investigation.

UKAB Note (2): The still screen shots of the ScACC radar recording show the Nimrod manoeuvring as a secondary contact within D807 indicating 000 Mode C – about 360ft QNH (1025mb). Approaching the vicinity from the WSW is a Civilian ac, which is that reported by Lossiemouth to the Nimrod crew to be overflying D807 at 2000ft; the ac maintains a broadly level cruise at 1600-1700ft Mode C - about 1930-2030ft QNH (1025mb). Just before these two ac pass port-to-port abeam one another the Nimrod is westbound 1700ft below the civilian ac that is 2·1nm to the SW heading ENE. As they pass, the Civilian ac commences a R turn about WSW'ly and the Nimrod is shown in a climb through 500ft Mode C just before commencing a R turn about to the E. At 1026:45, the Sea King Mk7 is shown for the first time climbing through 600ft Mode C - about 960ft QNH – as the Nimrod turns

through N indicating 800ft Mode C at a range of 9·1nm which is the CPA to the Sea King. The Civilian ac has meanwhile turned R through S maintaining 1700ft Mode C and clears, whilst the primary contact of an Unknown ac is shown approaching the vicinity from the NE with no Mode A or C displayed and perceived to be the second contact reported to the Nimrod crew by Lossiemouth. As the Nimrod continues E at an indicated 700ft Mode C – 1060ft QNH – it passes 4·6nm S of the Unknown ac which then draws astern and the Sea King Mk7 maintains a steady climb through 1900ft Mode C – about 2260ft QNH – some 760ft above the upper limit of D807.

HQ AIR (OPS) comments that the Nimrod crew believed there was a confliction with them whilst they were IMC within sanitised airspace; they took a safe course of action to maximise separation by terminating their activity. In fact the other ac concerned were outside of the range and no confliction existed. Not immediately reporting the Airprox via RT to the controlling agencies significantly reduced the amount of evidence available to the investigating office.

HQ NAVY COMMAND had nothing further to add.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board readily understood the Nimrod pilot's concern that, whilst operating in D807 in IMC, they perceived another ac was flying in close proximity to them within the confines of the Danger Area. Nevertheless, it seems that the Nimrod's radar was unable to determine the height differential between their ac and other ac in the vicinity. The closest of these contacts was reported by his radar operator to be 2nm away and so the pilot, suspecting that it was the helicopter from Illustrious, elected to climb to 1000ft QNH. However, the ScACC radar recording showed that it was actually the civilian ac in the vicinity, indicating 1930-2030ft QNH – some 500ft clear above the Danger area throughout; it was 1700ft above the Nimrod's indicated level at a range of 2·1nm and not less than 1000ft above it when within a range of 5nm. Indeed the Nimrod's climb actually reduced the vertical separation against this civilian ac after they passed abeam one another.

It was unfortunate that the Nimrod crew had not reported the Airprox at the time it had occurred on RT to HOMER, and the general message here to all aircrew was to ensure that the controller providing the ATS was aware at the time of the incident that reporting action would be taken. It is far better to highlight the incident at once whilst it is fresh in the controller's mind. Subsequently, if it becomes clear that initial concerns were unfounded, the Airprox can be either downgraded to an occurrence or withdrawn.

Under the BS provided by HOMER onboard Illustrious, the controller had no responsibility to provide TI to the Nimrod pilot, but it seemed from the controller's recollection of the event that he had co-ordinated the Sea King's transit against the Nimrod under the DS provided to the helicopter crew when they encountered poor weather in the climb. The Navy Cmd Member advised that HOMER could also have provided a DS to the Nimrod crew if it had been requested at the time. Nevertheless, the ScACC radar recording shows that the Sea King did not enter the Danger Area at any stage during the period of this Airprox; the helicopter flying no closer than 9·1nm to the Nimrod as the latter turned away to the E, whilst the Sea King climbed above the upper limit of D807 and remaining clear of the lateral confines of the Danger Area as it did so.

The third contact in the mêlée at the time was an unknown ac that approached D807 from the N. As a primary contact with no Mode A or C, it remains unidentified and it is not feasible to determine its altitude. Thus there is no evidence to confirm whether or not it entered D807. The minimum recorded horizontal separation against this ac is shown as 4·6nm as the Nimrod flew E at about 1060ft QNH, the unknown ac clear to the N of the boundary of D807 at the time. However, its projected course suggests that the unknown ac passed through the NW'ly sector of the lateral confines of D807 after the Nimrod had cleared to the E, but at an undetermined altitude.

Board Members understood that the approach of this second unknown ac would have been of concern, but debated the pilot's comment about the lack of confidence in the protection that he believed the Danger Area should have afforded. The Board was acutely aware that the promulgation of a notified Danger Area does not guarantee exclusive use nor that other ac will remain clear of that airspace. The Board was briefed that no Statutory Instrument was applicable to this Danger Area which might prohibit entry to civilian ac and certainly two of the other three ac cited by the Nimrod pilot were undoubtedly outside the confines of D807 and clear of the Area during his

evolutions; in the case of the third unknown ac it remains unproven. Whilst the Board was not charged with the investigation of Danger Area infringements, the salutary lesson here was that the notification of an active Danger Area will not necessarily guarantee exclusive use of that airspace and that other measures might need to be taken to minimise any risk of an incursion. A possibility here was to use the resources of Illustrious perhaps to better advantage and a DS, even if it was limited at the extremity of radar coverage, could prove to be more beneficial than a BS when operating in IMC.

In their assessment of Cause and Risk, the Board could only consider what had actually happened and not what might have occurred if circumstances had been slightly different. Members therefore debated whether the presence of other ac in the vicinity constituted a Risk of collision with the Nimrod: plainly, in view of the recorded radar evidence, none were in direct conflict at close quarters. Therefore, Members agreed unanimously that this Airprox had resulted from an aircrew perceived conflict where no risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

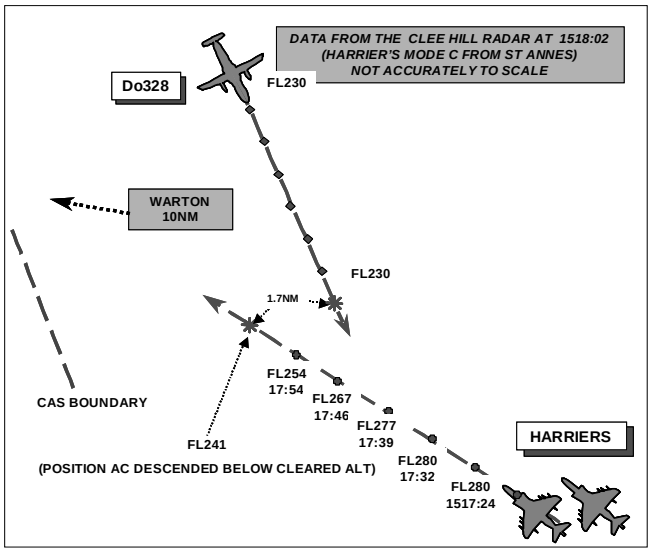
Cause: Aircrew perceived conflict.

Degree of Risk: C.

AIRPROX REPORT NO 2009-138

Date/Time: 22 Oct 1518
Position: 5345N 00235W (10nm E Warton)
Airspace: N615 (Class: A)
Reporter: Manchester ACC

	1st Ac	*2nd Ac*
Type:	Do328	Harrier
Operator:	CAT	HQ AIR (OPS)
Alt/FL:	FL230	FL230
Weather:	NR	VMC
Visibility:	NR	20km
Reported Separation:		
	NR	N/K



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

CONTROLLER REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

The Do328 pilot reported the incident at 1518:30 saying '*er yep two er military jets have just gone straight through our level within two miles of us'* and further stated '*yeah they were literally er two miles er to our righthand side they were I guess one thousand feet above us er till they passed our twelve o'clock and then they cleared our level'.* The MACC S29 Planner advised the Do328 pilot that the Harriers had *'bust their level'* and the pilot responded '*er Manchester C/S as we were visual with the jets coming in and we didn't get er a resolution advisory we won't be filling out paperwork'.* The Harriers then continued their descent and the separation opened.

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

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

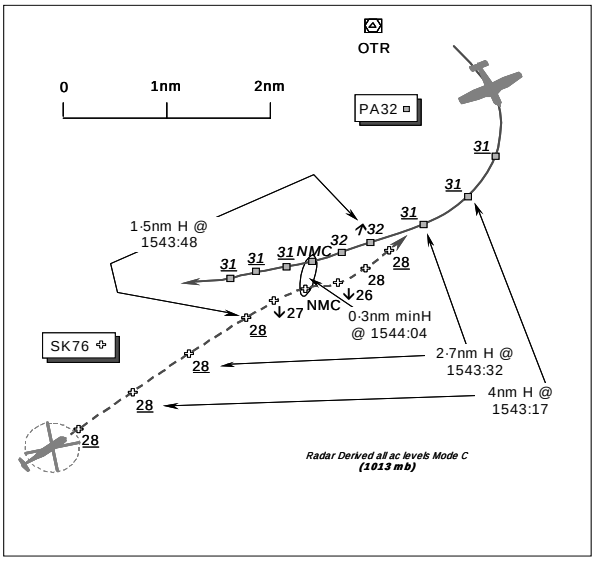
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT NO 2009-139

Date/Time:	30 Oct 1544	
Position:	5359N 00006W (3nm S of OTR VOR)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Sikorsky SK76	PA32
Operator:	CAT	Civ Pte
Alt/FL:	3000ft	3000ft
	QNH (1021mb)	QNH (1012mb)
Weather:	VMC	VMC
Visibility:	6km	1nm
Reported Separation:		
	300ft V/100m H	400ft V/500m H
Recorded Separation:		
	0·3nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SIKORSKY SK76 HELICOPTER PILOT reports that he was outbound from Humberside to the Minerva oil platform under VFR, below cloud in VMC, whilst in receipt of a TS from Humberside RADAR on 119·125MHz. The helicopter has a red, white & blue livery; the HISLs and forward facing searchlight were all on. The allocated squawk was selected with Mode C; TCAS is not fitted.

Approaching the S Bank of the Humber River on a heading of 060° at 140kt, in a level cruise at 3000ft QNH (1021mb), ATC advised them of traffic at the OTTRINGHAM (OTR) VOR, which would be turning NW at a similar altitude. They spotted the low-wing single-engine ac [the PA32] about 7nm away in a gentle turn, reported visual to RADAR, then kept an eye on it as it turned from an easterly direction and then towards them. The other ac's turn was shallower than expected and they realised that the ac was now flying a reciprocal heading towards them. He asked ATC for an update on the other ac's intentions but the closing speed was too great to wait for a reply, so to avoid the PA32 they banked sharply to the R and descended 300ft. The PA32 passed 100m to port about 300ft above them with a 'high' Risk of a collision.

He added that ATC said afterwards that because they were under a TS they were not allowed to give them updated information about the other ac. Because he was 'visual' at one point, the controller seemed to think he should not call the traffic again because of 'the rules'.

He stressed that he does not blame ATC or anyone. He does question whether under a TS 'the rules' put pressure on ATC to keep quiet unless they are 100% certain ac would otherwise collide.

In the MOR first rendered, the SK76 pilot commented that the previous Radar Information Service would have been more helpful in suggesting a possible confliction but under the new Traffic Service the ATC provider will keep quiet.

THE PIPER PA32 PILOT reports that he was operating VFR, in VMC 'on top', some 500ft above and 1nm clear of cloud. He had departed Sherburn-in-Elmet for a private strip near Finningley and was in receipt of a BS from Humberside RADAR on 119·125MHz, squawking the allocated code with Mode C; TCAS is not fitted. Flying level at 3000ft BARNSLEY RPS (1012mb) at 150kt, he had just completed a R turn over the OTR VOR onto a heading 265°. The SK76 helicopter was first seen off the port side and passed some 500m to port and 400ft below his ac. No avoiding action was necessary and he assessed the Risk as 'low'. His PA32 is coloured white, with blue and brown stripes and the HISL was on.

THE HUMBERSIDE APR reports that the SK76 helicopter was en-route offshore under a TS when the pilot was advised of traffic ahead of him at a similar level – the PA32; the pilot reported visual with the ac. As both ac came

into closer proximity, the SK76 pilot asked what the PA32 was doing and was informed that it was turning towards the NW. The PA32 pilot was informed about the helicopter and he reported visual with it. The SK76 pilot then advised that he had to take avoiding action by descending 300ft and he would be filing an Airprox.

The Humberside METAR for 1550UTC was: 14008 5000 HZ FEW035 14/11 Q1021.

ATSI reports that the PA32 pilot established communication with Humberside APPROACH (RADAR) at 1532 and was assigned a squawk of A4270. The pilot reported *"out of Sherburn routeing out to OTTRINGHAM turning at OTTRINGHAM and then back into a private site Finningley"*. Relative to Humberside Airport, OTTRINGHAM is situated approximately 12nm to the NE and the private strip at Finningley village (near Doncaster Sheffield Airport) is about 24nm to the WSW. The pilot requested a BS at 3000ft, to which the controller agreed. The BARNSLEY RPS (1012mb) was passed and the PA32 pilot was requested to report turning at OTTRINGHAM.

Some 7min later, the pilot of the SK76, which was outbound from Humberside on a VFR flight to the Minerva Rig, (situated over 40nm NE of the airport) made his initial call on the frequency. He reported *"just passing 2 thousand feet for 3 thousand feet 1-0-2-1"*. The helicopter pilot was informed his SK76 was identified (it was squawking 0241, an Anglia squawk), that he would be provided with a TS and advised the HUMBER RPS was 1017mb. The pilot read-back the ATS and RPS correctly.

(ATSI Note: There is a local agreement between Humberside ATC and the helicopter company for the provision of a TS for these flights. He was then advised he could set course on a direct track to the Minerva Rig.)

At 1542, the PA32 pilot reported *"OTTRINGHAM and in the turn"*. Shortly afterwards, at 1543:00, the controller issued TI to the SK76 *"there is traffic manoeuvring just through your 12 o'clock range of 4 miles similar level to yourself it's just commencing a right turn towards the Ottringham VOR"*. The SK76 pilot reported visual with the traffic. The radar photograph, timed at 1543:00, shows the helicopter tracking NE, maintaining FL28. The PA32, at FL31, is turning right, just over 1·5nm SE of OTR, onto a reciprocal track, at a range of 5·7nm. The PA32 was informed *"there is traffic to the southwest of you range of 3 and a half miles now similar level it's a helicopter has you in sight"*.

Shortly afterwards, the SK76 pilot asked *"Er RADAR ?????* [what] *is this aircraft doing* [C/S]". The controller responded *"He should be turning on to a northwesterly heading"*. He then asked the PA32 *"confirm you're gonna turn northwest or continue on the track the helicopter's er just to the south of you by half a mile"*. The PA32 pilot reported visual with the helicopter at 1544:00. Thereafter, the pilot of the SK76 commented that he had to take a hard right avoiding action turn, descending 300ft. After the event, discussion took place between the controller and the pilot of the SK76, about the intentions of the PA32. The controller stated *"he was manoeuvring at Ottringham and then turning onto a westerly heading routeing back towards Finningley"*. He continued *"..he told me he was turning at OTTRINGHAM and at OTTRINGHAM he's turning back onto a westerly heading"*. The controller believed that the PA32 pilot intended setting course to Finningley from overhead the OTR VOR. Consequently, when he observed it in a wide right turn after the pilot had reported at OTR, he believed the ac was turning back to the beacon, before setting course. This explains why he, initially, informed the SK76 that the traffic was turning right towards OTR and, subsequently, that it should be turning on to a NW heading.

In accordance with the TS being provided to the SK76, TI was issued about the PA32, albeit its pilot may have been misled about the intended routeing of the PA32. Both pilots reported visual with the other ac.

The radar recordings show that when the distance between the aircraft had reduced to 1·5nm, the PA32 and the SK76 were at FL28 and FL32 respectively. By now the PA32, still in the SK76's 12 o'clock position, had commenced a gentle R turn. This turn continued and at a range of 0·9nm, the SK76 was at FL27 and the PA32 at FL32. The PA32 passed 0·3nm N of the SK76, which had also commenced a R turn, but at this time the SSR Mode C returns of the subject ac were not displayed. Just after passing each other, when the range between them was 0·5nm, the PA32 was at FL31 and the SK76 at FL26.

The SK76 pilot commented in his CAA 1601 MOR: 'The previous Radar Information Service would have been more helpful in suggesting a possible confliction but under the new Traffic Service the ATC provider will keep quiet.

RIS was defined as 'an air traffic radar service in which the controller shall inform the pilot of the bearing, distance and, if known, the level of the conflicting traffic. No avoiding action shall be offered. The pilot is wholly responsible for maintaining separation from other aircraft, whether or not the controller has passed traffic information'.

A Traffic Service is defined as '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'.

In the circumstances of this Airprox, the required traffic information should have been the same, whichever service was being provided.

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 a report from the appropriate ATC authority.

It was evident to the Board that this Airprox had stemmed from Humberside APR's confusion over the intentions of the PA32 pilot. The SK76 crew was not on frequency when the PA32 pilot initially reported to the APR that he would be "*..turning at OTTRINGHAM..back into a private site Finningley*". It was some 7min later that the SK76 crew called the APR for a TS. When the PA32 pilot subsequently reported turning at the OTR, the controller passed TI to the SK76 crew about the PA32, *"..traffic manoeuvring just through your 12 o'clock range of 4 miles similar level to yourself it's just commencing a right turn towards the OTTRINGHAM VOR"*. Thus the SK76 crew were under the false impression that the PA32 would continue its right turn to the OTR, whereas it was actually routeing direct to Finningley to the WSW. Controller Members emphasised that the PA32 pilot had done exactly what he said he was going to do to, but it was easy to see why the SK76 crew, expecting the PA32 to continue towards the Ottringham VOR and fly clear to the L of their intended track, was perplexed. Hence the SK76 crew's subsequent query as to what the PA32 was doing and the confusion evident when the APR reinforced the perception that the PA32 pilot was doing something unexpected by adding that "*he should be turning on to a north-westerly heading".* Although the APR might have slightly underestimated the separation between the aircraft when he first passed TI (4nm) to the SK76 – the radar recording reveals that the two ac were over 5nm apart - the SK76 pilot had acquired the PA32 at a range of about 7nm; he reported this to the APR and kept the PA32 in sight as they maintained their NE'ly course. Having been given TI and told that the PA32 was manoeuvring, experienced pilot Members confirmed that under the TS, having sighted the other ac at range, despite being misled about the intended routeing of the PA32, the SK76 crew had a responsibility to avoid the other ac and maintain appropriate separation against it.

The PA32 pilot was operating legitimately under VFR in the 'open FIR' where he had equal responsibility for avoiding other ac. Although there was no requirement under the provisions of a BS for the APR to pass TI to the PA32 pilot he had conscientiously warned the PA32 pilot about the helicopter approaching from the SW, adding that the SK76 crew had his ac in sight. When the PA32 pilot reported he had sighted the SK76 to port and below his aeroplane, it was moments before the CPA and after the APR passed a further warning about the helicopter. It was evident that the PA32 pilot did not take any avoiding action himself. A pilot Member pointed out that the SK76 had reported flying below cloud in VMC, whereas the PA32 pilot said he was VMC 'on top', some 500ft above cloud. The reported Humberside weather gave FEW at 3500ft, which might have been a factor here in the relatively late sighting by the PA32 pilot.

Taking all these factors into account, it seemed that the SK76 crew had been surprised by the unexpected close quarter's situation, but had taken robust action to increase the separation by descending and turning R off their track. Having seen the PA34 and descended as they passed 0·3nm abeam one another, the SK76 crew's descent had subsequently increased the separation to about 500ft below the PA32. Nonetheless, the radar recording showed that the two ac were always separated by a minimum of 300ft as they approached each other. Consequently, the Board concluded that this Airprox was the result of a sighting of another VFR flight in Class G airspace. In the Board's view, having sighted the PA32 and decided to increase the separation, the helicopter pilot had fulfilled his responsibilities entirely and that no Risk of a collision had existed in these circumstances.

AIRPROX REPORT No 2009-141

Turning to the SK76 pilot's comments relating to the old RIS and the newer TS that had replaced it, ATSI's explanation had shown that there is no significant difference in the definition of either ATS. Under both forms of ATS, once the pilot had been passed TI by the controller, it was the pilot's responsibility to ask for an update. Moreover, in the application of either service, the 'rules' did not constrain the controller from issuing a warning about other traffic that might constitute a hazard if it was considered necessary, as indeed the APR had done here.

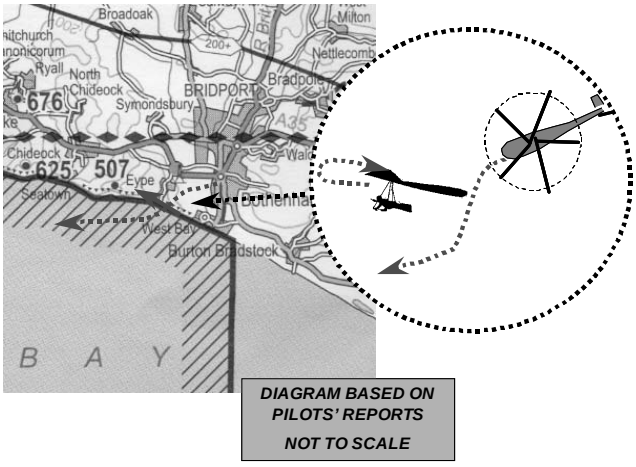
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting Report.

Degree of Risk: C.

AIRPROX REPORT NO 2009-141

Date/Time:	28 Oct (Wed) 1157	
Position:	5043N 00247W (Bridport)	
Airspace:	Lon FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Paraglider	Sea King MK4
Operator:	Civ Pte	HQ JHC
Alt/FL:	290ft	200ft
	(QNH 1013mb)	(N/K)
Weather:	VMC	VMC
Visibility:	10nm	>10km
Reported Separation:		
	0ft V/ 200m H	30ft V/300m H
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

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

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

On notification of the Airprox 3 weeks after the event, he contacted the crew and they confirmed his recollection of events. As they climbed to 200ft agl to cross a headland just to the SW of Bridport, while heading 260° at 90kt,

they saw a paraglider 700m away on the top of the headland. He instructed P2, who was the handling pilot in the LHS, to turn left (out to sea) to give the glider room and ensure that it was not forced over the water. The aircrewman monitored the relative position of paraglider to ensure they were a safe distance away before they turned back on track and continued over the land. They did not come any closer than 300m to the glider, a distance he considered suitable considering the late sighting.

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

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

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

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

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

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

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

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

AIRPROX REPORT No 2009-142

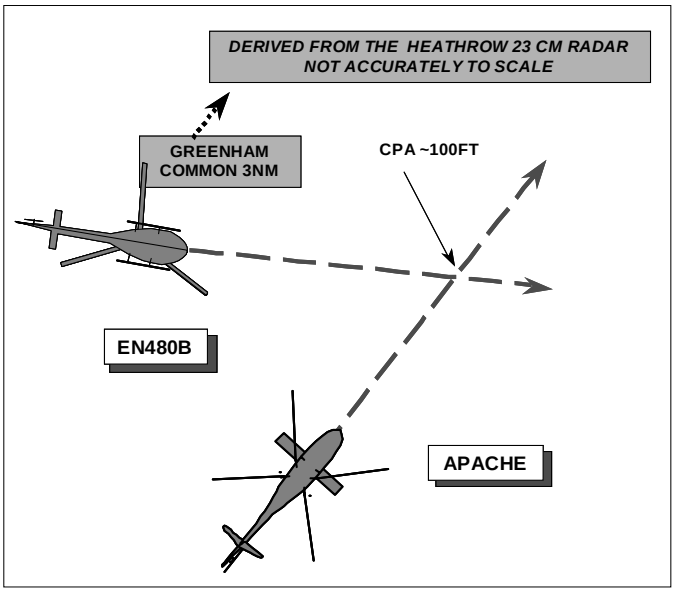
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT NO 2009-142

Date/Time:	13 Oct 1433	
Position:	5120N 00121W (3.5nm SW Greenham Common)	
Airspace:	UKDLFS/LON FIR(Class: G)	
	Reporting Ac	*Reported Ac*
Type:	Apache	Enstrom 480B
Operator:	HQ JHC	Civ Pte
Alt/FL:	1500ft (QNH 1027mb)	1500ft (QNH)
Weather:	VMC CAVOK	VMC CAVOK
Visibility:	>10km	20km
Reported Separation:	100ft V/0m H	200ft V/Nil
Recorded Separation:	100ft V/ <0.1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

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

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

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

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

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

UKAB Note (1): ATSI contacted Farnborough who stated that the EN480B called them at 1429 and was advised to standby. This was due to the controller attempting to split the cross-coupled Approach and LARS West

frequencies. Once this split was achieved at 1433, the ac was given a BS. The pilot did not mention an Airprox on the RT so the controller did not complete a report.

UKAB Note (2): An analysis of the Heathrow 23cm, 10cm and Clee Hill radars shows the event, both ac squawking 7000 with Mode C. The Apache approaches the CPA tracking 045° and the EN480B 095°, as both pilots reported (on a line of constant bearing). Initially the EN480B is at an alt of 1700ft and the Apache 1600ft (Mode C – accuracy 200ft). When the ac were about ½ nm apart the EN480B descends by about 100ft (no Mode C on sweep of the CPA) to pass below the Apache before recovering to 1600ft. Both tracks suffer from jitter so individual returns have not been depicted on the diagram above.

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

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

PART C: ASSESSMENT OF CAUSE AND RISK

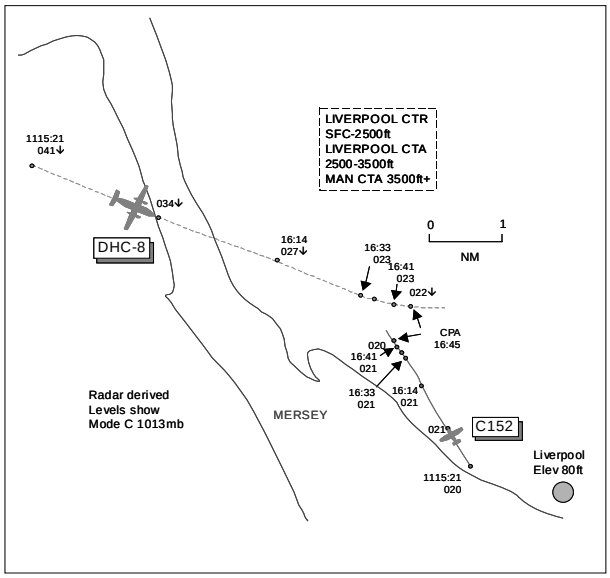
Cause: The EN480B pilot flew close enough to the Apache to cause its crew concern.

Degree of Risk: C.

AIRPROX REPORT No 2009-143

AIRPROX REPORT NO 2009-143

Date/Time:	7 Nov 1117 (Saturday)	
Position:	5322N 00255W (3·25nm NW Liverpool - elev 80ft)	
Airspace:	CTR	(Class: D)
	Reporting Ac	*Reported Ac*
Type:	DHC-8	C152
Operator:	CAT	Civ Trg
Alt/FL:	↓1600ft (QNH 992mb)	NR (QNH)
Weather:	VMC CLBC	VMC NR
Visibility:	10km	NR
Reported Separation:	200ft V/NR H	NR
Recorded Separation:	200ft V/0·6nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

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

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

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

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

At 1110:00, the DHC-8 flight, inbound on an IFR flight from the Isle of Man, established communication with Liverpool Approach, reporting descending to FL70 to TIPOD; the ac was 33nm NW of the airport at the time. The pilot was informed that he would be vectored to the ILS RW27, No 1, with no speed restriction. The flight was turned L heading 115° and descended to an altitude of 2500ft. Subsequently, at 1114:40, when it was 12nm NW of the airport, the DHC-8 was instructed to turn L heading 095°, to position RH downwind for RW27. The pilot commented, *"we're visual if that helps".* The controller replied, *"affirm you're cleared for the visual approach traffic is a police Islander operating currently at the Runcorn Bridge not above Fifteen Hundred feet and they'll be routeing to Widnes shortly"*. The pilot acknowledged the information. The APR stated that he would usually limit ac on visual approaches initially to an altitude of 2500ft, to ensure 1000ft vertical separation from outbound VFR

traffic. He could not explain why he had not passed the instruction on this occasion. However, his subsequent actions were based on the belief that the altitude restriction had been issued. The APR telephoned the ADC to inform him that the DHC-8 was making a visual approach. This was acknowledged by ADC, who reported it would be No 2, following cct traffic. The APR said he would keep the DHC-8 until it was visual with the Islander.

Meanwhile, at 1112:30, the C152 flight, in contact with Liverpool Tower, had been cleared for take-off, with a R turn out, from RW27. It was departing to the NW, not above 1500ft, on a local VFR flight. VFR flights are routinely cleared to leave the Liverpool CTR VFR, not above 1500ft, to squawk 0260, the Liverpool conspicuity code. No departure release is requested from Approach but fpss on these ac are provided to Approach Control and this position is then subsequently informed of its departure time. Approximately 2min after the ac had been cleared for take-off, the C152 was transferred to Liverpool Approach. On initial contact, the pilot of the C152 reported enroute to Seaforth, which is a VRP situated on the northern edge of the Liverpool CTR. The radar timed at 1115:21, as the C152 flight makes its initial call, shows it tracking NW, squawking 0260. The SSR Mode C of the C152 shows it at FL020, which is equivalent to an altitude of 1400ft on the Liverpool QNH 992mb. The DHC8 is 7·9nm NW of the C152, passing FL041 (3500ft QNH), with its Mode S return, which is not available to Liverpool controllers, showing it descending to an altitude of 1600ft. The C152 flight was requested to report leaving the Zone. The pilot asked to climb to 2000ft to which the controller replied, *"maintain fifteen hundred initially got inbound traffic"*. The controller still believed that the DHC8 was descending to 2500ft and the 2 ac would be separated by 1000ft. Consequently, he considered that it was not necessary to issue further TI at the time. He also believed that the DHC-8 would make a wider visual cct than it actually carried out.

At 1116:15, the APR, realising that the DHC-8 had descended below 2500ft, advised the pilot *"there is light aircraft in your right two o'clock range of two miles Fifteen Hundred feet and below and the circuit's active as well"*. The traffic was the subject C152 at FL021 (1500ft QNH), which was now 2·7nm SE of the DHC-8 and passing FL027 (2100ft QNH) and descending to 1600ft. No further information was passed to the subject flights about each other. After TI about the Islander was updated, the DHC-8, at 1117:30, was instructed to contact the Tower frequency. By this time, the DHC-8 was N of the airport, well clear of the C152.

[UKAB Note (2): The radar recording at 1116 33 shows the DHC-8 levelling-off at FL023 (1700ft QNH) and crossing 1·1nm ahead of, and 200ft above, the C152. The next radar sweep shows the horizontal separation reducing to 1nm with the DHC-8 commencing a L turn followed, on the next sweep 4sec later, as separation just over 0·6nm and still 200ft. The CPA occurs at 1116:45, as the C152, now indicating FL020 (1400ft QNH) passes just less than 0·6nm SSW of the DHC-8, which is now descending through FL022 (1700ft QNH).]

The MATS Part 1, Section 1, Chapter 2, Page 1, states the minimum services to be provided by ATC in Class D airspace: *'(a) Separate IFR flights from other IFR flights; (b) Pass traffic information to IFR flights on VFR flights and give traffic avoidance if requested; (c) Pass traffic information to VFR flights and other VFR flights'*. On this occasion, the C152 was advised that there was an inbound ac but with no further information and the DHC8 was informed about the C152, albeit when the distance between the ac had reduced to about 2·7nm. Up to that point, the controller believed that the 2 ac would be separated vertically, by 1000ft.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

Members agreed that the passing of TI on the Islander ac operating at Runcorn Bridge had not helped the DHC-8 crew's SA with respect to the closer C152. The C152 had been given generic TI on the DHC-8 as *"...got inbound traffic"* when the pilot requested climb to 2000ft but this was not updated when the DHC-8 descended through

2500ft and flew closer to the airport than the APR anticipated. The APR gave TI to the DHC-8 crew, albeit late; however, by that stage the crew already had the 'heads-up' from TCAS of the potential conflict with the C152 and arrested their descent at 1800ft simultaneously as a TA was generated. After visually acquiring the C152 2nm away and 200ft below, they made a L turn away from it. Although this had been a slightly untidy affair, the Board believed that the good SA, visual sighting and subsequent actions taken by the DHC-8 crew were enough to ensure any risk of collision had been quickly and effectively removed.

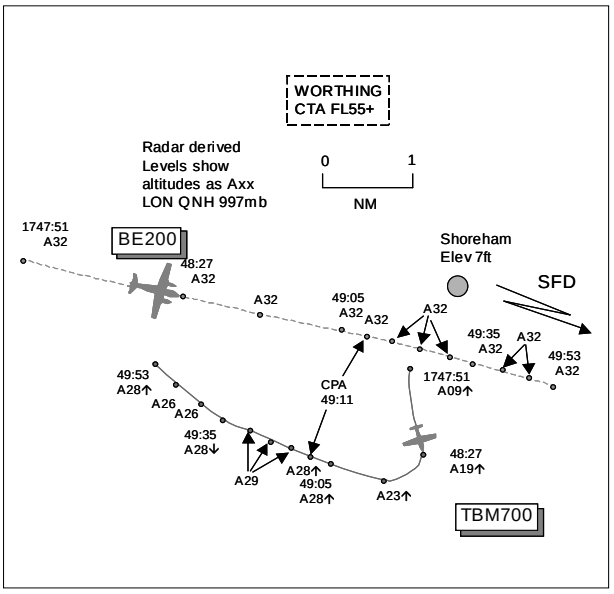
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT NO 2009-144

Date/Time:	6 Nov 1749	NIGHT
Position:	5049N 00020W (2nm SW Shoreham - elev 7ft)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	BE200	TBM700
Operator:	Civ Comm	Civ Pte
Alt/FL:	3200ft (QNH 997mb)	3000ft↑ (QNH)
Weather:	IMC KLWD	IMC KLWD
Visibility:	NR	NR
Reported Separation:	NK	500ft V/700m H
Recorded Separation:	400ft V/1·6nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BE200 PILOT reports approaching Shoreham from the W, descending to leave CAS E of SAM and being given a handover to Shoreham Approach on 123.15MHz. He was IFR and in receipt of a PS from Shoreham Approach, squawking 7000 with Modes S and C. He was instructed to descend, maintain and report level at 3200ft; at the time he was routeing direct to SHM and expecting a hold and procedure. Then he was told to establish inbound to SFD VOR and report the radial. He turned R about 10° and informed Approach that he was established on the SFD 285R inbound heading 105° at 160kt and maintaining 3200ft. He was told to maintain for coordination with departing traffic and to expect this level until E of Shoreham. The A/P was engaged with the Flight Director in HDG and ALT HOLD Mode with 3200ft in the pre-select window. He was aware of the departing TBM700 flight being instructed to climb and maintain 2200ft due to traffic and heard its pilot report established on the 280R from SFD. The controller later asked the TBM700 pilot to confirm his altitude to which the pilot replied, *'I'm sorry we seem to have gone through we are now at 3200ft'*. The controller informed the TBM700 pilot that he had bust his assigned altitude and asked him his range from SFD; the controller then asked for the BE200's range, which he thought was 23D. He was then informed about the level bust and that a risk of collision existed. At the time he was about 4nm W of Shoreham in cloud at night so he did not sight the other ac. He was not aware of the relative position of the TBM and he didn't know what corrective action had been taken, if any, by its pilot so he was unable to take evasive action. The TBM pilot asked if he should climb or return to 2200ft and was told he might as well climb to FL50 now as he had passed the traffic. The controller informed the TBM pilot that he would be

filing for the 'level bust' and the flight was then transferred to London. Neither the controller nor TBM pilot mentioned an Airprox. He was then cleared back to the beacon for the approach and was asked for any information he had from TCAS; he informed ATC that the ac was not TCAS equipped. He assessed the risk as medium.

THE TBM700 PILOT reports outbound from Shoreham IFR and in communication with Shoreham Approach on 123·15MHz squawking 3266 with Modes S and C; TCAS I was fitted. After line-up on RW20 at Shoreham ATC gave a new clearance, amending departure from direct GWC at FL50 to intercept the SFD 268R, he thought [actually 280R] at altitude 2200ft; this occurred the last second before departure roll. The Flight Director was set for the revised clearance and an immediate take-off commenced without discussion between pilots. (The co-pilot was in all respects his senior being a qualified instructor/examiner with over 20000hr). Soon after take-off the radial began to move and he commenced a R turn to complete the intercept. At this point the co-pilot told him to stop the turn and continue RW heading until on the radial. He immediately turned the ac onto RW heading, which was inconsistent with the FLT DIR indications but he followed the co-pilot instructions, which subsequently included 'continue the climb'. His concern at this time was adjusting the navigation instruments and engaging the A/P and when range 5nm QDR200° SHM they turned R. However at 3000ft and 140kt he queried with the co-pilot if he was happy they were above 2200ft and he said *'call Shoreham'*. At that moment Shoreham requested their height, which he gave as 3000ft, he thought. He was aware there were other ac in the area inbound to Shoreham on an IFR plan and that his co-pilot had in front of him the MFD, which was selected to traffic. The co-pilot later told him that the other traffic was seen on TCAS at 8nm and that it passed 700m away and 500ft above; at the time they were in cloud and rain with no visibility in the open FIR. In retrospect, as pilots they should have discussed and agreed their understanding of the very late clearance; had there been a difference they could have clarified it with ATC. He assessed the risk as none.

THE SHOREHAM ADC/APP reports the incident occurred 3nm SW of Shoreham with both ac under a PS. The TBM700 flight was cleared to 2200ft on the SFD 280R outbound towards GWC whilst the BE200 was cleared at 3200ft inbound SFD 285R. The TBM700 pilot reported at 3600ft, he thought, when he believed the ac was very close to the BE200, about 3nm SW of SHM.

ATSI reports that the Airprox occurred at 1749 UTC, 3nm SW of Shoreham Airport in Class G airspace. Both flights were operating IFR and in receipt of a PS from Shoreham ATC operating a combined Aerodrome and Approach control service on frequency 123.150MHz with RW20 in use. Approach aids are situated on the airfield and include VDF, the SHM(L) NDB and the SRH DME. Shoreham Approach also utilised the SFD VOR/DME situated 16·5 nm E of the airfield.

METAR EGKA 061750Z 21019G29KT 5000 RA SCT007 BKN011 OVC017 11/11 Q0998.

The TBM700 was given start and taxi clearance and at 1740 ATC passed departure instructions, *".....after departure right turnout on track Golf Whiskey Charlie climb flight level five zero to remain outside of controlled airspace squawk three two six six and when instructed contact London Control one three three decimal one seven five".* The TBM700 pilot read back the clearance correctly and requested clarificaton of the requirement to climb outside CAS. The controller confirmed this and the aircraft, now holding at GOLF, was instructed to call ready for departure.

Shoreham MATS Pt2, Section 4, Page 4, Para 6 states: *'Aircraft inbound to Shoreham are normally cleared to leave CAS in the descent for the SHM NDB. There will not necessarily be any prior co-ordination or even notification of an IFR inbound……..'*. There was no prior coordination from London Control and at 1743:05 the BE200 flight called Shoreham Approach *"...er passing six thousand feet descending two thousand two hundred we've got er twenty two point five miles to run"*. Its pilot passed an estimate for Shoreham of 1748 and ATC requested clarification of the passing level and range before passing the new QNH 998mb.

There now existed a conflict between the inbound BE200 and outbound TBM700 waiting at the holding point. The controller elected to utilise the SFD VOR/DME and provide 1000ft vertical separation between the two ac. At 1744:00, ATC instructed the BE200 aircraft to, *"...descend initially to altitude three thousand two hundred feet and er report reaching";* this was correctly read back by the pilot. The TBM700 flight was then instructed to line up RW20 and was passed the new QNH of 998mb. At 1744:35 ATC requested the BE200 flight, *".....separation can you establish on a radial to Seaford and report that radial please"*. The BE200 pilot reported established on the SFD 285 inbound radial with a reported range from SFD of 28nm. At 1745:10 the TBM700 was lined up RW20

and ATC advised, *".....revised clearance after departure climb to altitude two thousand two hundred feet and establish on the er outbound Seaford two eight zero radial".* This was acknowledged with, *"understand two thousand two hundred and outbound Seaford which radial please".* The controller repeated the radial of 280 which was correctly readback. At 1746:00 the TBM700 was cleared for take off, *".....report reaching two thousand two hundred feet the wind two one zero degrees one seven clear take off."* Shortly afterwards, at 1746:30, the BE200 reported level at 3200ft.

At 1748:30, after a request from ATC, the TBM700 pilot reported established on the SFD 280 radial at range 17nm from SFD and the BE20 reported at 18miles from SFD. At 1749:05 the controller asked the TBM700 pilot to, *"TBM700 c/s report your level"* and the pilot replied, *"unfortunately we seem to be er we've gone through to three two".* It is believed that the pilot of the TBM700 is refering to FL32 which converts to altitude 2795ft (27ft per mb QNH 998mb). Radar recordings show the 2 ac passing 1·6nm abeam each other 1749:11 with the BE200 maintaining altitude 3200ft and the TBM700 passing altitude 2800ft in the climb. Vertical separation did not exist.

MATS PT2, Section 1, Chapter 3, Para 4, states: *'Essential traffic is traffic which is separated for any period by less than the specified standard separation. It is normally passed in situations when ATS surveillance systems are not available. Essential traffic information passed to an aircraft shall include:*

a) Direction of flight of conflicting aircraft;

b) Type of conflicting aircraft;

c) Cruising level of conflicting aircraft and ETA for the reporting point, or for aircraft passing through the level of another with less than the normal separation; the ETA for the reporting point nearest to where the aircraft will cross levels; and

d) Any alternative clearance'.

The controller responded, *"Roger essential traffic information opposite direction King Air passing through your level three thousand two hundred".* The pilot of the TBM700 reported *"understood we're descending".* ATC then passed TI to the BE200 just before 1749:30, *"BE200 c/s essential traffic information similar position T B M seven hundred level bust er three thousand two hundred".* The TBM700 was asked to transmit for DF and at 1749:52 the controller advised the TBM700 pilot, *".....I believe you are clear of that traffic and continuing the climb to five zero will probably benefit you now",* and the pilot replies, *"Thank you we got him on TCAS".* At this point radar recordings show that the 2 ac have passed abeam, with the BE200 positioned to the SSE of Shoreham at altitude 3200ft and the TBM700 to the SW of Shoreham at altitude 2600ft at a distance of 4·1nm and increasing. The controller then descends the BE200 to 2200ft and instructs the flight to continue on the radial for the moment.

At 1750:32 ATC requested the TBM700 pilot to, *"....report your passing level".* The pilot advises *"er we're on er five thousand feet now".* At this point the vertical separation has been re-established and the controller transfers the TBM700 to London Control and gives the BE200 clearance to return to the SHM for an NDB DME approach for RW20. ATC asks the pilot of the BE200 for any information that may have been derived from TCAS to which the pilot reports, *"er negative TCAS...."*.

The MATS Part1 Section 1, Chapter 11, Page10, Para 6.1 6.1.1 states that: *'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."*

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 expressed concern with respect to CRM within the TBM700 cockpit. It was unclear whether this was a single pilot or 2 crew operation or who was the commander of the flight. Members agreed that a crew brief should have taken place before taking off after receiving a revised ATC clearance immediately before rolling –

experienced CAT Members advised that pilots generally feel an imperative to roll immediately after taxiing into position on the runway, but a short hold there rarely causes undue difficulty for other traffic or ATC. This would have ensured that the new outbound track, based on a SFD radial, and the stop-off altitude were correctly understood by both pilots. As it was, the PF, whilst concentrating on the NAV intercept element, then allowed himself to be 'directed' by the co-pilot during a critical phase, immediately after departure when 'after take-off checks' are carried out whilst in IMC. This led to the TBM700 pilot climbing above his assigned altitude and into conflict with the BE200, which caused the Airprox.

As the late clearance aspect had sowed the seed for the Airprox, a pilot Member wondered whether there should be a 'standing agreement' between London TC and Shoreham whereby inbound traffic leaving CAS descends to an intermediate level (FL50) which would allow the use of FL40 for outbound traffic. Although this was thought to be good in principle, under the present arrangement there is the flexibility for Shoreham to manipulate the traffic situation, which is very much dependant on updated ETAs from the inbound ac and the controller not knowing how much time the departing flight needs before being ready for take-off. The consensus of opinion was that the ADC/APP had been as expeditious as possible, he had not delayed either flight unnecessarily and that the existing arrangement was adequate, subject to pilots complying with their ATC clearances.

Members commended the 'defensive' technique utilised by the ADC/APP when he placed the subject ac on different radials separated by 5° when he endeavoured to provide PS in this non-radar environment. This had effectively built in some lateral separation as well as the intended vertical separation from his assigned altitudes. The BE200 pilot was undoubtedly concerned when he heard the TBM700 pilot reporting his 'level-bust', knowing that the ac was in his immediate vicinity but being unable to see it owing to IMC. Correlating this transmission to the radar recording, it certainly appeared that the TBM700 pilot was making reference to FL32 (about 2800ft QNH) and not altitude 3200ft. Following his receipt of essential TI, the TBM700 pilot reported descending, which is borne out by the radar as the ac peaks at altitude 2900ft before descending quickly to 2600ft. Unbeknown to the BE200 pilot, his ac was displayed on the TBM700's MFD (TCAS) and was seen to pass to the N in the opposite direction 500ft above. Although this had had the potential to be a serious incident, the actions taken by the ADC/APP and the TBM700 pilot when combined with actual geometry of the encounter that pertained, were enough to persuade the Board that although deconfliction minima had been breached (<1000ft vertical separation), any risk of collision had been quickly and effectively removed.

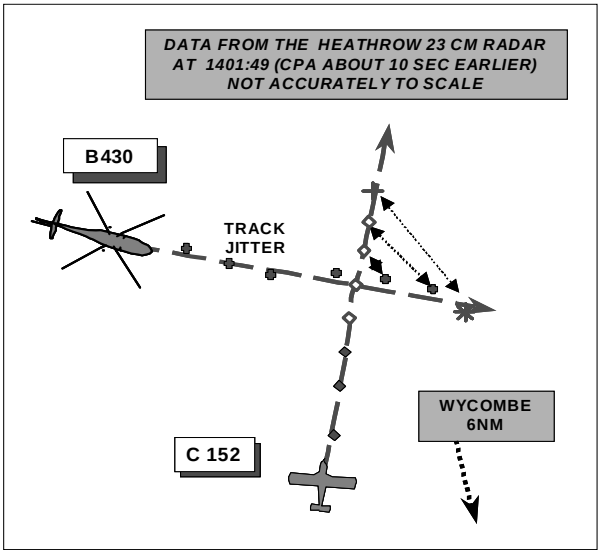
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The TBM700 pilot climbed above his assigned altitude and into conflict with the BE200.

Degree of Risk: C.

AIRPROX REPORT NO 2009-145

Date/Time:	21 Oct 1402	
Position:	5143N 00057W	(2nm W Chinnor)
Airspace:	Lon FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Cessna 152	Bell 430
Operator:	Civ Trg	Civ Pte
Alt/FL:	2200ft (QNH)	2000ft (RPS 996mb)
Weather:	VMC CLBC	VMC CAVOK
Visibility:	10km	>10km
Reported Separation:	100ft V/Nilm H	300ft V/500m H
Recorded Separation:	See UKAB Note (2).	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

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

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

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

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

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

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

There are no apparent ATC causal factors.

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

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

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

PART C: ASSESSMENT OF CAUSE AND RISK

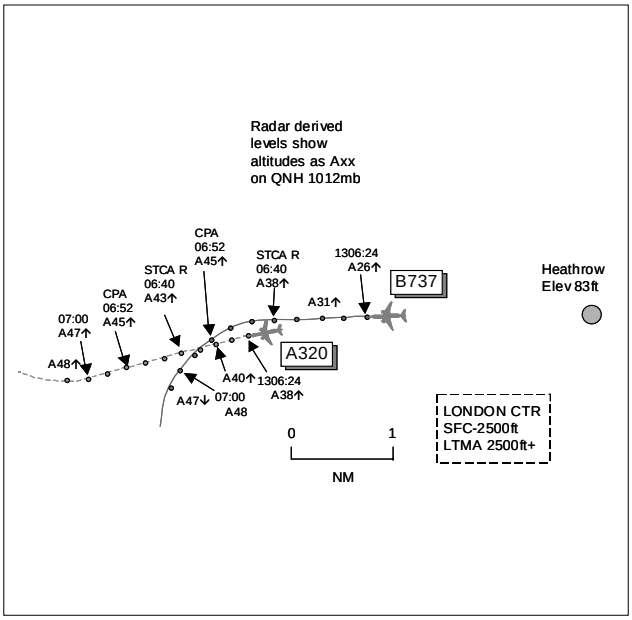
Cause: The B430 pilot flew close enough to the C152 to cause its pilot concern.

Degree of Risk: C.

AIRPROX REPORT No 2009-146

AIRPROX REPORT NO 2009-146

Date/Time:	19 Nov 1307	
Position:	5128N 00034W (4nm W Heathrow - elev 83ft)	
Airspace:	LTMA	(Class: A)
Reporter:	LTC SW DEPS	
	1st Ac	*2nd Ac*
Type:	A320	B737-500
Operator:	CAT	CAT
Alt/FL:	5000ft↑ (QNH)	3800ft↑ (QNH)
Weather:	VMC NR	VMC NR
Visibility:	NR	NR
Reported Separation:	NR	NR
Recorded Separation:	Nil V/0·8nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LTC SW DEPS/WILLO CONTROLLER reports that the A320 took off on a CPT departure whilst the next departure was the B737 on a DVR SID. He thought that the separation looked 'quite tight' and assumed the Tower would keep the flights and separate them visually in the vicinity of the aerodrome or stop the climb of the B737. Just as STCA activated with a high severity alert, the A320 was transferred to his frequency climbing to 6000ft. His first call was to give avoiding action onto heading 300°; he instructed a R turn because the DVR SID flown by the B737 would eventually turn away to the L. He also passed TI on the B737 behind. At this point he could not distinguish between the 2 ac datablocks above the radar returns and he saw the B737 at the same level as the A320 (4600ft altitude) and then climbing to 4800ft before descending in the turn on the DVR SID back to 4000ft. The lateral separation appeared to be about 0·5nm with the B737 having a faster GS, determined from the ac's trail dots. The A320 crew did not report any TCAS alerts and continued their departure. After issuing avoiding action there was nothing he could do, as the returns were so close he could not decipher and/or be sure of the datablock information.

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

THE A320 PILOT reports departing Heathrow IFR on a CPT SID and in communication with London squawking an assigned code with Modes S and C. As they climbed through 5000ft, he thought, for 6000ft, ATC issued an avoiding action R turn onto heading 300°. The A/P was disconnected and the ac was turned R and the climb was continued. Later ATC informed them that this was due to the proximity of another ac that departed behind them, also from RW27R. The other ac was not seen and neither a TCAS TA or RA was received.

THE B737 PILOT reports departing Heathrow IFR when the controller instructed them to level off at 4000ft. At the time they were climbing through 3800ft with inflight MET conditions of VMC and they had been visual contact with

traffic ahead at all times. They reduced power to idle to comply with the instruction but owing to their vertical speed the ac's climb was only stopped at about 4500ft; an immediate descent to 4000ft was performed. No Airprox report was filed because from their perception the proximity of the other ac was not critical; no TCAS warnings were triggered during the incident.

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

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

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

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

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

The A320 flight was instructed to contact the LTC SW DEPS Controller at 1306:25. At the time, the A320 was passing 3800ft, 1·2nm ahead of the B737, which was passing 2600ft. After the A320 had been transferred, the mentor looked at the ATM and observed that the B737 was catching up the A320. He realised that the A320 should not have been transferred. The trainee, also, was aware of the situation and instructed the B737 to *"...stop your climb four thousand feet maintain four thousand feet"*. It is unclear whether or not the trainee asked the mentor if she should take this action. The pilot replied *"...we're already passed four thousand and we're now descending"*. The mentor reported that he could see both ac clearly out of the window, observing that the B737 had commenced a L turn behind the A320, which was turning R. After the tracks of the 2 ac were diverging, the B737 was cleared to climb to 6000ft, in accordance with the SID.

The CPA, 0·8nm, occurred at 1306:52. The Heathrow H10 radar display shows both ac passing 4500ft, climbing to 6000ft. The Mode S of the A320 indicates its heading as 251°, with GS 164kt and the B737 heading 251°, at GS 194kt. As the B737 turned to pass 0·9nm behind the A320 and 100ft above it (1407:00), it had reached 4800ft before commencing its descent back to 4000ft.

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

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

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

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

TCAS Performance Assessment

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

InCAS Alert Statistics

Closest Point of Approach (CPA)

CPA Time	Horizontal Sep. (NM)	Vertical Sep. (ft)
13:06:52	0·824	22

Minimum Lateral Separation

Min. Latsep Time	Horizontal Sep. (NM)	Vertical Sep. (ft)
13:06:52	0·824	22

Minimum Vertical Separation

Min. Vertsep Time	Horizontal Sep. (NM)	Vertical Sep. (ft)
13:06:51	0·826	0

Assessment of TCAS Performance

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

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

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

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

The table indicates that although the vertical separation between the ac was sufficient to generate a TA and RA; the lateral separation although small at ~0·8nm was still larger than the 0·48nm required to issue a TA or 0·35nm required to issue an RA for this encounter.

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

Table 1: Sensitivity Levels of TCAS II

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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

The A320 crew was unaware that the B737 was closing up and followed the avoiding action R turn issued by LTC SW DEPS. The B737 crew were told by Air N to stop their climb at 4000ft, but as they were already passing that altitude with a high ROC, they reached 4800ft before commencing a descent. The geometry of this encounter was, surprisingly, outside the parameters to trigger a TCAS alert/warning, even though separation had reduced to 0·8nm. Owing to the good Wx the B737 crew had maintained visual contact with the preceding A320 throughout and had monitored its flightpath whilst complying with ATC stop-off instruction. This visual contact was enough to allow the Board to conclude that any risk of collision had been effectively removed.

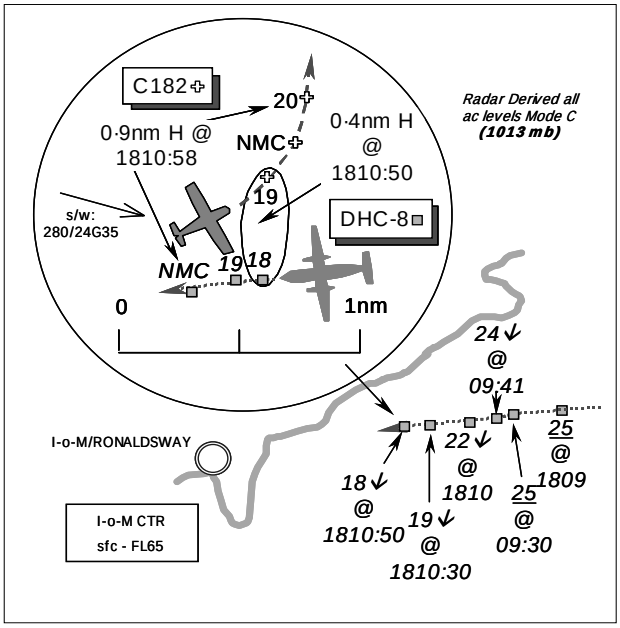
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT NO 2009-147

Date/Time:	23 Nov 1808	NIGHT
Position:	5406N 00431W (4nm finals to RW26 I-o-M - elev 52ft)	
Airspace:	Isle of Man CTR	(Class: D)
	Reporting Ac	*Reported Ac*
Type:	DHC-8	C182
Operator:	CAT	Civ Pte
Alt/FL:	1300ft↓	1000ft
	QNH (994mb)	QNH (994mb)
Weather:	VMC CLBL	VMC CLOC
Visibility:	10km	10nm
Reported Separation:		
	300ft V/1nm H	NR
Recorded Separation:		
	100ft V/0·4nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DHC-8 PILOT reports he was inbound to Isle-of-Man (I-o-M)/Ronaldsway from Manchester under IFR in VMC some 500ft below cloud, in between layers. The allocated squawk of A7407 was selected with Mode C on; the ac navigation lights, white HISLs and landing lights were all on.

After following radar vectors for a LOC/DME approach to RW26 at I-o-M they became visual with the airport from over 10nm, but continued with the IFR procedure and transferred to the TOWER (TWR) on 118·9MHz at 8nm. Descending through 1300ft QNH (994mb) approaching 4nm, gear down with 15° of flap, heading 265° at 130kt, the PNF was completing the cockpit checks and calling the altitudes when they heard TWR talking to a light ac pilot flying in the cct at about 1300ft. Visual contact was established with an ac 3nm ahead and below, whose navigation lights indicated that the ac was in a L turn away from the FAT [from a reciprocal heading] towards the North.

TWR asked the pilot of the other ac [the C182] to confirm his position and whether he was visual with the traffic on approach, to which the other pilot replied 'affirm'. His DHC-8's TCAS then enunciated a TA. With no other traffic in the close vicinity, this TCAS contact was identified as the ac seen ahead visually, which was now observed to be passing clear of their track. At this point the TCAS enunciated an RA - CLIMB CLIMB. As the traffic was now well clear to their R they continued the approach and did not follow the RA. He estimated the minimum separation from the other ac [the C182] was 1nm and 300ft vertically and assessed the Risk as 'low'.

TWR was informed of the TCAS 'warning' and ATC agreed to contact them on arrival. The ATC Watch Supervisor came to the ac and informed them that the other ac was a C182 operating in the visual cct under SVFR.

Referring to the manual would lead them to believe that they should have actioned the RA. However, as the conflicting C182 was identified, fully visible and turning away from their track, they judged that the collision danger had passed. The pilot of the C182 was aware that they were on the approach, had confirmed visual contact with his DHC-8 and was manoeuvring away to avoid a conflict. Nevertheless, he added frankly that if they had climbed in response to the RA it might not have reduced the risk of a collision as the C182 was not fitted with TCAS and its pilot may well also have climbed. Therefore continuing the approach was, in his view, the safest course of action in these circumstances.

THE CESSNA C182 PILOT reports that he was operating at I-o-M under IFR in VMC, some 10nm clear of cloud with FEW at 2000ft and an in-flight visibility of 10nm. The navigation lights and anti-collision beacon were on. He

had just completed the third radar vectored LLZ/DME approach to RW26 and had requested from RADAR on 120·85MHz a visual circuit, after this touch and go. He was transferred to TWR on 118·9MHz and instructed to make a RH cct, after the touch and go. As he climbed out he was instructed to make an early R turn for a landing ac [not the DHC-8], which he commenced as he climbed through 500ft QNH (994mb). The downwind leg was flown on a heading of 080° and he was then instructed to make a LH orbit because of an inbound ac [the DHC-8]. He was very worried about any incoming ac and at the start of his downwind leg had set his GPS OBS [bearing marker] to 263° to clearly show the FAT for the LLZ/DME approach to RW26 [QFU RW26 – 262°(M)]. The holding LH orbit was flown at 130kt in winds of 280°/25kt, gusting 35kt, which was very turbulent, but at no stage did his ac fly S of a bearing of 243° to I-o-M, he thought. The other ac's landing lights were seen as it descended on the LLZ. Furthermore, the number one ac LLZ was set on the I-RY on 111·15MHz and being scanned. He was fully aware of the presence of the other ac and visual at all times in the orbit.

THE I-o-M TOWER CONTROLLER (TWR) reports that the C182 was operating under Special VFR (SVFR) in the RH cct to RW26 and had been instructed to hold N of the airport [RW26 centre-line] to allow commercial traffic to land. The C182 pilot was advised that there would be a delay of several minutes so he confirmed visually and with reference to the Aerodrome Traffic Monitor (ATM) that the C182 was in a LH orbit and N of the airport. After a few minutes of fairly high RT loading, dealing with taxying and parking ac, he was finally able to issue a landing clearance to the DHC-8 crew. On checking the position of the DHC-8 on final he saw that the C182 had drifted very close to the RW26 FAT. The pilot of the C182 was requested to confirm that he had the landing DHC-8 in sight and instructed to continue his L turn to position further to the N. TI was passed to the DHC-8 crew who advised that they had the C182 in sight but had received a TCAS 'alert'.

THE I-O-M APPROACH RADAR CONTROLLER (APR) reports that 1min after the DHC-8 crew switched to TWR, after giving them a closing heading for the LLZ, he realised there might be an issue with separation between the IFR DHC-8 and the C182, which was operating under SVFR in a visual RH cct. At about the same time, he heard [on the TWR frequency] the TWR controller issuing an instruction to the C182 pilot to remain N of the airport. Subsequently, with the C182 tracking in a southerly direction just N of the RW26 centre-line about 3½nm out, he reached towards the phone with the intention of telling the TWR controller to instruct the C182 pilot to head 180° [to cross through the centre-line and clear to the S]. However, at this point TWR transmitted to the DHC-8 crew, so he did not 'press the button'. He heard the TWR controller reiterate the instruction to the C182 pilot to remain N of the airport as he watched the C182 turn L on his radar display. The radius of the C182's turn meant that the ac was flying on the RW26 centre-line, but eastbound, indicating an altitude of 1300ft Mode C. The L turn took the C182 to the N, but it passed very close to the DHC-8. He estimates the separation was less than 0·5nm horizontally and less than 200ft vertically.

I-O-M/RONALDSWAY ATC provided a report and an RT transcript; the following narrative is a compilation of the two.

The Airprox occurred after the APR had transferred the inbound DHC-8 established on the LLZ to the TWR, when the APR became aware that there might be a conflict with the C182 that was flying a visual circuit. The C182 had previously been conducting instrument training, flying radar vectored LLZ/DME approaches with a RCS from the APR under IFR. The pilot of the C182 had then requested a touch and go from the last approach to be followed by a visual cct before landing. This request had been discussed with the aerodrome controller before the flight was transferred to TWR. The co-ordination did not include any agreement as to the flight rules to be followed in the cct, but the APR assumed that following transfer to TWR the flight would be conducted in accordance with SVFR. Therefore, the APR was of the opinion that he retained responsibility for ensuring separation between the SVFR C182 and other pertinent IFR traffic. The C182 turned downwind just before 1806:00. Upon observing the potential conflict on his radar display, the APR was about to intervene with further co-ordination with the TWR when he heard the TWR issue an instruction to the pilot of the C182 to remain N of the airfield and so assumed that TWR had therefore taken positive action to ensure there was no conflict. Just after 1807:00, TWR instructed the C182 pilot to, "..[?? possibly 'one'] *left hand orbit there",* which the pilot read-back. TWR advised the C182 pilot after 1809:00, *"..I'll have to continue to hold you to the north of the field for a couple of minutes yet",* which the pilot acknowledged. TWR's attention was then taken up for several minutes by ground operations involving several taxying and parking ac, during which TWR considered his RT loading was high. The DHC-8 crew called the TWR in the descent to 2600ft and was instructed to continue before being cleared to land on RW26 (surface wind - 280°/24kt). Subsequently, the APR observed the C182 on radar to be tracking in a southerly direction towards the RW26 centreline about 3½nm E of the airfield. The APR was about to advise TWR to instruct the pilot of the C182 to fly a radar heading of 180° to take him through and away from the RW26 FAT when he heard the

TWR call the DHC-8 pilot and so elected not to do so. Upon confirming the position of the DHC-8 by observation of the ATM he became aware that the C182 had drifted very close to the RW26 centre-line. TWR queried the C182 pilot at 1810:15, *"..do you have the traffic* [the DHC-8] *in sight on short final?",* who replied *"affirmative* [C/S]". Whereupon TWR instructed the C182 pilot, *"..okay you route a bit further north if you would then",* who acknowledged *"routeing north..".* Following this exchange TWR passed TI to the DHC-8 crew at 1810:30, *"..you might see traffic on the right it's in the circuit..light aircraft does have you in sight".* The DHC-8 pilot replied, "*roger we've just got a TCAS warning from him",* adding *"he passed very close".* TWR asserted that the C182 was, *"..supposed to be holding north of the field",* to which the DHC-8 pilot contended, *"he was holding right in front of us".* The DHC-8 then landed off the approach whereupon the C182 pilot was cleared to Final for RW26.

The following contributory and possible causal factors were identified by the Unit:

Contributory Factors:

Prior to the incident ATC did not provide traffic information to the DHC-8 crew regarding the position and intentions of the C182 in the cct. However, the DHC-8 pilot reports that he did overhear TWR talking to another ac which made him aware of it. There was no agreement reached between the APR and TWR regarding the flight rules being followed by the C182 pilot whilst in the visual cct and consequently who was responsible for the separation of these two ac. When requesting the pilot of the C182 to remain N of the airfield at night, it may have been difficult for the pilot to estimate his exact position due to the lack of any discernible ground features to use as a visual reference. Additionally, with a strong WNW wind [gusting to 35kt] the C182 pilot could be expected to encounter moderate turbulence that might have affected his ability to maintain position. The pilot of the C182 reports that he utilised both GPS and the presentation of the LLZ course to maintain his position N of the airfield. This reliance on cockpit-derived information may have affected his ability to maintain separation from the FAT visually. At the time of the Airprox the TWR controller's attention had been distracted by ground activities and he was of the opinion that this may have reduced the amount of time that he had to monitor the cct activity with respect to the ac on final approach.

Causal Factors:

The TWR controller, having assumed the responsibility for ensuring separation between the two ac, allowed the pilot of the C182 to stray from the expected holding position and come into close proximity with the DHC-8 on final approach. The pilot of the C182 did not comply with the ATC instruction to hold N of the airport and subsequently allowed his ac to drift towards the RW26 FAT and into conflict with the DHC-8 on final approach.

Local Unit recommendations:

A number of recommendations were made for additional points to be stressed during training at the Unit including:

The potential for TCAS alerts being generated from ac under their control with particular reference to traffic flying in the ATZ.

The need to prioritise the control of air traffic over other tasks to ensure that separation does not become eroded.

ATCOs responsibilities for handling and integrating traffic in the visual cct, especially at night or in meteorological conditions that necessitate issuing a SVFR clearance.

The necessity to pass pertinent traffic information when required.

In addition to fully debriefing those involved together with any required refresher training, the content of this report was promulgated throughout ATC to provide learning opportunities for all.

UKAB Note (1): The St Anne's Radar recording is inconclusive as the location of the Airprox is at the extremity of coverage. The DHC-8 is shown as a SSR contact only steady inbound (on a QDR 261°(M) to I-o-M airport) indicating 2500ft Mode C (1013mb) – about 1930ft QNH (994mb). A descent is initiated just before 1809:41, when the DHC-8 is shown descending through 2400ft and then 1800ft at 1810:50. As the twin descends flying westbound out of coverage, track jitter becomes prevalent, but simultaneously the C182 is shown for the first time in a L turn through NE about 100ft above and 0·4nm off the DHC-8's starboard wing on a bearing of 252½°(M) to

I-o-M airport). This is presumed to be the CPA. Thereafter, the range increases as the C182 turns L and draws astern into the DHC-8's 4 o'clock, which itself fades after 1810:58.

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 a report from the appropriate ATSU. The investigation of incidents involving ATSUs located in Crown Dependencies lies outwith the purview of ATSI.

The Board noted from their frank accounts that, although the C182 pilot had requested his night visual cct beforehand, the TWR and APR controllers did not discuss or agree on the flight rules to be applied. The C182 pilot reported he was flying under IFR in the cct, but it was evident that the TWR was treating it as a Special VFR flight, and the APR, on hearing TWR speaking to the C182, was content to relinquish responsibility for its holding pattern. Here TWR had assumed responsibility to ensure separation was maintained between the inbound IFR DHC-8 and the C182, whose pilot had been instructed by TWR to take up a "*..left hand orbit there",* but it was not completely clear where this was. Later the C182 pilot was advised *"..I'll have to continue to hold you to the north of the field for a couple of minutes yet",* which the pilot had acknowledged. It was evident that the C182 pilot had not established a visual hold far enough to the N of the airport, but controller Members were critical of the phraseology used by TWR, which Members believed was inexact. This Airprox occurred at 4nm finals to RW26 – virtually E of the airport and far from being to the N as specified in the later instruction, which the C182 pilot appears to have interpreted as an orbit to the N of the RW26 centre-line. A controller Member explained that TWR could apply 'reduced separation in the vicinity of the aerodrome', when adequate separation can be provided by the TWR controller between ac that are continually visible to the controller from the VCR. At I-o-M an ATM is also fitted but, in general, this can only be used as an aid to identifying the position of ac in the cct in relation to ac carrying out an instrument approach and is not to be used as a surveillance radar or for separation. It was plain from the controller's report that TWR had been distracted at one stage by airport ground movements and had not been able to keep a close watch on the C182. When he realised that the C182 had not orbited to the N of the airport clear of the FAT as he believed and was in conflict with the inbound DHC-8, TWR had promptly confirmed that the C182 pilot was visual with the DHC-8 and instructed him to fly further to the N.

Notwithstanding ambiguity over how far N of the field the C182 was expected to hold, pilot Members were disappointed that the pilot had allowed himself to drift toward the final approach area. It was plain that the strong gusting wind – 280/24G35 – had a detrimental effect on the C182 pilot's ability to maintain an orbit clear to the N of the FAT and in these turbulent conditions he had flown closer than he intended, despite setting his GPS marker on a bearing of 243° to I-o-M as an aid to keep to the N of it. A highly experienced GA pilot Member pointed out that the C182 pilot's reported TAS of 130kt was significantly higher than the recommended 'turbulence speed'. He suggested that if the C182 pilot had flown the orbit 20-30kt slower, the turn would not have been so wide and hence he might have been able to keep station more easily and maintained an orbit without flying so close to the DHC-8 that was following the LLZ course. Whilst the recorded radar data did not illustrate to the Members the entire orbit flown throughout the period of the Airprox because it was at the extremity of range of the St Annes Radar, it did show the latter stages of the encounter. With the DHC-8 steady inbound the C182 was first shown about 100ft above, 0·4nm away, off the DHC-8's starboard wing and therefore somewhat S of the C182 pilot's quoted bearing marker.

The DHC-8 crew were not given TI on the C182, but were alerted by TWR's RT exchange with the C182 pilot. They saw the C182 3nm ahead before their TCAS enunciated a TA and thereafter the CLIMB RA, which the DHC-8 Captain candidly reported he had elected not to follow. The Board understood the DHC-8 Captain's rationale for not complying with the RA and commended him for his frankness in recognising that this was not in accord with accepted practice. However, CAT pilot Members were somewhat surprised that he had not immediately followed the commanded RA since company policy undoubtedly mandated strict compliance. Furthermore, at night, notwithstanding that the crew believed they had correctly identified the 'intruder' visually, strict compliance was wiser airmanship in case another ac was actually lurking elsewhere unseen. Moreover, although not a factor in this Airprox, as TCAS/Mode S equipped ac are able to communicate to co-ordinate the resolution advice to each pilot, it is essential that both ac comply with their part of the 'contract'. Not doing so will cause the TCAS to revert to uncoordinated RA demands, but the delay may increase the dynamics of the demanded manoeuvre and increase the risk. The salutary lesson here being to follow the demanded RA promptly and correctly.

Whilst TWR had plainly issued instructions, which the controller believed would ensure separation between these ac, controller Members stressed that the other important facet was that the TWR controller had to monitor the situation to ensure his instructions were being followed. The ATSI Advisor concurred and agreed that action could have been taken at an earlier stage if TWR had appreciated the situation sooner. Nevertheless, in these turbulent conditions, at night, some Members believed that it was unwise to apply 'reduced separation in the vicinity of the aerodrome'. Therefore, the Board agreed this Airprox had resulted because the ADC did not detect that the C182 pilot had not followed his instructions. However, it was plain from the C182 pilot's account that the DHC-8 had been in sight throughout. Moreover, the DHC-8 crew were also visual with the other ac, had assessed the situation and would have been able to take more robust action if needed. Taking all the foregoing into account, the Members agreed unanimously that no Risk of a collision had existed in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The ADC did not detect that the C182 pilot had not followed his instructions.

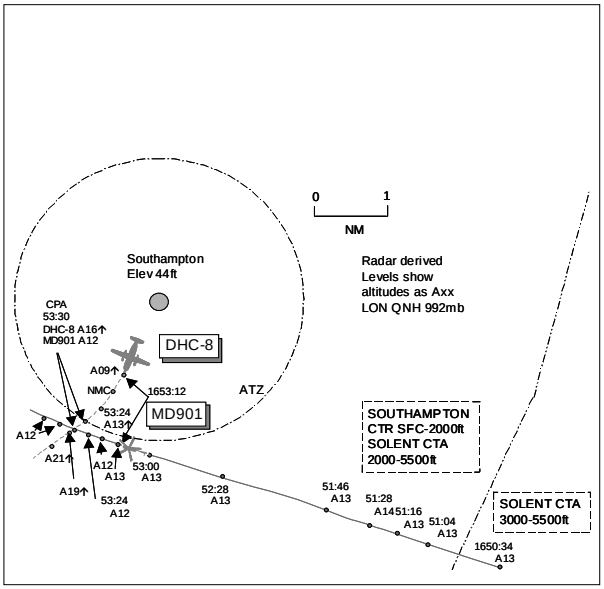
Degree of Risk: C.

AIRPROX REPORT NO 2009-148

Date/Time: 28 Nov 1653 (Saturday) NIGHT

Position: 5055N 00123W (2nm SSW Southampton - elev 44ft)

Airspace:	ATZ	(Class: D)
	Reporting Ac	*Reported Ac*
Type:	DHC-8	MD901 Explorer
Operator:	CAT	Civ Comm
Alt/FL:	1500ft ↑ (QNH 991mb)	1200ft (QNH)
Weather:	IMC KLWD	VMC CLBC
Visibility:		>10km
Reported Separation:	<400ft V/NR H	NR
Recorded Separation:	400ft V/0·2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DHC-8 PILOT reports outbound from Southampton, IFR and in communication with Southampton Tower on 118·2MHz, squawking 7771 with Modes S and C. On receipt of take-off clearance RW20 they were advised of a police helicopter operating to the S of the aerodrome with its heading and altitude and that it was Category A flight. They observed the helicopter on TCAS and at that point there did not appear to be any conflict. Shortly after take-off heading 217° at 180kt and having turned away from the traffic while complying with the noise abatement procedures, they noticed the TCAS target move more rapidly towards them. Seconds later whilst climbing through about 1500ft QNH 991mb, TCAS generated a TA followed very quickly by an RA. Appropriate action was taken and ATC were informed. Owing to IMC (cloud base 1100ft) they could not see the helicopter but separation was <400ft. He assessed the risk as 'too close'.

THE MD901 EXPLORER PILOT reports en-route to Southampton Hospital from an ad-hoc landing site near Chichester with a critically ill patient on board. He requested clearance from Solent Radar to transit their airspace and he was using his c/s with suffix 'A' (SFN7/2009) owing to the serious condition of the patient. Solent Radar cleared him through their airspace on track to the hospital special VFR, he thought [actually VFR], not above 1500ft

QNH and on entering their airspace he was given a RCS. Heading 280° at 120kt at 1200ft QNH he was told that a fixed-wing ac was on the RW at Southampton about to take-off and was asked could he see it. The in-flight visibility was good and he saw the ac and maintained visual contact with it all of the time until it passed above and behind him on its climb-out; no avoiding action was necessary. Solent had kept him informed of the ac at all times and continually asked him if he could see it, which he could. He did not deem it necessary to alter track or height at any time as he was on a RCS and was in continual visual contact with the ac. He assessed the risk as none.

THE SOUTHAMPTON APR reports the DHC-8 was released for departure and the MD901 squawk was observed approaching the Solent CTR from the E. The MD901 flight called on frequency declaring CAT A status so the ADC was told to 'call before release' on the outbound whilst the flight details of the MD901 were obtained. The MD901 pilot requested entry into CAS to Southampton hospital. The flight was issued entry clearance not above 1500ft VFR; however, she had not noticed that it was now official night and therefore the transit should have been special VFR. Tower was told to release the outbound with TI on the helicopter and that there was inbound traffic on the ILS at approximately 8nm. TI was passed to the MD901 flight and the pilot was requested to report descending into the hospital. The ADC advised that the DHC-8 flight had been given TI and was departing. She updated the TI to the MD901 pilot who reported having the DHC-8 visual. On departure the DHC-8 crew reported a TCAS RA to Tower, who relayed the information to her; at this point she suddenly realised it was official night. The DHC-8 crew then confirmed they would be filing an Airprox.

Southampton METAR shows EGHI1651Z 09003KT 7000 RA FEW010 SCT020 BKN035 06/04 Q0991=

ATSI reports that at the time of the Airprox, the MD901 was under the control of the Solent APR and the DHC-8 was in communication with the Southampton ADC. Both controllers described their workload and traffic loading as 'light'. The ADC is employed on a part-time basis and is not valid in approach.

The DHC-8 flight established communication with the ADC and requested to push and start, which was approved. The ADC informed the APR, at 1646:25, and the APR released the ac. At 1646:30, the DHC-8 crew requested taxi and were cleared to holding point Bravo 1 for a RW20 departure. Some 30sec later an inbound flight called the ADC and, having reported established on a 7nm final for RW20, was instructed to continue approach. At 1649:10, the MD901 flight called the Solent APR, who having dealt with another ac first, instructed the pilot to pass his details. The pilot reported having departed from Chichester, was inbound to Southampton Hospital and gave his position as, *"…seven point five to the east of yourselves…"*. The APR replied, *"MD901 c/s identified clear to transit controlled airspace not above altitude one thousand five hundred feet VFR QNH niner niner one millibars"*.

Discussions took place between the ADC and the APR and it was agreed that the DHC-8 could be lined up to depart ahead of further inbound traffic, an EMB195, which was on final approach. The APR advised the ADC of the MD901 and placed a 'check before release' restriction on the DHC-8, but the APR advised the ADC that she could instruct the DHC-8 crew to line up. The clearance to back track and line up was passed to the DHC-8 crew at 1650:20, and they were advised that the EMB195 was on an 8nm final. At 1650:50, the APR released the DHC-8 for departure provided it was given TI on the MD901. This was done at 1651:30, the ADC reporting the position of the MD901 as *"...about four miles to the east of the field transiting westbound not above one thousand five hundred feet VFR…"*. The DHC-8 crew replied that they had the helicopter on TCAS and *"...we'll keep an eye out for him…"*.

Meanwhile, at 1650:30, the APR passed traffic to the MD901 flight on the DHC-8 advising that it would be departing RW20 S'bound and climbing through the helicopter's level IFR, which was acknowledged. At 1651:15, the APR asked the pilot of the MD901 whether he was visual with the traffic to which the reply was, *"Not yet…"*. The APR instructed the MD901 pilot (1651:45) to report commencing descent into the hospital and advised that the DHC-8 was turning around and shortly to depart. At the same time, the ADC cleared the DHC-8 flight for take-off advising that the inbound EMB195 was inside 4nm, and 10sec later the pilot of the MD901 reported that he was visual with the DHC-8. At 1652:30, the APR changed the service being provided to the MD901 to radar control and advised that the DHC-8 was about to rotate. The pilot of the MD901 acknowledged the change of service and confirmed he was visual with the traffic. The APR transmitted (1652:50), *"MD901 c/s just confirm happy still with the Dash Eight who will be climbing through your level south-south westbound",* to which the pilot replied, *"Affirm I'm visual thanks very much…."*. The ADC advised the APR that the DHC-8 was airborne and asked whether she should cancel the noise abatement procedure. The APR replied, "*No that's fine the MD901's got him in sight*". Some 20sec later the APR asked the ADC when official night commenced and the ADC advised that official night

had commenced at 1633. Some 20sec later the crew of the DHC-8 reported receiving a TCAS RA and, having informed the APR of this, the ADC instructed the crew to change frequency to radar.

This Airprox took place within Class D CAS at a time when it was night. Rule 20 states that at night an ac must be flown in accordance with the Instrument Flight Rules when in a Control Zone unless it is flying on a Special VFR flight. At this unit, the time at which official night commences is promulgated, along with other information, in the 'general' box on the Met Display. This information is available in both the tower and the approach room. The ADC had been operating without an assistant for a while in order to facilitate a fatigue break. The ADC had completed and transmitted the 1650 METAR, which was done at 1642. When the ATSA returned, at 1646, a SPECIAL METAR was completed and, in accordance with the unit's procedure, the time of official night (1633) was removed from the display. As the MD901 flight should have been issued with a Special VFR clearance, the requirements of MATS Part 1, Section 1, Chapter 2, Page 5, para 8.3 would apply, in that standard separation is to be applied between IFR flights and Special VFR flights.

When the pilot of the MD901 first called the ac was on the SAM120R at a range of 8·5nm. The ac was displaying a conspicuity code allocated to the MD901 operator, which the code c/s computer at Swanwick had converted to the MD901 c/s. However, as the helicopter had departed from a private site and not been in contact with any ATSU equipped to validate or verify the data, the APR should have regarded this as unverified and unvalidated. Furthermore, the pilot had reported 7·5nm to the E when in fact the helicopter was SE of the airport. This means that the correct identification procedures had not been followed and so the MD901 was not identified. The APR reported that helicopter flights to and from the hospital (which is located approximately 3nm SW of Southampton Airport) occur some 2 or 3 times a week but the majority of them are carried out by a Helimed helicopter which is a 'day only' operation. The APR was still under the impression that it was daytime and so cleared the subject helicopter into the Control Zone VFR.

The APR advised later that, once the crew of the MD901 called, her priority was to clear the flight direct to its destination with the minimum of delay, as it was operating as 'Category A' traffic. The APR could not explain why she had not placed the flight under a BS but did recall changing the service once it was within the CTR. Initially, she believed that the flight paths of the 2 ac would not be in conflict. In her experience, many of the flights operating into the city and approaching from the E would route via Southampton Water, usually following a track Calshot [8nm S of Southampton] to Totton [5nm WSW of Southampton] and so cross the extended RW C/L some distance out. Furthermore, these helicopters frequently started descending before they crossed the C/L and so would be below the level of any departures. The APR entered a mindset that it was daytime and so a direct track with the provision of TI to the helicopter on the departing DHC-8, and vice versa, would enable her plan to be executed. The alternative solution of holding the DHC-8 on the ground until the helicopter had passed and, if necessary, orbiting the EMB195 on final was not considered, nor was the option to route the MD901 via the O/H of the airport thus avoiding the departure climb out track.

Meanwhile the ADC could see that it was night but was unaware that the APR had cleared the MD901 into the control zone on a VFR clearance. The ATM was set to 15nm and the helicopter was clearly displayed on it. The ADC reported later that although she was slightly uncomfortable when the release on the DHC-8 was given, she was expecting the helicopter to descend as it got closer to the hospital. Both the ADC and the Tower assistant realised that the flight paths of the 2 ac would be close but relied on the APR's judgement, the fact that TI had been passed to both crews and the crew of the DHC-8 were happy to depart. At no time did the ADC or ATSA see the MD901 from the VCR, only on the ATM.

The Noise Preferential Route (NPR) for departures from RW20 requires ac to *'As soon as possible after passing 500ft ALT, turn right to intercept VOR SAM RDL 217. Maintain RDL 217 until 2000ft ALT'*. Once the DHC-8 had departed, the ADC called the APR and asked whether the DHC-8 could ignore the NPR. This was an attempt to increase the separation between the 2 ac. However, the APR advised that there was no need as the pilot of the MD901 had the DHC-8 in sight (ATSI note: Southampton is not approved to utilise the further uses of the ATM and so the ADC could not intervene of her own accord). The ADC watched the 2 ac converge on the ATM and thought it was quite close so it was not a great surprise when the crew of the DHC-8 reported a TCAS RA.

Analysis of the radar recording shows the MD901 approaching from the SE and tracking approximately 290° to cross through the climb out of RW20 at a range of 2·2nm. At 1653:12, when the DHC-8 is first seen, it is in the 2 o'clock position of the MD901, range 1nm and 400ft below. At 1653:24 the DHC-8 is in the 3 o'clock position of the MD901 range 0·4nm and the DHC-8 is 100ft higher than the helicopter. The DHC-8 is then observed to turn

R and at 1653:30, the CPA, is still in the 3 o'clock position but at a range of 0·2nm with the MD901 indicating 1200ft and the DHC-8 1600ft.

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.

There were several underlying factors that had played their part in the lead up to the Airprox. The primary factor was the APR being unaware that night had fallen at 1633; confirmation of this element on the Wx information screen had been removed shortly after 1633 when the Wx had been updated in accordance with SOPs. The NATS Advisor informed Members that since this incident the ATSU had revised its procedures for showing the time of night, which is now displayed permanently. Controller Members remarked that whilst working in Approach Control rooms it can be easy to lose track of time as they are normally operated with low ambient light conditions at all times and there are usually no outside clues to the onset of night. The APR, under the misapprehension throughout that it was still day, had given the MD901 flight the most expeditious routeing under a VFR entry clearance and then ensured that she had discharged her responsibilities by giving TI on the departing DHC-8 and giving reciprocal TI to the DHC-8 crew through the ADC. These actions were consistent with, and entirely correct for, daytime operations. Members also discussed whether the DHC-8 crew should have held on the runway until the MD901 was clear of the departure lane. Within Class D airspace, an IFR flight has the option of requesting avoiding action against VFR traffic, which in scenarios such as this Airprox but in daylight hours, the crew could have challenged the take-off clearance and requested a short hold on the ground until happy with the traffic situation. However, at night the option does not exist since the controllers should not release ac without ensuring separation. Furthermore when the DHC-8 was given clearance to enter and backtrack the RW, the ADC and APR were endeavouring to depart the flight ahead of an inbound EMB195. This may have placed additional pressure on the DHC-8 crew to depart immediately, after being given TI on the MD901 and take-off clearance, acutely aware that the EMB195 was close in behind them on final approach. The DHC-8 crew had 'seen' the MD901 on TCAS and rolled but had then become concerned when the TCAS contact had moved rapidly towards their projected flightpath. This should not have been unexpected. TCAS was designed to resolve conflictions only in the vertical plane; the azimuth resolution is not as accurate as the vertical, and the azimuth display is known to be difficult to interpret at short ranges. For her part, the APR believed that the helicopter would route further out from the airport and descend earlier than it did, so that it would not be in conflict with the departing DHC-8. However, the APR was content when the MD901 pilot had then reported visual with the DHC-8 on the RW and that he was happy to continue on his current flightpath. From his report, it appeared that the MD901 pilot believed that whilst under a RCS in Class D he did not have to alter his flightpath. This is not the case, as under normal operations the onus is still on the VFR traffic to alter his flightpath in order to avoid IFR traffic; RCS service is the only radar service that can be given within CAS. Members were disappointed that the ADC, aware that it was night and unable to see the MD901 visually, had not challenged the APR's departure release or stated her concern with the deteriorating situation once the DHC-8 was airborne. Clearly the ADC was concerned because she had asked the APR if the DHC-8 flight could cancel the NPR, in an attempt to increase separation, but the APR, ignorant of the situation, declined the offer as she was happy with the helicopter pilot's visual sighting of the airliner. Notwithstanding this, and taking all of the factors above into consideration, the Board concluded that root cause of the Airprox was that the Southampton APR did not apply prescribed separation between the IFR DHC-8 and SVFR MD901.

Turning to the risk element, the DHC-8 crew were given TI and had seen the helicopter on TCAS prior to departure. However, once airborne the MD901 target was seen to move into confliction, which triggered a TCAS TA warning, and then a RA command, which was promptly actioned. Owing to the cloud base they were unable to acquire the helicopter visually but observed it on TCAS pass just ahead about 400ft below. Meanwhile, the MD901 had been given TI with updates which allowed the pilot to see the DHC-8 on the RW and then he watched the airliner as it passed above and behind without the need to take any action. Although these ac should have been provided with separation by ATC, the Board concluded that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Southampton APR did not apply prescribed separation between the IFR and SVFR traffic at night.

Degree of Risk: C.

AIRPROX REPORT NO 2009-149

Date/Time: 27 Nov 1548

Position: 5255N 00016W (10nm SE Cranwell - elev 218ft)

Airspace: Lincs AIAA (Class: G)

	Reporting Ac	*Reported Ac*
Type:	BE200	Grob Tutor II
Operator:	HQ Air (Trg)	HQ Air (Trg)
Alt/FL:	4000ft QFE (988mb)	3000ft↓ (RPS)
Weather:	IMC Below cloud	VMC CLAC
Visibility:	8km+	10km+

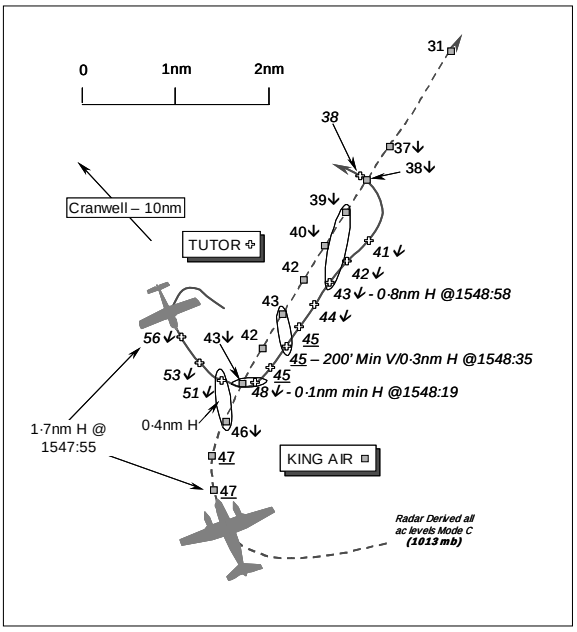
Reported Separation:

NK 300ft V/1nm H

Recorded Separation:

200ft Min V @ 0·3nm H

0·1nm H @ 500ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BEECH BE200 SUPER KING AIR PILOT, a QFI, reports he was the PNF in the RH seat conducting an instrument flying training sortie. His student PF in the LH seat was head-down using commercial shades for simulated instrument flying. They were in receipt of a TS from Cranwell APPROACH (APP) on 280·775MHz (STUD 5), in a level cruise at 4000ft QFE (988mb) at 160kt whilst being marshalled about 10nm SE of Cranwell for a radar approach. A squawk of A2603 was selected with Mode C on. Enhanced Mode S and TCAS are fitted. His ac has a white and blue colour-scheme and the HISLs were on.

On initial contact with APP they were No3 in the sequence for recovery and the frequency was fairly busy. Flying in IMC, some 300ft below cloud with an in-flight visibility of more than 8km, they were given a R turn from a westerly heading onto 360°, he thought [actually 030°]. Rolling out on course he visually identified a previously noted TCAS contact as a white Grob Tutor II through a small gap in the clouds about 2nm directly ahead; it was displayed on TCAS 1500ft above his ac. As they tracked N converging with the Grob that was still shown on TCAS and had been sighted briefly, TCAS enunciated a TA with the other ac displayed 900ft directly above and descending. About 2sec later TCAS enunciated a DESCEND RA, which was followed at 1500ft/min after a brief pause whilst he took control from his student who had been slow to react. As they followed the DESCEND RA command he briefly saw the Tutor almost directly above them in a RH descending turn through a small gap in the cloud. Minimum separation was not known but he assessed the Risk as 'Medium'.

He advised APP of their TCAS RA and deviation from their assigned cruising height, whereupon APP instructed them to descend further to 1800ft QFE. After he informed the controller that he would be filing an Airprox, the Tutor pilot identified himself on the RT. The radar approach was then continued without further incident.

THE GROB 115E TUTOR II PILOT, a QFI, reports he was instructing an elementary flying training sortie - Climbing and Descending 1 - about 13nm SE of Cranwell. He was not in receipt of an ATS but listening out on the Cranwell/ Lincolnshire Agreed Airspace deconfliction frequency of 282·6MHz and was operating VFR in VMC at about 4500ft Barnsley RPS some 1200ft above a cloud layer with the edge of the layer just to the SE. A squawk of A2637 was selected with Mode C and elementary Mode S is fitted. His aeroplane is white and the nav lights, wingtip HISLs and landing lamp were on.

After the last instructional element of the sortie, he took control and positioned his ac to head SE towards an area clear of the thin (2-300ft) cloud layer at about 3000ft ALT. He commenced a descent after selecting his SSR code from A2637 to A2641 [at 1547:24] in accordance with the Lincolnshire Agreed Airspace procedures and making

a blind call on the deconfliction frequency before switching frequency to Cranwell APP on STUD 5. The descent was continued in a descending weave as a teaching point to the student whilst maintaining a good lookout below. The descent rate was also increased significantly as part of the teaching element of the descent. Once clear of the edge of the thin cloud layer a L turn NW towards Cranwell was commenced to return at 120kt for a visual recovery under the cloud layer. The APP frequency was very busy with RT exchanges to radar recovery traffic during this descent. Whilst waiting to 'get a word in edgeways' to announce his intention for a visual recovery from the SE, his student spotted the King Air ac in their 10 o'clock position about 1nm away, flying away from them and slightly lower than his ac under the cloud layer. Whilst listening to the exchange between the King Air QFI and ATC it became apparent that the King Air pilot was discussing a TCAS alert he had responded to and his intention to file an Airprox report. In view of the profile just flown it appeared possible that the TCAS alert had been caused by their descent manoeuvre whilst above the cloud layer. Announcing his callsign to both the King Air pilot and ATC, he advised that the conflict was probably with his ac and that he was in good visual contact with the King Air whilst inbound for a visual recovery to Cranwell. The minimum separation was not known but his first sighting was when the two ac were 1nm and 300ft apart. He does not believe there was any risk of collision as they were in good VMC above the cloud layer and around it. Nevertheless, this is very busy airspace for military training ac and he fully understands the King Air pilot's concern given his better situational awareness from his TCAS.

THE COMBINED CRANWELL APPROACH CONTROLLER & DIRECTOR (APP) reports controlling intermittent multiple IFR and VFR recoveries to Cranwell and Barkston Heath whilst operating with APP and DIR bandboxed. She vectored the King Air downwind in the radar pattern at 4000ft QFE and passed TI about traffic manoeuvring 2nm NW, 1500ft above. The Grob Tutor pilot then called up for a visual recovery. As the immediate priority was to pass control instructions and TI to the instrument traffic, she did not answer the Tutor pilot immediately. She gave a descent instruction to 1800ft QFE to the King Air crew, who then reported taking a TCAS RA descent against traffic. The King Air pilot also stated that he was visual with the other ac, which was the previously called traffic. The Grob Tutor pilot stated that his was the proximate ac to the King Air and was also visual with it. The Grob Tutor pilot then requested a visual recovery, whereupon aerodrome details and TI about instrument traffic was provided.

HQ AIR ATM SAFETY MANAGEMENT reports that the BE200 King Air was being marshalled for recovery to Cranwell under a TS from APP. The Tutor was recovering VFR from a recognised local training area in Class G airspace and good weather conditions. Although the Tutor pilot had checked in on the APP frequency of 280·775MHz, due to the busy nature of the recovery pattern at the time of the Airprox no ATS had been asked for or applied.

APP was manned by an experienced multi tourist controller with a sound understanding of Cranwell procedures. The SUP reports that APP was bandboxed with DIR and was working traffic recovering both to Cranwell and Barkston Heath, which is common practice. APP reports a medium workload with 4 ac on frequency and had been on console for 50min, but did not consider this to be a contributory factor. The SUP further reports that, although it had been 1hr 49min since the controller's last scheduled break, the controller had not been used in the previous hour and was therefore considered sufficiently rested.

The King Air was at 4000ft QFE (998mb), squawking A2603 with Mode C, being vectored downwind within the radar pattern. At 1547:20, APP turned the King Air R onto a heading of 030° from W. The Tutor was manoeuvring to the N and TI was passed by APP at 1547:27 [just after the Grob's squawk changed from A2637 to A2641], "[King Air C/S] *traffic north 2 miles manoeuvring indicating 1500 feet above*". On the radar recording the Tutor is seen heading NW indicating 6300ft Mode C (1013mb). This was a suitable time to call the traffic to the King Air crew and the controller acted correctly within the spirit of a TS. Later, at 1547:55 the Tutor turned towards the King Air and descended. The Grob pilot also called APP to advise of his visual recovery at 1548:01; however, the controller was busy vectoring another ac in the final portion of an ILS approach and did not respond. The Tutor pilot then conducted a descent towards the King Air triggering a TCAS RA.

[UKAB Note (1): APP instructed the King Air crew to descend to 1800ft QFE and placed him 'in checks' at 1548:23, after the Grob had crossed ahead from L - R and the point of minimum horizontal separation, whereupon the pilot reported *"..just had a T-CAS R-A which we followed..we will file an Airprox".* APP acknowledged the transmission *"..called traffic to the North",* whereupon the King Air pilot advised, *"understood traffic descended onto us and triggered an R-A we were visual".* The Grob Tutor pilot then advised *"…that was* [Grob C/S] *we spotted you just after we came through the* (??? - transmission clipped)". The pilots involved then agreed to speak on the ground.]

The Tutor pilot called APP again at 1549:07, whereupon the controller responded, however, by then the Airprox had occurred.

APP acted within the guidelines for the provision of a TS. APP was controlling mixed IFR/VFR recoveries, which is a standard procedure and not considered to be a contributory factor. Although APP and DIR were bandboxed and this increased the workload, this is not considered a contributory factor. When the initial vector onto 030° was given, the conflicting traffic was called correctly. Given the time between the turn instruction being issued and the descent of the Tutor, coupled with the vectoring requirements for the other ac on frequency, it was unlikely that APP had time to call the contact again once the Grob's descent had begun.

SATCO Cranwell has advised that Tutor and Firefly pilots have been reminded of the ease with which a TCAS warning can be triggered and to give other ac a wider berth when recovering VFR in the vicinity of the aerodrome radar pattern.

It was recommended to the Unit that recovery procedures for ac returning from the designated training areas should be reviewed.

UKAB Note (2): The Cranwell Weather was: RW26; CC BLU; 40km nil Wx; SCT@3500ft.

UKAB Note (3): The Claxby radar recording shows the King Air turning R onto 030°, at 4700ft (1013mb) – about 4250ft QFE (998mb), with the Grob Tutor indicating 900ft above and descending at a range of 1·7nm on a SE'ly heading. When the King Air steadies on course at 1548:11, a descent is evident through 4600ft Mode C, probably in response to the reported TCAS DESCEND RA, with the Grob descending through 5100ft Mode C 0·4nm distant. The point of minimum recorded horizontal separation of 0·1nm – 200yd – is shown on the next sweep, some 10nm SE of the aerodrome, as the Grob crosses from L – R, 500ft above the King Air in a L turn onto a broadly parallel NE'ly track. The Grob levels at 4500ft Mode C for three sweeps and the King Air levels off some 200–300ft below, the point of minimum vertical separation occurring at 1548:35, with the King Air starting to draw ahead. Both ac are then seen to descend further about 400ft apart, before the Grob turns L NW'ly towards Cranwell and crosses 1·7nm astern of the King Air that maintains its course.

HQ AIR (TRG) comments that this Airprox occurred in busy Class G airspace as both aircraft were positioning for recovery to Cranwell. Extant recovery procedures did not prevent this Airprox therefore this HQ supports the recommendation for the Unit to review its recovery procedures. In the longer term all Tutors are to be equipped with a CWS which will help to increase the SA of Tutor crews, the modification is planned to start at the end of 2010.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Within this Airprox between IFR and VFR traffic in the busy 'see and avoid' environment of the Class G Lincolnshire AIAA, both crews had an equal and mutual responsibility to afford each other appropriate separation with or without the assistance of ATC.

Looking firstly at the ATS aspects of this Airprox, with the exception of one transmission of TI, ATC had little impact on forestalling this encounter. A controller Member was concerned that the BE200 under the TS provided by APP had been vectored towards the descending and turning Grob. Even though TI had been provided as the Grob flew NW'ly, it was reported to be manoeuvring, suggesting to the BE200 crew that the controller believed the Grob's course might be unpredictable. Conversely, the squawk change by the Grob – both codes being deemed verified and validated - might well have highlighted to APP that the Grob was now on recovery. However, the BE200 crew had been given a heading that should have taken them astern of the Grob, which was pointing towards base and indicating well above the twin, so APP had no reason to suspect that the Grob would turn towards the BE200, until it did so. Given the limited accuracy of TCAS azimuth displays at close quarters, as the Grob was reported to be manoeuvring this might have prompted the BE200 crew, flying in IMC, to request to be kept updated about the traffic. However, it was clear that the controller had turned her attention to other traffic and remained focused on the instrument pattern, to the exclusion of the Grob pilot, who went unanswered when he made his initial call and

who did not have the benefit of TCAS to assist his SA. The Board discussed whether band-boxing was a factor here and a military controller Member did not believe it was. Nevertheless, whilst band-boxing might be commonplace, HQ Air's comment that because of the vectoring requirements for the other ac in the instrument pattern it was unlikely that APP would have had time to update the TI to the BE200 again once the Grob's descent had begun, suggested that it may have affected the overall ATS provided to both crews. The Board was encouraged to learn, however, of the fitment in the near future of a CWS to the Grob Tutor fleet to assist pilots' SA independently.

As this close quarters situation developed it was evident that the only visual sighting beforehand was by the King Air's QFI in his capacity as safety pilot, when he spotted the Grob briefly through a small gap in the clouds about 2nm directly ahead. Thereafter, the King Air's QFI would have become unsighted as the Grob crossed above and drew astern on the King Air's starboard side. However, this Airprox was a good example of the benefits that TCAS II can provide as the Grob would have been displayed throughout, thereby maintaining the King Air crew's SA.

Whereas the BE200 was flying in IMC beneath the cloud layer, the Grob pilot had said that he was originally operating 1200ft clear above cloud whilst instructing his student and that the Airprox had occurred after he had descended around the edge of a cloud layer whilst maintaining VMC. It was evident from the radar recording that he had steadied NE'ly on a broadly parallel track to the King Air's. Although the Grob pilot reports the descent was accomplished in a descending weave whilst maintaining a good lookout below, the HQ Air Ops Member noted that the Grob pilot had not spotted the King Air beneath him. It was not until his Student drew his attention to the King Air in their 10 o'clock position about 1nm away, flying away from them and slightly lower than his ac at this point, that the Grob instructor was aware of the proximity of the twin. However, that was after the King Air's TCAS had already identified the conflict with the Grob and earlier commanded a descent by the BE200 crew, so that when the Grob QFI saw the King Air the CPA had passed and the conflict had already been resolved. Some Members were inclined to the view that although he was unaware of the King Air below him, the Grob Instructor was clearing his flight path ahead; with 500ft vertical separation as the Grob crossed from L-R above the King Air, there was no confliction. However, other Members considered that only one crew was aware of the actual situation here, and the BE200 QFI flying in IMC had to take control of his ac in order to comply promptly with the demanded TCAS RA descent so a conflict had actually existed. The Board was fairly evenly divided between a 'sighting report' and 'conflict'. However the 200ft minimum vertical separation at a range of 0·3nm convinced the Members that this was more serious than a 'sighting report'. After a wide-ranging debate the view of the majority of the Members held sway and it was concluded that this Airprox was the result of a conflict in the Lincolnshire AIAA that had been resolved by the BE200 pilot following TCAS. Whilst the vertical separation actually decreased after the point of minimum horizontal separation, the 40kt speed differential between these two ac ensured that the BE200 gradually pulled ahead to the point that the Grob student saw it ahead and slightly beneath them. By an overwhelming majority the Members agreed, therefore, that no Risk of a collision had actually existed.

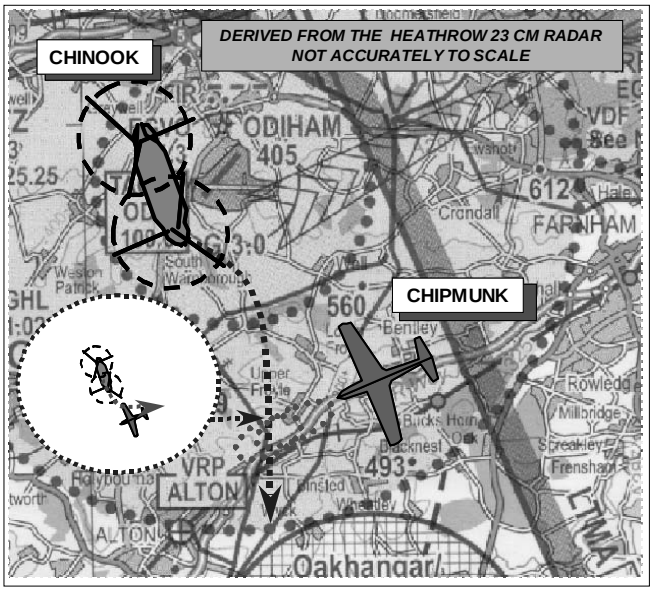
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the Lincolnshire AIAA resolved by the BE200 pilot following TCAS

Degree of Risk: C.

AIRPROX REPORT NO 2009-150

Date/Time:	1 Dec 1335	
Position:	5113N 00053W (3.4nm SSE Odiham - elev 405ft)	
Airspace:	Odiham MATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Chinook	Chipmunk
Operator:	HQ JHC	Civ Club
Alt/FL:	1000ft (QFE 997mb)	NR (NR)
Weather:	VMC	VMC
Visibility:	>10km	10km
Reported Separation:	50ft V/500m H	Not Seen
Recorded Separation:	NR V/ 0 H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CHINOOK PILOT reports that RAF Odiham uses a gate system to aid traffic flow in and out of the airfield and these areas are very busy with departing and recovering traffic. At the precise time the cockpit crew was in a high workload situation flying a VFR climb-out towards the Southern Gate from Odiham, squawking as directed with Mode C switched off [see UKAB Note (1)] in receipt of a BS from Odiham TWR but about to change to APP, when they saw a Chipmunk ac ½nm ahead and slightly above them. They broke left and reported the incident immediately to TWR and by telephone to Farnborough on landing. If the ac in question had not been seen, a collision could have occurred. He assessed the risk as being high.

The Chipmunk was a civilian ac and was flying aerobatics in close proximity to a very busy airfield which he considers poor airmanship.

UKAB Note (1): The Odiham FOB states at 380.102.3:

'In order to expedite traffic and to enable ATC to determine separation between IFR and VFR traffic, all rotary ac equipped with IFF are to squawk Mode 3/A 3647 and no mode C when operating within the MATZ at or below 1000ft QFE and Mode 3/A 3646 with mode C when outside and within LFA1B'.

UKAB Note (2): The Odiham S arrival departure sector - 'Gate' is the arc 120°–180° effectively from ATZ boundary to the MATZ boundary.

THE CHIPMUNK PILOT reports flying an instructional flight in good VMC performing basic aerobatics. [Although he reported that his Mode C was switched on, it was not seen on the radar recordings]. Farnborough was giving a 'Basic Radar Service'. Aerobatics at between 2000/3000ft were flown by the club CFI/Examiner using the A31 line feature N/E of Alton and S of the Odiham ATZ. The other ac was not seen.

DAATM reports that Odiham RT and landline transcripts were not available due to a power outage in the equipment room that caused an unserviceable data recorder.

About 20min before the incident at 1315 Farnborough passed TI on the manoeuvring Chipmunk to Odiham APP as *'manoeuvring in the block 2500 -3000ft FBO QNH*'. The Odiham ADC passed TI on the Chipmunk derived from the Hi-Brite as, "*Traffic South of ODI 4 nm manoeuvring".* The ADC's recollection was that about 2nm separation existed between the Chinook and the Chipmunk and the Chinook pilot reported visual shortly afterwards but continued to track towards the Chipmunk. The radar recording clearly captured the incident but no Mode C was evident [from either ac]; the Chipmunk was squawking 0421 and the Chinook 3647.

The radar recording at 1334:07 showed the Chipmunk tracking ENE separated by 1.3nm from the Chinook which was tracking S. At 1334:27 the Chipmunk had reversed direction and was tracking WSW on a track closing towards the Chinook, which had turned onto a SSE track. At 1334.43 the Chinook turned further E onto an ESE track as the separation closed to 0.2 nm and then 0.1 nm with both ac on reciprocal tracks of East and West respectively.

The ATS provided by military controllers to ac operating in the visual circuit is not defined; however, ac are considered to be under a BS. The Chipmunk was in receipt of a BS from Farnborough and was operating outside of the Odiham ATZ, the dimensions of which are 2nm radius centred on the mid point of the RW up to 2000ft above airfield elevation, active H24. The TI passed by Farnborough was considered to be for information only and did not constitute nor was it considered as co-ordination. The Odiham ADC observed the Chipmunk manoeuvring on the Hi-Brite and passed accurate lateral TI, which enabled the Chinook pilot to acquire the Chipmunk visually.

ATSI reports that the Airprox occurred in Class "G" airspace to the NE of Alton, which is 5nm S of Odiham and lies on the Southern edge of the Odiham MATZ.

The Chipmunk departed Farnborough under VFR at 1316 displaying a Farnborough squawk of 0421 without Mode C reporting and was identified on departure at 1318:05 by Farnborough Radar who provided BS. On initial contact Farnborough Radar provided general TI and shortly afterwards the Chipmunk reported passing one thousand eight hundred for two thousand five hundred feet for operation in the Alton area. At 1321:25 the Chipmunk pilot reported *"..... three miles east of Alton and er request climb er to three thousand feet for operation between three thousand five hundred and two thousand feet aerobatics over".* A MoU exists between Farnborough and RAF Odiham for the purpose of defining procedures between the two units and para 3.10 states:

MATZ Crossing Aircraft, 'all Military aircraft require clearance to transit Odiham MATZ, even when under the control of Farnborough. Civilian aircraft are to be instructed by Farnborough to avoid the Odiham ATZ (2nm and 2000ft Odiham QFE/2500ft Farnborough QNH) unless otherwise cleared by Odiham ATC."

At this point radar recordings show the Chipmunk crossing the Odiham MATZ and passing 3.6nm SE of Odiham. The Chipmunk was instructed to remain outside controlled airspace and Farnborough provided additional TI at 1322:30 and again at 1324:30 *".....there's multiple contacts now operating in your area including traffic just to the east of Alton by one mile northbound at two thousand feet".*

At 1325:10 radar recordings show the Chipmunk had commenced manoeuvring 3.9nm SE Odiham and at this point RAF Odiham ATC contacted Farnborough Radar and requested the intentions of the Chipmunk. Farnborough reported that RAF Odiham were advised that the Chipmunk intended to carry out aerobatics in a block between 2500ft and 3500ft and these levels were also recorded on the flight progress strip. This is at variance with the level of 2000ft to 3500ft reported on RT by the Chipmunk pilot and the controller's recollection of events on the day is vague. RT recordings show that the Farnborough controller was then occupied with the primary task of vectoring inbound traffic for left hand pattern ILS for RWY24 and at 1330:05 he asked the Chipmunk "*.....for coordination are you able to main no fur-maintain no further east than your present position to accomodate traffic inbound for runway two four"* and in response the Chipmunk replied *"Affirm".* The Chipmunk continued manoeuvring between 3.9nm and 5nm SSE of Odiham.

At 1332:06 radar recording show an aircraft 0.5nm W of RAF Odiham displaying an RAF Odiham squawk of 3647 without Mode C. The Farnborough MATS Pt2 Chapter 5, Para 5.2.1 – 8 states, 'Any aircraft observed within 5nm of Odiham, inside the MATZ, squawking 3647 (Callsign converts to "M") and no Mode C is deemed to be not above 1500ft Farnborough QNH'.

The radar recording shows the ac squawking 3647 tracking SSE and converging with the Chipmunk. At 1334:43 both ac are 3.8nm SSE of RAF Odiham and within close proximity of each other with neither aircraft displaying Mode C data. The Chipmunk Pilot did not make any report over the RT regarding the close proximity of another ac and it was only after the Chinook had landed that RAF Odiham advised Farnborough that a Chinook pilot had reported an Airprox; as a consequence the controller was not advised of the Airprox until after returning from leave and his recollection of events was vague.

A Basic Service is described in MATS Part 1, Section 1, Chapter 11, Page 4, Para 3.5.1 and 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'.

The Farnborough controller complied with the conditions described in MATS Part 1 for the provision of a BS.

HQ JHC comments that airspace regulations (Odiham FOB and the MoU) in this area are such that vertical separation of approximately 1000ft should be maintained. It is clear that this was not the case, despite the fact that the height of the Chipmunk at the time of the Airprox is unknown.

The report highlights that the TI on the Chipmunk that was passed to Odiham APP (manoeuvring in the block 2500-3000 ft FBO QNH) was flawed, as the pilot had requested "climb for operation between three thousand five hundred and two thousand feet aerobatics". The order of the height band request (from the highest height to lowest height) was incorrect and this information was not passed to the Chinook. Additionally, as the Chipmunk had requested to manoeuvre down to 2000ft QNH and the Chinook was at 1000ft QFE, planned separation would have been reduced to about 500ft.

In addition, while there was nothing preventing the Chipmunk pilot from performing aerobatics in that particular area it appears to be poor judgement that he chose to do so.

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 was shown a detailed sequence of radar photographs leading up to the CPA that showed the event as described by ATSI above. The Chipmunk can be seen heading ENE away from the Chinook when the ac are separated by 1.0nm and the Chipmunk is in the Chinook's 10 o'clock. It then reverses course on to WSW and the Chinook can be seen turning left to pass behind it. However, the Chipmunk turns right 30°, which put the respective tracks directly in conflict. Although frustrating in that it did not permit any verification/clarification of the disparate reported altitudes/vertical separation, Members accepted that the Chinook was complying with the local SOPs by switching his Mode C off for his VFR departure and the SOP is imposed for a sound reason; they could not explain however, why the Chipmunk's Mode C was not displayed.

While Members recognised that airspace suitable for flying aerobatics close to Farnborough is scarce due to the constraints of the local CAS, they agreed unanimously that flying aerobatics in the (albeit unpublished) departure lane and inside the MATZ of a very busy military airfield is ill advised. One GA Member observed that, since it is well known that the Class G airspace in that vicinity is constrained and very busy, pilots should conduct an even more thorough lookout than usual; another observed that, although probably lower than the Chipmunk and well camouflaged against an agricultural background, the Chinook is a large ac and should have been visible to the Chipmunk pilots had they conducted a thorough clearance of the airspace in which they were operating. An instructor Member also pointed out that when instructing/examining, pilots have divided responsibilities between their essentially 'heads-in' instructional tasks and maintaining a 'safety' lookout; allocating time to and correctly prioritising these tasks, particularly when the workload is high, is most important and in some cases lookout can be neglected. Members agreed that had the Chipmunk instructor been aware of Odiham procedures he would probably not have chosen to operate in that area, despite the A31 road providing a good and easily visible ground datum. Further, had the Chipmunk pilot called Odiham on the RT advising them of his intentions, this would have been relayed to the Chinook crew more clearly and allowed them to take appropriate avoidance. That being the case, they encouraged the Ops staff at Odiham to inform local airfields and clubs of their procedures and traffic patterns.

Although the Chipmunk pilot had informed Farnborough LARS that he was flying aerobatics, the position and the alt band (albeit later changed) this information was lost in the communication chain and did not reach the ADC or therefore the Chinook crew. Notwithstanding that these procedures did not work, the Chinook crew was given TI by the ADC on his own initiative based on the 'Hi Brite' where he saw an unidentified, manoeuvring contact in potential conflict with his departure traffic. This enabled the Chinook pilot to see the Chipmunk about one mile away..

Despite the factors above, both ac were operating in Class G airspace where they had an equal and shared responsibility to see and avoid other ac. In the later stage of the conflict the Chipmunk had the Chinook on its right and, under the Rules of the Air (Rule 9 (3)), should have given way to it but since neither Chipmunk pilot saw it, they could not. The Chinook pilot on the other hand saw the Chipmunk turning back towards him and (based on the radar) tried to turn behind it, but this was counteracted by the Chipmunk turning further towards the Chinook. The radar verified that there was no lateral separation but did not show what vertical separation existed; although the Chinook pilot reported 50ft, Members thought that, since by that stage the Chipmunk had been behind the Chinook, the actual separation had most likely been somewhat larger and that any risk of collision had been removed.

Members were concerned the Chipmunk pilot, the CFI, described the ATC service he was receiving from Farnborough LARS as a "Basic Radar Service" implying that he expected to be given radar derived traffic information. While on occasion Controllers may do so if they have the capacity, they are under no obligation to provide traffic information when providing a BS. Pilots who wish radar derived traffic information or avoidance should request either a TS (Traffic Service) or a DS (Deconfliction Service).

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: While conducting aerobatics near the Odiham ATZ, the Chipmunk pilot flew into conflict with the Chinook, which he did not see.

Degree of Risk: C.

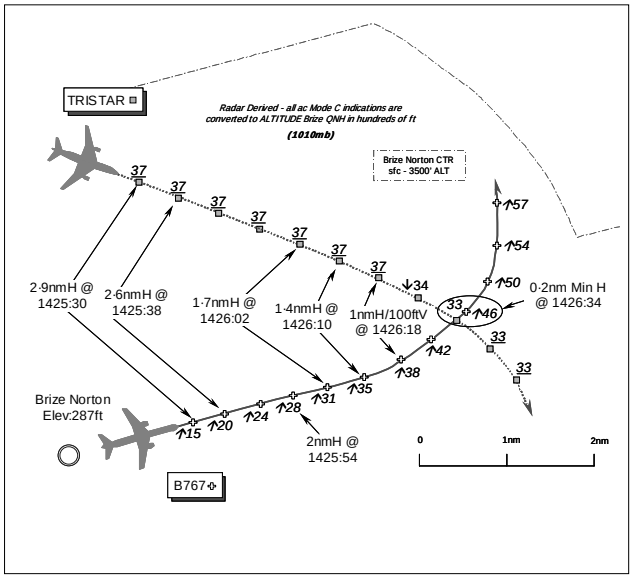
AIRPROX REPORT NO 2009-151

Date/Time: 1 Dec 1426

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

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

	Reporting Ac	*Reporting Ac*
Type:	Lockheed Tristar	B767
Operator:	HQ Air (Ops)	CAT
Alt/FL:	3500ft	2800ft↑
	QFE (1000mb)	QNH (1010mb)
Weather:	NR	NR
Visibility:	10km	NR
Reported Separation:		
	200ft V/0·8nm H	NR
Recorded Separation:		
	100ftV @ 1nmH/0·2nm MinH @1300ft V	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

BOTH PILOTS FILED

THE LOCKHEED L-1011 TRISTAR PILOT reports he was the Pilot-in-Command (P-i-C) conducting a training sortie whilst in receipt of a TS from Brize Norton Director (DIR) on 133·75MHz. A squawk of A3740 was selected with Mode C; Mode S and TCAS are fitted.

Whilst commencing the right hand turn at the end of the outbound leg of the Brize Norton NDB [Locator/DME] hold for RW08, a B767 was first seen 1½nm on their starboard side slightly below his ac. The B767 continued to climb through the Tristar's level and then turned towards his ac. To avoid the B767 he rolled out of the turn onto a heading of 112° and commenced a descent at 800ft/min. At the same time TCAS enunciated a TA and ATC demanded an immediate avoiding action turn to the L. Since he deemed that the B767 was so close that any turn - either L or R - would endanger his ac, he continued the descent without initiating a turn. The B767 passed slightly ahead from R – L; he estimated the horizontal separation as 0·8nm when the B767 was some 200ft above the Tristar and assessed the Risk as *'very high'*. DIR was immediately informed that an Airprox had occurred.

THE BOEING B767 PILOT reports departing under IFR from Brize Norton bound for Trenton Canada. The departure clearance was issued whilst taxying out for RW08; however, the clearance was refused as it involved the use of QFE, which was not in accordance with company SOPs. A further clearance was then copied of: "cleared runway heading [RW08 QFU – 076°] 2800ft on QNH 1010mb to join CAS 5nm N of MALBY level Flight Level 80 squawk 3247 London CONTROL 134.75 Brize when instructed 127.250". Both pilots understood this meant climb straight ahead to 2800ft QNH (1010mb) but that their cleared level was FL80. In hindsight, he can see the potential for clarification to be sought, but at the time neither pilot felt there was any ambiguity. On departure passing approximately 1700ft QNH (1010mb), he thought, [actually at 2400ft QNH] the crew called Brize Approach (APP), reported their altitude passing and 'climbing Flight Level 80 runway heading'. This statement was not queried or challenged by ATC. Shortly afterwards he saw the Tristar on his L about 3nm away and 300ft above them – apparently operating on a different frequency. Simultaneously they received an instruction to turn left onto a radar heading of 260°. [UKAB Note (1): The B767 P-i-C may have confused the timing of this instruction with the outbound radar vectoring instruction onto 280° issued by APP earlier at 1425:53.] He refused the instruction and maintained their current heading deciding that with their current rate of climb the potential conflict would be over in seconds. He was able to monitor the Tristar visually and with TCAS that confirmed the latter was flying level [at that point]. TCAS enunciated a momentary TA but they did not receive an RA. APP then stated they had been instructed to 'stop climb at 2800ft but this was not the case verbatim; if the words 'stop climb' or 'climb to altitude 2800ft' had been used in the departure clearance he can without doubt say that he would have interpreted the clearance correctly and selected 2800ft as his initial cleared altitude.

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

THE BRIZE NORTON AERODROME CONTROLLER (ADC), a Local Examining Officer (LEO), reports that this Airprox occurred during the examination of another controller for the award of his local ADC validation. [The LEO was responsible for the operating position with both Brize Ground (121·725) and Tower (123·725MHz) combined onto the ADC position.] The B767 was due to depart on RW08 for MALBY under IFR. The MALBY SID requires ac to be TACAN-equipped but the B767 was not fitted with TACAN. Therefore, to avoid passing a lengthy scripted clearance that might require clarification, the ADC candidate liaised with APP before passing the B767's clearance [words to the effect of]:

'After departure maintain runway track climbing 2800 feet QNH, for radar vectors to join CAS 5nm N MALBY level Flight Level 80, squawk....frequency for London control 134·750 when instructed. Frequency for Brize Approach 127·250.'

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

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

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

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

THE BRIZE NORTON DIRECTOR (DIR) reports he was Mentor to a trainee controller operating DIR, using the Brize Watchman ASR and Brize SSR that were fully serviceable and set to a 20nm displayed range. The Tristar was the only ac under control at the time of the Airprox; it was in the Brize hold at 3500ft QFE (1000mb) under a TS and he assessed his workload as 'low'. The trainee was in full control of the ac when APP co-ordinated the B767's departure from Brize Norton not above 2800ft QNH (1010mb). He overheard the Approach Controller [APP - who was also under training] instruct the ADC to maintain runway track 2800ft QNH for the departure of the B767 and then release it. His trainee then gave traffic information about the departing B767 to the Tristar crew. As the B767 got airborne the Tristar was turning S in the hold at 3500ft QFE (1000mb). He then noticed that the B767's Mode C was indicating 032 - 3200ft (1013mb) - [about 3110ft QNH (1010mb) when the ac were 1·7nm apart] and shouted to the APP controller asking what his traffic was doing whilst simultaneously his trainee issued an avoiding action instruction to the Tristar crew to turn to the N. The Tristar crew did not take the turn and elected to descend below the B767 as the latter continued to climb; at this point the Tristar crew informed him that they would be filing an Airprox against the B767. He estimated minimum separation to have been 200ft vertically and 1nm horizontally.

THE BRIZE NORTON APPROACH CONTROLLER (APP) reports that he was Mentor to a trainee controller who was operating the APP position on 127·25MHz from 1413:00, also using the Brize Watchman but with SSR from the Clee Hill source that was fully serviceable. The B767 was awaiting release from RW08 for a MALBY departure but the crew were unable to fly the SID, so the intention was to climb the ac on departure on RW track to an altitude of 2800ft Brize QNH (1010mb) and then give radar vectors for MALBY. With the Tristar in the locator hold at a height of 3500ft Brize QFE (1000mb) under a TS, when the ADC called for a release on the B767 his trainee gave the instruction to maintain RW track, climb to 2800ft Brize QNH (1010mb). As the B767 became airborne his trainee was co-ordinating on landline a LARS track transiting close to the Brize overhead. Due to that landline

conversation he did not hear clearly the initial airborne call from the B767 crew. As the co-ordination conversation was taking place the DIR Mentor noticed that the B767 was climbing above his cleared altitude. Avoiding action was issued to the B767 crew to descend and DIR issued an avoiding action turn to the Tristar crew. The B767 crew reported visual with the Tri-star. When he asked the B767 crew why they had climbed above an altitude of 2800ft QNH, the pilot said he understood that he had been cleared to climb to FL80 to join CAS at MALBY. He informed the B767 pilot that APP had not cleared him to climb above 2800ft and that the Tristar crew was filing an Airprox. Subsequently, the B767 continued en-route with LAC.

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

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

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

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

At 1408:49 the ADC called APP on the landline to notify APP that the B767 had started to taxy for a MALBY departure squawking A3247. The MALBY SID is based on the BZN TACAN but, as the B767 was not TACAN equipped, it could not fly the procedure as published. The ADC continued to explain, *"he's got no TACAN so can you give him a SID B and then vectors or do you want me to read the spiel to him?"* The ADC, in referring to '*the spiel',* meant the text from the TAPs/Mil AIP which, when passed, would allow the B767 pilot to input the applicable reporting points of OSGOD and MALBY into their navigation system and thus fly the briefed profile. However, APP agreed to a SID B, squawking A3247 and to frequency 127·250 MHz. SID B is a climb on runway track to 2500ft QFE [2800ft QNH]. Shortly after this exchange APP dealt with numerous LARS and landline calls before APP/LARS was 'split' at 1413:00 and the LARS task handed to another controller. Meanwhile, at 1412:20 the ADC passed the B767's departure instructions and included the airways joining clearance, using QFE as the pressure datum. However, the B767 crew required to use QNH so the ADC re-negotiated with APP and an amended departure clearance was issued. This was transmitted by the ADC, together with the CAS joining clearance, to the B767 crew at 1413:32:

"[B767 C/S] *after departure climb runway track 2800ft QNH 1010 to join controlled airspace 5 miles north of MALBY level FL80 squawking 3247 and frequency for London, when instructed, 134·750, after departure contact Brize APPROACH 127·250."*

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

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

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

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

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

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

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

After reading back their take-off clearance the B767 crew was immediately transferred, at 1424:21, to APP on 127·250MHz. At 1425:36, APP called LARS on the landline requesting co-ordination for the B767 against another ac under the control of LARS. As this request was being made the B767 crew called APP at 1425:37, *"Brize Approach good afternoon* [B767 C/S] *passing 2 thousand 4 hundred climbing Flight Level 8-0 climbing straight ahead."* The pilot noted in his report that the above statement was neither queried nor challenged by ATC. Whilst the B767 crew was passing their message, the LARS controller replied to an ac on the LARS frequency; the landline to APP was still open. The APP controller's report acknowledged that the B767 pilot's initial call was not heard clearly due to the distraction of the landline conversation. At 1425:46 APP acknowledged the B767 pilot's transmission by advising "[B767 C/S] *Brize APPROACH identified."* A few seconds later, under instruction from the Mentor, the APP trainee instructed the B767 crew to turn L onto 280°, which at 1425:48 the crew read-back. APP then continued to co-ordinate with LARS.

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

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

At 1426:24 the Tristar crew reported that they were maintaining 3000ft [QFE] and at the same time the B767 crew reported to APP that they were *"OK* [C/S] *now in the turn".* APP asked the B767 crew if they were *"..visual with that traffic"* to which the B767 crew replied at 1426:27, *"affirm* [pause] *and well clear."* APP continued the co-ordination with LARS, agreeing to take 1000ft Mode C separation below the LARS track with the B767, whilst DIR and the Tristar crew discussed the situation. DIR advised the Tristar crew that the B767 had *"..bust his level he didn't stop off",* to which the Tristar pilot replied that he would be filing against the B767. DIR further advised that when it was noticed that the B767 was climbing above the expected altitude, the B767 was given avoiding action;

the Tristar pilot re-iterated that a report would still be filed. At 1427:08, the APP Mentor - who had taken over direct control of the position - asked the B767 crew to *"confirm you were given a stop climb 2800ft QNH on departure?",* to which the B767 crew replied *"Negative, FL80."* APP then placed the B767 under a DS outside CAS and passed traffic information on the co-ordinated LARS traffic. After the B767 crew was given 'own navigation' to MALBY and a further climb, APP advised that the Tristar was filing an Airprox. APP added that, *"..the instructions should have been to stop climb 2800 feet on the Brize QNH when you were airborne you were given a left turn on to* [heading] *2-8-0 at no point were you given an instruction to climb to Flight Level 8-0"*. The B767 crew then advised APP, *"…keep the tapes because that's not our understanding of how it was, we understood maintain runway track 'til 2 thousand 8 hundred feet and then it was the departure to join controlled airspace Flight Level 8-0. We understood the clearance to maintain track until passing 2800 feet."* About 30 sec later the B767 pilot added, *"also on first contact with Brize Radar* [APP] *passing 1500 feet I reported passing I think 2300..sorry passing 1500 or thereabouts,* [the B767 pilot called passing 2400ft] *climbing Flight Level 8-0 was my first call…".* APP acknowledged the B767 pilot's comment and switched the flight to London Control.

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

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

APP was distracted by an open landline with LARS and did not hear the B767 crew report "…*passing 2 thousand 4 hundred climbing Flight Level 8-0 climbing straight ahead."* The B767 climbed through the level of the Tristar at a range of just over 1nm. Although ATC issued avoiding action instructions to both crews, both ac captains decided their own course of action was the safest resolution of the confliction.

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

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

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

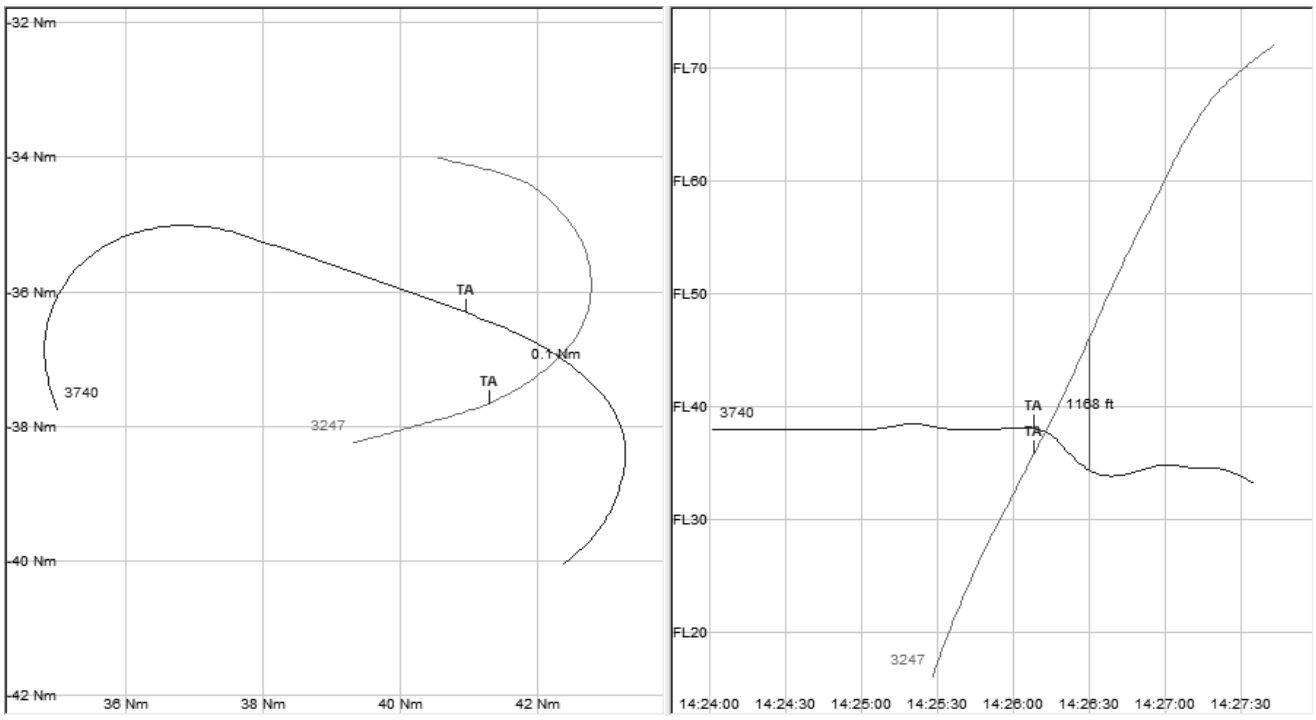
The B767 is shown climbing into coverage through an altitude of 1500ft at 1425:30, squawking the assigned code of A3247, which is subsequently converted to the flight ID through the Code Callsign Distribution System. Meanwhile the Tristar is shown squawking A3740 maintaining 3700ft Brize QNH – above the upper limit of the CTR (3500ft amsl) in Class G airspace. Both ac converge as the B767 maintains a steady course on departure passing 2800ft QNH at 1425:54, with the Tristar 2nm away directly off the port beam 900ft above. At 1426:02 when the ac are shown 1·7nm apart, the B767's Mode S selected level is displayed as FL80, but this would not have been apparent to the controllers within the Brize ACR who are not provided with Mode S data. The B767 is shown in a L turn, in compliance with the radar vector onto 280° issued by APP, having climbed through the level of, and indicating 100ft above, the Tristar that has closed to a range of 1nm still off the port beam, with both ac now in Class G airspace above the CTR. A combination of the B767's RoC through 4200ft QNH and the Tristar crew's

avoiding action descent through 3400ft QNH into the CTR results in 800ft of separation on the next radar sweep where the ac are shown ½nm apart. The B767 crosses the Tristar's nose from R – L, in between sweeps, and draws L into the Tristar's 10 o'clock 0·2nm at 1426:34 - the point of minimum recorded horizontal separation; the Tristar levels at 3300ft as the B767 climbs through 4600ft when separation of 1300ft is evident. The Tristar commences a R turn and the B767 continues to turn L and climb whilst the range opens and the latter clears to the N.

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

The InCAS simulation based on interpolated single source radar data from the Clee Hill Radar only simulated the generation of TCAS TAs, which were received by both aircraft at 1426:08 at a range of 1·4nm. The ACAS diagnostics provided by the InCAS simulation indicates that although the 'Range Test' that would have enabled an RA was passed at 1426:14, the subsequent 'Altitude Test' showed the predicted vertical miss distance at the CPA of 881ft was greater than the threshold value of 600ft. In summary, the results of the simulation confirm and explain the TCAS warnings reported by both crews and that an RA would not be triggered in these circumstances.

INCAS SIMULATION



Encounter diagram based on Clee Hill single source Radar data

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It seemed that 'Human Factors' had played a significant part in this Airprox. It was immediately apparent to the controller Members that every operating position, with the sole exception of the SUP, was manned either by a trainee screened by a Mentor or, in the case of the ADC, by a controller undergoing a validation check from an

LEO. Usually, it is a matter for individual unit SUPs to balance the weight of the training task against the overarching requirements of safety. Whilst acknowledging the necessity to progress individual controllers training towards validation efficiently, controller Members considered it unwise to have every operating position manned in this way throughout the Tower. The potential for an error to go unchallenged was significant and this Airprox was a salutary example to Mentors/Supervisors of what can go wrong when their attention is momentarily diverted, potential pitfalls are not spotted, or action that they themselves would have accomplished if operating 'solo' is not taken promptly.

It was clear at the outset that neither the LEO nor the B767 crew recognised any ambiguity when the ADC passed the B767's departure instructions and CAS joining clearance in one seamless transmission. Both the LEO and candidate were content in their minds that 2800ft QNH (1010mb) was the extent of the B767 crew's clearance whereas the B767 crew believed the ADC's instruction allowed them to climb straight ahead to 2800ft QNH, then continue the climb to FL80 to join at MALBY. It was clear that the choice of phraseology used by the ADC to pass both the CAS joining clearance and the climb-out restriction in the one transmission was the crux of the issue. One CAT pilot Member thought it unusual to receive two levels in the same transmission, which would have prompted him to clarify what was required, whereas others were unsure. The Board was briefed that a 'straw poll' amongst transport crews at Brize suggested that some thought it ambiguous and they would have challenged the instructions issued by the ADC, whereas others would have followed the profile flown by the B767 crew. With the facts laid bare by the RT transcript and the MAA ATM Safety Analysis report, all Members agreed with the B767 pilot's view that, without some specific instruction to stop the climb at 2800ft, the combined instructions/clearance given were open to mis-interpretation – as occurred here. The accounts provided by those involved in the incident suggest that clearances were routinely issued in this manner; however, Members and Advisors familiar with Brize commented this was not universal throughout the unit, or military ATC in general. Controller Members suggested that a CAS joining clearance is never issued together with a local climb-out restriction in this manner and the Board was briefed that accepted teaching on this topic at the Central ATC School (CATCS) is to pass them separately. All the controller Members assembled, without exception, would have transmitted these two instructions separately. First, the CAS joining clearance for MALBY, from London Control. Secondly, the local climb-out restriction from APP, which must be issued before the take-off clearance, to ensure separation between departing and holding traffic. Members said that if done in this manner, it would have reduced the potential for any ambiguity or mis-interpretation and made plain what was required. Members concurred that the phraseology used by the ADC was not clear. Therefore, the Board agreed unanimously that this Airprox had occurred because the ADC passed an ambiguous clearance to the B767 crew, which resulted in a conflict with the Tristar.

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

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

The Board also noted that there was no evidence that APP had verified the B767's Mode C indication. A controller Member questioned whether the APP team were paying sufficiently close attention to their radar display as they did not notice the B767's Mode C indicating above 2800ft QNH. However, the ROC of the departing ac left little time to react: on the LATCC (Mil) recording the B767's Mode C indicated 2800ft at 1425:54 and thus it was not until the next sweep, 8sec later at 1426:02, that it would have been evident that the B767 was above the altitude APP was expecting the ac to level at. It seemed that the alert DIR Mentor spotted the true situation barely moments later as at 1426:11, DIR issued the avoiding action turn to the Tristar crew. The DIR's and SUP's reports both state that the DIR Mentor shouted a verbal warning 'off-mic' to APP about the confliction, which it seemed was when APP first realised what was happening. It is important to emphasise here, that the radar recording available to the Board, which included Mode S data, was not the same as that displayed to the controllers in the

Brize ACR at the time. Although Brize is supplied with Clee Hill SSR data in addition to the local SSR source, controllers within the Brize ACR are not provided with Mode S data on their displays. If they were, the Downlinked Ac Parameters, which include the selected level (SEL), could be displayed to the controller. Here the B767's Mode S SEL of FL80 could have been another trigger that might have alerted the radar controllers that the B767 was not going to level at 2800ft as they anticipated. Regardless of the provision of Mode S, however, it was important to monitor departing traffic's Mode C closely and to be prepared for the unexpected.

Turning to the Risk, the Board noted that APP had co-ordinated with DIR to ensure that the Tristar maintained 3500ft QFE/3800ft QNH in the hold and had planned for the B767 to climb up to 2800ft QNH beneath it. This ensured that the required 1000ft standard separation would be preserved under the RCS provided by APP to the B767 crew – the type of service is not stated on the RT because it is deemed to be so and the only radar service that can be given to IFR flights in the Class D CTR. From APP's perspective, nothing further was required until the B767 was clear of the Tristar horizontally and the B767's climb could be resumed to join CAS at MALBY. Meanwhile, DIR had promptly passed TI to the Tristar crew, who, primed about the departing airliner, were able to react swiftly when the B767 was first seen 1½nm on their starboard side, slightly below, about the same time as TCAS generated a TA. The Board supported the Tristar pilot's decision, based on his visual assessment of the geometry and dynamics of the situation, to ignore the DIR's avoiding action turn to the L, which would have put him belly-up to the B767, in favour of a descent that enabled him to remain in visual contact. The Board noted that the Tristar's descent, combined with the B767's rate of climb, avoided the parameters that would have triggered a TCAS RA and resulted in a separation of 100ft at 1nm range and 1300ft at 0.2nm range. For his part, the B767 pilot saw the Tristar some 300ft above his ac - he said from a range of 3nm. This did not quite gel with the radar recording, which showed the B767 600ft below the Tristar at a range of 1·7nm so it was feasible he first saw it somewhat closer. Nevertheless, Members recognised that the ROC achieved by the B767, clearly illustrated by the TCAS Encounter diagram and the radar recording, was taking the B767 rapidly through the B767's altitude. Fortunately, the B767 crew chose to ignore the avoiding action descent transmitted by APP; the radar update just before the B767 crossed through the Tristar's 12 o'clock shows 800ft of vertical separation and then 1300ft clear above it before the point of minimum horizontal separation of 0·2nm was reached. Clearly, this encounter might have ended differently had both crews not seen the other ac, and some Members expressed reservations that safety had not been assured as it was. However, on balance, the visual sighting by both crews and the Tristar's descent coupled with the B767's continued rapid climb convinced the Board that no risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The ADC passed an ambiguous clearance to the B767 crew, which resulted in a conflict with the Tristar.

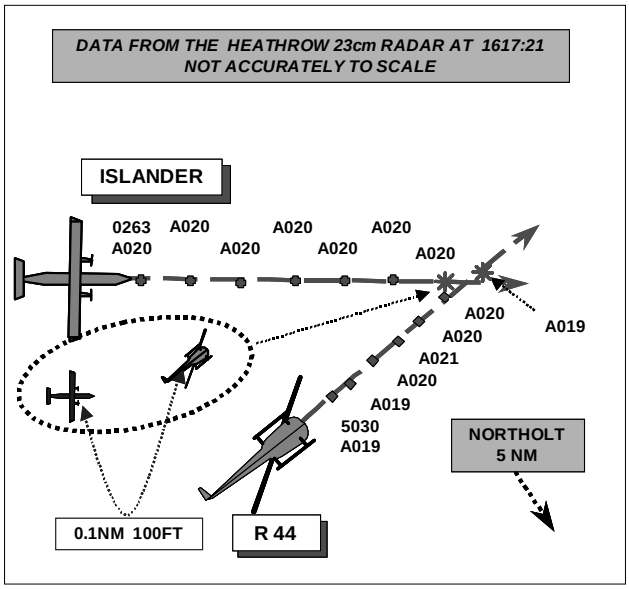
Degree of Risk: C.

Contributory Factors: The B767 pilot's first call reporting their cleared level was not assimilated by APP.

Safety Recommendation: That the MoD requests a review of the CAP413 instructions about the passing of climb-out restrictions.

AIRPROX REPORT NO 2009-152

Date/Time:	3 Dec 1617	
Position:	5138N 00031W	(4nm N Denham)
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	R44	BN2 Islander
Operator:	Civ Trg	N/K
Alt/FL:	2000ft	2000ft
	(QNH 1000mb)	(QNH 1000mb)
Weather:	VMC CLBC	VMC
Visibility:	>10km	>20km
Reported Separation:		
	100ft V/30m H	N/K
Recorded Separation:		
	100ft/0.1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE R44 PILOT reports flying a training flight with a student pilot and an observer in a green helicopter with all lights switched on, in receipt of a TS from Farnborough and squawking as directed with Modes C and S but no TCAS fitted. At the time of the incident the student was the handling pilot and they were level at 2000ft Lon QNH and heading 020° at 100kt. On initial contact with Farnborough North the controller immediately advised him of traffic on his left at 1nm at a similar level which his observer saw and he immediately confirmed that he had it in sight. He (the instructor) did not see the traffic at this stage and they maintained their course and speed. Farnborough then reported the traffic as being in their 9 o'clock at a range of 0.5nm. He spotted the traffic, a light grey Islander with no other markings visible, in a symmetrical head on profile, at the same level in their 8 o'clock where it remained at a constant relative bearing until he took avoiding action by descending to 1800ft. His observer estimated the minimum separation as being 100ft but was unable to note its registration due to the speed at which it passed above and behind them as they descended. He assessed the risk as being low.

He took avoiding action having decided that either the Islander pilot had not seen them or had elected not to give way in contravention to The Rules of The Air Regulations, Rule 9 (3).

The carriage of an observer on his ac was unusual and incidental to the purpose of his flight. It is his opinion that without the timely and effective Traffic Service from Farnborough North the risk of collision would have been high.

Although he elected to withdraw the Airprox while airborne he subsequently changed his mind.

THE BN2 ISLANDER PILOT reports that he was on a delivery flight and holding outside the London TMA waiting to be positioned for an approach to RAF Northolt. At the time of the incident he was flying at 2000ft on the London QNH, heading Easterly at 120kt, squawking as directed with Modes C and S and TCAS was fitted. He 'saw' the R44 initially on the TCAS, then visually describing it as blue or black, in the 2 o'clock position at 1500ft and it was called by Northolt. The other ac held a northerly heading and climbed to pass into front of him. He did receive a TCAS TA, but the bearing was never constant and he had the R44 in sight at all times as it crossed 2-300m ahead of him. He considered that there was absolutely no collision risk.

UKAB Note (1): An analysis of the Heathrow 23cm radar (and others) showed the incident clearly. The Islander approaches the CPA tracking E, at a constant alt of 2000ft and squawking 0263 (Northolt), while the R44 tracks 060° squawking 5030 (Farnborough LARS) with its alt indicating around 2000ft. The R44 alt, however, does show a descent from 2100ft to 1900ft over the 4 sweeps (16 sec) leading up to the CPA when it passes (just) ahead of the Islander. The ac maintain the same relative bearing for well over one min leading up to the CPA.

UKAB Note (2): The incident took place in Class G airspace outside the London TMA. Despite being on a heading directed by Northolt APP to maintain separation on the two ac ahead in the pattern and in receipt of a TS, under the Rules of the Air (Rule 9 (3)) the Islander, having the R44 on its right was required to give way to it.

ATSI reports that this incident occurred in Class G airspace 4nm NW of Denham Airfield.

The R44 helicopter was airborne under VFR and had departed from Denham establishing contact with Farnborough Radar at 1616:00, requesting a TS and reporting 3nm N of Denham heading NE at 2000ft on a local flight towards BPK then BKY. At 1616:28 Farnborough Radar instructed the R44 to select a Farnborough squawk of 5030 and passed the London QNH of 1000mb.

At 1616:36 before the R44 helicopter was positively identified, the Controller observed traffic displaying an RAF Northolt squawk of 0263 approximately 1.5nm from the position given by the R44 helicopter. The Farnborough controller's recollection was that TI was passed using the phrase "Traffic believed to be you has ....." however the RT transcript shows that the Controller passed the following message, *"... traffic beneath you is traffic in your half past nine range of one mile left to right same altitude",* the pilot acknowledged with *"Roger...".*

Shortly afterwards at 1616:56 Farnborough radar identify the R44 and pass further TI, *".....you are identified one and a half miles northeast of Saint Giles under a traffic service and you still have that traffic in your ni-nine o'clock now quarter of a mile";* 5sec later the pilot responds *"Traffic service and we're visual with it..."* and then at 1617:16 he reported, *"...we were visual with the traffic we've had to descend to avoid it it's an Islander I don't have any details of the registration but I'd like to file an Airprox*". The R44 pilot reported maintaining 1800ft and radar recordings show the other ac tracking E and displaying the RAF Northolt squawk of 0263 with Mode C showing an alt of 2000ft.

Farnborough advise the pilot of the R44 helicopter *"...have spoken to Northolt who were working the traffic and er I have the details if you wish to file".* (Northolt confirmed to Farnborough that the other traffic was an Islander squawking 0263).

At 1621 the pilot of the R44 advised that he did not wish to file a report but the following day he changed his decision.

A TS is described in MATS Part 1, Section 1, Chapter 11, Page 5 and 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 Farnborough controller complied with the conditions described in MATS Part 1 for the provision of a TS.

HQ AIR ATM SM reports that Northolt APP was vectoring an Islander, under a TS in Class G airspace clear of the Denham ATZ, for an approach to RW25. The position had been band-boxed with DIR and the controller had been on the console for two hours and was working four ac; however, prior to the Islander coming on frequency another controller took the DIR responsibilities to enhance APP capacity. The Islander pilot checked in at 1609:46 and, although no service was requested, a TS was applied and the pilot did not question it. At 1616:09 APP called traffic as, "C/S traffic right 1 o'clock 3nm crossing right to left, indicating 100ft below and climbing", although the Heathrow radar recording showed that it displayed 200ft height difference. At 1616:19 (40 sec before the CPA when the ac were 2.3nm apart) the pilot reported "in sight" and the controller then passed TI on another ac, a Griffin, ahead in the radar pattern but the pilot reported (after the CPA and the ac had crossed) that the only contact he had was passing down his right-hand side and behind (not the R44 but possibly the Griffin). The Islander pilot then converted to a visual recovery at 1621:16 and called TWR.

The Islander was under a TS and was given TI on an ac that had appeared at 3nm near Denham and climbing towards it on a converging heading. Given the task being conducted and the closing speeds of the contacts, there was sufficient time for the pilot to acquire the ac visually, seek avoidance/further TI if required or formulate his own avoiding action iaw the rules governing a TS. Due to the pilot's response to the initial TI (he then called traffic in sight) the controller did not offer any update.

It is considered that Northolt ATC acted correctly and in accordance with stipulated procedures for a TS and therefore they did not contribute to this Airprox.

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 Board determined that, despite some nuances, this was straightforward encounter in Class G airspace where both pilots had an equal responsibility to see and avoid other ac in accordance with the Rules of the Air. Under Rule 9 (3) the Islander, having the R44 on its right was required to give way to it. The Islander pilot was first made aware of the R44 from his TCAS (subsequently displaying a TA only) and by the TI passed by Northolt ATC; he maintained visual contact with it as it crossed ahead of him, considering there to be no risk. The R44 captain having a poorer view of the event, was more concerned and elected, correctly in the Board's view, to descend, thereby also adding vertical separation.

While Members agreed that there had been no risk of collision, the proximity of the Islander (about 200m) to the R44 had undoubtedly caused its crew concern.

Members agreed that it is always good practice to take visible avoidance, rather than making a speed alteration or electing to 'stand on' as the latter both provide the other pilot with no positive indication that his ac has been seen, thus engendering a degree of apprehension.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Islander flew close enough to the R44 to cause its crew concern.

Degree of Risk: C.

AIRPROX REPORT NO 2009-153

Date/Time: 10 Dec 1511

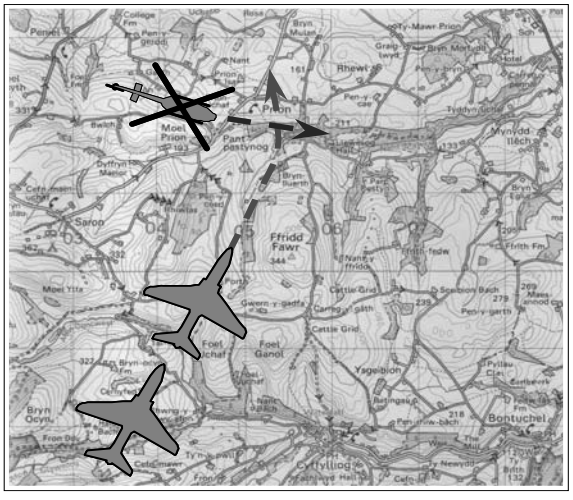
Position: 5309N 00324W (2nm W Ruthin)

Airspace: UKDLFS/LONFIR(Class: G)

	Reporting Ac	*Reported Ac*
Type:	Hawk TMK2	Untraced Helicopter
Operator:	HQ AIR (TRG)	NK
Alt/FL:	455ft agl	NK
Weather:	VMC CAVOK	NK
Visibility:	>30km	NK

Reported Separation:
50-100ft V/100-200m HNK

Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK TMK2 PILOT reports flying solo, leading a pair of ac on a low-level training sortie in LFA7 in excellent weather. They were squawking 7001 with Modes C and S and all lights, including the nose light, were switched on. While heading 020°, out of sun, at 450kt and about 450ft agl a red, black and white twin-engine civilian helicopter was seen in the left 11 o'clock slightly low and about 1-200m away. The sighting was too late to take

effective avoiding action to reduce the collision risk other than a slight climb and wing waggle. TCAS was fitted but no warning was given. He did not assess the risk.

THE HAWK UNIT comments that the Hawk crews were not aware of any other ac operating in LFA 7. The Hawk TMK2 was fitted with a serviceable TCAS 2, but both ac were operating at low level and neither the presence nor position of the helicopter was detected, even in the avoidance manoeuvre after clear line-of-sight had been established.

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

UKAB Note (2): The incident shows on the recording of the St Annes radar. The helicopter shows intermittently, squawking 7000 with a Mode C level of FL004, tracking about 110° towards the CPA, while the Hawks, flying in about 1nm trail, approach tracking 025°, lead indicating FL008 descending. When the ac are about 0.5nm apart, with the helicopter (last showing FL004) is in lead Hawk's 11 o'clock, the latter now indicating FL007, it turns about 10° to the left to pass close behind the helicopter; as they pass both ac's Mode C drops out.

HQ AIR (TRG) comments that due to TCAS limitations detection of other ac whilst low flying cannot be guaranteed. It is important that users of TCAS equipped ac in the UKDLFS continue to use lookout as the primary means of detecting other ac. Although the Lead Hawk pilot saw the helicopter late, he managed to initiate avoiding action but the lack of reaction or report from the helicopter pilot, it can only be assumed that he did not see the Hawk or considered it not to be an Airprox.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the Hawk formation lead pilot, a radar recording and a report from the Hawk operating authority.

When analysing the separation achieved the Board noted the rolling terrain, which had precluded early acquisition of the helicopter by the Hawk crew. Also since the Hawks were flying in (long) line astern formation the crew of the number 2 ac were not in a position to assist with the lookout to the front sector. Bearing in mind the close proximity of the Hawk, Members were surprised that the helicopter pilot had apparently not been aware of it, even though it was approaching from 'up-sun', and also reported the incident.

Members also unanimously agreed that the helicopter pilot had been unwise to chose to fly in a busy and promulgated low flying area, at an alt regularly used by military fast jet ac to meet their training objectives.

Although unanimously agreeing the cause, Members were undecided as to the degree of risk; exactly half considering that there had been an actual risk of collision. The Chairman however, decided that, since there had been some (albeit small) extant separation and that the Hawk pilot's manoeuvre, although late, had not been too late to be effective, the combination had removed any actual risk of collision; due to the lateness of the sighting, however, normal safety standards had been eroded.

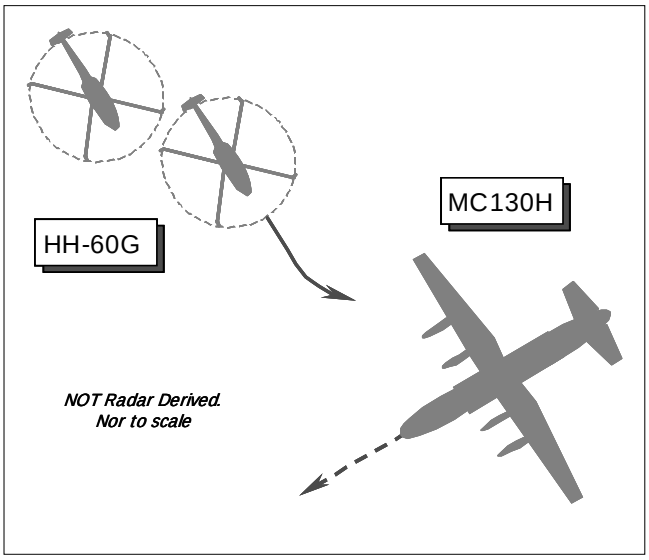
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A presumed non-sighting by the helicopter pilot and a late sighting by the Hawk crews.

Degree of Risk: B.

AIRPROX REPORT NO 2009-154

Date/Time:	7 Dec 1812	NIGHT
Position:	5251N 00047E (1nm NE of Sculthorpe)	
Airspace:	UKNLFS	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	MC130H	HH-60Gx2
Operator:	HQ 3AF	HQ 3AF
Alt/FL:	200-300ft↓	150ft
	QFE (992mb)	agl
Weather:	VMC NR	VMC In Rain
Visibility:	NR	5km
Reported Separation:		
	50-100ftV/nil H	500ft V/1nm H
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LOCKHEED MC130H CAPTAIN reports that he was conducting a night training flight into Sculthorpe using Night Vision Devices and was operating VFR, in VMC, whilst in receipt of a limited TS, he thought, [actually a BS] from Marham APPROACH (APP) on 124·15MHz. The allocated squawk was selected with Mode C; Mode S and Enhanced TCAS [ETCAS] are fitted, the latter having a 'lockout' below certain altitudes. The ac was crewed with 2 pilots, 2 navigators, a flight engineer and 2 loadmasters; the ac was displaying navigation lights, wing tip lights, formation lights, anti collision beacon and strobes .

On short final descending through 200-300ft agl at Sculthorpe LZ/DZ, heading 235° at 130kt, about 1½nm from the runway threshold, his navigator detected helicopter traffic on an infrared sensor crossing in front and below, whereupon his flight engineer saw the traffic and both called for a level-off. He then saw the lead helicopter, with its lights on, crossing from R to L on a heading of about 150° across the extended centre-line, under his ac's nose as he searched for a No2. The loadmaster saw both helicopters – perceived to be CH47s at the time - cross about 50–100ft underneath his ac after the level off and climb had been initiated. He assessed the Risk as 'high'.

He questioned APP, who had been providing 'traffic advisories', about the reported helicopter traffic [but they were unaware of the flight of HH-60Gs]. Marham was aware of the MC130 operations at Sculthorpe, which had been NOTAM'ed active from the surface [to 2000ft] covering their location.

UKAB Note (1): UK NOTAM Y5408/09 was issued on 4 Dec, promulgating the MC130 pilot's airdrops at Sculthorpe DZ. The NOTAM, for the period between 071700ZDEC – 082300ZDEC, was for drops between 1700-1900Z on the day of the Airprox when a mandatory temporary avoidance (MTA) was in force (2100-2300Z for the following day). It was stated at para E, F & G that:

'Multiple C130 ac will conduct air drops within an area bounded by specified coordinates [broadly a rectangle 7nm wide – 3½nm either side of the centreline aligned on 235°, 13nm long, extending from 3nm SW of Sculthorpe to the coast at Blakeney Point, surface to 2000ft agl, although the activity extended above this height]….All aircrew must be aware that although the airdrops will take place at Sculthorpe [DZ], participating ac will manoeuvre within the area stated and may be unable to comply with the Rules of the Air….This NOTAM is a mandatory temporary avoidance, however, crews in receipt of a radar service from a radar equipped unit may be given radar vectors through the MTA if it is known that there is no airdropping taking place.'

THE SIKORSKY HH-60G PAVEHAWK PILOT reports he was leading a flight of two grey HH-60G helicopters in the UKNLFS, operating VFR in VMC some 600ft below cloud with a flight visibility of 5km in rain. He was not in communication with any ATSU but monitoring the low-level operating frequency, squawking A7001 with Mode C on; neither Mode S nor any form of TCAS are fitted. The ac position lights and upper night strobe were all on.

He recalled from memory and records of that night, that his formation was operating in the vicinity of Sculthorpe accomplishing portions of a mission flight checkride evaluation. While heading SE in the vicinity of Sculthorpe at 100kt, level at 150ft agl, they first noticed an MC130 type ac 3nm away flying toward them at the airstrip. They attempted multiple times to hail the MC130's crew on the UK low-level frequency to deconflict, but with no answer. His formation also attempted contact on the Stanta Range frequency [Stamford PTA – EGD208] to hail the inbound MC130 but from his recollection there was no answer to either. His formation remained 'eyes-on' the traffic the entire time and as the MC130 approached to a range of 1nm the formation was turned E to increase the separation. They did not feel threatened or believe safety of flight was compromised for either ac in his formation. Minimum horizontal separation was 1nm as the MC130 passed 500ft above his formation with a 'low' Risk of collision. After separation was 'regained', they continued training and returned to base.

HQ AIR ATM SAFETY MANAGEMENT reports that the MC130 was conducting parachute drops in the vicinity of Sculthorpe. The activity was subject to NOTAM action.

The MC130 was handed over from Norwich to Marham ZONE on 124·15MHz and instructed to squawk A3660. At 1732:25, the MC130 crew checked-in with ZONE requesting a BS at 1000ft Marham QFE (992mb), which was applied. However, the controller asked the MC130 crew, "*…and if you could advise before turning towards..Sculthorpe, the Marham radar pattern is active at the moment".* This was not an attempt to identify the ac to provide a radar service, but to co-ordinate the MC130 against traffic in the Marham radar pattern. After co-ordinating the Marham radar pattern traffic in height blocks above the MC130 crew's co-ordinated maximum height of not above 1300ft QFE (992mb), the controller saw no conflicting traffic during the time the MC130 was on frequency. However, the pilot of the MC130 reported 2 helicopters passing his position at 1814:38, "…*there looks as though there was a helicopter that passed by about 200 feet, it looked like a Blackhawk..without communication"*. A civil helicopter pilot inbound to a private site in the vicinity of Langham disused A/D near Blakeney Point was questioned by ZONE; however, the pilot reported that he had the MC130 on his TCAS on the run in. [As the MC130 departed Sculthorpe to the SE bound for Mildenhall some 2min after the Airprox had occurred, it flew beneath this civil helicopter].

It is clear from the RT transcripts and radar replay that, although ZONE was busy, having decided to 'bandbox' positions, the controller monitored the flight of the MC130 correctly within the principles of a BS. The radar recording does not show any conflicting traffic passing in front of the MC130.

UKAB Note (2): This Airprox occurred outwith recorded radar coverage. The MC130 is shown approaching Sculthorpe and descending on long final to the DZ within the NOTAM'ed area from 1600ft (1013mb) – about 970ft QFE (992mb). Radar contact on the MC130H is lost after the ac descends through 1100ft Mode C – about 470ft QFE - 1nm NE of Sculthorpe at 1812:07. No other primary or secondary contacts that might be associated with the flight of HH-60G helicopters are evident at all on the recording.

HQ 3AF comments that the MC130 crew was carrying out a routine exercise at Sculthorpe, which was covered by NOTAM Y5408/09. Given the frequency of the particular MC130 exercise and the NOTAM handling procedures extant on the helicopter squadron, it seems highly unlikely that the helicopter formation leader would have been unaware of the NOTAM; regrettably, due to movements of key personnel during and since the Airprox, the latter cannot be confirmed with absolute certainty. What appears clear, however, is that the Captain of the lead helicopter, after acquiring the MC130 visually at 3nm, approached it sufficiently close to cause the MC130 Captain to take avoiding action.

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 HQ 3AF Advisor briefed the Board that MC130 night training exercises at Sculthorpe are commonplace; consequently special procedures are in place to allow these fixed-wing ac to enter the Night Rotary-wing Region (NRR) to accomplish their training objectives. As the MC130 and the HH-60 operate from different locations, direct co-ordination is not usual. Nevertheless, the MOD Low-Flying Advisor explained that access routes into the vicinity of the Sculthorpe LZ have been established for MC130 ac that are activated by a Y Series NOTAM, issued by LF Ops, promulgating the details of the activity to other LFS users. The procedures allowed the MC130 ac to

operate down to 1000ft agl within NRR 5 outside the NOTAM area, which was promulgated from the surface to 2000ft agl, within the specified co-ordinates. Furthermore all RW ac operating within the NRR were required to fly at or below 500ft agl. It was explained to the Members that the HH-60G is equipped with a Moving Map Display device (MMD) to which LFS NOTAM information is uploaded and added to the displayed data. This displays NOTAM information to crews in the form of a label on the MMD and in this instance it appears that this NOTAM data was either not loaded correctly or had been moved out of view on their screen. The HQ 3AF Advisor added that the MMD is updated before take-off but it would seem that these movable labels might have been manipulated in such a way as the NOTAM information was not shown. For some inexplicable reason, therefore, neither helicopter crew were aware of the MC130's night training exercises at Sculthorpe beforehand, where they themselves were conducting their own flight 'check ride'. This was of concern to some Members who believed that the MC130's activities should have been apparent at the pre-flight brief, which should have included a review of the applicable NOTAMs. As it was, the HH-60 flight was operating in the NOTAM area at odds with the promulgated procedure. The NOTAM clearly stated that this was a 'mandatory' temporary avoidance, which could only be penetrated if it was known that no airdropping was taking place, and then only when in receipt of a radar service. It seemed inconceivable that the HH-60G flight leader would have knowingly taken his flight into this 'mandatory' temporary avoidance if he knew of it in advance. However, as the HH-60 flight crews were seemingly unaware of the details of the MC130 crew's evolution from the NOTAM, they could not comply with its contents, which seemed to the Members to be the crux of the Airprox.

Turning to the encounter itself, the HH-60G flight had spotted the MC130 at a range of 3nm and, unable to contact the MC130 crew on RT, had turned away to the E to increase the separation. A helicopter pilot Member was surprised that the HH-60G flight had not tried UHF Guard – 243·0MHz - to establish contact with the MC130 crew, which might have allayed the latter's concerns. As it was, the MC130 crew were evidently working Marham on the VHF approach frequency, but Members thought they should have been monitoring the UHF LFS frequency as well if they were able. The HH-60G flight leader reports the MC130 passed no less than 1nm away and both helicopter crews maintained visual contact with the MC130 throughout as it flew through the LZ, he said 500ft above his flight. This was at variance with the MC130 Captain's account who reported that he saw the lead helicopter crossing from R to L under his ac's nose as he searched for a second helicopter. Whereupon the loadmaster saw both helicopters cross about 50–100ft underneath his ac, but after the level off and climb had been initiated. It was not possible for the Board to resolve this anomaly as the helicopters were not shown at all on the radar recording, before or after the encounter; this was unfortunate as they were squawking the LFS conspicuity code with Mode C on, but radar contact was also lost on the MC130 during the period of the Airprox. The Board had no reason to doubt the veracity of either report, but without recorded radar data illustrating the Airprox the Members were unable to reach more meaningful conclusions about the geometry of the encounter. Therefore, the Board agreed unanimously that the Cause of this Airprox was that the HH-60 formation penetrated a NOTAM area and flew close enough to the MC130H to cause its crew concern. Nevertheless, as the HH-60 flight had spotted the MC130 at range and the latter's crew had themselves detected the helicopters, levelled-off and initiated a climb to avoid them, in the Board's view, no Risk of a collision had existed in these circumstances.

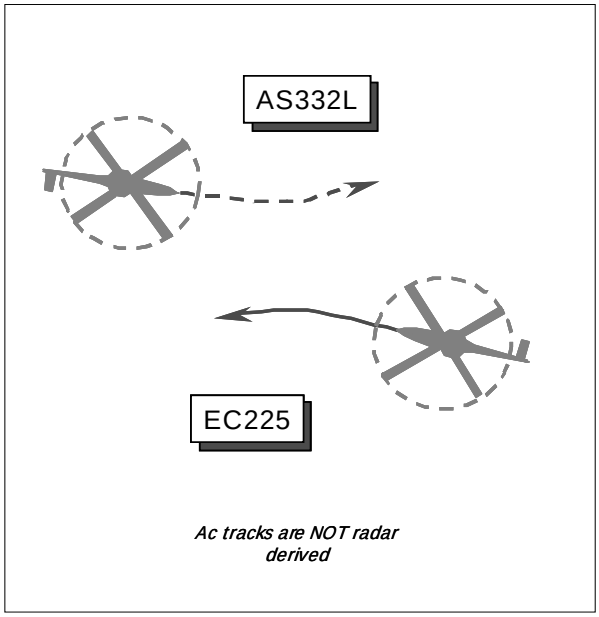
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The HH-60 formation penetrated a NOTAM area and flew close enough to the MC130H to cause its crew concern.

Degree of Risk: C.

AIRPROX REPORT NO 2009-155

Date/Time:	9 Dec 0955	
Position:	5700N 00150E (~099°(M) ADN VOR 130nm)	
Airspace:	HPZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	EC225	AS332L
Operator:	CAT	CAT
Alt/FL:	700ft↑	1500ft↓
	QNH (1008mb)	RPS (1012mb)
Weather:	VMC Haze	NK Haze
Visibility:	~8nm	NR
Reported Separation:		
	Nil V/1½nm H	NR
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PILOT OF THE EC225 reports that they had just lifted from the Safe Caledonia, an Oil Rig located about 099° ABN VOR 130nm adjacent to the ELGIN fixed offshore installation, in VMC bound for Aberdeen on an IFR FPL. He was not in receipt of any ATS and was solely in communication with the rig on 122·325MHz. The helicopter has a red, white and blue livery; the forward floodlights and the HISLs were all on. A squawk of A3650 was selected with Mode C on; TCAS I is fitted.

As the PNF, he had just completed the after take-off checks whilst the PF was rolling out of the R turn onto the heading for Aberdeen of 280°(M), climbing at 120kt through 700ft QNH (1008mb). At that stage they were unaware of an inbound helicopter descending through their level. The first indication of a conflict was when the crew of the other helicopter – the AS332L - called them on the rig frequency to tell them they had received a TCAS warning. They replied that they also now had a TCAS contact (at about 3nm), which became a TA within 2nm when 'TRAFFIC TRAFFIC' was enunciated. At this point they saw the other helicopter and, as they were not quite head-on, turned L to avoid it, advising the crew of the AS332L also to turn L. The helicopters passed abeam one another - starboard to starboard - at a range of 1½nm at the same altitude without incident. If it had not been for the TCAS I fitted to their helicopter and the TCAS II fitted to the AS332L, which is far from the norm for the North Sea helicopter fleet, he opined that the Risk would have been high and a collision 'most likely'.

THE PILOT OF THE AS332L did not consider that the occurrence constituted an Airprox and did not submit a CAA 1094 report. Nonetheless, he provided the following brief account through his Company Flight Safety Officer.

Inbound to the Erskine platform [which is about 6nm further E than the Safe Caledonia] the P-i-C noticed a contact on the ACAS climbing on a reciprocal heading. He quickly gained RT contact on the rig traffic frequency with the other crew and confirmed the position and intentions of the other helicopter – the EC225 – and then turned L to avoid it, whereupon the pilot of the EC225 reported visual with their ac. Weather on the day was hazy with no significant cloud.

Subsequently, both Captains spoke on the telephone and agreed that TCAS had improved their situational awareness, but if they had been operating in IMC under IFR without TCAS their conflicting flight paths would have been a cause for concern. With the weather as it was, not being 'full IFR' and the benefit of TCAS [I & II respectively] they avoided each other's ac by a healthy margin, but before their descent he was unaware of the other helicopter until it was seen on their TCAS II.

THE AS332L PILOT'S COMPANY FSO added that his crew was unclear if the EC225 had TCAS 1 or TCAS 2, the latter fitted to the AS332L. Nevertheless, this was a sensible use of TCAS in the prevailing circumstances.

ATSI reports that the outbound AS332L contacted the N Sea Offshore (FIS) position situated at Aberdeen at 0934, reporting, *"with you handover 3 Thousand feet range 82 miles on the 1-0-1* [ADN radial] *this time and next call 1 hundred"*. The controller confirmed the service as an 'Offshore Basic Service' and issued the Fulmer QNH (1012mb).

There is a Memorandum of Understanding (MoU) between NATS Aberdeen and the local offshore support helicopter operators. This MoU defines the provision of the 'Offshore Basic Service':

'Offshore Basic Service may only be provided to signatory helicopters when operating within North Sea Airspace, where surveillance services are not available. No elements of procedural 'separation' will be applied and pilots remain responsible for their own collision avoidance'. Contrary to a Basic Service as described in CAP774 [UK Flight Information Services], 'controllers will endeavour to pass traffic information to participating helicopters about other relevant aircraft. Controllers will use the following criteria when considering whether other aircraft are relevant: From the information available to the controller it appears that aircraft are or may be less than 1000ft vertically deconflicted and are likely to pass within 10nm of each other'.

The pilot of AS332L reported at 100nm at 0941 and 120nm at 0949 adding, *"Loman has our flight watch details if you're happy we'd like to commence descent and..QSY"*. The controller replied *"roger there's no known traffic to affect your descent and just on the Safe Caledonia there's* [C/S of EC225] *if you can report passing 1 Thousand 5 Hundred feet please"*. Just over 4 minutes later, at 0954:43, the pilot of the AS332L reported, *"through 15 Hundred feet and visual with the outbound traffic from the..Safe Caledonia"*. The helicopter crew was cleared to transfer frequency. As soon as the AS332L was transferred, the pilot of the EC225 called on the frequency, reporting passing 800ft, having just lifted from the Safe Caledonia. He was advised, *"the only known traffic to affect you is* [AS332L C/S] *descending into the Erskine..he's just reported through 1 Thousand 5 Hundred feet..there's no other known traffic to affect your climb 2 Thousand feet back-track the 0-9-8* [radial] *the Aberdeen QNH is 1-0-0-7 millibars…Offshore Basic Service"*. The pilot responded *"visual with that traffic* [AS332L] *just passed us and..no other traffic to affect altitude 2 Thousand feet.."*. Thereafter, no further comments were made on the ATC frequency about the other helicopter.

The Offshore area below 1500ft, excluding the East Shetland Basin, is divided into nine Traffic Areas, each with a specific VHF Traffic Frequency. The UK AIP, Pages ENR 1-15-11/12, state the procedures for use of the Area Traffic frequency:

The [Area] Traffic frequency is to be used for giving information on aircraft positions, obtaining deck clearance, and for lifting calls'. For flights outbound to an offshore destination: 'Pilots who are in communication with the ATSU should, once established in the descent and still above 1500 feet, establish contact with their destination on the Area Traffic Frequency, and hand over the flight watch. They should then advise the ATSU on passing 1500 feet. Landing clearances should be obtained from the HLO [Helicopter Landing Officer] who will be operating on the [Area] Traffic frequency'. For helicopters inbound from the offshore installation 'Lifting calls should be made on the [Area] Traffic frequency. Once airborne establish communication with the appropriate ATSU whilst below 1000 feet or as soon as practicable.

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the EC225 pilot and a brief account from the AS332 pilot and his company; transcripts of the relevant RT frequency and a report from the appropriate ATC Authority.

Although the P-i-C of the EC225 reported that he was operating under IFR, in this low-level Class G environment outside normal surveillance ranges, 'see and avoid' is the primary means of maintaining separation between ac. Here, the EC225 pilot reports he was operating in VMC and although it was unfortunate that more detail was not available from the AS332L pilot, it seemed as though the AS332L crew was also flying in VMC. Therefore, it was plain to the Board that this Airprox was fundamentally a lookout and sighting issue, which significantly had been aided by TCAS – in its various forms - in both ac.

Under the Offshore Basic Service provided by Aberdeen to local offshore support helicopter operators, the crew of the AS332L had been advised of the presence of the EC225 on the Safe Caledonia. Thus the AS332L crew was primed to look for the EC225 as they approached the vicinity of the rig, spotted the departing helicopter on their TCAS II display and called the latter's crew on the Area Traffic Frequency. It was clear that the TI provided under the Offshore Basic Service was of benefit and a 'good call' by the controller.

Plainly the crew of the departing EC225 could not obtain TI from Aberdeen until they switched from the local Area Traffic frequency, whereupon they were informed of the AS332L, which they had already seen. Nevertheless, it was evident that the AS332L crew had followed the procedure for crews to call on this frequency and thereby alerted the EC225 pilots to the inbound helicopter. Thus forewarned and with both ac evident on each other's TCAS display, each crew took appropriate and co-ordinated action to maintain separation.

The Board were in no doubt about the intrinsic value of TCAS and Members recognised the enhanced situational awareness provided in this instance. TCAS II has proved its worth especially in large passenger carrying ac and Members recognised that the use of TCAS I is steadily increasing in smaller ac. With TCAS II designed to provide resolution advice in the vertical plane, however, Members cautioned against over reliance on azimuth information to judge the geometry of a situation and hence afford horizontal separation against other ac. In azimuth, TCAS displays are not as accurate and can give misleading impressions of a dynamic situation, but as an aid to visual acquisition this Airprox was a salutary example of where TCAS had proved its worth.

When considering Cause and Risk, the Members could only assess an Airprox on the basis of what had actually happened and not what might have occurred if circumstances had been different. The Board agreed unanimously that when the crew of the EC225 saw the AS332L, following their co-ordinated action to maintain separation, this had effectively removed any inherent Risk. The Board concluded, therefore, that this was a sighting report and that no Risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

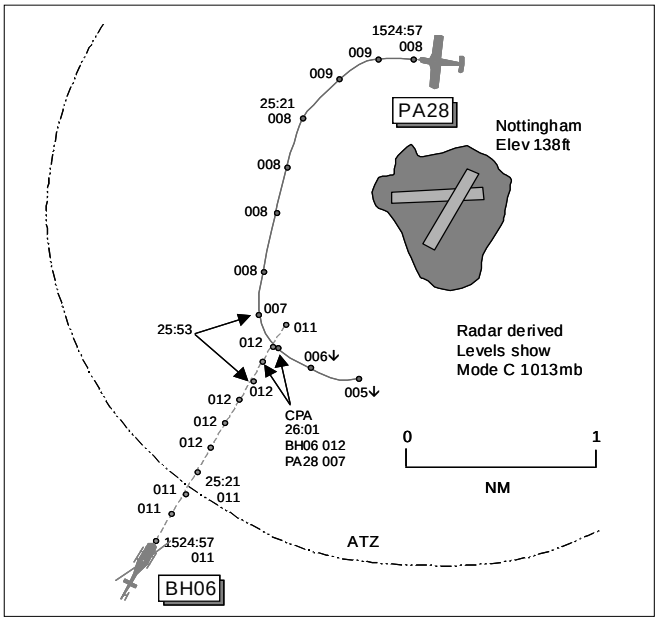
Cause: Sighting Report.

Degree of Risk: C.

AIRPROX REPORT No 2009-156

AIRPROX REPORT NO 2009-156

Date/Time:	17 Dec 1526	
Position:	5254N 00106W (1·25nm SW Nottingham - elev 138ft)	
Airspace:	ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	BH06	PA28
Operator:	Civ Comm	Civ Trg
Alt/FL:	1000ft (QFE)	700ft↓ (QFE)
Weather:	VMC CLBC	VMC NR
Visibility:	>10km	10km
Reported Separation:	50ft V/60m H	150ft V/0·5nm H
Recorded Separation:	500ft V*/0·1nm H * see UKAB Note (5)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BH06 PILOT reports flying a pipeline survey through the Nottingham ATZ and in communication with Nottingham Radio on 134·875MHz, squawking 0036 with Modes S and C; TCAS 1 was fitted. The visibility was >10km flying 5000ft below cloud in VMC and the helicopter was coloured silver/black with nav, landing and strobe lights all switched on. At approximately 1520 he contacted Nottingham A/G to request flying through the ATZ from S to N, then around the airfield boundary in a clockwise direction and then out to the N; this inspection is carried out fortnightly. Whilst height and speed can be adjusted without affecting the survey, the ac's track must be maintained. At the time he was at 1000ft QFE and was informed that the RW in use was 03 with a LH cct and that there was cct traffic. He looked out for this traffic and heard A/G warn the cct traffic of his intentions. Once within the ATZ heading 360° at 90kt he saw the cct traffic about 2nm away, and stated so on the RT, flying downwind N to S on his LH side to the W of the airfield at about 800-950ft. Later the cct traffic, a white coloured low-wing single-engine ac, turned L across the front of his helicopter by 60m, appearing to be slightly lower by about 50ft; a TA was triggered. If he had turned his helicopter R at this point the confliction would still have been there so he climbed to avoid a collision. About 1min later he told the A/G operator what had happened and stated that he thought the other ac's pilot had probably not seen him. The other pilot stated that he had seen his helicopter, whilst flying at cct height, and that the course of action taken by him in his helicopter had been wrong. He told Nottingham Radio that he would telephone later after landing. He spoke to the other pilot, an instructor, who told him that his cct had been at 800ft downwind and that after being warned of his flightpath he had seen his helicopter but it was within his cct. He could not understand why the other pilot had made it worse by turning L, after seeing the confliction, when a R turn to avoid was in order. They agreed to disagree as to who was in error and he elected to file an Airprox so that lessons could be learnt from the incident. The other pilot could have easily extended the downwind leg before turning base but it appeared that he had reached the point on the ground where a base leg turn is normally commenced and had, regardless of the situation, turned at that point. As the Wx was VMC, his visual sighting and climb had avoided a collision/near miss.

THE PA28 PILOT reports flying a dual training sortie from Nottingham VFR and in communication with Nottingham Radio on 134·875MHz squawking 7000 with Mode C. The visibility was 10km in VMC and the ac was coloured blue/white with strobe lights switched on. On first sighting of the helicopter about 1·5nm away his ac was on the downwind leg for RW03 LH cct at 800ft QFE. The helicopter was flying in the opposite direction, about 50ft higher heading about 040-045°. As the helicopter was at a safe distance in front, he told his student pilot, PF, to continue the standard cct and to turn L onto base leg and to start descending. When heading 120° at 85kt, the helicopter passed about 0·5nm behind and 150ft above, as he had descended to approx 700ft. He assessed the risk as none.

THE BH06 HEAD OF FLIGHT OPERATIONS reports this incident highlights the need to remain vigilant even when pilots have good visual contact as the human factor element can lead to poor decision-making. This incident will be disseminated to all of the operational staff and discussed at the next Flight Safety Meeting. This will remind pilots of the vigilance required on pipeline inspections as it potentially brings their helicopters into conflict with cct traffic at a number of locations.

UKAB Note (1): Met Office archive data provided the nearest METAR East Midlands (10nm SW of Nottingham) as EGNX 171520Z 36014KT 9999 FEW030 01/M03 Q1014=

UKAB Note (2): The UK AIP at ENR AD 2-EGBN-1-5 Para 2.22 Flight Procedures states *'Circuit height 800ft QFE'.*

UKAB Note (3): The Rules of the Air Regulations Rule 12 Flight in the vicinity of an aerodrome states *'(1) Subject to paragraph (2), a flying machine, glider or airship flying in the vicinity of what the commander of the aircraft knows, or ought reasonably know, to be an aerodrome shall; (a) conform to the pattern of traffic formed by other aircraft intending to land at that aerodrome or keep clear of the airspace in which the pattern is formed; and (b) make all turns to the left unless ground signals otherwise indicate. (2) Paragraph (1) shall not apply if the air traffic control unit at that aerodrome otherwise authorises.'*

UKAB Note (4): Rule 45 Flight within aerodrome traffic zones states during the notified hours of watch of the air/ground radio station Para (5) *'...the commander shall obtain information from the air/ground communication service to enable the flight to be conducted safely within the zone.'* Para (6) states *'The commander of an aircraft flying within the aerodrome traffic zone of an aerodrome shall; (a) cause a continuous watch to be maintained on the appropriate radio frequency notified for communications at the aerodrome; or (b) if this is not possible, cause a watch to be kept for such instructions as may be issued by visual means; and (c) if the aircraft is fitted with means of communication by radio with the ground, communicate his position and height to the .....air/ground communication service at the aerodrome on entering the zone and immediately prior to leaving it.*

UKAB Note (5): Analysis of the Claxby and Clee Hill radar recordings at 1524:57 shows the BH06 2·3nm SW of Nottingham tracking 030° and squawking 0036 (pipeline conspicuity code) at unverified FL011 (1130ft QNH 1014mb or 992ft QFE). At this time a 7000 squawk is seen, believed to the PA28, 0·8nm N of Nottingham tracking 290° crosswind for RW03 and indicating unverified FL008 (830ft QNH or 692ft QFE). The PA28 then commences a L turn downwind and momentarily climbs 100ft on Mode C for 2 sweeps before steadying downwind at 1525:21 at FL008 (830ft QNH or 692ft QFE) with the BH06 in its 12 o'clock, range 2·1nm, flying in the opposite direction at FL011 (1130ft QNH or 992ft QFE) having just entered the ATZ. The ac continue to close on steady converging tracks, the BH06 now at FL012 (1230ft QNH or 1092ft QFE). As separation reduces to 0·4nm at 1525:53, the PA28 is seen to commence a L turn onto base leg and descend, indicating FL007 (730ft QNH or 592ft QFE), placing the PA28 in the BH06's 11 o'clock on a crossing track from L to R; vertical separation showing 500ft. The CPA occurs on the next sweep at 1526:01 with the PA28 at FL007 (730ft QNH) just R of the BH06's 12 o'clock range 0·1nm tracking SE'ly having just crossed ahead, the helicopter still indicating FL012 (1230ft QNH). The subject ac thereafter diverge rapidly, the PA28 descending as the BH06 crosses behind it. Vertical separation shown by the recorded radar (500ft) does not reflect that reported by both pilots, however Mode C tolerance is ±200ft.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were disappointed that this cct incident appeared to have occurred because of a lack of flexibility/understanding/cooperation, particularly when both pilots had seen each other in good time but were intent on continuing with their tasks to hand. Under the terms of the Air Navigation Order, a helicopter flying on a pipeline inspection is not afforded any priority over cct traffic, and should comply with the Rules of the Air Rule 12 and 45. The PA28 flight had already established the cct pattern and the helicopter pilot should have conformed to that pattern or kept clear of the airspace. Notwithstanding this, the BH06 pilot had broadcast his intentions and had entered the ATZ at 1000ft, and so was arguably 200ft above the cct traffic, which is flown at 800ft. A better option, alluded to by the BH06 pilot, would have been for him to climb higher or to descend in order to afford all cct traffic greater vertical separation depending on the position of the cct traffic relative to the helicopter's desired track. As it was, the BH06 pilot elected to climb slightly as the PA28 turned to pass ahead; the PA28 pilot monitored the

helicopter's progress and continued with his normal cct pattern. The recorded radar shows the incident clearly, the geometry confirming that described by both pilots, although Mode C does indicate more vertical separation pertained than reported. In the end the Board were minded to conclude that the BH06 pilot had eventually fulfilled his responsibilities, climbing above the cct traffic, and that this Airprox had been a sighting report where any risk of collision had been removed.

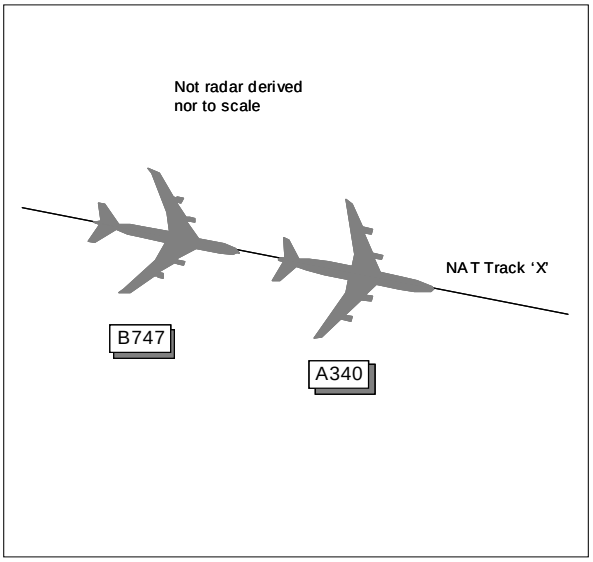
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT NO 2009-157

Date/Time:	11 Dec 0717	NIGHT
Position:	4930N 02423W	(NAT TRACK 'X')
Airspace:	Shanwick OCA	(Class: A)
	Reporting Ac	*Reported Ac*
Type:	A340	B747-400
Operator:	CAT	CAT
Alt/FL:	FL350	FL360
Weather:	IMC KLWD	VMC NR
Visibility:		
Reported Separation:		
	<1000ft V	NR
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A340 PILOT reports routeing eastbound IFR on NAT Track 'X' heading 090° at M0·80 and FL350 and in receipt of an ATS from Shanwick, squawking 2000 with Modes S and C. At position 4930N 02423W they encountered severe turbulence, with strong vertical accelerations, which lasted 10min. A TCAS TA was received and then 3xTCAS 'descend' RAs demanding a descent of 2000ft. Initially they were in SKC VMC but then IMC in cloud. They altered their heading 30° L to avoid overtaking traffic identified on the ND just above them, the subject B747, which had descended. Minimum separation was <1000ft during the encounter. The wind was 180° at 80kt with an OAT ms58°C.

THE B747 PILOT reports routeing eastbound IFR on NAT Track 'X' at M0·85 and FL360 and in receipt of an ATS from Shanwick squawking 2000 with Modes S and C. Some turbulence had been reported by company dispatch in the area of 24W at time 0720Z. As they encountered moderate turbulence they had a TCAS RA 'adjust v/s' on an ac they were overtaking 1000ft below and 1nm to their R. They reached a maximum of FL368 before returning to FL360 at time 0723Z. Although they sent a message on 121·5MHz and advised Shanwick, the Radio Operator did not understand the 'TEE-CAS-AR-AY' message and 15min later they were asked to file an altitude deviation report.

THE B747 AND A340 OPERATOR'S FLIGHT SAFETY AND ANALYSIS DEPT reports the A340 was cruising FL350 and the B747 was cruising at FL360. Both ac were on track X and the B747 was overtaking the A340 owing to its higher Mach number (M0·85 v M0·80). At around 24W, moderate to severe clear air turbulence was encountered by both ac at their respective FL. At a certain point when the B747 was above the A340, the B747

lost around 100ft due to severe turbulence and the A340 gained altitude. Both ac thus encountered a TCAS TA then an RA a few seconds later. The B747 had to climb 800ft to be clear of conflict while the A340 had to descend 2000ft to be clear of conflict.

Time UTC Description

0717:15 A340 has TA at FL350

0717:17 A340 has first RA “descent 1600ft/min”

0717:19 B747 has RA “adjust vertical speed” at FL360

0717:41 A340 has second RA “descent 1600ft/min”

0718:16 A340 has third RA “descent 1600ft/min” while at FL340

0718:26 A340 is clear of conflict while at FL335

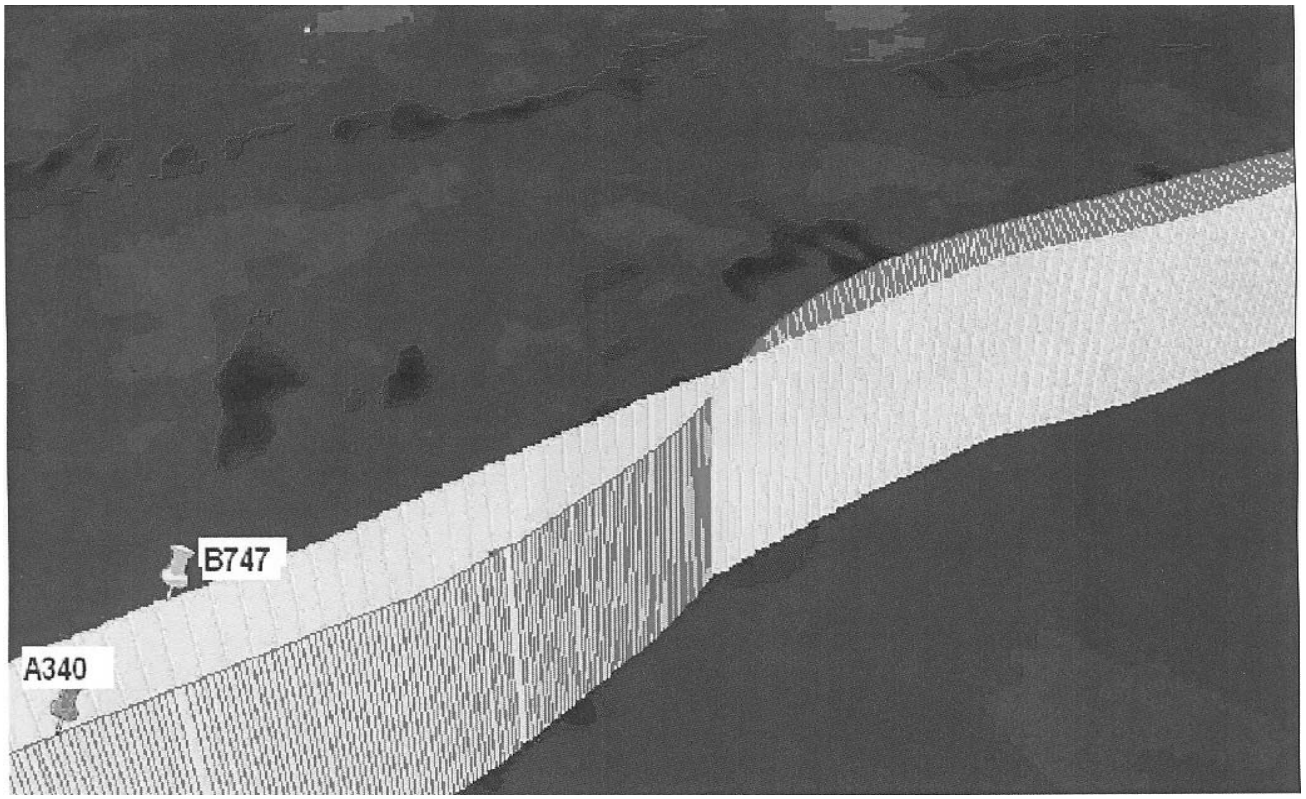
0718:40 A340 levels off at FL330 and starts left deviation

0718:56 B747 levels off at FL368

0720:17 B747 is back at FL360

0722:00 A340 is back at FL350

Below are the trajectories of the A340 in red (dark shading) and the B747 in yellow (light shading).



Both aircraft were on track X without any offset. During the TCAS event and after their descent, the crew of the A340 saw the conflicting traffic just above them on the Navigation display, so they initiated a deviation to the L with a 3nm offset.

The Flight Data Monitoring (FDM) department can analyse data retrieved from the acs' Quick Access Recorders (QARs). They record the vertical speed value ordered by the TCAS on the A340 but not on the old generation ac such as the B747. Concerning the B747, they recorded a TCAS RA event, and the crew climbed in accordance to the event to FL368 and was then clear of conflict. Concerning the A340, they recorded a TA event for a few seconds then a first RA 'descent 1600ft/min'. The crew reacted correctly, disengaged AP and FD but stated that turbulence was severe and they had difficulty in manually flying the ac during the descent. They encountered a second RA 'descent 1600ft/min' shortly after the first one since the ac descended only 500ft. After losing 1000ft (FL340) and with the B747 (FL365) then 2500ft above, the A340 encountered a third RA 'descent 1600ft/min', followed correctly by the crew and descended an additional 1000ft. At this stage, they could not explain why the A340's TCAS ordered 3500ft vertical separation with the B747 above. No other conflicting traffic was mentioned by both crews, which could have explained more easily the third RA 'descent 1600ft/min' encountered by the A340 crew. The A340 crew thought that the B747 was descending (which was not the case), that is why they deviated to the L in order to maintain horizontal separation. TCAS warnings ceased afterwards.

In conclusion, both crews filed Air Safety Reports and were eventually interviewed by their respective FSOs. The context of this event is severe turbulence, which made flying the ac manually much more difficult. However, Flight Data Analysis confirms that the A340 crew reacted accordingly to the TCAS order which is recorded by the QAR, but the FDM dept cannot explain at this stage why the A340 TCAS system ordered the crew to descend around 3500ft below the B747.

NATS UNIT INVESTIGATIONS reports that this report covers related incidents. An Airprox due to severe turbulence occurred between a B747 and an A340. This was followed by 2 Losses of Separation as a result of TCAS action following the Airprox.

A CA4114 was received from a Shanwick En-Route controller on an apparent Loss of Separation in Shanwick Oceanic airspace which was instigated following a message from the B747 crew that the ac was, *"...returning to FL360",* which was his cleared level.

At time 0656 UTC the Shanwick En-route controller received a message from the A340 requesting climb to FL380 due ac performance. The controller replied on CPDLC stating, *"Unable/Due to Traffic"*. The conflicting traffic was AC3 at FL370.

At 0720 UTC the message stating that the B747 was returning to FL360 was received. There was no information at this time that the ac had vacated FL360 so this came as a surprise to the controller. The Shanwick controller then asked the B747 flight to explain the reason behind this message and at 0730UTC the crew replied that they had climbed to FL368 due "Jet Waves" for 1 to 2min. The controller checked for conflicts to find that there had been a Loss of Separation with AC3 at FL370 approximately 5min ahead of the B747 where 10min was required. At this point there was no indication of any other aircraft involvement.

In the light of the information contained in the aircrews' reports and the analysis from the operators' safety department, the NATS investigation concentrated on 3 principle questions:

Did the 3 TCAS RAs received by the A340 all relate to the same ac?

During the initial RA between the A340 and the B747 what was the minimum separation that existed between these 2 ac? This was not stated by either crew or in the company's report.

Also, why was it necessary that the A340 descended 2000ft from its cleared level?

Turbulence does seem to be the primary causal factor that triggered this event. There was little evidence of this being a concern to ATC staff at the time. The Local Area Supervisor (LAS) asked another flight ahead of the A340 about turbulence and he had stated that there had been no problems. So while the tactical suspension of Reduced Vertical Separation Minima (RVSM) may have prevented this incident occurring there was no prior or subsequent knowledge available to Shanwick ATC to suggest that this was necessary.

The B747 crew also pointed out that the "Shanwick Radio Operator at Ballygirreen didn't understand the TCAS RA message". Enquiries were made to Ballygirreen regarding this and an RT sample was forwarded. The RT gave the following interactions;-

B747 – *"We had TCAS RA and had to climb to FL368 and returning to FL360 right now"*

Ballygirreen – *"Say again".*

The message is repeated by the B747 crew.

Ballygirreen – *"You are returning to FL360? Is that correct?"*

Ballygirreen – *"What do you mean about returning to FL360? Did you leave FL360?"*

B747 – *"At time 0720 we had TCAS RA with traffic below and we have resolution climb to FL368 and return"*.

Ballygirreen – *"Say again"*.

The message is repeated and then the B747 crew emphasises *"TCAS RA, TCAS RA"*.

B747 – *"We had Resolution Advisory to climb to FL368"*.

A few minutes pass with other flights calling.

Ballygirreen – *"Can you be more accurate about this message? We do not understand"*.

Ballygirreen – *Confirm at time 0700 you climb to FL368"*.

B747 – *"Negative. At time 0720"*.

There is no further conversation regarding the incident

There is no evidence that the TCAS RA aspect of this exchange was passed on to the Shanwick controllers at Prestwick from Ballygirreen. Reassurances were sought from Ballygirreen that Radio Operators were fully aware of the phrase "TCAS RA". This is perhaps a less than common RT phrase to be heard by Radio Operators in Oceanic airspace.

The following reassurance was provided by the Operations Manager at Ballygirreen: -

Our staff would or should be familiar with TCAS and how it works and the relevance of a TCAS notification. It would be part of their basic training. We are carrying out our own internal investigation into how we handled the incident and in this regard on the following day I re-issued guidelines to all staff on TCAS operation and relevance.

It should also be noted that there was no message to Shanwick at all from the A340 regarding the incident.

During the investigation the company operating AC3 were contacted in order to throw any more light on the events. The company reported that AC3 received no TCAS events but that there was turbulence in the area. Altitude was stable to within 60ft.

Further investigation looked at the Losses of Separation that may have occurred and a SAATS (Shanwick Automated System) was replayed for clues to potentially conflicting ac.

In the case of the B747 climbing, it was clear that there had been a loss between that ac and AC3 at FL370. From the information available it was concluded that there had been 5min and 200ft between the B747 and AC3 where 10min and 1000ft was required.

Since the A340 had descended 2000 feet below its cleared level there was a requirement to check for potential conflictions at FL340 and at FL330. This may have revealed other potential TCAS events. It was assessed that there had been no conflicting traffic within 15min of the A340 at FL330 but at FL340 there was a confliction with AC4. It was estimated that there was approximately 7min between the 2 flights when the A340 past behind at the same level (FL340).

ATSI reviewed the NATS Prestwick Centre (Oceanic) report and concurs with its findings. ATSI considers there to be no implications for ATC as a consequence of this Airprox.

ATSI also sought additional information from the operator of the B747 and A340 with regard to the exact proximity of the 2 ac during the encounter. In particular information was sought on the altitude, range and bearing of each ac's 'intruder' as recorded and actioned by each respective TCAS. To date no further information has been forthcoming from either the operator or the operator's National Supervisory Authority.

The UK Met Office, Exeter was also approached for information regarding the wind conditions at the time in the area of the Airprox. The following information was provided:

'Overall, reviewing the forecast chart and verifying it against the satellite imagery, the forecast clearly demonstrated the risk of turbulence in the area and the satellite suggested the forecast position of the jet-stream to have been accurate.'

The 11 December 2009, 0600 UTC, SIGWX chart for FL250-FL630 depicted a jet-stream to the W of the UK running S to N almost directly over the incident site with winds of over 80kt; within which moderate, occasionally severe, turbulence from below FL250 to FL380 was forecast.

UKAB Note (1): The UK AIP at ENR 2-2-4-12 Shanwick Oceanic Control Area (North Atlantic region – NAT) Special Procedures for in-flight Contingencies (Regional Supplementary Procedures DOC 7030 and PANS Doc 4444 ATM/501) Para 12.1 states *'The following procedures are intended for guidance only. Although all possible contingencies cannot be covered, they provide for the most frequent cases such as inability to continue flight in accordance with its ATC clearance, inability to maintain assigned flight level, en-route diversion across the prevailing traffic flow and encounters with wake turbulence.* Para 12.5 Procedure for Strategic Lateral Offsets in NAT Airspace states *'**Note 1**: The following incorporates lateral offset procedures for both the mitigation of the increasing lateral overlap probability due to increased navigation accuracy and wake turbulence encounters. **Note 2**: The use of highly accurate navigation systems (such as the global navigation satellite system (GNSS)) by an increasing proportion of the aircraft population has had the effect of reducing the magnitude of lateral deviations from the route centre-line and, consequently, increasing the probability of a collision should a loss of vertical separation between aircraft on the same route occur.* Para 12.5.1 states *'It has been determined that allowing aircraft conducting oceanic flight to fly lateral offsets, not to exceed **2nm** right of centre-line, will provide an additional safety margin and mitigate the risk of conflict when non-normal events such as aircraft navigation errors, altitude deviation errors and turbulence-induced altitude-keeping errors occur.'* Para 12.5.2 states *' This procedure provides for offsets within the following guidelines. Along a route or track there will be three positions that an aircraft can fly: **centre-line or one or two miles right**. Offsets will not exceed **2nm** right of centreline. The intent of this procedure is to reduce risk (add safety margin) by distributing aircraft laterally across the three available positions. The following procedures apply: (a) Aircraft without automatic offset programming capability must fly the centre-line. (b) Operators capable of programming automatic offsets may fly the centre-line of offset by **1nm or 2nm** right of centreline to obtain lateral spacing from nearby aircraft (offsets will never exceed **2nm** right of centre-line). An aircraft overtaking another aircraft should offset within the confines of this procedure, if capable, so as create the least amount of wake turbulence for the aircraft being overtaken. (c) Pilots should use whatever means available to determine the best flightpath to fly. (d) Pilots should also fly one of the three positions shown above to avoid wake turbulence. Aircraft should not offset to the left of centre-line nor offset more than **2nm** right of centre-line. Pilots may contact other aircraft on frequency 123·450MHz, as necessary, to coordinate the best wake turbulence offset option. **Note**: It is recognised that pilots will use their judgement to determine the action most appropriate to any given situation and have the final authority and responsibility for the safe operation of the aircraft. (e) Pilots may apply an offset outbound at the oceanic entry point and must return to the centre-line at the oceanic exit point. (f) Aircraft transiting oceanic radar areas may remain on their established offset positions. (g) There is no ATC clearance required for this procedure and it is not necessary that ATC be advised. (h) Voice position reports should be based on the waypoints of the current ATC clearance and **not** on the offset positions.*

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Commercial pilot Members discussed the SOPs for operating within Shanwick Oceanic Control Area. Taking into account that the NAT Track structure is formulated to take advantage of the N Atlantic jetstream, it is not unusual to encounter turbulence whilst flying on designated tracks. The Strategic Lateral Offset procedure was introduced primarily for reducing wake turbulence during RVSM operations. In this case, with the B747 overtaking the A340, the B747 should have established an offset as promulgated in the UK AIP and detailed above in UK Note (1). Although the B747 Capt reported that the A340 appeared to be 1nm to their R and 1000ft below, the company report states that no offset was utilised. . A pilot Member suggested that with the strong S'ly wind in the area of the Airprox, both ac would have had a significant drift angle to the R which might have given the appearance of an offset track observed by the crew; the A340 crew made no mention of the B747 being offset, 'sighting' the ac on TCAS passing above them. The A340 crew reported severe turbulence before a TCAS TA then RA 'descend' was generated and, believing the B747 was descending on top of them, elected to turn their ac 30° to the L to increase separation. The company findings from the QAR data downloads revealed the A340's manoeuvre placed the ac with an offset to the L, which was at variance to the Strategic Lateral Offset procedure.

The company reported that the B747 descended about 100ft whilst the A340 gained altitude, which could explain the generation of TCAS alerts/advisories. The minimum separation between the ac was not provided. The B747's TCAS RA 'adjust v/s' is an RA requiring the pilot to reduce the ac's ROC or ROD; however, the crew reported climbing 800ft to FL368 before recovering to FL360, which Members thought was unusual. The A340 crew, in their written report, reported receiving 3xRA 'descend' commands resulting in a 2000ft height loss; the company determined that the ac reached FL335 before 'clear of conflict' was received and the ac levelled-off at FL330. This separation was far in excess of system design parameters, with TCAS logic attempting to provide 600ft vertical separation between ac in the height band 20000-42000ft and Members considered whether TCAS serviceability was a factor in the occurrence. The company was unable to provide a clear explanation of the 3 RAs demanded by the A340's equipment.

The Board then considered the ac handling aspects. Both crews disconnected their A/P in response to the RA demand, in accordance with SOPs. However, pilot Members were well aware that the handling characteristics of modern airliners at altitude and the relatively small performance margins could have made the sudden switch to manual flying a challenge in turbulent conditions; the company confirmed that the A340 crew had handling difficulties. In the absence of the 3 RA warnings, these difficulties might have accounted for the large height deviation. Members questioned the wisdom of disconnecting the A/P at altitude. Although TCAS performance is predicated on assumed response times and manoeuvre rates, the desired performance might be available using the A/P at altitude.

Turning to the reporting aspects, the Board noted that the B747 crew attempted to report the occurrence but the radio operator appeared not to understand their message. The A340 crew did not report any altitude deviation or Airprox via radio or CPDLC, only filing a CA1094 Airprox report much later. The Director undertook to write to the Irish Aviation Authority about the involvement of Ballygirreen in the incident.

In trying to determine the Cause, pilot Members thought it likely that the altitude excursions of both ac caused by turbulence had triggered TCAS RAs in both ac. However, the behaviour of the TCAS equipment and actions taken by both crews cast doubt in Members minds. Without more detailed information Members agreed that there was insufficient information available to assess the incident. It was proposed that a recommendation should be raised for the CAA to request further information from the operator.

PART C: ASSESSMENT OF CAUSE AND RISK

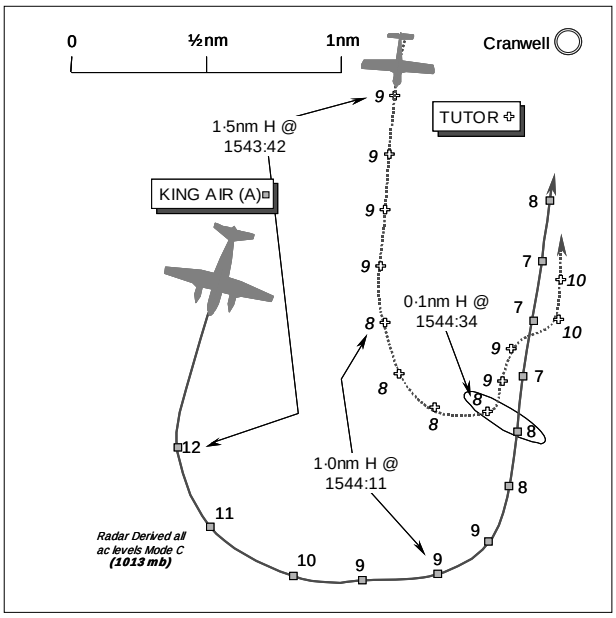
Cause: Cause not positively determined.

Degree of Risk: D.

Recommendation: It is recommended that the CAA should request further information from the aircraft operator.

AIRPROX REPORT NO 2009-158

Date/Time:	30 Nov 1544	
Position:	5301N 00029W (1½nm final to RW01 at Cranwell Cct - elev 218ft)	
Airspace:	Cranwell MATZ/ATZ (Class: G)	
	Reporting Ac	*Reported Ac*
Type:	King Air	Grob Tutor
Operator:	HQ Air (Trg)	HQ Air (Trg)
Alt/FL:	500ft	500ft
	QFE (997mb)	QFE (997mb)
Weather:	VMC	VMC
Visibility:	10km+	10km
Reported Separation:		
	50ft V/20m H	100ft V/50m H
Recorded Separation:		
	Nil V/<0·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PILOT OF KING AIR (A) reports that after joining from Waddington, he was operating VFR in the LH cct to RW01 at Cranwell during a local instructional sortie and in communication with TOWER (TWR) on 125·05MHz. SSR was switched to standby with Modes C & S off he thought [it was switched off after the Airprox occurred]. The ac has a white and blue colour scheme; HISLs and the landing lamp were on.

His King Air was No2 on Final behind another King Air [King Air (B)] whose intentions were to land. Descending through 500ft QFE (997mb) turning L onto 011° at 130kt, the crew saw a Grob Tutor, 50ft above his ac, closing from the L in a LH descending turn as if it were on a finals turn. He initiated a 'go around' and they informed ATC that they would fly down RW01 at 500ft QFE to avoid the Tutor off their left wing. Once clear of the Tutor they turned Downwind and landed without further incident. Minimum separation was 50ft vertically, 20m horizontally and he assessed the Risk as 'high'. An Airprox was reported to TOWER on RT.

THE GROB TUTOR PILOT, a QFI, reports he was recovering to Cranwell under VFR following an instructor training sortie. He was the PF from the RHS. His original intention was to join for a 'Run-in and Break', so he positioned at Initials for RW01 at 500ft QFE (997mb). On contacting TWR on 125·05MHz, it was apparent that the cct was busy so he elected to continue at 500ft, but complete a normal join at 80kt. As he was turning onto the liveside, there was a series of transmissions on RT between a King Air pilot and TWR regarding the intentions of a foreign air force twin, which was also joining the cct. The TWR controller, who also appeared to be operating the GROUND frequency, thought it was joining on the Deadside, but both the Tutor pilot and the King Air (B) pilot had noted that the pilot of the foreign twin intended to join on L Base. This RT traffic caused him to delay his Downwind call, and in response, TWR informed him that there were 2 ahead in the cct. Both he and his student identified these as the foreign twin on short Final and a King Air [King Air (B)], which had just begun its Final turn. They also noted a further King Air 2-3nm S of the airfield, which they assumed was positioning to join the cct. He commenced a level Final turn in the normal position for a Tutor, which he assessed would provide ample spacing on the King Air [King Air (B)] ahead. After approximately 1/3 of the turn, well before commencing a descent to intercept the normal approach path, he noted a King Air [King Air (A)] approximately 100ft below him on what appeared to be a straight–in approach. Unable to make a call on the RT due to frequency congestion, he elected to go-around. He then flew behind and above the King Air and repositioned onto the Deadside before flying a normal cct to land. Estimating the minimum separation to be 100ft vertically/50m horizontally he believes that the significant level of RT traffic and non-standard phraseology during the incident led to a reduction in the SA of all concerned. He assessed the Risk as 'low'.

THE CRANWELL COMBINED TOWER & GROUND CONTROLLER (TWR) reports that he took over the TWR position just after 1500 and shortly afterwards band-boxed the GROUND (GND) frequency as well. After a steady stream of arrivals and a couple of departures, King Air (B) joined the LH cct for RW01 followed in quick succession by the foreign twin-jet, the Grob Tutor and the King Air (A). At this point he called for a GND controller as flights were still calling on the GND frequency. King Air (B) called for a low level cct, making him, he thought, the first ac downwind; the foreign twin then called for a Downwind join, to position for initials. The King Air (A) crew then called for a downwind join followed by the Grob Tutor crew calling extending behind the King Air low level [King Air (B)]. He checked the position of the foreign twin and in his mind at the time the order downwind was, King Air (B), King Air (A), and the Grob Tutor with the foreign twin downwind flying towards Initials. However, King Air (B) pilot said he could extend for the foreign twin on Final, to which he replied that the foreign twin was not on Final but flying out to Initials. King Air (B) was then given a 'continue' for another ac taking off, but still on the runway. At this point he missed a few calls due to 2 or 3 ac all stepping on each other. The foreign twin pilot then made a short Finals call, so he cleared him to land and informed the pilot of King Air (B) that he was now No2 in the cct; the Grob Tutor called Downwind and was told 2 ahead – but it should have been 3 including the King Air (A). The pilot of King Air (B) then said he was going around, whereupon King Air (A) called Final and was given a 'continue'. There were more stepped-on transmissions, before he then gave King Air (A) 'clear to land 1 on [the foreign twin]', to which the pilot replied that he was going around for the Tutor turning in ahead of him within 50ft. The Grob Tutor pilot then also called going around. He assessed his workload as 'high'.

HQ AIR CMD ATM SAFETY MANAGEMENT reports that the Cranwell TWR controller was also operating the GND position bandboxed with TWR. At 1540:28, the crew of King Air (A) reported to Cranwell TWR on 125·05MHz that they were joining the visual cct from Waddington [N of Cranwell], with information 'Tango'. TWR responded "[King Air (A) C/S]*..TOWER join tango correct 1 in*"; the '1 in' mentioned was King Air (B). At the same time a visiting foreign twin-jet, which had been switched to TWR by RADAR, was approaching the Downwind leg but had not yet checked in on the RT. The crew of the foreign twin called TWR at 1540:41, and reported "*beginning of downwind*", whereupon TWR 'lined-up' another ac. TWR called the crew of the foreign twin at 1540:54, "[foreign twin C/S] *Cranwell TOWER, join runway 0-1 left hand QFE 9-9-6 millibars 1 in*", this was incorrect as at this time there were 2 ac in the cct [King Air (B) ahead of King Air (A)].

At 1541:10, the crew of the subject Grob Tutor called TWR to join the cct, and the controller responded "[Tutor C/S] *TOWER join runway 0-1 left hand QFE 9-9-7 millibars* [the new value] *1 in, 1 joining*". This cct state was again transmitted incorrectly, as the foreign twin, King Air (B) and the subject King Air would all be considered within the visual cct. At this point TWR asked for a GRD controller to reduce the workload created by the bandboxed TWR and GRD operating frequencies. [At 1541:36, the Grob Tutor crew called *"????*(possibly initials) *for the Break"*] and moments later another flight was cleared for take-off; 2sec later, at 1541:45, the pilot of King Air (B) requested a "low-level" cct. However, at 1541:47 TWR transmitted to the Tutor crew,"*..1 cross wind 1 on for departure, surface wind 3-3-0 14, break,* [King Air (B) C/S] *low level approved".* The Tutor crew reported positioning behind the King Air low-level at 1542:03. Between 1542 and 1544 there are several transmissions that are either clipped or unclear, possibly due to dual transmissions; however, from those transmissions that are clear, it appears that TWR believed that the foreign twin was flying to Initials. [UKAB Note (1): However, at 1542:14, with the foreign twin steady on a downwind heading the transcript notes the foreign twin crew reporting *" just ???? turning downwind to turn baseleg",* which was acknowledged by TWR. Although the crew of King Air (A) had earlier requested a downwind join that was approved this was repeated at 1542:22, when King Air (A) crew advised "[C/S] *to join downwind",* whereupon TWR advised that there was *"1 ahead".*] At 1542:57, the crew of King Air (B) transmitted "*..we are happy to extend slightly for the* [foreign twin C/S] *on finals*". To which TWR responded "*..he's actually going around for Initials he's not in* (sic) *finals",* whereupon the crew of King Air (B) reported at 1543:04, "*ok, he's at low-level and we're turning left finals gear down*". At this point King Air (B) was instructed to 'continue'. At 1543:14, the crew of King Air (B) advised "*I'm not convinced, he's going in….on finals*"; although the transmission is clipped it is clear the crew of King Air (B) was concerned about the intentions of the foreign twin. TWR informed the crew of King Air (B) at 1543:18, to 'continue' and that the foreign twin *"..is now ahead",* whereupon [without any 'final' call apparent on the transcript] the foreign twin was cleared to land. At 1543:31, the Grob Tutor crew reported *"late downwind low land";* TWR reported 2 ahead, but in reality as King Air (A), late downwind, had been placed on a 'continue' at 1543:40, with King Air (B) already turned onto final on a 'continue' and the foreign twin now cleared to land, there were 3 ahead. Assuming that TWR still believed that the foreign twin was still going to initials, King Air (A) was one of the two reported by TWR to be ahead also on a continue. The crew of King Air (B) then reported going around at 1543:44. At 1544:37, the crew of King Air (A) reported to TWR, "*got* [a] *Tutor by me, just on the left, at 5 hundred feet"*. At 1544:52, TWR cleared King Air (A) to *"..land 1 on";* however, the crew then reported "*going around for the Tutor on my left hand side, 50 feet*". The Tutor pilot

then also reported that he had initiated a go-around. The radar recording shows the Tutor had carried out a short cct and turned inside King Air (A).

SATCO reports the incident happened during a busy period of mixed type ac recovering to the aerodrome; furthermore there was a lack of available manpower due to sickness. The TWR controller had a high workload, which was further increased by the visiting foreign twin whose crew seemed to be unfamiliar with local procedures. The initial cct state passed by TWR was inaccurate which would have decreased the pilots overall SA. The Tutor crew conducted a low-level cct which, the radar recording shows, was shorter than those flown by the other ac and that it cut in front of King Air (A). When the Tutor crew reported late Downwind and were incorrectly told by TWR that there were 2 ahead [instead of 3]; this might have contributed to the Tutor crew turning in early for the runway. Notwithstanding the lack of accurate TI, military pilots are expected to maintain good lookout in the visual cct. Air Cmd BM Safety Management considers that a high workload and inaccurate TI combined with incomplete pilot SA led to this confliction in the Cranwell visual cct.

Air Cmd BM Safety Management recommended that controllers should be re briefed on the importance of accurate TI to ac arriving into the visual cct. Best practice remains to have GRD available during busy recovery periods; alternatively, during periods of constrained manpower, recoveries could be restricted - this has already been discussed at unit level. Squadrons should be briefed on the importance of maintaining a good look out especially approaching Final.

UKAB Note (1): The Claxby Radar recording shows King Air (A) approaching Cranwell from the N as the Grob Tutor approaches from the S. The Tutor over flies the aerodrome indicating 1000ft Mode C (1013mb) - about 520ft QFE (997mb) - and turns crosswind at 1543:00, as the King Air joins the cct downwind indicating 1400ft (1013mb) – about 920ft QFE (997mb) – 1nm W of the Tutor. King Air (A) overhauls the Tutor downwind and follows the pattern established by the preceding ac – the foreign twin - that turns L inbound at 2½nm from the aerodrome and possibly King Air (B), which is not evident on the recording at all but No2 to the foreign twin. King Air (A) turns onto a short base-leg at 1543:42, with the Tutor 1·5nm away at 7 o'clock some 300ft below. The Tutor is just behind King Air (A)'s port wing and 1nm distant as King Air (A) turns onto final, now descending from 900ft (1013mb) – about 420ft QFE; meanwhile the Tutor has descended to 800ft (1013mb). King Air (A) steadies on finals just before the foreign twin lands; King Air (B), which is perceived to be following on final, is not shown. At 1½ nm final at 1544:34, King Air (A) indicates 800ft Mode C – the same level as the Tutor, which has turned inside and closed from the L to a range of 0·1nm. King Air (A) then overhauls the Tutor leaving the latter to port and descends 100ft as the Tutor climbs to 900ft giving 200ft vertical separation at the closest point horizontally. The Tutor then draws astern of King Air (A) and flies to starboard and thus into the deadside as both ac go around.

HQ AIR (TRG) comments that this Airprox occurred when 4 ac were joining the Cranwell visual cct in a relatively short timescale. This Airprox has a combination of factors that included missed or misunderstood RT calls combined with some inaccurate TI and crews visually misidentifying other ac. During the downwind leg the Tutor crew had the opportunity to see the King Air (A) who was ahead. Unfortunately, once the Tutor had turned finals it was belly up to King Air (A) and the opportunity to see it was much reduced.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Whilst the controller had elected to combine TWR and GND when he took over, it was evident that the local traffic situation later changed considerably in a very short period. The RT transcript revealed that the number of ac in the cct grew from 1 to 4 in the space of 40 sec, including, significantly, the visiting foreign twin-jet, plus one for departure. It seemed plain to the Board that TWR had been unable to cope when his workload rapidly increased but a military controller Member was concerned over the supervisory aspects of this Airprox. If no further manpower was available to man GND, then in his opinion, the ATC Supervisor should have rallied to TWR's assistance, even if it was just to look over the controller's shoulder and help him spot the position of ac in the cct. In this Member's view a breakdown of Supervision had occurred within ATC that contributed to the way events unfolded.

The presence of a visiting foreign ac in the cct, with a crew unfamiliar with local and national procedures, was a complicating factor and undoubtedly added to TWR's workload. On this aspect, Members said the foreign-twin's join could have been handled better and it was evident that there was confusion in the TWR controller's mind over how the foreign crew was positioning their ac in the pattern and the sequence for landing. This was a salutary lesson as to what not to allow in the cct; military controller Members opined that it was usually far simpler to 'take charge' of the visitor and feed it into the radar pattern for a radar straight-in or for a PAR to land. By applying more positive control ATC could 'drive' the visiting crew around the sky and the onus would then be on other local cct traffic to stay clear of the unfamiliar visitor. Here it was evident that TWR believed that the foreign twin was flying out to Initial before turning inbound; it seemed this must have been from prior liaison with Radar – but it was not at all clear to the Members why TWR thought this was so. As it was the crew of the foreign twin had not made their intentions plain at the outset when they called TWR, so the controller should have attempted to clarify exactly what they were doing. Believing that the visitor was flying out to Initial might have been the reason that it was not included in the cct state passed to other ac, which was always one less than it should have been if, as it transpired, the foreign-twin had joined the cct on a long LH downwind and ended up ahead of King Air (B) in the sequence to land.

It seemed plain that TWR had not realised that the foreign-twin had turned onto final ahead of King Air (B) until the latter's pilot queried what the foreign twin was doing. Whereas TWR's workload was undoubtedly high, it was the confusion over this foreign twin that had been the catalyst to this Airprox. The controller seemed to miss a lot of calls, which Members believed was indicative of a heavily overloaded controller, but the clue should have been when the crew of the foreign twin reported *"..downwind to turn baseleg".* Members perceived that King Air (B) had been baulked in the cct by the foreign twin whose crew had evidently flown an expanded cct the radar recording showing that the foreign twin had flown out to a range of 2½nm before turning onto final. This excessively large cct was also a factor in this Airprox and military pilot Members stressed that the cct should not extend downwind in this manner. It was an 'old chestnut', but nonetheless worth repeating here: ccts should not be extended downwind – it was better airmanship to 'go-around' at cct height from the point at which a normal final turn would commence, rather than fly out, as here, to the ATZ boundary. The Grob Tutor pilot's account had noted that he saw a King Air 2-3nm S of the airfield, which he assumed, was positioning to join. With no other traffic visible on the radar recording it seemed probable to the Members that this was indeed King Air (A) - which the Tutor crew was supposed to be following in the cct – and had been 1nm to the W when they were cross-wind. It seemed that King Air (A) had followed the pattern formed by King Air (B) - although this ac was not evident on the radar recording probably because the SSR was 'off' in the cct. However, as King Air (A) was so far downwind with the cct state passed by TWR as only 2 in, which the Tutor crew could probably see were ahead – the foreign-twin followed by King Air (B) – King Air (A) was discounted as another ac positioning to join rather than being ahead in the cct. Having discounted it as a factor, the Grob Tutor crew turned inside King Air (A) leading to the close encounter at 1½nm on final. The Board agreed the incorrect cct state transmitted to all the ac involved was fundamental to this Airprox. The Board agreed that the Cause of this Airprox was incorrect TI led to a conflict between the King Air and Tutor on final approach.

During their Final turn, the Grob crew would have been focused on the aerodrome and cct traffic they had been told to follow to their L, belly up and unaware that they were about to baulk King Air (A), which was closing rapidly from the starboard side. Although the crew of King Air (A) should have been aware of the Grob in the cct from the crew's RT calls, again, it was probably not apparent from the cct state given. Furthermore, whilst flying on the downwind leg the Tutor was astern of them; nevertheless, the Tutor was evidently there to be seen when they turned base and onto final. It was unclear to the Members why the crew of King Air (A) had not spotted the Grob earlier; it was on the inside of their L turn onto final but it was not until it flew in to their field of view 50ft above them that they saw the Grob and took prompt action. It seemed to the Members that both the Grob crew and the crew of King Air (A) probably saw each other at about the same point and the latter initiated a go-around followed by the Grob Tutor crew also breaking–off their approach and flying into the Deadside astern of King Air (A). The combined actions of both crews thereby forestalled a collision. Nevertheless, with vertical separation reported to be 50ft by the King Air crew and the radar recording showing both ac at the same level on Mode C closing to a range of less than 0·1nm – 200yd – it was evidently a close quarters situation with little time to react. The Members agreed unanimously that in these circumstances the safety of the ac involved had been compromised.

AIRPROX REPORT No 2009-159

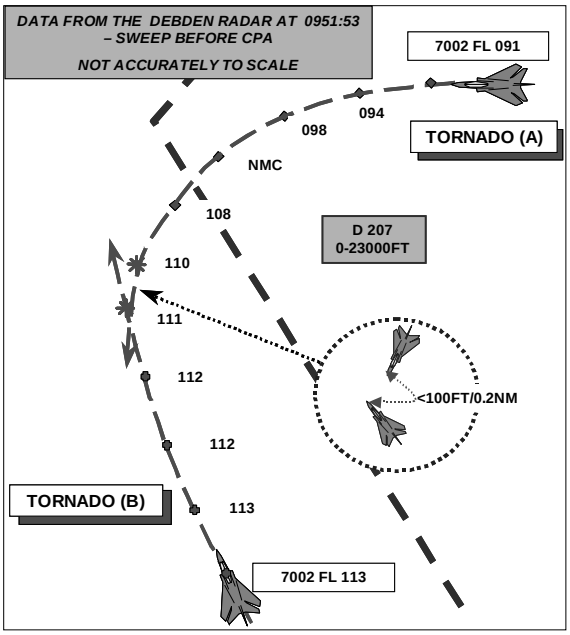
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Incorrect TI led to a conflict between the King Air and Tutor on final approach.

Degree of Risk: B.

AIRPROX REPORT NO 2009-159

Date/Time:	10 Dec 0952	
Position:	5252N 00003E (Holbeach Range area)	
Airspace:	Wash AIAA	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Tornado GR4 (A)	Tornado GR4 (B)
Operator:	HQ AIR (OPS)	HQ AIR (OPS)
Alt/FL:	11300ft	11400ft
	(QFE 1026mb)	(QNH 999mb)
Weather:	VMC CAVOK	VMC CAVOK
Visibility:	30km	>10km
Reported Separation:		
	50ft V/300ft H	0ft V/500ft H
Recorded Separation:		
	<100ft V/0.2nm H (between sweeps)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO GR4 (A) PILOT reports that during a range profile, while leading a pair of ac, at Holbeach AWR he was established in a left hand 'Close Air Support wheel', positioning for 30° strafe on Target 2 and in contact with Holbeach primary frequency while squawking 7002 with Mode C. At 0952 the ac was passing 11300ft (on the range QFE) in a climb to 12000ft, flying at 330kts, turning through a heading of 206° for 319° while the Weapon System Operator (WSO) was tracking the strafe panel on the Thermal Imaging and Laser Designator (TIALD) pod and the pilot was looking into the turn at the panels and the general target/range area. On looking forward to check their height and speed the pilot immediately saw another Tornado GR4 crossing from left to right though the HUD and at the same height 300ft away; the WSO confirmed the estimate of 300ft. He continued the turn after momentarily dropping the right wing to confirm the other ac was well clear. He assessed the risk as very high and reported the incident, which took place about 1½ nm to the W of the D207 boundary, to Sqn Ops. The remainder of the sortie was completed without further incident.

After landing and upon returning to Sqn HQ, they viewed the ac video, which clearly shows another Tornado GR4, straight and level, in the HUD field of view, about 50ft high and very close to the lead ac. The ac involved was traced to another unit.

THE TORNADO GR4 (B) PILOT reports that they attempted to enter Holbeach range to conduct work towards a strafe trial. On check-in with the range, it was discovered that the range had apparently been double booked and was occupied by other users, so they left the range area, maintaining clear of the restricted airspace (approx 3-4nm to the W) and entered a gradual, wings level descent prior to entering the LFS. Since they were in sight of the ground in good weather conditions, they elected to leave the Holbeach frequency and descend VFR, squawking 7000 [actually 7002] with Mode C while heading 335° at 370kt.

During the descent another Tornado GR4 was seen 500ft away, at the same height, passing down their right hand side, in a left hand turn. They thought that it had been conducting weaponry profiles that took it slightly outside the restricted airspace of the AWR (D207).

They considered that their sighting of the conflicting ac was late but, apart from the initial surprise, it caused no other reason for concern; no avoiding action was required and they assessed the risk as medium.

TORNADO (B) Station commented that the decision to file an Airprox, or not, was a matter of judgement; in this case OC Ops Wing reviewed the incident and was content that the UKAB had sufficient information to investigate it thoroughly without further Station input.

HQ AIR (AWR) reports that Tornado (A) flight was operating in their booked slot up to 1015. The crew of Tornado (B) may have been under the impression that they had an earlier booking but they were, in fact, booked from 1015 to 1030, with another user booked from 1030 onwards. It is not clear where the confusion over the booking arose, but HQ AIR (AWR) is content that the booking system used does not permit double-bookings.

The duty RSO reported that Tornado (B) informed him that he would hold to the W of the Range to await a call-in. Tornado (A)'s last firing pass was recorded at 1014 and the formation departed the Range shortly afterwards. Tornado (B)'s first pass over Target 1 was at 1021 and his last at 1035 as the following traffic was a few minutes late. (Range times are over-target times and not times for arriving/departing range airspace).

UKAB Note (1): An analysis of the Cromer, Debden and Claxby radars was conducted and they all show the incident clearly as depicted above. Although the primary and secondary responses correspond, some transposition of Mode C data was required to complete the diagram. The CPA was 1.0nm outside the boundary of D 207.

HQ AIR (OPS) did not comment.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Although Tornado (A) was conducting a weaponry profile at Holbeach Range, the pattern being flown took the ac outside the boundary of the Range Danger Area (D207) and the incident occurred in unregulated Class G airspace where the 'see and avoid' principle pertains. The Board noted that the crew were conducting a very high workload exercise with both crew members concentrating on their respective tasks, but Members agreed that the crew retained the obligation to conduct a thorough lookout. Indeed, in many respects the dynamic nature of the profile being flown required an even more vigilant lookout than would be the case when flying a more predictable flightpath.

Notwithstanding that they had expected to enter the Range, Members agreed that the crew of Tornado (B) had been unwise to execute their descent to low level so close to the boundary of the Range Danger Area, despite that it was in Class G airspace. It was suggested that they might had not have expected to encounter an ac to be exiting the Range in their position or alt, but the HQ Air Member informed the Board that they were an experienced (trials) crew who would have been familiar with most of the Holbeach weaponry patterns; furthermore on seeing the other Tornado they were immediately aware that it was Range traffic.

Members agreed that neither crew had seen the opposing ac in time to take any avoiding action. Noting that the actual CPA took place between radar sweeps, Members also agreed that the horizontal miss-distance had probably been slightly less than the 0.2nm (360m) indicated above, as the ac passed at about the same alt one climbing and one descending. It was unfortunate that Tornado (A) HUD/HDD video was not available to the Board to verify the actual miss-distance, but Members unanimously agreed that it had been close.

Although by happenstance the flightpaths of the two ac were such that they were not in actual conflict, since neither crew saw the opposing ac in time to take any avoiding action, Members agreed unanimously that there had been a risk of collision.

There was considerable discussion as to whether it is desirable to have Range Danger Areas large enough to contain ac flight profiles, such as already exists at Tain Range, rather than just the weapon release profiles as in most other ranges. Opinion was mixed, as this would necessarily mean larger Danger Areas. On the other hand, high energy, high workload manoeuvring such as being flown by Tornado (A) pair would be segregated from routine traffic. The DAP Advisor informed the Board that a Danger Area review was ongoing; Members accepted that this would probably address the issue and agreed not to make any specific recommendation.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively non-sightings by both crews.

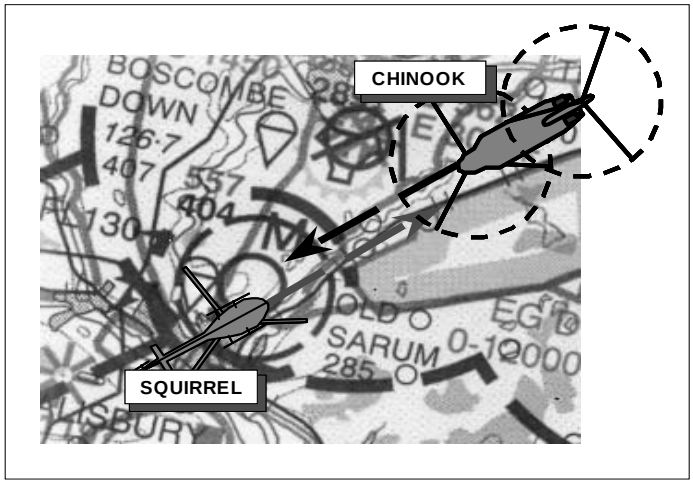
Degree of Risk: A.

AIRPROX REPORT NO 2009-160

Date/Time: 3 Dec 1845

Position: 5107N 00146W (2nm S Boscombe Down)

Airspace:	Boscombe ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Squirrel	Chinook
Operator:	HQ AAC	HQ JHC
Alt/FL:	450ft (QFE NK)	500ft (NK)
Weather:	VMC CAVOK	VMC CAVOK
Visibility:	15-20km	NK
Reported Separation:	200m H	~500m H
Recorded Separation:	Not Recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SQUIRREL PILOT reports that he was the instructor on a single ship Night Vision Device (NVD) training sortie with all lights switched on. They were returning to Middle Wallop along the Wilton to Grateley low-level route, heading 060° at 90kt, under a BS from Boscombe Down for the MATZ transit, when Boscombe passed TI on a Chinook that was flying in the opposite direction transiting along the Andover to Wilton railway. He initially thought he could see the Chinook but it proved to be another ac further along the route. It was difficult to see any ac due to background cultural lighting and the Chinook did not appear to display standard or 'Black Light' strobes. The ac was finally spotted by the student, ½nm ahead and he then saw it 500m ahead flying in the opposite direction at the same height.

He then called the Chinook crew on the RAF Boscombe Down Zone Frequency to confirm that their strobes were switched on and the strobes became visible. He turned right by 10° and the Chinook passed down their port side about 200m away at the same height.

On landing he called Boscombe who said that the Chinook's call to them was quite late, almost S abeam the field.

They continued the sortie without further incident, assessing the risk as being medium/high.

UKAB Note (1): The incident was initially reported as an incident (DFSOR) rather than an Airprox; however, following discussion with DARS the pilot decided to submit an Airprox. Unfortunately, the paper Airprox Report

went missing in the post, which resulted in some delay in requesting the Chinook report. However, the Secretariat contacted the Squirrel pilot and sufficient information was passed by telephone to conduct a full investigation. The Boscombe Down RT tapes, however, had been returned to use so no transcript was available.

THE CHINOOK PILOT reports (3 Months after the event due to the delay explained above) that he was the centre-seat captain of an Chinook based at RAF Odiham on an OCU training mission for 2 pilots and 2 crewmen; TCAS was not fitted. They were flying in good weather, squawking as directed with Mode C and had strobes and nav lights switched on. The sortie comprised of a transit to multiple locations covering all aspects taught to the students up to that stage of training.

Having completed NVD Circuits at Barton Stacey they transited via Grateley [Low Level Route] to Deptford Down for further landings. They established communications with Boscombe Down and a BS was agreed. During this phase a Squirrel helicopter passed down their port side. The ac had been identified early and suitable clearance (his diagram showed ~500m) was awarded for the transit. Once passed, the Squirrel declared that he had not been visual with their ac and it was confirmed on the RT that the ac lighting was checked and confirmed on. They assessed the risk as being low and no further action was taken.

UKAB Note (2): The incident took place below recorded radar cover.

UKAB Note (3): The Boscombe Down FOB contains the regulations for the Wilton to Grateley Low Level Route. The pertinent section (Order 14 Para 2) is as follows:

'**2. Wilton to Grateley when Boscombe Down ATC is Open.** When Boscombe Down ATC is open the terms and conditions for this route are as follows:

a. When joining from the east, pilots should aim to join the route at the Grateley VRP whenever possible.

b. Pilots are to call Boscombe Zone on frequency 126.7MHz for clearance to transit along the route. If Boscombe Zone is busy then a call stating 'callsign, holding at Grateley/Wilton for low level route' should be made.

c. Helicopters will fly not above 500ft Boscombe QFE and will squawk SSR Mode 3/A 2657 (with Mode C if fitted) along the route. Light ac may use the route at 600ft Boscombe QFE.

d. Controllers at Boscombe Down may assume that the radar contact on the low-level route is not above 600ft Boscombe QFE and is thus known traffic.

e. Helicopters may retain the 2657 squawk between Grateley and Middle Wallop provided that they remain not above 500ft Boscombe QFE, or equivalent.'

HQ AAC comments that the Squirrel pilot complied with the appropriate procedures while transiting the Wilton-Grateley Low Level Route. The Chinook late call "S abeam the field" was not 'quite late' but far too late (See regulation b. above). Further, the Chinook external lighting at the time remains questionable.

The procedure for returning RT tapes to use that were probably known to include information on a possible incident should be reviewed by the MAA.

HQ JHC comments were provided after the Board meeting and were there for not available to Members. HQ JHC observed that the discrepancy between the accounts of each crew regarding both the distance between the ac and the status of the Chinook lighting means that it is difficult to determine the cause. Having been passed TI on a Chinook that they subsequently failed to identify early, it is disappointing that the crew of the Squirrel did not take avoiding action sooner, given that they reported on the R/T that they were visual before taking avoiding action, noting that they would have been limited in the avoiding options available laterally due to the proximity of a Danger Area.

It is not clear from the report whether the crew of the Chinook were operating in accordance with Order 14 Para 2 (b) as their report does not state when they managed to establish communications. However, the Squirrel pilot reports that the controller was aware that the Chinook call to them was late. As the reports conflict on the status of the Chinook lighting it is not possible to ascertain whether this affected the outcome.

In summary, the confliction of flightpaths was resolved by the Chinook but not to the satisfaction of the Squirrel crew. The Chinook crew were possibly late in calling Boscombe, which may have contributed to the late identification by the Squirrel. The Squirrel crew themselves had an opportunity to ensure that the risk of collision was reduced still further by making an early alteration to heading or height before they made the R/T call when they had identified the Chinook. It is probable that if earlier avoiding action had been taken, the risk of collision and subsequent Airprox would have been avoided altogether.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that this was an unusual incident involving 2 military ac operating VFR at night using NVDs. The Board was fortunate to have 2 helicopter pilots, one Member and one Advisor, with significant NVG/NVD experience to provide some background. The term NVD is a generic descriptor covering NVGs and aircraft sensors. In this Airprox all the pilots had been operating on NVGs, which provide a limited field of view and can be affected adversely by background cultural lighting.

Members also noted the procedures for using the Grately Low Level Corridor, which should, and in this case did, ensure that users are informed about other traffic. While Members accepted that the Chinook crew had made the appropriate RT call, since there was no RT transcript they could not determine whether it had been made at the optimum time or late. A Member with extensive experience of Grately Corridor observed that Chinook RT calls were often later than optimum because of frequency congestion combined with the relatively higher speed of Chinook ac. It was also noted that both ac were 'framed' in a background of cultural lighting from Salisbury and Andover respectively making the discrimination of both difficult. Another experienced NVG user informed Members that even in good 'light' conditions, distance perception is very difficult and estimates are frequently inaccurate.

With no additional information Members could not determine whether or not the Chinook lights had been on prior to the call by the Squirrel pilot, but they agreed that they had been on after the call. The Board was informed that the lighting selections would be different if ac were operating as singletons or in formations. A singleton ac operating outside the SPTA would be expected to display as a minimum the (upper) strobe and nav lights. Inside the SPTA 'visible' lights could be switched off depending on the area and profile being flown; good practice is to make a positive lighting check when leaving any Training Area.

Notwithstanding the factors above, both ac were operating in under VFR in Class G airspace where see and avoid pertains; the Squirrel crew did not, possibly because of its lighting regime, see the Chinook until later than optimum, but the Chinook crew saw the Squirrel and avoided it by a margin they considered safe. The Board accepted that the Chinook crew's acquisition of the Squirrel was early, that they had maintained visual contact with it and that their estimate of separation was reasonably accurate; they were, therefore, persuaded that there had not been a collision risk.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Squirrel pilot was unable to see the Chinook until a late stage.

Degree of Risk: C.

2009-118	25/09/09	B737-800 v H269	6nm SSE Liverpool	C	157
2009-119	25/09/09	DG500 Glider v Hawk T Mk1 pr	~2nm NE Skelling Farm Glider Site	A	159
2009-120	28/09/09	BE200 v Tornado GR4	19nm E Leeds/Bradford	C	162
2009-121	27/09/09	Grob Tutor v Model Ac	1·5nm S Cranwell Airfield Datum	B	164
2009-122	17/09/09	Tornado GR4 v Untraced Light Ac	2nm E Bala	C	166
2009-123	01/10/09	Robin DR300 + Glider Combination v Spitfire	3·25nm NW Dunstable Downs	C	168
2009-124	02/10/09	AC90 v C182	11½nm ESE I-o-M Ronaldsway	C	170
2009-125	30/09/09	AW139 v F406	NAB Tower – 6nm E Bembridge	C	174
2009-126	18/08/09	Hawk T Mk1 v Hawk T Mk1	River Prysor Valley – 6nm SE Blaenau Ffestiniog	C	175
2009-127	14/09/09	Sea King Mk3 v Hawk T Mk1	11nm NE Valley	C	178
2009-128	04/10/09	EV97 Eurostar v R22	5nm NE Spalding	A	182
2009-129	08/10/09	DHC-8 v PA28	3·5nm NW Plymouth	C	183
2009-130	08/10/09	Bell 206 v Vans RV8	Shoreham A/D cct	C	186
2009-131	05/10/09	AW109E v AW109E	1nm SW BPK VOR	C	190
2009-132	13/10/09	RA390 Premier 1 v Untraced Paraglider	3nm SW Guildford	C	193
2009-133	10/10/09	Slingsby T59D v Cessna C303	2nm E Andover	C	195
2009-134	17/10/09	Gulfstream 5 v Europa	6nm SW Cambridge	C	198
2009-135	14/10/09	Hawk T1 v Hawk T1	1nm E Dolgellau	B	200
2009-136	13/10/09	B737-700 v R44	3nm FIN APP RW26 Luton	C	202
2009-137	13/10/09	BAe Nimrod MR2 v Sea King	18nm NNE Lossiemouth	C	204
2009-138	22/10/09	Do328 v Harrier	10nm E Warton	C	207
2009-139	30/10/09	Sikorsky SK76 v PA32	3nm S OTR VOR	C	211
2009-141	28/10/09	Paraglider v Sea King MK4	Bridport	C	214
2009-142	13/10/09	Apache v Enstrom 480B	3·5nm SW Greenham Common	C	216
2009-143	07/11/09	DHC-8 v C152	3·25nm NW Liverpool	C	218
2009-144	06/11/09	BE200 v TBM700	2nm SW Shoreham	C	220
2009-145	21/10/09	Cessna 152 v Bell 430	2nm W Chinnor	C	224
2009-146	19/11/09	A320 v B737-500	4nm W Heathrow	C	226
2009-147	23/11/09	DHC-8 v C182	4nm Finals RW26 I-o-M	C	230
2009-148	28/11/09	DHC-8 v MD901 Explorer	2nm SSW Southampton	C	234
2009-149	27/11/09	BE200 v Grob Tutor 11	10nm SE Cranwell	C	238
2009-150	01/12/09	Chinook v Chipmunk	3·4nm SSE Odiham	C	242
2009-151	01/12/09	Lockheed Tristar v B767	5nm ENE Brize Norton	C	246
2009-152	03/12/09	R44 v BN2 Islander	4nm N Denham	C	254
2009-153	10/12/09	Hawk T Mk2 v Untraced Helicopter	2nm W Ruthin	B	256
2009-154	07/12/09	MC130H v HH-60G x 2	1nm NE Sculthorpe	C	258
2009-155	09/12/09	EC225 v AS332L	~099°(M) ADN VOR (130nm)	C	261
2009-156	17/12/09	BH06 v PA28	1·25nm SW Nottingham	C	264
2009-157	11/12/09	A340 v B747-400	NAT TRACK 'X'	D	266
2009-158	30/11/09	King Air v Grob Tutor	1½nm Final RW01 Cranwell cct	B	272
2009-159	10/12/09	Tornado GR4 v Tornado GR4	Holbeach Range area	A	276
2009-160	03/12/09	Squirrel v Chinook	2nm S Boscombe Down	C	278