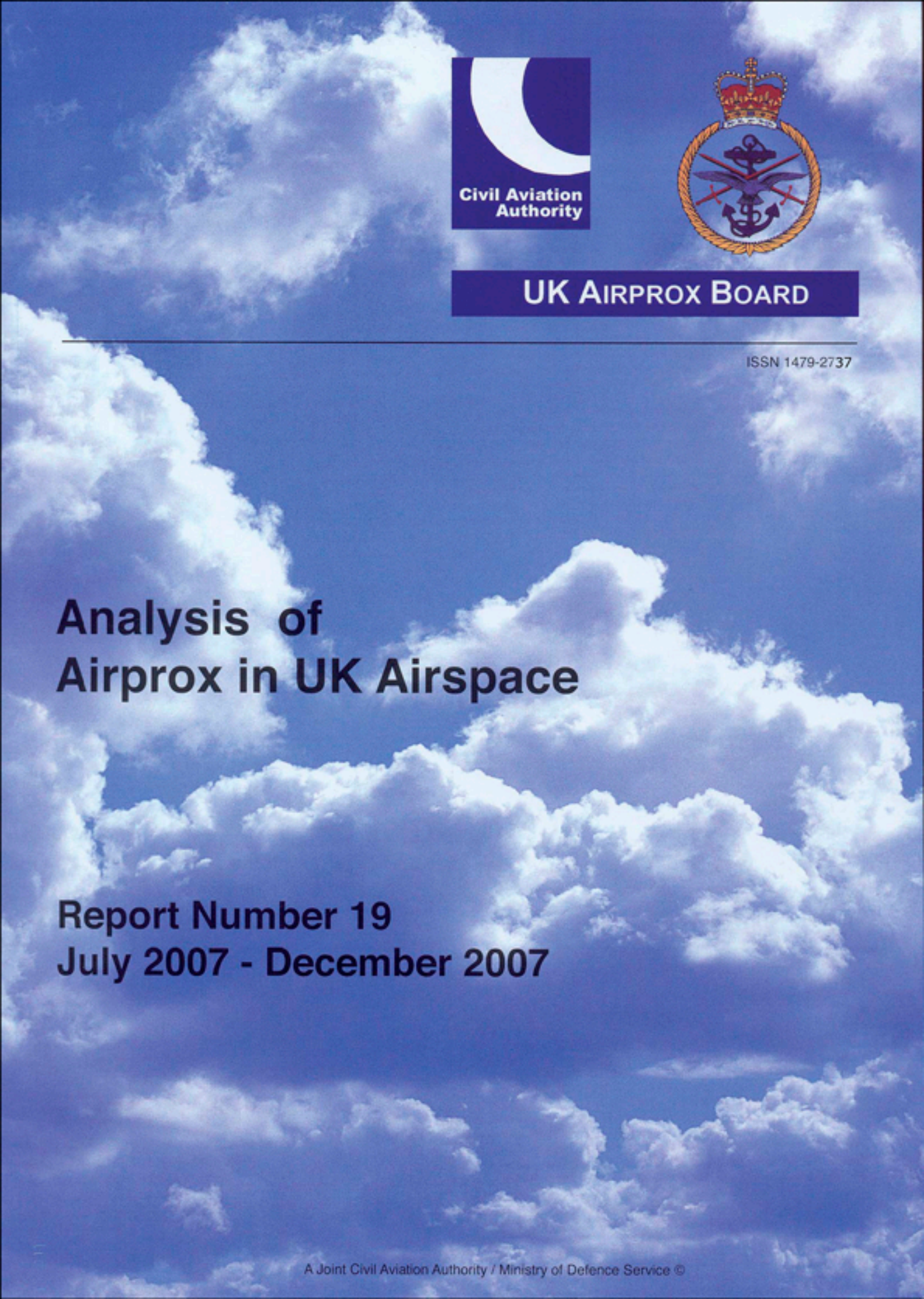


UK AIRPROX BOARD

ISSN 1479-2737

Analysis of Airprox in UK Airspace

Report Number 19
July 2007 - December 2007

Nineteenth Report by the UK Airprox Board:

‘Analysis of Airprox in UK Airspace’

(July 2007 to December 2007)

produced jointly for

The Chairman,
Civil Aviation Authority

and the

Chief of the Air Staff,
Royal Air Force

FOREWORD

The primary purpose of this, the nineteenth Report from the UK Airprox Board, is to promote air safety awareness and understanding of Airprox. “Book 19” covers the second half of 2007 in detail, containing findings on all of the Airprox which were reported as occurring within UK airspace in that period and which were fully investigated. In addition to the individual Airprox reports, all of which have already been published on the UK Airprox Board website - www.airproxboard.org.uk - this Report contains a range of graphs and tables highlighting many of the key statistics from UK Airprox throughout the whole of 2007.

As regards the last six months of 2007, 79 Airprox were fully investigated having been reported as occurring in UK airspace during that period. The total of 79 is 21 less than the average of comparable figures in each of the previous five years. With regard to ‘risk bearing Airprox’ (i.e. Risk A plus Risk B), numbers for the second six months of 2007 are fewer than those for the same period in the preceding year, 24 vs 31 to be precise. As Figure 1 (page 6) illustrates, the total number of Airprox in 2007 as a whole was 154 against a ‘prior five year’ average of 191. The total number of Airprox investigated in 2006 was 159: broadly speaking, statistics for the whole of 2007 are comparable to those for calendar year 2006. More details are contained in this Report.

Although this Report is primarily intended for those who in one way or another are involved with aircraft and flying, it is understandable that people generally are interested in the safety of commercial air transport. In this regard, the total number of risk bearing Airprox in year 2007 and which involve at least one CAT aircraft is the lowest in the period 1998-2007: there were no Risk Category A occurrences and just five Risk Category B. Further information is given in the Commercial Air Transport section of this Report.

It has long been part of the aviation safety culture for people to report openly any safety-related incident. This openness facilitates safety improvement action and the identification of lessons for the benefit of others. I am pleased to report that in general this spirit of openness continues, people being keen to ensure that others learn from the unfortunate situations in which they have found themselves and therefore being willing to cooperate fully with UKAB’s investigations. It is important that we sustain this culture for the future.

If the collective effort helps to make flying safer – over the UK of course, and in other countries where this publication is also read – then all involved will have felt their efforts worthwhile. For that benefit to be realised, it is essential that this Report be made freely available, in particular to pilots and air traffic controllers. Please would you help the process along by ensuring that your crew room, club house or work place has a copy of this Report available for people to read.

Peter Hunt

Director
UK Airprox Board

CONTENTS

INTRODUCTION

UK AIRPROX BOARD (UKAB) COMPOSITION

The UKAB is an independent organisation sponsored jointly by the CAA and the MOD to deal with all Airprox reported within UK airspace. There are eight civilian and six military voting Members on the Board which is 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:

- Air Traffic Terminal Control, Area Control and Airfield Control, military and civil;
- Commercial Air Transport (CAT) flying, both fixed and rotary wing;
- General Aviation (GA) flying, including gliding; and
- Military flying, both fixed and rotary wing, 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 plus analyses of the main causal factors;
- Assess the risk levels involved;
- Make Safety Recommendations where appropriate to reduce the risk of incident recurrence; and
- 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's reports.

RISK CATEGORIES

Risk level assessments are made on the basis of what actually took place and not on what may or may not have happened. There are four agreed categories as follows:

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

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.

THE UKAB DATA SET

The UKAB Airprox database comprises a set of records each of which relates 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 follows established practice, giving a broad overview on general trends and then examining in more detail some specific results for each of the three principal airspace user groups Commercial Air Transport (CAT); General Aviation (GA) and Military (MIL).

To begin this review, Figure 1 overleaf shows the cumulative distribution of Airprox that were reported in 2007 and which were subsequently opened for full investigation. Please note that some events reported as Airprox are subsequently withdrawn and are thus not subject to full investigation. Only the reporter can withdraw an Airprox.

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 its Contractors - Defence Equipment and Support - undertaking production and flight test activities and by US Air Forces Europe.

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

AIRPROX RESULTS FOR 2007

Numbers of Airprox - 2007

Figure 1 shows the cumulative distribution of Airprox by month during 2007 compared with a 'prior-five-year average' of the progressive totals. With the sole exception of August, the number of Airprox in each month of 2007 was below the prior-five-year average. The year as a whole ended with a total of 154 compared with the prior-five-year average of 191 Airprox.

Twenty reports - a typical number - were initially made during 2007 but then subsequently withdrawn (by the reporters) after reflection and in the light of fuller information.

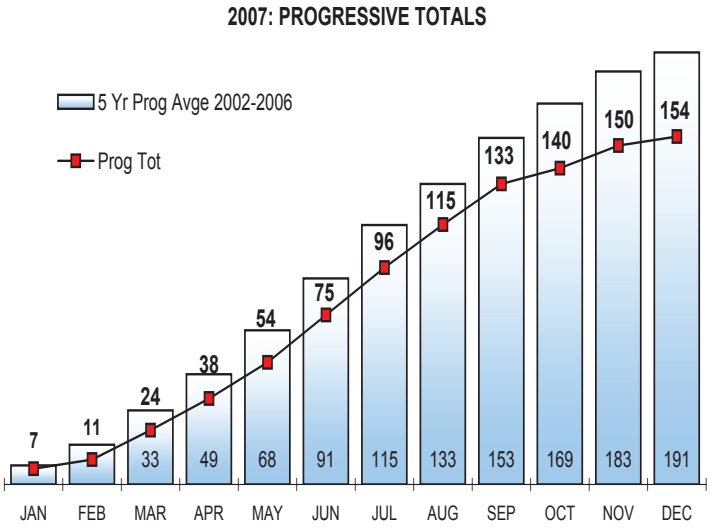


Figure 1: Numbers of Airprox during 2007

Trends by User Groups

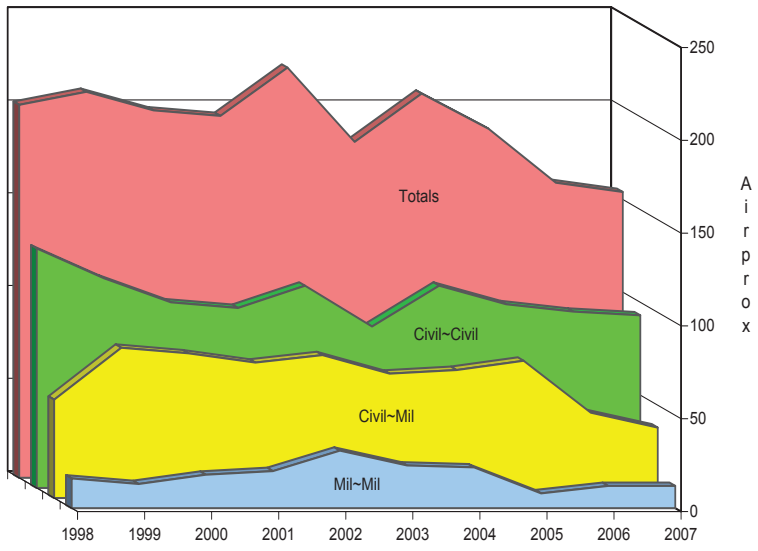


Figure 2: Airprox totals by main user groups

Airprox totals over the last ten years, by main 'user groups', are shown in Figure 2, the underlying data being in Table 1 below. The downward trend in the total number of Airprox continues. Of particular note in Figure 2/Table 1 is the end-of-year 'Total' for 2007, the lowest figure in the dataset.

Examination of those year 2007 Airprox in the category 'Other' shows that whilst the absolute number - 11 - is greater than hitherto, there is little that is otherwise noteworthy. Two of the 11 - compared with one in six in 2006 - were Risk Category B, there being no Risk Category A events in either year. Similar proportions of untraced aircraft in the 'Other' group were also noted, year on year.

Table 1: Airprox totals by main user groups

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Civil~Civil	129	113	100	97	109	87	109	99	95	93
Civil~Mil	53	81	78	73	77	67	69	74	46	38
Mil~Mil	16	13	18	20	31	23	22	8	12	12
Other	3	1	2	5	4	4	7	7	6	11
Totals:	201	208	198	195	221	181	207	188	159	154

Airspace in which conflicts took place

Figure 3 shows the airspace types in which the various encounters took place. During 2007, three changes were made to airspace classifications on the UKAB database to keep step with actual classifications: 'Restricted Area (Temporary)' was introduced whilst the upper limit of 'Class F - Advisory Routes' became FL195 with a similar change to the upper limit of 'Class G'. Notwithstanding these revisions, most Airprox in 2007 still occurred in Class G airspace, around 70% of the total to be precise, substantially the same as in previous years. Given this statistic, the Board continues to welcome the Airspace & Safety Initiative (ASI), a joint CAA, NATS, Airport Operator's Association, General Aviation and Ministry of Defence effort to investigate and tackle the major safety risks in UK airspace. The new Air Traffic Services Outside Controlled Airspace are planned to be introduced in March 2009, details being available through many sources including the internet at http://www.airspacesafety.com

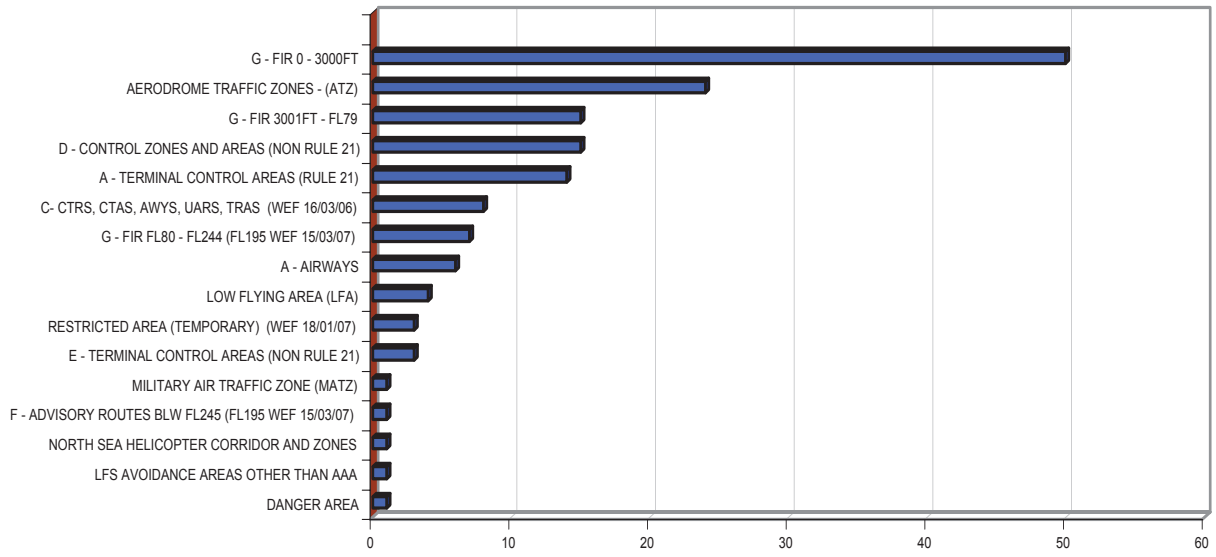


Figure 3: Types of airspace - all Airprox in 2007

COMMERCIAL AIR TRANSPORT (CAT) SECTION

CAT Risk Results

The data in Table 2 below and the associated plot in Figure 4 overleaf show the numbers, by Risk rating, for Airprox involving at least one CAT aircraft over the decade 1998-2007 inclusive. Also shown - in both the Table and Figure - are figures for 'Hours flown', computed from data provided by the UK Civil Aviation Authority and using long-established formulae which facilitate direct comparisons from year to year.

CAT Risk	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
CAT Risk A	1	4	6	0	1	0	1	1	0	0
CAT Risk B	14	12	8	14	7	12	7	7	6	5
CAT Risk C	82	83	85	65	70	54	67	78	68	60
CAT Risk D	1	0	1	4	4	0	4	1	0	0
CAT Total Airprox	98	99	100	83	82	66	79	87	74	65
Hours x 10K	125.9	133.2	138.9	139.5	136.6	139.8	148.5	154.6	160.2	162.0
All Airprox	201	208	198	195	221	181	207	188	159	154

Table 2: CAT Risk data 1998 - 2007

CAT Risk Results (cont.)

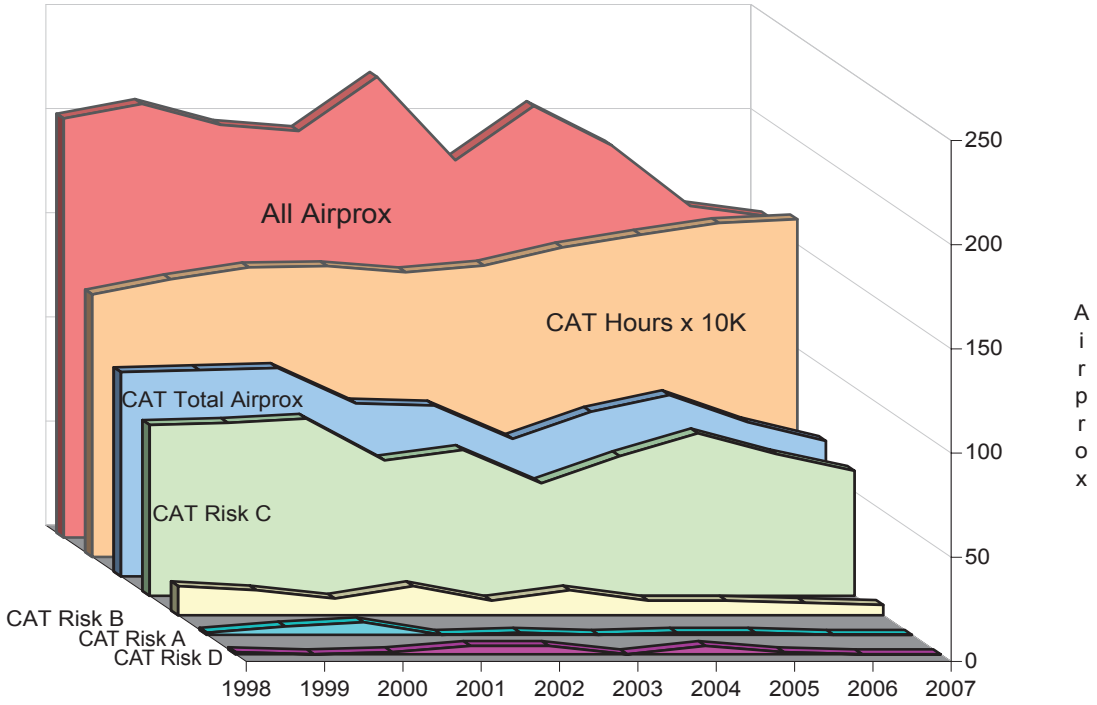


Figure 4: CAT Risk distribution 1998 - 2007

The most noteworthy conclusion from Table 2/Figure 4 is that in 2007 the number of Risk Bearing Airprox involving at least one CAT aircraft was again at a low figure: no Risk A and five Risk B events making a total of five for the year as a whole, the lowest in the 10-year period. Examination of the figures in Table 2 also reveals that 'CAT Risk C', 'no risk of a collision' events, has remained at the same proportion - 92% - of 'CAT Total Airprox' as in 2006.The increase in the number of CAT Airprox reports in years 2003~2005 has thus been followed by two years of reducing numbers: 74 (2006) and 65 (2007).

Turning to the five events where the UK Airprox Board assessed the degree of Risk as 'B', one - involving two CAT aircraft - occurred in Class D airspace, the other four in Class G. Of these four, two involved a CAT and a MIL aircraft, the other two being 'CAT on GA'. All five events occurred in different parts of the UK and form such a small sample that it is unwise to attempt to draw generalised conclusions other than the aforementioned point that four of the five events occurred in Class G airspace. The reader is referred to the individual reports for the details.

Table 3 overleaf shows CAT Airprox rate information. Figures are derived by taking the 'raw data' in Table 2 and dividing by flying hours - also in Table 2 - to obtain rates. This information is plotted in Figure 5, with (logarithmic) trend lines added, for all CAT Airprox and for Risk Bearing incidents only. The trend rate for 'all CAT Airprox' continues downwards, partly due to decreasing numbers of Airprox year-on-year and partly due to increasing flying hours. Similarly, the downward trend in the CAT 'risk bearing' rate continues, the year-on-year improvement being from 0.37 to 0.31, the 'CAT Airprox Rate per 100,000 hrs flown' in 2007.

CAT Airprox Rates

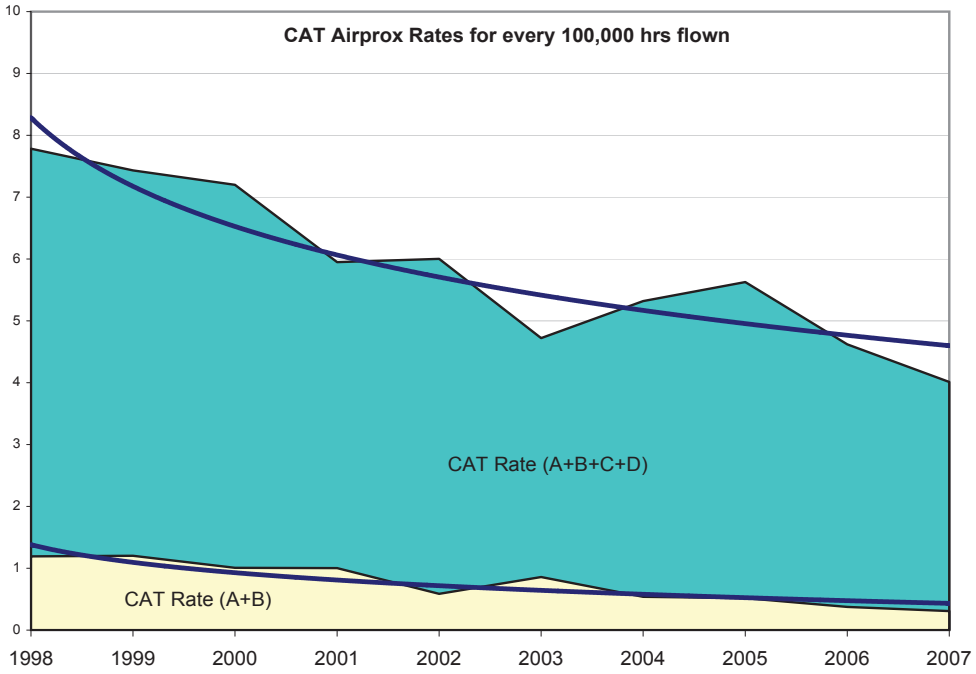


Figure 5: CAT Risk rates 1998 - 2007

Table 3: CAT Airprox Rates per 100,000 flying hours

CAT Rates	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
CAT Rate (A+B)	1.19	1.20	1.01	1.00	0.59	0.86	0.54	0.52	0.37	0.31
CAT Rate (A+B+C+D)	7.78	7.43	7.20	5.95	6.00	4.72	5.32	5.63	4.62	4.01
Hours x K	1,259	1,332	1,389	1,395	1,366	1,398	1,485	1,546	1,602	1,620

CAT Causal Factors

Table 4 below lists the predominant Causes behind the 65 Airprox involving at least one CAT aircraft. One Airprox can have more than one causal factor, 126 such factors being allocated in toto to the 65 Airprox. Those Causal Factors assigned four or more times are listed in Table 4 below, the list being similar to that in previous years. In the context of Serials 2 and 3 in Table 4, attributed to Pilots, the UKAB continues to share industry concern regarding 'infringements' and 'level busts' and fully supports the safety improvement actions aimed at reducing these risks.

Table 4: Most common Causal Factors in Airprox during 2007 having a CAT aircraft involvement

Ser.	Cause	Totals	Attributed to
1	DID NOT SEPARATE/POOR JUDGEMENT	15	CONTROLLER
2	PENETRATION OF CAS/SRZ/ATZ WITHOUT CLEARANCE	10	PILOT
3	CLIMBED/DESCENDED THROUGH ASSIGNED LEVEL	7	PILOT
4	CONTROLLED AIRSPACE CONFLICT IN VMC	5	OTHER
5	DID NOT PASS OR LATE PASSING OF TRAFFIC INFO	5	CONTROLLER
6	INADEQUATE AVOIDING ACTION/LACK OF POSITIVE CONTROL	5	CONTROLLER
7	NOT OBEYING ORDERS/ FOLLOWING ADVICE/ FROM ATC	5	PILOT
8	DID NOT ADHERE TO PRESC'D PROCED'S/OPERAT INSTR'S	4	CONTROLLER
9	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	4	PILOT
10	LACK/BREACH OF CO-ORDINATION BETWEEN CONTROLLERS	4	CONTROLLER

GA Risk Results

Figure 6 shows the Risk distribution for those Airprox in which at least one aircraft was categorised as GA. More often than not flying outside controlled airspace; in aircraft from the size of microlights through to sophisticated aeroplanes and helicopters; piloted by student pilots through to the very experienced professional, this range of activities and experience levels makes it unsurprising that the largest proportion of Airprox in UK airspace involve GA pilots. As Figure 6 illustrates, over the last three years the 'All Airprox' trend is essentially downwards, albeit the 'GA Totals' for 2006 and 2007 are identical at 103 Airprox in each of the two years. It is noteworthy that the ratio between Risk Bearing and total number of Airprox involving at least one GA aircraft is approximately 4:10. In year 2007 that ratio fell to its lowest level in a decade which is to be welcomed.

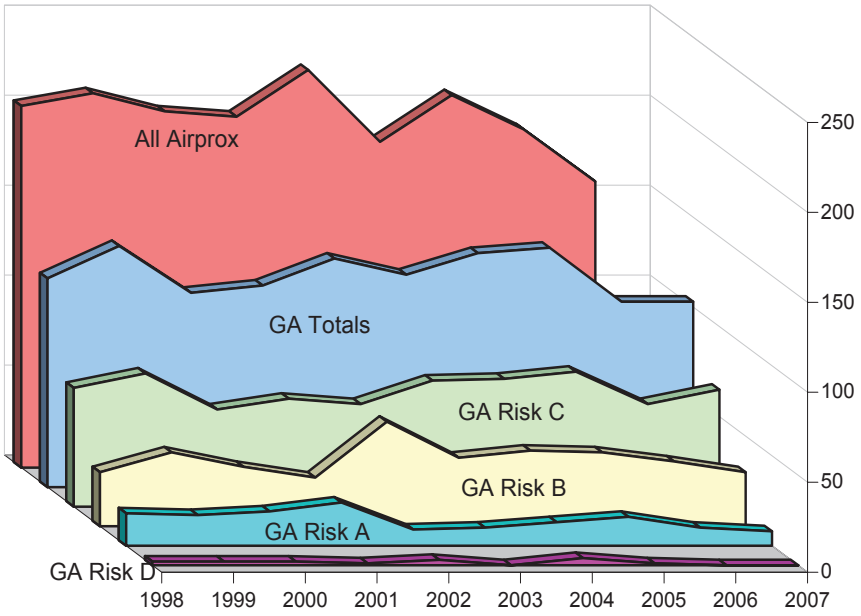


Figure 6: GA Risk distribution 1998 - 2007

Figure 6 is based on the data in Table 5 below. Further visual inspection of the Figure shows that the steady downward trend in Risk Category A and B events over the last two/three years is continuing, this being balanced - in year 2007 compared with 2006 - by a commensurate rise in the number of Risk Category C ('no risk of collision') Airprox. Being involved in an Airprox is one thing - being involved when safety was compromised quite another. It is to be hoped that the GA community will continue to heed the lessons identified from Airprox investigations, particularly those lessons such as maintaining a good lookout; keeping well clear of notified and active gliding sites unless operating therefrom; joining the circuit correctly and both carrying and operating a transponder with Mode C switched 'on' during flight.

Table 5: GA Risk data 1998 - 2007

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
GA Risk A	18	17	19	24	9	10	13	16	10	8
GA Risk B	30	41	33	27	58	38	42	41	36	30
GA Risk C	66	74	54	60	57	70	71	75	57	65
GA Risk D	2	2	2	1	3	0	4	1	0	0
GA Totals	116	134	108	112	127	118	130	133	103	103
All Airprox	201	208	198	195	221	181	207	188	159	154

GA Airprox Rates

The chart at Figure 7 and Table 6 give more information regarding GA Airprox, this time from the perspective of rates rather than absolute numbers. The current 'best estimate' of GA hours flown in 2007 is 1,377,000 hours (but see Note 2, in ***Notes regarding the calculation of rates of occurrence*** on page 5 above). Using this and the numbers of Airprox in Table 5, rates have been calculated for risk bearing (i.e. Risk A plus Risk B) and for all GA Airprox. These rates are in Table 6 from which Figure 7 is plotted. Trend lines have been added from which it can be seen that the 10-year trend in rate per 100k hours flown is sloping gently downwards - by visual inspection, more so since year 2002 - for the two groups of events.

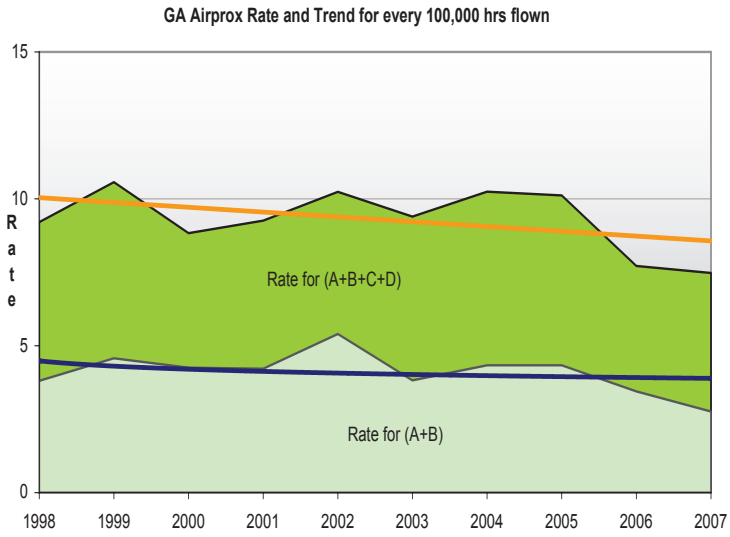


Figure 7: GA Risk rates 1998 - 2007

Table 6: GA Airprox Rates per 100,000 flying hours

GA Rates	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Rate for (A+B)	3.81	4.57	4.25	4.22	5.40	3.82	4.33	4.34	3.45	2.76
Rate for (A+B+C+D)	9.21	10.57	8.83	9.26	10.24	9.40	10.24	10.12	7.72	7.48
Hours flown in K	1,260	1,268	1,223	1,210	1,240	1,256	1,269	1,315	1,335	1,377

GA Causal Factors

Table 7 below gives the most common causal factors assigned to Airprox involving GA pilots. A total of 40 different factors were assigned to the 103 'GA Airprox' - one Airprox event can have more than one cause. The 'top ten' factors are listed in Table 7. By far the largest numbers involve sighting issues as would be expected when so much GA flying is in the 'see and avoid' environment of Class G airspace. 'Did not see the conflicting traffic' and 'Late sighting of conflicting traffic' were assigned a total of 50 times in 2007, again serving to emphasise the importance of good lookout. These data also serve to remind all who fly in Class G airspace of the importance of full use of an aircraft's transponder further to improve safety.

Table 7: Most common causal factors in Airprox during 2007 having a GA aircraft involvement

Ser.	Cause	Totals:
1	DID NOT SEE CONFLICTING TRAFFIC	28
2	LATE SIGHTING OF CONFLICTING TRAFFIC	22
3	DID NOT SEPARATE/POOR JUDGEMENT	12
4	PENETRATION OF CAS/SRZ/ATZ WITHOUT CLEARANCE	11
5	DID NOT PASS OR LATE PASSING OF TRAFFIC INFO	10
6	DID NOT ADHERE TO PRESCRIBED PROCEDURES	10
7	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	7
8	FLYING CLOSE TO/OVER GLIDER OR PARADROP SITE	6
9	CONFLICT IN OTHER TYPE OF AIRSPACE	6
10	POOR AIRMANSHIP	5

MIL Risk Results

The immediate conclusion from Figure 8 below (and Table 8, on which the Figure is based) is that the number of Risk Cat A events in those year-2007 Airprox involving at least one military aircraft is the lowest in the dataset. In other respects, numbers of events are much as in 2006.

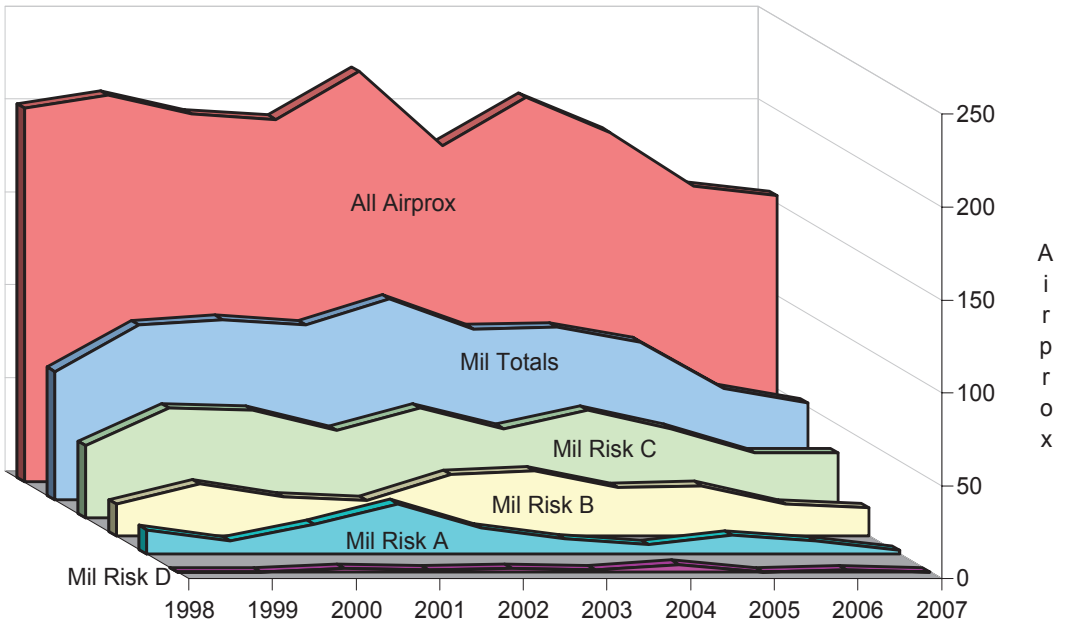


Figure 8: Military Risk distribution 1998 - 2007

Table 8: Military Risk data 1998 - 2007

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Mil Risk A	13	7	16	27	14	8	5	10	7	2
Mil Risk B	17	28	21	19	33	35	26	27	17	15
Mil Risk C	39	59	58	47	59	48	58	48	35	35
Mil Risk D	0	0	2	1	2	1	4	0	1	0
Mil Totals	69	94	97	94	108	92	93	85	60	52
All Airprox	201	208	198	195	221	181	207	188	159	154

MIL Airprox Rates

As with the CAT and GA information earlier in this Report, rates have been calculated both for all Airprox involving at least one Military aircraft and for risk bearing events. Figure 9 and Table 9 overleaf present the results, based on flying hours for 2007. As can be seen in Figure 9, underlying trends have aso been plotted: from visual inspection it is evident that the trend in recent years has been more positively downwards than the 10-year line would indicate.

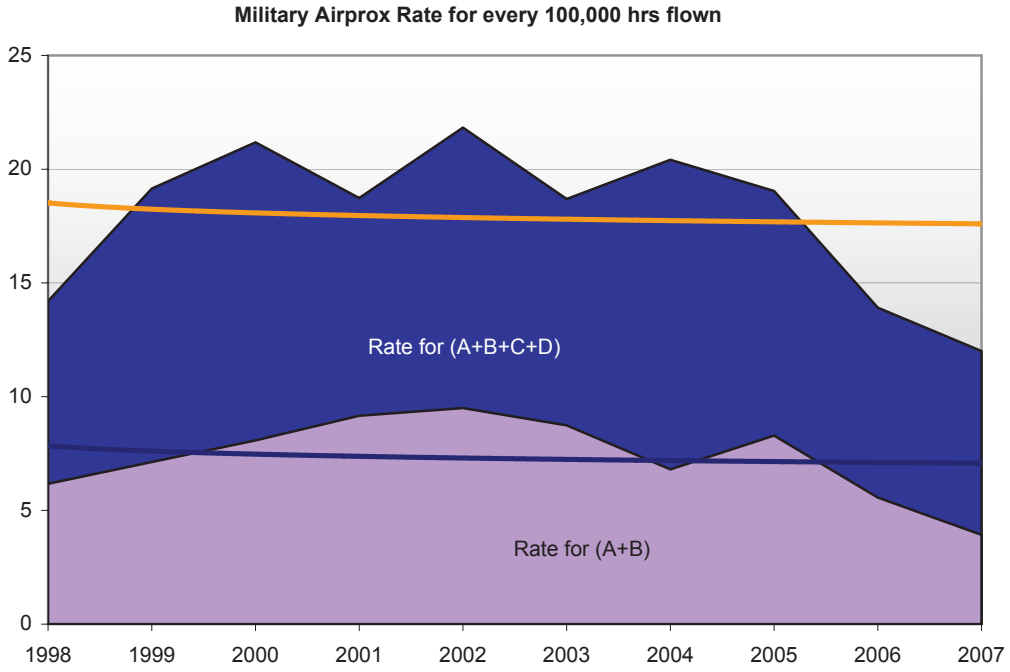


Figure 9: MIL Risk rates 1998 - 2007

Table 9: MIL Airprox Rates per 100,000 flying hours

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Rate for (A+B)	6.17	7.13	8.08	9.16	9.50	8.74	6.80	8.29	5.56	3.92
Rate for (A+B+C+D)	14.20	19.14	21.18	18.73	21.83	18.69	20.41	19.04	13.91	12.00
Hours flown in K	486	491	458	502	495	492	456	446	431	433

MIL Causal Factors

From a total of 30 different factors that were identified following investigation of the 52 Airprox involving at least one military aircraft, those assigned at least four times are listed in Table 10. A look at Table 10 shows that the main causal factors assigned to the set of risk bearing Military Airprox in 2007 relate predominantly to sighting issues. This is unsurprising given that as with GA much of the Military activity takes place in Class G 'see and avoid' airspace.

Table 10: Most common causal factors in Airprox during 2007 having a MIL aircraft involvement

Ser.	Cause	Totals:
1	DID NOT SEE CONFLICTING TRAFFIC	12
2	LATE SIGHTING OF CONFLICTING TRAFFIC	11
3	DID NOT PASS OR LATE PASSING OF TRAFFIC INFO	8
4	PENETRATION OF PROHIBITED/RESTRICTED/DANGER AREA	4
5	LACK/BREACH OF CO-ORDINATION BETWEEN CONTROLLERS	4
6	INADEQUATE AVOIDING ACTION/LACK OF POSITIVE CONTROL	4
7	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	4
8	FAILURE TO ADHERE TO PRESC'D PROCED'S/OPERAT INSTR'S	4
9	CONFLICT IN OTHER TYPE OF AIRSPACE	4

Airprox Trends

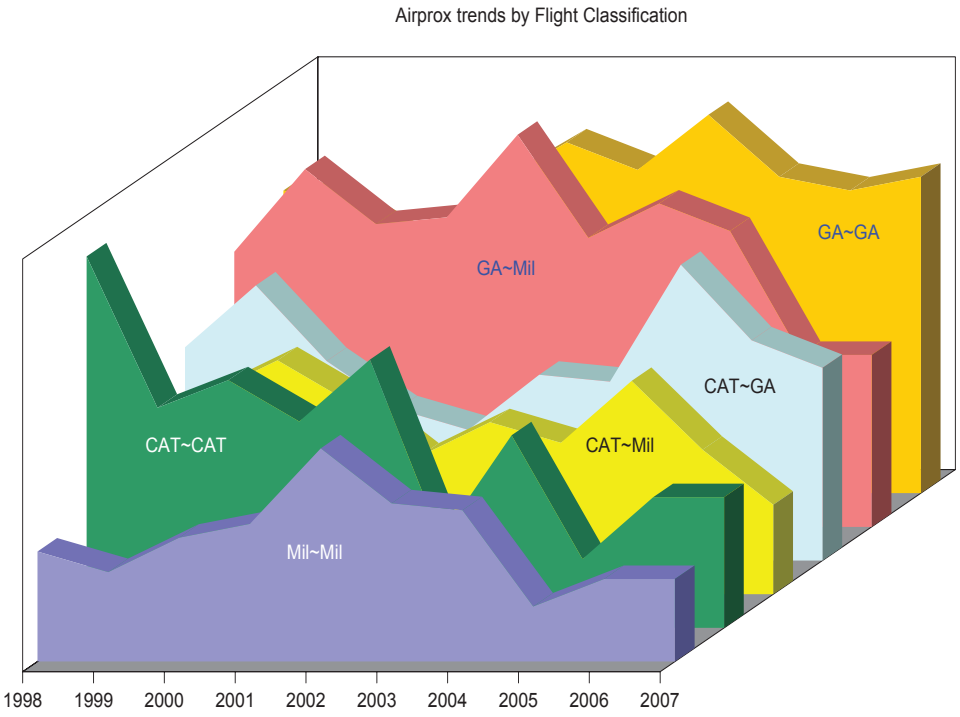


Figure 10: Airprox trends by Flight Classification

Figure 10, derived from data in Table 10 below, is arguably one of the quickest ways to obtain a snapshot of the UK's Airprox 'scene'. From 1997 until 2002, the underlying trend in MIL~MIL encounters was upwards - from the 2002 peak, the trend has been downwards. CAT~CAT Airprox data is shaped like a sawtooth but the trend is downwards over the decade. CAT~MIL and CAT~GA data reveals an upward trend in recent years until peaks were reached in 2005 since when there has been a reduction. GA~MIL data indicates a peak in 2002 followed by an increasingly downward trend whilst GA~GA data shows a peak in 2004 followed by a drop and then a flattening.

Table 11: Airprox trends - annual encounters involving CAT, GA and Military aircraft

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
GA~Mil	40	52	44	45	57	42	47	43	25	25
GA~GA	44	41	35	45	51	47	55	46	44	46
CAT~CAT	54	32	36	30	39	13	28	10	19	19
CAT~GA	31	40	29	22	19	27	26	43	32	28
CAT~Mil	13	29	34	28	20	25	22	31	21	13
Mil~Mil	16	13	18	20	31	23	22	8	12	12

UKAB SAFETY RECOMMENDATIONS

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

186/05-02 06 Oct 05 involving a Duo Discus T Glider and a Tornado F3 Risk A

RECOMMENDATION: The CAA should continue to promote and with renewed urgency the production of a 'lightweight' transponder and, when available, consider mandating its carriage and use in gliders.

ACTION: The CAA accepts this Recommendation. The CAA proposes, "to amend the Air Navigation Order 2005 for the purpose of improving the technical interoperability of all aircraft in UK airspace" with the aim of introducing new regulatory requirements in March 2008. The Regulatory Impact Assessment, which received Cabinet Office approval for publication on 3 June 2006, will consult on the need to increase the carriage and operation of transponders to improve secondary radar conspicuity and to enhance ACAS and CWS capability. The CAA is promoting the development of a low powered SSR transponder to meet the needs of light-motorised and non-motorised aircraft.

UPDATE DEC 2006: The CAA is continuing to work towards development of a low powered SSR transponder, as covered in the published Regulatory Impact Assessment. A draft requirements document has been circulated to Industry and user groups and there are currently several companies in the UK which are in the process of developing a product.

UPDATE JUN 2007: A draft European Concept of Operations is being prepared by the CAA for submission into Eurocontrol and a EUROCAE meeting has been arranged for 29 June 2007 to discuss the associated technical issues.

UPDATE DEC 2007: The draft Concept of Operations was completed and submitted to Eurocontrol who have, however, classified the document as Guidance material. The EUROCAE meeting which took place in Jun 2007, was very constructive and resulted in a proposal for a review of MOPS for LPST to be assigned to EUROCAE WG49. Confirmation that this task will be accepted is still awaited but European support for this is uncertain. Work on LPST development by several UK companies continues but firm commitments will depend on the next stage of CAA-initiated consultation on proposed regulatory changes to transponder carriage and operation. This consultation is planned for Jan 2008. The CAA continues to work with Government departments to identify potential means of mitigating costs and encouraging development.

UPDATE JUN 2008: The CAA consultation on the expansion of SSR carriage proposals closed on 31 May 08 and the responses are now being considered. The CAA continues to encourage development of an appropriate low cost transponder but it is recognised that the solution lies with industry. In respect of European activities, the CAA continues to lobby for development of appropriate MOPS by EUROCAE.

STATUS – ACCEPTED – OPEN

122/07 25 Aug 07 involving an EMB195 and an R44 Risk C

RECOMMENDATION: The CAA should initiate a review of the Exeter SRE display system to ascertain why neither primary nor secondary radar data from the R44 helicopter was displayed to the controllers at the Approach and Tower positions.

ACTION: The CAA accepts this Recommendation. The Air Navigation Services Provider (ANSP) at Exeter is certified under the Single European Sky Common Requirements Regulation, the scope of which includes surveillance equipment. Therefore, the CAA has required Exeter to undertake a review of its radar's performance in compliance with the Exeter Airport Safety Management System to ascertain why neither primary or secondary radar data from the R44 helicopter was displayed to the controllers at the Approach Radar and Tower positions.

STATUS – ACCEPTED - OPEN

List of Abbreviations

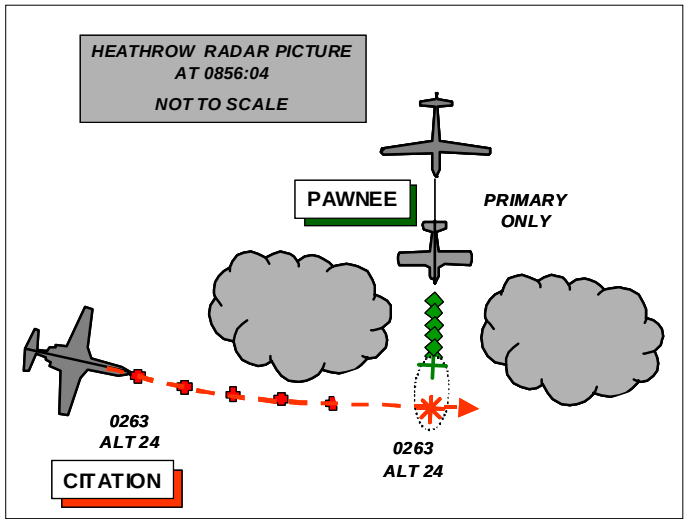
aal	Above aerodrome level
ac	Aircraft
ACAS	Airborne Collision Avoidance System
ACC	Area Control Centre
ACN	Airspace Co-ordination Notice
A/D	Aerodrome
ADC	Aerodrome Control(ler)
ADF	Automatic Direction Finding Equipment
ADR	Advisory Route
AEF	Air Experience Flight
AEW	Airborne Early Warning
AFIS(O)	Aerodrome 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
AOB	Angle of Bank
A/P	Autopilot
APP	Approach Control(ler)
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
BHAB	British Helicopter Advisory Board
BHPA	British Hang Gliding and Paragliding Association
BINA ERS	British Isles/N Atlantic En Route Supplement
BMAA	British Microlight Aircraft Association
c	circa
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
CinC Fleet	Commander in Chief Fleet, Royal Navy
CLAC	Clear Above Cloud
CLAH	Clear Above Haze
CLBC	Clear Below Cloud
CLBL	Clear Between Layers
CLOC	Clear of Cloud
CMATZ	Combined MATZ
CPA	Closest Point of Approach
C/S	Callsign
CTA	Control Area
CTR/CTZ	Control Zone
CWS	Collision Warning System
DA	Decision Altitude
DAAvn	Director Army Aviation
DAP	Downlinked Ac Parameters [Mode S]
DAP	Directorate of Airspace Policy CAA
D & D	Distress & Diversion Cell
DF	Direction Finding (Finder)
DH	Decision Height
DME	Distance Measuring Equipment
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
FIS	Flight Information Service
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
JOI	Joint Operating Instruction
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
LLZ	Localizer
LJAO	London Joint Area Organisation (Swanwick (Mil))
LoA	Letter of Agreement
LTMA	London TMA
MACC	Manchester Area Control Centre
MATS	Manual of Air Traffic Services
MATZ	Military Aerodrome Traffic Zone
mb	Millibars
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
OLDI	On-Line Data Interchange
PAR	Precision Approach Radar
PFL	Practice Forced Landing
PF	Pilot Flying
PI	Practice Interception
PINS	Pipeline Inspection Notification System
PNF	Pilot Non-flying
QDM	Magnetic heading (zero wind)
QFE	Atmospheric pressure at aerodrome/airport elevation (or at runway threshold)
QFI	Qualified Flying Instructor
QHI	Qualified Helicopter Instructor
QNH	Altimeter sub-scale setting to obtain elevation when on the ground
R	Right
RA	Resolution Advisory (TCAS)
RAS	Radar Advisory Service
RAT	Restricted Area (Temporary)
RCO	Range Control Officer
RH	Right Hand
RIS	Radar Information Service
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
SC	Sector Controller
ScATCC(Mil)	Scottish Air Traffic Control Centre (Military) [Prestwick]
ScOACC	Scottish and Oceanic Area Control Centre
SFL	Selected Flight Level [Mode S DAP]
SID	Standard Instrument Departure SMF Separation Monitoring Function
SOP	Standard Operating Procedures
SRA	Surveillance Radar Approach
SRE	Surveillance Radar Element of precision approach radar system
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
TBC	Tactical Booking Cell
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
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
UTA	Upper Control Area
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

AIRPROX REPORT No 086/07

AIRPROX REPORT NO 086/07

Date/Time:	3 Jul 0856	
Position:	5146N 00048W (3nm SW Halton - elev 370 ft)	
Airspace:	Lon FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	PA25 + Glider	C550
Operator:	HQ PTC	Civ Exec
Alt/FL:	↑1800ft (QFE 987mb)	2400ft (QNH 999mb)
Weather	VMC NR	VMC NR
Visibility:	50+km	10+km
Reported Separation:	0 V/100-200m	NR
Recorded Separation:	~30ft V/ 400m H (see UKAB Note (2))	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA25 PAWNEE PILOT reports flying a blue and yellow ac with strobes switched on but with no SSR fitted, on a local glider towing flight from RAF Halton while in receipt of an Air/Ground Service from Halton. At about 0950 he departed from RW26 on his third aerotow of the day and about 5min later he was overhead the HEN beacon heading 240° at 65kt, 100ft above the cloud base between two broken cumulus layers but in sight of the ground and with forward visibility of 7–8 km. A white Citation ac with a green stripe came out of the cloud on his right at the same altitude; flew across the nose of his ac 1-2sec later (100-200m away) and then flew back into cloud on his left. He was only visual with the ac for about 3-4sec. He reported the incident to Halton Radio who in turn called Luton but they said that although they had the ac on radar they were not working it.

He did not have time to react to the other ac and assessed the risk as being medium to high.

THE C550 PILOT submitted a report seven weeks after the incident. He reports flying a white and green ac IFR from Gloucestershire to Northolt at 190kt, squawking 0263 (at the incident time) with Mode C and Mode S selected on; TCAS was fitted. He recalled that it was a pleasant day with good visibility and that the fight was conducted outside CAS with a RIS from Brize Norton, Luton then Northolt. It was a typically normal day with TI on numerous pop-ups, with no height information, being passed by ATC. He thought that although they had visually acquired most of the traffic reported, it is possible they missed some or made contact with ac other than that reported by Radar. They did not need to make any evasive manoeuvres for any of the traffic that they made visual contact with or of which they were aware: they may have had a TA and he does not think they had any RAs on the day in question. He did not see the reporting ac and cannot recall whether it was reported to him.

UKAB Note (1): By the time the pilot's report, which stated that he was working Brize Norton then Luton, was received, the RT tapes at both units had been reused. Duty ATC staff at neither unit had any recollection of the event.

UKAB Note (2): An analysis of the Heathrow radar showed the Citation squawking 0263 and indicating an altitude of 2400ft, approaching the incident area from the W at 239kt (RGS). Meanwhile a primary-only contact, presumed to be the Pawnee combination, heading about 185°, approaches the area slowly from the N. The CPA occurs 3.1nm SSW of Halton at 0856:04 when the Citation, indicating 2400ft amsl, passes from W to E, 400m directly in front of the combination. The pilot of the combination reported that at the time he was at 1800ft on the Halton QFE of 987mb which equates to 2370ft amsl.

UKAB Note (3): The Luton METAR for 0950Z was:

0950 230/11 VRB 100/270 9999 SCT 2200 +17 +11 0999.

HQ AIR (TRG) comments on behalf of JSAT (G) that it is disappointing that nobody seems to recall the incident apart from the reporting pilot. The cumulus cloud may have restricted the opportunity the pilots had in seeing each other, significantly contributing to the Airprox.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted that the radar recording showed the Citation to be flying at 2400ft and about 240kt through the Class G airspace just S of Halton, the base of CAS being 3500ft reducing to 2500ft ahead on the Citation's track. Two pilot Members considered 240kt to be unwise in a congested area and in such cloud/weather conditions; one stated that his company imposed a limit of 190kt to allow more time to 'see and avoid'. He also observed that, in his experience and although there was nothing to suggest that this was the case in this instance, a small number of pilots thought that by flying IFR in Class G airspace this somehow absolved them of their 'see and avoid' obligation.

Notwithstanding the weather, both pilots had an obligation to see and avoid the other ac. Although the Citation pilot had no way of knowing it, as he did not see the combination, the Pawnee had right of way by virtue that he was towing a glider. Although noting that seeing other ac when skirting round cumulus cloud is often very difficult, the Board agreed that this incident had been a sighting issue. Since the Citation pilot had not seen the combination and the Pawnee pilot had not had time to react, safety had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

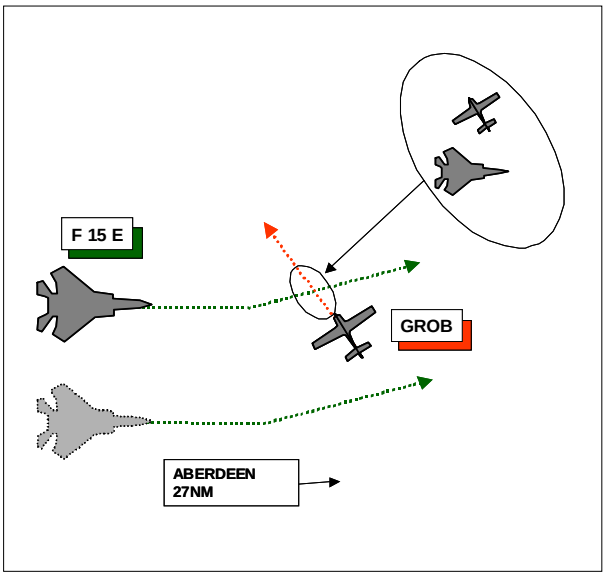
Cause: A non-sighting by the Citation crew and an effective non-sighting by the Pawnee pilot.

Degree of Risk: B.

AIRPROX REPORT No 088/07

AIRPROX REPORT NO 088/07

Date/Time:	3 Jul 1152	
Position:	5710N 00302W (27nm WSW Aberdeen)	
Airspace:	UKDLFS	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	F15E	Grob Tutor
Operator:	Foreign Mil	AIR TRG
Alt/FL:	1000ft AGL	1200ft
	(NR)	(RPS NR mb)
Weather	VMC CLBC	VMC CLBC
Visibility:	10nm	30km
Reported Separation:		
	0ft V/1nm H	300ft V/500m H
Recorded Separation:		
	100ft v/~1nm in 12 o'clock (reducing) (See Note (1)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE F15E PILOT reports flying a dark grey ac with strobes and nav lights switched on, squawking 7001 [actually 7002] with Mode C on a low level tactical training flight in LFA14 as leader of a pair of ac with his No2 in tactical formation 1.5nm S of his ac. While about 25nm to the W of Aberdeen, in good VMC below cloud, heading 080° at 410kt groundspeed and at 1000ft agl, he saw a light ac sharply turning [he thought] to avoid his flight path. Neither he, his WSO nor the crew of his No 2 saw the other ac, which was in his 12 o' clock on a reciprocal heading, until it began manoeuvring at a distance estimated to be 1.5nm. Had the other ac not manoeuvred it would have passed very close indeed to their ac and he assessed the risk as being high (had the other ac not manoeuvred).

THE GROB TUTOR PILOT reports flying a low level navigation training flight with a student pilot in a white ac with strobes and nav lights switched on and squawking 7000 [actually 2602]. While straight and level, heading 360° at 120kt and 1200ft [presumed agl] and on a simulated IP to target run, a heavy shower was situated in the vicinity of the target so the run was aborted and the ac flown to the W of the target and then flown N to intercept the NAV route. During transit N a single F15 was seen in their 8 o'clock position travelling in a straight line from L to R and slightly above them. They maintained their heading and height as the F15's track was taking it safely behind them. The F15 was visually monitored and was seen to turn S when in their 6 o'clock position. He took no avoiding action and assessed the risk as being low.

UKAB Note (1): The recording of the Aberdeen Radar, although of poor quality and very large scale, shows the incident. The F15 leader can be seen squawking 7002 at FL034 and initially tracking 090° with its No2 showing as an intermittent primary contact 1½ nm to the S on a parallel track. The Grob pops up in the F15's 1'oclock at 9nm, squawking 2602 and initially at FL 027, and crosses from R to L, tracking about 310°, in front of the F15s which had turned about 10° to the L thus keeping the Grob in their 1 o'clock but now at 6nm. The ac continue to close almost on a line of constant bearing but the F15 disappears from radar while indicating FL030, just as the Grob passes through its 12 o'clock also indicating FL030 at 1151:50 (CPA while closing) about 1nm ahead and still tracking 310°. The F15 reappears in the Grob's 6 o'clock at about ½nm and indicating FL029 after they had passed. Possibly due to the scale, no manoeuvre by the Grob (as described by both pilots) is shown on the radar recording.

HQ AIR (TRG) comments that the Tutor pilot had visual contact with one of the F15s and did not think avoiding action was necessary. The concern appears to be from the formation leader who did not know what the Tutor pilot was doing.

HQ 3 AF comments that the F-15E crew were 'heads up' at the time and did well to spot the Grob which, initially, was nose on to their aircraft; the F-15 pilot was certain that it was the Grob's manoeuvre which enabled him to see

it as it cleared his track. A subsequent review of the F-15 radar tape showed that the Grob had painted briefly before the visual acquisition.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were not able to resolve the apparent anomaly between the descriptions of the Grob's routeing given by the pilots and the radar recording. The Board accepted, however, that it was the manoeuvre by the Grob that highlighted it to the F15 leader. The investigation revealed that the Grob had not been manoeuvring to avoid the F15 but to regain his planned track after a small weather deviation. Nonetheless, the separation was never close enough to cause either pilot serious concern, the F15E pilot noting that had the Grob not manoeuvred then it would have passed very close indeed to their ac, or compromise the safety of their ac.

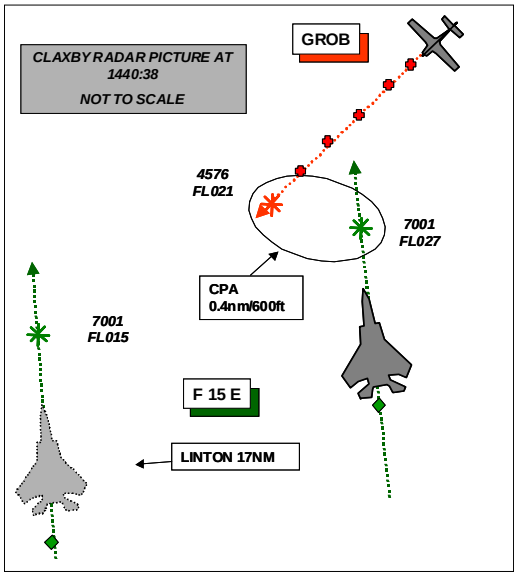
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the UKDLFS/FIR.

Degree of Risk: C.

AIRPROX REPORT NO 089/07

Date/Time:	5 Jul 1441	
Position:	5404N 00046W (17nm E Linton on Ouse)	
Airspace:	UKDLFS	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	F15E	Grob Tutor
Operator:	Foreign Mil	HQ Air Trg
Alt/FL:	1500ft agl	2500ft
	(QFE)	(RPS)
Weather	VMC NR	VMC CLBC
Visibility:	10nm	30km
Reported Separation:		
	0ft V/300m H	100ft V/900m H
Recorded Separation:		
	600ft V/ 0.4nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE F15E PILOT reports leading a pair of grey ac on a low level and GH sortie, squawking 7001 and listening out on the Low Level common frequency. They were operating in LFA 11 and after completing a 180° turn onto heading 360° in 1.5nm battle formation with leader to the E and flying at 470kt, he first saw a white civilian light ac at a distance of about 1nm but passing between him and his No2. It passed about 1000ft horizontally from him and was heading S at the same height as their formation. He climbed immediately and assessed the risk as being high.

THE GROB TUTOR PILOT reports that he was flying a white ac with HISLS and nav lights switched on operating on a quiet frequency and squawking 4576 (Vale of York AIAA conspicuity) with Mode C and was conducting a routine GH sortie in the Church Fenton local area. His student had just overshot from a PFL and they had levelled at an altitude of about 2500ft (RPS) for the transit back to their home base.

He had just begun teaching the student how to deal with an electrical malfunction and was holding the Flight Reference Cards up to the canopy when, while conducting the lesson, he caught sight of an F15 in their 10 o'clock, at the same altitude, moving rapidly S to N. He put down the Flight Reference Cards and pointed out to the student that fast jets often come in pairs: therefore they should now look for his "mate". He looked into the 6-7 o'clock and saw another F15 manoeuvring in a manner which suggested he had already climbed and turned E a little to avoid them and was now turning towards them to regain position alongside the F15 wing-man.

In summary, the two F15's approached them originally from their left 8-9 o'clock while they were heading 270° at 100kt and the Grob Tutor would have appeared in the F15's 12 o'clock. At the speed the F15's were travelling, they would have caught sight of the Grob Tutor fairly late as its colour scheme makes it very difficult to spot. He took no avoiding action, as it was obvious that the F15 had avoided them, but he assessed the risk as being medium.

UKAB Note (1): The incident is seen clearly on the recording of the Claxby Radar. The F15s are seen squawking 7001 tracking 355°, the Leader with no Mode C displayed whilst No2 indicates FL015. The Grob is seen squawking 4576 at FL021 initially in the F15's 12 o'clock tracking 230° and passing between the formation elements, the leader now indicating FL027 with the No2 remaining at FL015. The CPA is at 1440:38 with the ac 0.4nm apart and separated by 600ft (presumably after the lead F15 has climbed as reported).

HQ AIR (TRG) comments that the see and avoid process seems to have worked in this case.

HQ 3 AF comments that this was a fairly routine, albeit uncomfortable, encounter in the UKDLFS which was resolved by the F-15 formation lead. A good spot by the F-15 lead given the Grob's diminutive size, slow speed and predominantly white paint scheme.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Both ac were operating in Class G airspace, the F15's in the UKDLFS and the Tutor in the FIR where 'see and avoid' is the principal method of collision avoidance. In this case, both pilots saw the opposing ac and the F15 pilot increased separation by climbing such that the Grob pilot decided that further avoidance was not required. It is, however, likely, that the Grob pilot initially saw the No2 F15 before seeing the leader passing behind him. The Board determined that this Airprox was a conflict in the UKDLFS/FIR and that any risk of collision had been effectively removed by the F15 pilot.

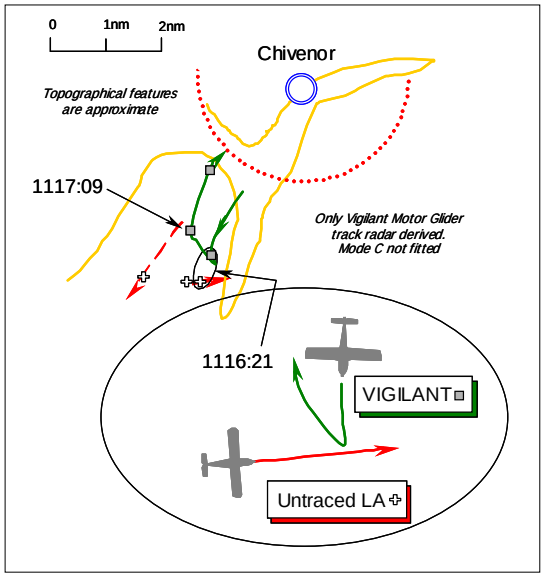
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the UKDLFS/FIR resolved by the F15 pilot.

Degree of Risk: C.

AIRPROX REPORT NO 091/07

Date/Time:	7 Jul 1116 (Saturday)	
Position:	5102N 00412W (4nm SSW Chivenor - elev 27ft)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Grob 109B	Unknown LA
Operator:	Air Cmd (Trg)	N/K
Alt/FL:	1900ft (QFE 1020mb)	NR
Weather	VMC CLOC	NK NR
Visibility:	30km	NR
Reported Separation:	10ft V/200m H	NR
Recorded Separation:	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GROB 109B VIGILANT PILOT, a gliding instructor, reports his motor glider (MG) is coloured white with orange dayglow markings; HISLs and landing lights were on whilst operating VFR clear of cloud with an in-flight visibility of 30km. They were not in receipt of an ATS but in communication with Chivenor 'ALPHA CHARLIE BASE' on 130·2MHz. A squawk of A7000 was selected; Mode C is not fitted.

Returning to Chivenor through the aerodrome overhead at 60kt, his student had begun to work through the rejoin checklist prior to the turn back towards Chivenor. He was monitoring his student closely, who had not flown for 3 months, to ensure that all checks were carried out correctly. Heading 185° some 3nm SW of Chivenor, level at 1900ft QFE (1020mb) once the checks were complete, the student was carrying out a pre-turning scan when he drew his attention to a light ac (LA) heading towards them in their 1 o'clock. Sighting the other ac himself about 200m away crossing from R – L, he took control of his MG from his Student and initiated a hard R turn to avoid the LA. [He later added that he stood the MG on its wingtip to make it more conspicuous in plan-form to the other pilot]. The LA passed 200m away with 10ft of vertical separation and a *"medium"* risk of a collision, but he could not assess whether the LA was above or below his MG. After continuing the turn back towards Chivenor, the LA was sighted again in a L turn, passing high and astern, before heading off in a SW'ly direction.

THE RADAR ANALYSIS CELL (RAC) AT LATCC (MIL) reports that despite exhaustive enquiries through known operators in the West Country, which ultimately proved fruitless, the RAC has been unable to identify the reported LA.

UKAB Note (1): The Burrington Radar recording does not show this Airprox clearly as the reported ac is not consistently shown. The Vigilant is shown departing the Chivenor overhead heading SW and then appears to alter L more southerly. Meanwhile another contact, which may or may not be the reported LA, is shown for two sweeps only until at 1116:21, the reported time of the Airprox, it closed to a range of about ½nm. The Vigilant turns sharply NW and opens before turning R onto NNE towards Chivenor at 1117:09. About one min later a contact, which is probably the reported LA, is shown subsequently heading SW, broadly in accord with the reporting pilot's account.

HQ AIR (TRG) comments that unfortunately the pilot of the LA could not be traced and the radar recording adds little to the detail. The distraction of checks or instructing should always be balanced with lookout, particularly in 'see and avoid' airspace. However, the Grob pilot did see the LA in sufficient time for avoiding to be taken.

AIRPROX REPORT No 091/07

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report solely from the Vigilant Instructor, radar video recordings and comment from the appropriate operating authority.

It was unfortunate that it had not been possible to trace the LA involved here and clearly in the absence of a report from its pilot the Board had only one half of the story. Therefore, it was difficult to come to any meaningful conclusions as to Cause and Risk. Nonetheless, as this Airprox occurred in the see and avoid environment of the 'Open FIR' this seemed to be fundamentally a lookout issue. The Vigilant Instructor's frank and honest account had revealed that he had been closely monitoring his student through the rejoin checklist prior to the turn back towards Chivenor and it was his student that had spotted the LA in the first instance. It seemed that the joining checks had been the focus of the instructor's attention at the critical moment, perhaps diverting his scan inside the cockpit. Fortunately, the student's 'heads-up' came just in time for his instructor to take decisive and robust action to avoid the LA to their R as, with the motor-glider under power, the Vigilant Instructor was indeed responsible under the 'Rules of the Air' for 'giving way' to the LA in the situation that the reporting pilot had described. Whilst it was indeed feasible that the LA pilot had not spotted the Vigilant at all, there was insufficient data on which the Board could comment so without a corroborating report any speculation on that score would be meaningless. Thus on the information conscientiously provided by the Vigilant instructor the Board could only conclude that this Airprox had resulted from a late sighting by the Vigilant pilot.

Regarding the inherent risk, here at the extremities of the Burrington Radar coverage - the nearest recorded radar source available – the very intermittent radar returns from the LA and the lack of data at the critical moment prevented independent determination of the minimum separation that pertained. However, there was no reason to doubt the veracity of the Vigilant Instructor's candid account, which stated that he had spotted the LA in time to take robust avoiding action, achieving separation of about 200m as he broke hard R and turned away. Notwithstanding the paucity of data available on which to base their assessment, one Member was of the opinion that at these distances the motor-glider's safety had been compromised, but this was an isolated view. The overwhelming majority of the Members of the Board considered that the Vigilant Instructor had seen the LA in time to take prompt and effective action which had indeed been sufficient to avert an actual collision.

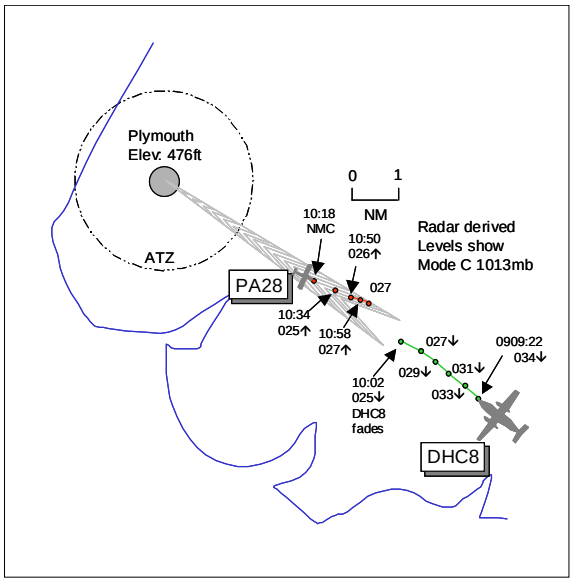
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by the Vigilant pilot.

Degree of Risk: C.

AIRPROX REPORT NO 093/07

Date/Time:	7 Jul 0911 (Saturday)	
Position:	5023N 00400W (5nm FIN APP RW31 Plymouth - elev 476ft)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	DHC8	PA28
Operator:	CAT	Civ Club
Alt/FL:	2300ft↓ (QNH 1018mb)	1000ft↑ (QNH)
Weather	VMC CLOC	VMC CLBC
Visibility:	>10km	>10km
Reported Separation:	150-250ft V	Not seen
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DHC8 PILOT reports heading 305° at 160kt fully established on the ILS RW31 at range 5nm and receiving an ATS from Plymouth on 133·55MHz squawking with Mode C. During the approach 2 TCAS contacts were observed flying in the opposite direction, 1 directly ahead [the subject PA28] showing 00, the same level, and 1 to the R of the ILS C/L showing –05. A TCAS RA 'monitor v/s' was received and the guidance was followed and as the visibility was >10km in VMC the other ac, a light coloured single-engined type, possibly an Arrow, was seen to overfly directly O/H with vertical separation of between 150-250ft. He assessed the risk as medium.

THE PA28 PILOT reports flying solo on a local sortie from Plymouth VFR and in receipt of a FIS from Plymouth on 133·55MHz squawking 7000 with Mode C. After take-off RW31 he climbed straight ahead to 500ft QFE and then turned L onto approximately a SE'ly heading. Climbing through 1000ft QNH, he thought, at 95kt he heard another pilot complaining on the RT but he did not see any conflicting ac at all. He opined that if the W'ly wind was more than forecast, it could have blown his ac towards the RW C/L.

THE PLYMOUTH ADC/APP reports that about 0910Z the pilot of the inbound DHC8 at 5nm final approach RW31 reported a light ac close to his position. Prior to this he had cleared a C152 to depart VFR to the E at 0904Z and the subject PA28 also to depart VFR to the E at 0906Z. The PA28 pilot requested a L turn out from RW31 which he approved and he passed TI concerning the inbound DHC8 to the PA28 pilot as well as instructing him to remain clear of the ILS FAT. The PA28 pilot reported that he would be operating at an altitude of 2500ft along the coast. The controller then passed TI on the C152 to the DHC8 crew and told the C152 pilot about the inbound DHC8. After the DHC8 landed, the Captain asked him for the registration of the PA28 operating to the SE as this ac would be the subject of an Airprox report.

The Plymouth METAR was EGHD 0850Z 29006KT 9999 SCT025 14/12 Q1018=

ATSI reports that unfortunately, owing to 'equipment failure' at Plymouth, it is not possible to obtain any RT recordings for this Airprox. Plymouth reports that the fault has been rectified and the recorder is currently serviceable.

Consequently, ATSI has nothing to add to the controller's report. He informed the PA28's pilot about the DHC8 and instructed him to remain clear of the ILS FAT (he reported intending to route along the coast). The controller did not believe it necessary to inform the DHC8 pilot about the PA28 as he did not anticipate it would conflict. It would appear that the PA28 pilot did not route along the coast nor avoid the ILS approach.

UKAB Note (1): The Airprox per se is not captured on the Burrington recorded radar as the DHC8 descends below radar cover prior to the PA28 appearing climbing out from Plymouth. The DHC8 is clearly seen leaving airway N864 at 0905:22 7nm NW of BHD tracking 230° descending through FL130. At 0907:54 when about 13nm SE of Plymouth, the DHC8 commences a R turn towards the RW31 ILS LLZ indicating FL064 descending, eventually establishing on the C/L 8·5nm from Plymouth at 0909:22 descending through FL034 (3550ft QNH 1018mb). The DHC8 continues its descent until it is last seen at 0910:02 about 6nm from touchdown at FL025 (2650ft QNH) before fading completely from radar. Sixteen seconds later a pop-up 7000 squawk is seen, believed to be the PA28, on the ILS C/L 4nm from Plymouth tracking ESE'ly showing NMC. After fading for 1 sweep, the PA28 reappears a further 8sec later (0910:34) 0·5nm further to the ESE of its previous position and now indicating FL025. Taking into account the DHC8's speed prior to fading, it is believed that it is at about this time the subject ac pass. Again the PA28 fades but reappears at 0910:50 just to the E of, and slowly diverging from, the FAT still tracking ESE'ly and climbing through FL026 (2750ft QNH) before fading altogether a further 16sec later, the Mode C showing FL027.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It appeared that ATC had tried to discharge responsibilities with respect to both flights in Class G airspace. The ADC/APP had given TI to the departing PA28 pilot on the inbound DHC8 and had instructed him to remain clear of the ILS FAT. When the PA28 pilot had stated his intention to route along the coast, the controller had assessed that this would further deconflict the ac from the DHC8 so did not pass TI to the DHC8 crew. However, for whatever reason, the PA28 pilot did not follow his stated route and contrary to ATC instructions flew onto the ILS FAT and into conflict with the DHC8 which he did not see. This had caused the Airprox.

From the geometry seen on the radar recording, the DHC8 was probably obscured from the PA28 pilot's view below the latter ac's nose in the climbing attitude. This known blindspot should always be taken into account by not flying a steady heading during climb-out; the area ahead along the intended flight path should be visually cleared by weaving the ac's nose side-to-side during the climb whilst visually scanning for traffic. Although the encounter went unsighted by one party, fortunately the DHC8 crew had been alerted by TCAS on the approaching PA28. The DHC8 crew had monitored the other ac's flight path whilst continuing their descent on the ILS before a TCAS RA 'monitor v/s' was generated. Continuing on the ILS flight profile, which also complied with the RA guidance, the PA28 was seen to fly directly O/H by 150-250ft in the opposite direction. The combination of the TCAS resolution and visual sighting by the DHC8 crew were enough to persuade the Board that safety had not been compromised during the encounter.

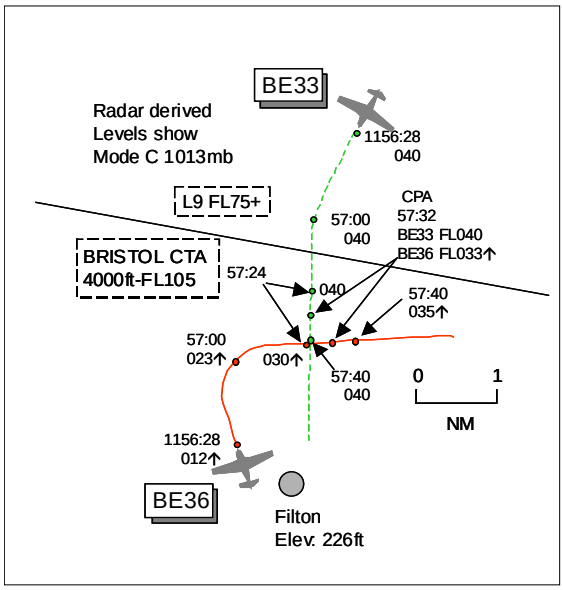
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA28 pilot did not follow his stated route and, contrary to ATC instructions, flew onto the ILS FAT and into conflict with the DHC8 which he did not see.

Degree of Risk: C.

AIRPROX REPORT NO 094/07

Date/Time:	12 Jul 1158	
Position:	5133N 00235W (2nm N Filton)	
Airspace:	Bristol CTA/LFIR	(Class: D/G)
Reporter:	Bristol International RAD1	
	First Ac	*Second Ac*
Type:	BE33	BE36
Operator:	Civ Pte	Civ Pte
Alt/FL:	4000ft (QNH)	↑4000ft (QNH)
Weather Visibility:	IMC NR	IMC NR
Reported Separation:	Not seen	Not seen
Recorded Separation:	700ft V/0·4nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BRISTOL INTERNATIONAL RAD1 reports acting as an OJTI to a trainee who was working a BE33 transiting the base of CAS at altitude 4000ft. Filton had coordinated a departure routeing towards CPT VOR at altitude 3000ft which was observed departing RW27. The SSR labels merged and on separation the Filton ac was seen to be at 3700ft. No avoiding action or TI was passed as the targets had already passed each other and separation was increasing.

THE FILTON ADC reports the BE36 flight was given departure clearance 'R turn own navigation climb altitude 3000ft squawk 4260'. This clearance was readback and, although distorted, was believed to be correct at the time. Take-off clearance was given and once airborne was transferred to Radar.

THE FILTON APR reports that S'bound traffic, the BE33, transiting the Filton area at 4000ft had previously been transferred to Bristol International when N of Filton for CAS crossing clearance, anticipating clearance at that level. The ADC requested clearance for the BE36. The data display (fps) indicated a requested altitude of 3000ft which was correct according to the pilot's booking out form faxed to ATC. In view of both the requested altitude and the known traffic at 4000ft, he passed the ADC a departure clearance of 'R turn out climb to altitude 3000ft' plus the required SSR code. As he was aware that Bristol Radar would observe the departure in close proximity to the CAS joining traffic, the BE33, he informed Bristol Radar of the departing ac's SSR code and that the ac would be climbing not above 3000ft in Class G airspace. The BE36 departed and was identified, validated and verified and a RIS was agreed. The pilot of a N'bound VFR helicopter under a FIS at low level then advised that he required to climb IFR to 3000ft owing to weather conditions. Because of its low level, he had no radar contact and therefore passed TI in respect of the BE36 'at altitude 3000ft'. This prompted the BE36 pilot to state that he was maintaining 4000ft. He queried this briefly and the pilot confirmed that he had read back 4000ft to the ADC, had written down that altitude and had reported climbing to that altitude when transferred to Radar. Soon after its departure, the labels of the 2 subject ac had garbled and he had not detected the climb above 3000ft nor the pilot report climbing to 4000ft. By the time the error became evident the ac were <3nm apart but on tracks diverging by about 90° so there was no practical point in passing TI. Immediately afterwards the BE36 was handed over to Lyneham Zone for service and crossing of the Lyneham CTA.

The Filton METAR shows EGTG 1150Z 26013KT 4000 VCSH OVC004 18/16 Q1014=

THE BE33 PILOT reports flying enroute to Exeter heading 190° at 150kt squawking with Mode C. He was informed by Bristol Radar of an incident when near to Filton – he asked if it was close but was not told. When N of Filton in VMC he was at the same level as a C130 which appeared to perform a procedural turn towards his ac.

Filton alerted him to this and he flew through the C130's slipstream. Nothing else was seen so he believed he was in IMC at the time of the Airprox.

THE BE36 PILOT reports outbound from Filton IFR and in receipt of a Radar service from Filton on 122·725MHz squawking 4261 with Mode S. He departed Filton RW27 with a R turn own navigation (heading 090°) climbing to 4000ft at 150kt. He was unaware of an Airprox until being informed on his return to Filton the next day. Owing to IMC the reporting ac was not seen which he understood was working Bristol International Radar.

ATSI reports that the BE33 flight contacted the Filton APR at 1139:10, and reported 'outbound from Birmingham to Exeter, 5nm SW of Worcester at 2000ft 1014, requesting a FIS and transit through Bristol'. This transmission was acknowledged and a squawk of 4270 allocated as well as confirming that a FIS would be provided. Discussions with the pilot continued as to whether he was VFR or IFR and the pilot advised that he was VFR at the moment but likely to change to IFR. He was then asked what level he was requesting to transit Bristol airspace. At 1142:15, the pilot requested climb to 4000ft and was advised that there was no reported traffic to affect this. At 1147:10, the pilot of the BE36 requested start from the Filton ADC, which was approved. The Filton APR advised the pilot of the BE33 that Bristol had his request to transit CAS but for the time being remain outside of CAS and expect to transit at 4000ft. This was acknowledged and then, at 1150:20, the Filton APR instructed the pilot of the BE33 to change squawk to 4633, which was acknowledged. At 1151:00, the Filton APR telephoned Bristol Radar and asked whether they wanted the BE33 placed on a heading to route to the E of Filton. There appeared to be some confusion with Bristol as to why this offer was being made but the conversation ended with the Bristol Radar ATSA saying "*East of Filton fine*". The Filton APR then instructed the pilot of the BE33, still under a FIS, to *"…turn left two zero degrees report heading*". The pilot advised that he was turning left onto 190° and the Filton APR instructed him to change frequency to Bristol Radar. At this time the BE33 was 15nm N of Filton, S'bound, with its Mode C indicating FL042 (QNH 1014 = 4230 feet). When the pilot of the BE33 contacted Bristol Radar, he was placed under a RIS and shortly afterwards requested an IFR transit of Bristol's CAS at 4000ft, which was approved.

Meanwhile, the Filton ADC informed the Filton APR that the BE36 was ready for departure. The APR passed a clearance of 'right turn out onto his own navigation, climb to altitude 3000ft squawk 4260 and he is released'. This was correctly read back by the ADC. At 1154:40, the ADC transmitted *"BE36 c/s after departure right turn own navigation stop climb altitude three thousand feet squawk four two six zero"*. The pilot read back *"After departure cleared right turn on track climb to four thousand feet squawk four two six zero"*, to which the ADC replied *"BE36 c/s read back correct you're cleared for take off surface wind two eight zero one zero"*.

At 1156:30, the ADC instructed the BE36 pilot to contact Filton Radar, which he did. The Filton APR informed the pilot that he was identified and enquired as to what radar service he was requesting. The BE36 pilot responded with *"Radar Information we're just passing two thousand two hundred feet for four thousand"*, to which the Filton APR replied *"BE36 c/s roger Radar Information Service"*. Analysis of the Clee Hill radar shows as this exchange was taking place (1157:00), the BE33, now working Bristol Radar, was 3·3nm N of Filton S'bound, whilst the BE36 was 2nm SW of the BE33 and in a R turn on track. At 1157:24, the radar shows the BE36 crossing from R to L in front of the BE33 at a range of 0·6nm with the BE33 maintaining FL40 and the BE36 passing FL30. At 1157:40 the BE33 crossed through the track of the E'bound BE36, which was now passing FL35, at a range of 0·5nm. At the time, the Bristol Radar controller made no comment nor did the BE33 pilot.

[UKAB Note (1): The CPA occurs at 1137:32 with the BE36 climbing through FL033 passing 0·4nm SE of the BE33 at FL040.]

At 1157:50, the pilot of a helicopter operating in the locality asked the Filton APR if they could climb IMC to 3000ft due to the poor weather low level. The Filton APR replied *"helicopter c/s negative radar contact and I do have IFR traffic just departed Filton immediately north abeam Filton tracking east at altitude three thousand feet*", however the radar recording clearly shows the Mode C of the BE36 indicating FL40. Shortly after this exchange, at 1158:25, the pilot of the BE36 reported level at 4000ft. A few minutes later the Bristol Radar controller informed the S'bound BE33 pilot that as he passed over Filton there was traffic which *"...was supposed to have climbed to three thousand feet he actually level busted and he was below you…"*. The pilot advised that he did not see anything at all.

Although the clearance passed by the APR to the ADC was correctly read back by the ADC, the ADC did not detect the wrong read back by the pilot. This was compounded when the pilot called on the APR's frequency and stated

that he was climbing to 4000 feet. Additionally, the APR did not detect from his radar that the BE36 had climbed above the cleared level. The incident only became apparent to the controllers when the BE36 pilot heard the inaccurate TI passed by the APR to the helicopter pilot.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The ATSI Advisor informed Members that although the ADC reported that the BE36 pilot's release clearance read back had been distorted, this was not apparent from an RT playback, RT transcript or the Unit's own report. This was the first opportunity to break the chain of events, but the incorrect read back went undetected and this was part of the cause of this Airprox. Once airborne, the BE36 flight had called on the radar frequency but the APR did not detect the pilot's erroneous assigned altitude report, another missed opportunity in the chain, and this was a second part of the cause. After the APR had identified the BE36, validated and verified the ac's SSR code and Mode C readout, the controller did not detect that the flight had climbed above 3000ft – the BE36 flight's assigned altitude - during routine scans of the radar display. This was a third part of the cause of the incident, the erroneous altitude only becoming apparent when the BE36 pilot queried the inaccurate TI being passed to a helicopter flight about his ac being at 3000ft. Members agreed that because of these 3 causal elements, Filton ATC had allowed the BE36 pilot to climb into conflict with the BE33.

Apart from the Filton ATC involvement, the potential conflict went unnoticed by the Bristol RAD1 controller owing to the SSR labels garbling, the BE36's climb above 3000ft only being detected after the subject ac had passed. Both pilots flying in IMC did not notice the situation and no TI had been passed by either ATSU to the two pilots involved here. These factors left the Board in no doubt that the passage of the subject ac had been down to luck, without any of the available safety nets working. It was fortunate that the BE36 had crossed through the BE33's 12 o'clock at a range of 0·6nm still 1000ft below, but climbing, with the CPA occurring shortly after this when the BE36 was climbing through FL33, 700ft below and 0·5nm to the SE of the BE33. Although the actual flight paths flown reflected by the radar recording revealed that the ac were not going to collide, with their passage going unnoticed by all parties involved, the Board concluded that safety had not been assured during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

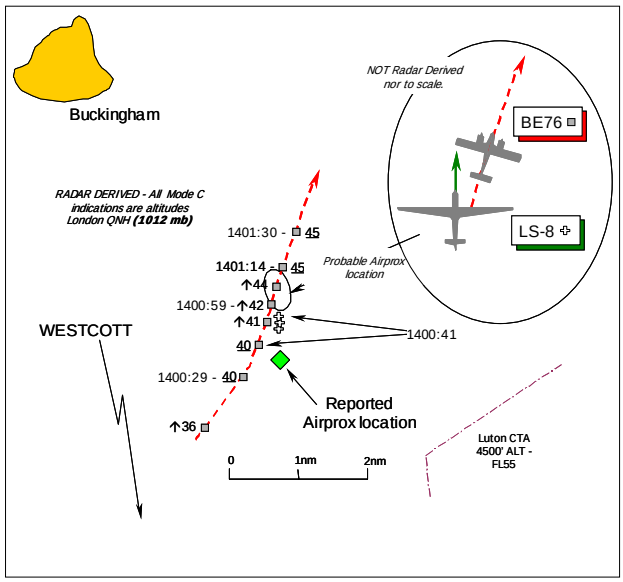
Cause: Following an undetected read back error, an undetected assigned altitude report and an undetected Mode C readout, Filton ATC allowed the BE36 pilot to climb into conflict with the BE33.

Degree of Risk: B.

AIRPROX REPORT No 095/07

AIRPROX REPORT NO 095/07

Date/Time:	9 Jul 1401	
Position:	5157N 00053W (6nm NNE of WESTCOTT Aylesbury)	
Airspace:	London FIR	(Class: G
	Reporting Ac	*Reported Ac*
Type:	LS8-18 Glider	BE76
Operator:	Civ Club	Civ Trg
Alt/FL:	4300ft↓	↑4500ft
	QNH (1012mb)	QNH
Weather	VMC CLBC	CLOC
Visibility:	30km	Good
Reported Separation:		
	100-200ft V/nil H	NK
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LS8-18m GLIDER PILOT reports he was competing in the 18m National Championships from Husbands Bosworth and was monitoring the gliding frequency 130·1Mhz.

Cruising from the top of one thermal towards the next cloud at a glide ratio of about 30:1, he was descending through an altitude of about 4300ft QNH (1012mb) some 300ft below and 4km clear of cloud. Heading N to the SE of Buckingham at 85kt, he first heard the noise of an engine about 10-20sec before seeing a twin engine propeller driven white aeroplane with a 'T' tail in his 1:30 position about 200m away as it headed away towards the NE. The other ac – the BE76 – was first seen after it had flown 100-200ft directly underneath his glider with a *"high"* risk of a collision. As he could not see the BE76 before the point of minimum separation he does not know if any avoiding action was taken by the other pilot. His glider is coloured white with dark blue numbers on the wing under surfaces and fin.

UKAB Note (1): A NOTAM about the gliding competition was issued (H2240/07) promulgating that gliders might be encountered within 5nm radius of Husbands Bosworth or concentrated in the airspace around or just downwind of the site and on the first leg of the cross-country route. A contact telephone number was given so that pilots might obtain information on the routes in use for the day.

THE BEECH BE76 DUCHESS PILOT reports that he first became aware of the Airprox some 5 months after the event when he was contacted by the RAC, LATCC (Mil) West Drayton. He was conducting an IR instructional flight from Wycombe Air Park, initially under VFR, before executing an IFR hold and instrument training approaches at Cranfield and then returning VFR to Wycombe. This is a frequent detail for instrument training flights from Wycombe. From time-to-time it is necessary to take avoiding action to avoid a conflict with other ac and whilst he does not rule out the possibility that they did so, he has no recollection of an incident on this day, nor does his student. He conscientiously looked up the records he made of the flight, which are the source of the information helpfully provided here.

The usual route and procedure is a transit from Wycombe to, or just to the east of, the Westcott NDB - WCO. A call would have been made to Cranfield APPROACH (APP) requesting a level at the Cranfield NDB – CIT - to enter the hold followed by IFR approaches. The student would have IR screens in place before reaching Westcott. The usual levels available for the CIT hold are 3500ft or 4500ft Cranfield QNH. Cranfield APP would usually instruct flights to climb to the assigned altitude and when level to report an estimated time of arrival at the CIT and to squawk A0247. Cranfield provided a FIS and an approach control service, non-radar, with the squawk for conspicuity to radar equipped ATSUs such a Luton. His flight on this day would have followed this route and procedure. They departed Wycombe at 1350UTC and would have been in the Westcott area at, or just after, 1400.

This coincides with the report by the glider pilot that an Airprox occurred at about 1400 between Westcott and Cranfield.

It is possible that they were in transit to the Westcott area at 2500ft initially (possibly higher, since they expected to proceed to the CIT and then hold) and would have contacted Cranfield APP. Once given a clearance by APP to go direct to the CIT with an assigned altitude they would have started a climb as necessary to either 3500ft or 4500ft on the Cranfield QNH and selected the squawk of A0247. In the information he received about the occurrence he was advised that just after the glider passed them they changed their SSR code from A7000 to A0247 – from that he deduced they must have been in contact with Cranfield APP and received a clearance to proceed to the CIT at an assigned level. They carried out 2 holds at the CIT, 2 ILS approaches and 1 NDB approach before returning to Wycombe, landing at 1520UTC. The weather he recorded for the flight was a wind of 270/20, good visibility, cloud SCT at 3500ft.

His ac is white with a broad coloured stripe.

ATSI reports that the BE76 was receiving an Approach Control Service from Cranfield at the time of the Airprox. Cranfield is not equipped with radar. Consequently, as the glider was not in contact with Cranfield, the controller would not be aware of its presence. Therefore, there are no ATC causal factors.

UKAB Note (2): This Airprox is not shown on recorded radar data because a contact that might be associated with the LS8 glider flown by the reporting pilot is not shown continuously during the period of the Airprox and cannot be positively identified on the recording. However, the BE76 is shown squawking A7000 with Mode C approaching the vicinity heading NE climbing through 3600ft London QNH (1012mb). The BE76 levels at 4000ft London QNH at 1400:29, when a primary contact believed to be the LS8 glider is shown 1nm ahead of the BE76. The twin-engined aeroplane then turned 20° L onto a NNE'ly track, passing just to the W of the reported Airprox location as the contact believed to be the LS8 is shown for several successive sweeps, northbound, just to the N of the reported location. The last radar return on the glider is shown at 1400:41, the range having decreased to 0·6nm as the BE76, level at 4000ft, closes from the glider's port quarter. Thereafter the BE76 commenced a climb to 4500ft London QNH as reported, but the absence of further contacts on the glider does not allow the separation to be determined. However, the projected track of the glider compared to that shown on the radar recording would suggest that the Airprox occurred about 1nm – 1½nm N of the reported location moments after 1401 when the BE76 had just passed 4200ft London QNH – 100ft below the glider pilots reported altitude of 4300ft (1012mb). The BE76's SSR Mode A code is shown being reset from 1401:07, whence A0247 is displayed as the aeroplane levels at 4500ft London QNH at 1401:14, whilst maintaining a NNE'ly course.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board was briefed on the difficulties that had occurred over the identification of the reported ac. It was originally thought to have been a white DA42 that was also conducting IFR approaches at Cranfield and not unlike the BE76, which was subsequently determined to be the twin-engined, high-tailed aeroplane involved. Recognising the significant interval between the date of the occurrence and when the pilot became aware of the Airprox, the Board commended the BE76 instructor for the very comprehensive account of his flight, which closely matched the recorded radar data of the event.

The ATSI report had shown that the Cranfield controller had no radar to assist him in this procedural environment and thus was powerless to affect the outcome. This Airprox in the see and avoid environment of the 'Open FIR' was, therefore, fundamentally a lookout issue. The LS8 glider pilot's report of the encounter which was largely supported by the radar recording, showed that the twin would have been approaching from abaft the glider's port beam. Members accepted that detection of any ac closing from this quarter would have been difficult as the other ac was closing 'head-on' from below, with little crossing motion. Therefore, Members considered it not unreasonable that the glider pilot had not seen the BE76 until it had under flown his glider, but he had clearly not recognised that the BE76 was climbing at the time, ultimately to an altitude above the gliders reported level.

The Gliding Member was also familiar with the BE76, which he recalled, has reasonable visibility but, like all twins some blind spots however, these are generally downwards rather than upwards. He also noted that with IF screens in place for instrument training, as here, this can hamper visibility to some extent. Nevertheless, well

designed IF screens, that are fitted properly, should not hamper a safety pilot's view excessively. In fact, it was clear that the glider was to starboard of the BE76 and above them as the latter approached and thus probably within the instructor pilot's field of view from the RH seat as the BE76 climbed up to 4500ft QNH. Nevertheless, a predominantly white coloured glider at a near tail-on aspect to the BE76 safety pilot, at a constant relative bearing before the twin overhauled the glider, with little relative motion to draw attention to it would have been understandably difficult to detect. The BE76 pilot's candid report had suggested that he might well have spotted the glider at the time and turned to avoid it, but neither he nor his student could recall any incident that day. Although the radar recording revealed a L turn by the BE76 just before the probable Airprox location, on balance, it seemed to the Members that this was unlikely to have been an avoiding action turn, although this could not be ruled out. The absence of recorded radar data illustrating the actual encounter throughout did not allow the Board to reach any firm conclusions, but it seemed likely that this would have been a very close quarters encounter and one that the BE76 instructor would probably have recalled if he had indeed spotted the glider. Moreover, it is likely that he would have effected a significant vertical manoeuvre to avoid the glider if seen and none was evident from his ac's Mode C, which indicated a continuous steady climb. It seemed inconceivable to Members that the BE76 pilot would have intentionally flown so close to the LS8 glider and this all seemed to have happened just as the BE76's SSR code was being reset and just before the ac levelled at 4500ft. Some Members postulated that the instructor pilot might have been concentrating on his student's actions or changing the SSR code himself at this point, potentially distracting him from his lookout scan at the critical moment, but this was merely speculation. Whilst it was difficult to determine what actually happened here, weighing all the available information carefully Members could only conclude that this Airprox had resulted from a probable non-sighting of the LS8 glider by the BE76 instructor pilot.

In assessing the inherent risk, the absence of comparative radar data from the glider, specifically Mode C, prevented determination of the minimum separation that pertained with any certainty. However the LS8 pilot reported that he was heading N and descending through an altitude of about 4300ft QNH (1012mb) when he detected the BE76 after it had passed some 100-200ft below his glider. It was clear that the glider pilot was not aware that the BE76 was climbing up to 4500ft QNH (1012mb) as revealed by the radar recording and could not prevent a close quarters situation himself. Therefore, as the glider pilot did not detect the BE76 approaching from astern and the latter's crew were probably unsighted when they climbed up below the descending glider, any vertical separation that existed was purely fortuitous and led some Members to contended that an actual risk of a collision had existed. Whilst far from ideal, the vertical separation that apparently existed here was sufficient to avert an actual collision. In other circumstances that might not be the case, but the Board could only deal with what actually happened and the glider pilot had reported the BE76 had passed 100-200ft below him. This convinced the majority of the Members that the safety of the ac involved had not been assured in the circumstances conscientiously reported here.

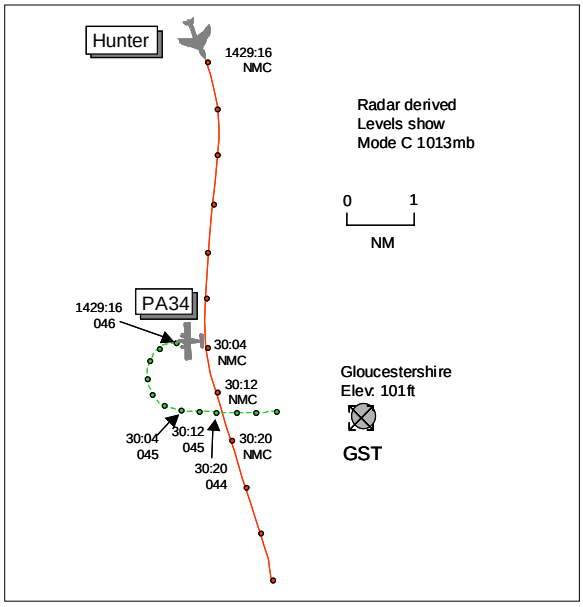
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A probable non-sighting of the LS8 glider by the BE76 instructor pilot.

Degree of Risk: B.

AIRPROX REPORT NO 096/07

Date/Time:	16 Jul 1430	
Position:	5154N 00213W (2nm W Gloucestershire)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	PA34	Hunter
Operator:	Civ Trg	Civ Pte
Alt/FL:	FL45	FL40↓
Weather	IMC IICL	VMC CLOC
Visibility:	>10km	50km
Reported Separation:		
	Nil V/50-100m H	Not seen
Recorded Separation:		
	0·25nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA34 PILOT reports flying a dual instrument training sortie IFR with another pilot seated in the rear in a holding exercise prior to an NDB approach at Gloucestershire and in receipt of an Approach Control service from Gloster on 128·55MHz squawking 7000 with Mode C; IF training screens were fitted to the LHS of the windscreen. The Western section of the hold was in VMC with visibility >10km but on the inbound leg there was building cumulus with fractus cloud underneath. Maintaining FL45 at about 2nm D from the GST tracking 094°QDM (heading 100°) at 110kt in IMC he suddenly saw a Hunter in his 10 o'clock crossing L to R at the same level passing quickly behind cloud before appearing again in his 3 o'clock in a slight descent. He belatedly went to descend in case another ac was in formation but quickly realised that it was too late. The initial sighting was due to a small gap in the cloud, the Hunter's separation distance estimated at 50-100m. The rear seat student also saw the initial contact of the Hunter and mistook it for a large bird close by. He assessed the risk as very high.

THE HUNTER PILOT reports he and another pilot were enroute from Fairford to Kemble VFR and in receipt of a FIS from Gloster Radar, he thought [actually Approach], on 128·55MHz squawking 7004 [aerobatic conspicuity] with Mode C, he thought. The visibility was >50km flying 5km clear of cloud in VMC and the ac was coloured grey/green with HISLs and nav lights switched on. Gloster Radar was busy and there had been several simultaneous transmissions which had blocked each other. At approximately 1535L he was passing through the Gloucestershire airport O/H heading 165° at 280kt in a shallow descent through FL40 when ATC informed him of a Seneca in the hold at FL45. At the time of this TI he was already S of the aerodrome descending through FL40 and so had already passed the Seneca. He believed he saw the Seneca earlier when it was at the end of its outbound leg of the hold on a W'ly track in his 1 o'clock range 3nm and realised that his track would pass well clear but he did not realise that the ac was in the hold and starting to turn L inbound. There were some towering Cu in the area which may have obscured the PA34 from his view as it turned inbound but he was VMC at all times, visual with the ground and keeping a very good lookout. After landing he was informed by ATC that an Airprox had been filed by the PA34 flight. He spoke to the PA34 pilot, who apprised him of his viewpoint, and apologised forgiving him a shock but as there was a high crossing rate he thought there was probably no risk of collision.

THE GLOUCESTERSHIRE ADC/APP reports taking over the combined position at 1429 with 1 flight, a PA44, standing-by. Before he was able to contact this ac he received a garbled transmission so he transmitted that 2 flights had transmitted together and that both were unreadable. His transmission was followed by a further garbled unreadable transmission as both flights transmitted again. He told the PA44 flight to pass his message and then he gave TI on the PA34 in the GST hold. He then asked the 2nd flight to pass his message which was the Hunter flight reporting O/H at FL40 so he passed the pilot TI on the PA34 in the hold at FL45 and asked if he was N or S'bound. The Hunter pilot reported he was 3nm S of Gloucestershire S'bound to Kemble and was changing to

Kemble Information. Immediately afterwards the PA34 pilot reported an Airprox with a Hunter which crossed from L to R, 1min previously, 100m ahead.

UKAB Note (1): The GST NDB is situated on Gloucestershire aerodrome and the holding pattern is a LH 1min racetrack with an inbound QDM 094°.

ATSI reports that the PA34 flight contacted the Gloster ADC/APP at 1411:25, and reported level at 4000ft and estimating the GST beacon at 1423. The controller advised them to undertake some delaying action, as the lowest level available was FL65. This was acknowledged and at 1412:30, the PA34 flight was cleared to the beacon at FL55 to enter the hold. Soon afterwards the pilot requested one hold, followed by an NDB approach for a low go-a

At 1419:15, the controller asked the PA34 pilot to report his range from the GST, to which they replied *"five miles…"*. The controller cleared the PA34 flight to descend to FL45. At 1422:25, the pilot reported entering the hold and was instructed to report when he was ready to commence the approach. Approximately 2min later a PA44 flight called but was unable to establish 2-way contact with the Gloster controller even though he received the transmission clearly and replied. At 1427:40, the PA34 pilot reported ready to commence the procedure and was cleared to commence the approach but to maintain FL45 until beacon outbound. Reference to the Clee Hill radar recording shows a return squawking 7004, 14nm NW of the GST SE'bound with NMC and a G/S of 320kt whilst the PA34 was at the start of the outbound leg, N abeam the GST beacon, at FL45.

The PA44 flight called again and was instructed to standby. It was not until 1429:15, that the Hunter pilot called, when it was only 5·5nm NW of the GST. Unfortunately the transmission crossed with another and the controller advised that both transmissions were unreadable. The Hunter pilot called again but the same thing happened and neither transmission was clearly decipherable. The controller instructed the PA44 pilot to pass his message, which he did. Having received and acknowledged the call the controller asked the other flight, i.e. the Hunter, to pass their message. The pilot transmitted *"(Hunter c/s) Hunter aircraft two on board just passing through your overhead flight level Four Zero*".

The controller immediately passed TI on the PA34 and asked the Hunter pilot if they were N or S'bound. The pilot replied that he was SE'bound and 3nm S of the airfield. The controller instructed them to report changing frequency to Kemble and the pilot replied that he would change now. Almost immediately afterwards, at 1430:35, the pilot of the PA34 advised that he wished to file an Airprox against the Hunter.

The radar recording shows the 7004 squawk (aerobatic conspicuity) operating in an area to the NW of Gloucestershire. Although NMC is displayed, the G/S varies between 350 and 315kt. Below FL100 there is a mandatory 250kt speed limit, which may only be exceeded when authorised by the Authority, and the flight must be in receipt of a radar service. There is nothing to indicate that the Hunter was in receipt of a radar service from an ATSU.

The UK AIP (GEN 3-3-3, para 3.4) details the responsibility of approach control units located outside CAS. This states that APP will provide separation between ac under its jurisdiction from the time and place at which transit ac first place themselves under the control of APP until they are clear of the approach pattern or state they no longer wish to be controlled. Para 5.3 describes the procedure for arriving VFR flights which says that they should make initial RT contact when 15nm or 5min flying time from the ATZ boundary, whichever is the greater.

As the Hunter was VFR there was no separation requirement between it and the PA34, however, it would have been prudent for the Hunter pilot to have followed the guidelines for arriving VFR flights when making the initial call. The radar recording shows the PA34 establishing on the inbound track to the GST at FL45 with the Hunter in its 10 o'clock at 1nm at 1430:04. The next frame, at 1430:12, shows the Hunter in the PA34's 11 o'clock at a range of 0·3nm crossing from L to R and at 1430:20, the Hunter is in the 2 o'clock position of the PA34 at a range of 0·5nm.

[UKAB Note (2): The CPA occurs between the radar sweeps timed at 1430:12 and 1430:20 as the Hunter (G/S 320kt) crosses rapidly through the PA34's 12 o'clock from L to R. By interpolation the horizontal separation at the CPA is calculated to be in the region of 0·25nm. The PA34's Mode C shows a loss of 100ft to FL44 as the Hunter passes ahead but vertical separation not determinable owing to the lack of Mode C on the Hunter.]

The Gloster controller was unaware of the Hunter until it's pilot made his call, by which time it was within the holding area. Although the Hunter passed 2nm W of Gloucestershire airport and, reportedly at FL40, this was through the GST hold. TI was passed immediately and little more could be expected of the controller.

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 stressed the need for pilots of ex-military fast-jets to comply with the provisos stipulated for the operation of their ac by the CAA, where pilots flying ac in circumstances such as this Airprox must obtain a radar service to allow the flight to operate above 250kt below FL100. The rationale for a speed limit is to ensure that the ac can be operated safely under VFR allowing the pilot more time to discharge his responsibilities to 'see and avoid' other traffic and afford adequate separation in Class D/E/F/G airspace. Although the Hunter pilot called Gloucestershire APP for a service, Members believed this should have been done earlier – the 2-way exchange of information was delayed owing to simultaneous crossed transmissions – as the ac's speed (GS 320kt) had led to the Hunter pilot passing quickly through the GST holding pattern, unaware that the PA34 was flying towards him in close proximity at FL45, before APP could pass TI. The Hunter pilot did see the PA34 earlier tracking W'ly, clear of his projected flightpath, but he did not maintain visual contact with it and missed its turn back towards the NDB and into confliction. Whilst flying clear of cloud, the Hunter pilot passed quickly ahead of the unsighted PA34 as the latter's pilot spotted the Hunter late, just before it passed behind a cloud, before reappearing out to his R. Members agreed that an effective non-sighting by the Hunter pilot and a late sighting by the PA34 pilot had caused this Airprox.

Although the PA34 was under IFR, the pilot still had the same responsibilities as the Hunter pilot although he was in receipt of an Approach Control Service and could reasonably expect separation from other participating IFR traffic. The PA34 pilot had reported seeing the Hunter in his 10 o'clock at a range of 50-100m which was not borne out by the radar recording, the separation being in the region of 1nm when that geometry pertained. Following the PA34 pilot's sighting the radar shows the Hunter fortunately turning slightly L about 10sec before the CPA, which increased the minimum horizontal separation to 0·25nm as the Hunter quickly passed through the PA34's 12 o'clock, which had also removed the actual risk of collision. However, with the Hunter pilot unaware of the PA34 passing to starboard, the brief late sighting by the PA34 pilot as the Hunter disappeared behind cloud ahead, combined with the actual geometry revealed by the radar was enough to persuade the Board that safety had not been assured during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

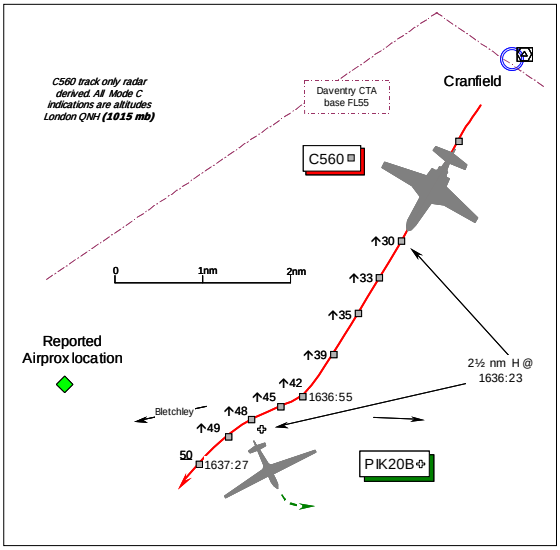
Cause: An effective non-sighting by the Hunter pilot and a late sighting by the PA34 pilot.

Degree of Risk: B.

AIRPROX REPORT No 097/07

AIRPROX REPORT NO 097/07

Date/Time:	8 Jul 1637 (Sunday)	
Position:	5201N 00040W (4nm SW Cranfield)	
Airspace:	London FIR	(Class: G
	Reporting Ac	*Reported Ac*
Type:	PIK 20B Glider	Cessna 560
Operator:	Civ Club	Civ Comm
Alt/FL:	4100ft↑	↑FL50
	QFE (1009mb)	
Weather	VMC CLBC	VMC NR
Visibility:	>10nm	20+km
Reported Separation:		
	100ft V/3m H	~500ft V/NK H
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PIK 20B GLIDER PILOT provided a very descriptive and frank account reporting that he was on a cross-country flight from Sackville Farm with turning points at Husbands Bosworth, Bletchley Park and then returning back to Sackville Farm. He was trying to reach his second turning point at Bletchley Park, but had drifted slightly downwind on his transit from Husbands Bosworth with the result that his glide had terminated just to the NE of Cranfield. In the last weak thermals of the day it seemed it was going to be a bit of a struggle to work his way back upwind to the turning point. Flying at 53kt, some 1500ft below cloud, he was managing to work his way upwind towards his turning point and was turning L with a low rate of climb in yet another weak thermal approaching 4100ft QFE (1009mb), when he spotted a small twin-engine jet [the Cessna 560] about ¼nm distant flying towards him from the E - the direction of Cranfield at that point. The jet appeared to be climbing slightly and seemed to be a little above him but it was difficult to estimate its size with no nearby reference. Whilst its wingspan appeared to be about the same as his glider - 15m - it was obviously a small white 'bizjet' with low partially swept wings. Having sighted the jet during the thermaling L turn after he had passed through W towards the S, he opened the L turn slightly to slow the rate of turn and keep the jet in sight. When he had first spotted the jet he had pondered for a short while over what he should do: dive and lose the thermal – "which was his ticket home", or, keep the other ac in sight and defer the decision. He opted for the latter on the basis that it seemed, at that time, that it was climbing slightly and it would pass overhead but not too close and was going to miss his glider. No avoiding action was taken as there was not a lot of time from first sighting to when the jet was passing 100ft almost directly overhead, as his glider's nose was turning through SE. The jet's registration he found difficult to read because of it's speed but he stressed he could see the letters.

Assessing the risk as *"medium"*, he opined that as he did not know the other pilot's intentions he is now not sure whether it would have been more prudent to have initiated a precautionary dive.

THE CESSNA 560 EXCEL CITATION PILOT reports his twin-jet has a white colour-scheme and a squawk of A7766 was selected, with Mode C & S 'on', as they departed from Cranfield under IFR for Jersey with a FIS from Cranfield. TCAS is fitted. Either climbing to, or, level at FL50 in VMC with the TAS increasing through 230kt in a slight R bank with the autopilot 'in', his RHS co-pilot became visual with a glider – he thought the glider was in a banked turn to the R - at about the 12:30 position - probably less than 1nm away turning below their ac. Climbing his jet to avoid the glider, he perceived it passed about 500ft below them but he did not observe the glider himself at anytime as it probably flew fairly directly below their flight path. The risk was assessed as *"low"* and he stressed that the weather was *"good"* VMC. Furthermore, both he and his co-pilot were aware of glider activity and substantial helicopter activity for Silverstone in the area following a warning from Cranfield on the RT before take-off. HISLs were on.

ATSI reports that the PIK20B glider was unknown to Cranfield ATC, consequently, no specific traffic information was issued to the Cessna Citation crew about it. Prior to departure from RW26, the Citation crew was informed about a PA38 S of the airfield joining LH downwind and a helicopter departing with an early R turn towards Silverstone.

UKAB Note (1): This Airprox is not illustrated clearly on recorded radar. The Cessna C560 Citation is shown on the Clee Hill recording departing from Cranfield and climbing on a SW'ly heading. The C560 passed 3000ft London QNH (1015mb) at 1636:23, when a single primary radar contact is shown in the vicinity that might, or might not be, the PIK20B glider flown by the reporting pilot. No other contacts are shown in the vicinity at the time – either glider or Executive twin-jet – which is some 7min before the reported approximate Airprox timing and 2nm ESE of the reported location. The Citation continues to climb through 4200ft London QNH whence, at 1636:55 an abrupt R turn is executed, followed by a gentle L turn back onto a SW'ly heading before the jet levels at 5000ft QNH.

The PIK20B glider pilot reports he was climbing slowly through a height of 4100ft QFE (1009mb) when he was overflown by the Citation 100ft above his glider. Such a height would equate to 4280ft London QNH (1015mb) suggesting that the Airprox occurred as the Citation climbed above 4400ft QNH.

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 clear to the Members that Cranfield ATC played no part in this Airprox and would have been powerless to prevent it since they are not equipped with radar and were thus unaware of the glider's presence. This incident was essentially a look-out issue in the 'see and avoid' environment of Class G airspace.

From the reporting PIK20B glider pilot's perspective, he perhaps spotted the small white Citation jet somewhat late - at ¼nm range he reports - electing to continue climbing slowly in the weak thermal not knowing whether the Citation pilot had seen his glider. Whilst this was evidently a small ac to spot visually, a GA Member observed that at such sighting distances an instant decision and action was probably warranted. The Board's gliding Member suggested that the PIK20B pilot would have been working hard to keep his glider airborne in the weak thermal conditions. Perhaps he might well have been a little over anxious in the circumstances and wondered if his ac had been spotted by the Citation crew. Most Members agreed with the glider pilot's view that it might well have been preferable to have dived away when he first saw the Citation to forestall a close quarters situation and ensure separation. Nevertheless, the glider pilot perceived in the first instance that the jet would not be too close as it passed by. In the BGA Member's view, pilots in both ac had seen each other's ac and acted appropriately. On a general note, he has already stressed to the gliding community the necessity of paying due regard to the likely arrival and departure routes from GA airfields in the FIR and the need to think through what those patterns might look like, especially when planning cross-country flights. In addition to the well known commercial and military airfields, some GA airfields - Cranfield being one of them and Oxford/Kidlington another - require extra vigilance because of where they are and the type of ac operating from them. The gliding Member undertook to highlight this issue in gliding publications and appropriate forums.

Whilst some might consider the Citation crew's sighting of the PIK20B glider at less than 1nm range a late spot – giving them in the order of 15sec to react at this closing speed – they did seem to have the situation well under control, assuming that they were looking at the subject PIK20B glider. Clearly, the Citation crew was responsible under the 'Rules of the Air' for giving way and avoiding the glider, though they appear to have perceived, erroneously, that the glider was turning R when it was actually turning L the glider pilot reports. Accordingly the Citation crew might have believed that horizontal separation was increasing, whereas it was apparently reducing and it was evident that the PF never saw the glider at all. It was clear however, from the Citation pilot's report that having been seen by the co-pilot, they had elected to climb above it; the radar recording also suggested they may have turned around it as well. Weighing all these factors carefully the Board concluded unanimously that this Airprox had resulted from a conflict in Class G airspace resolved by the Cessna 560 Citation crew.

Turning to risk, it was feasible that the vertical separation might have been less than the Citation crew had perceived as both pilots were unsighted when the glider passed beneath their jet; they reported about 500ft vertical separation, which was significantly different to the glider pilot's report of 100ft. Although the glider pilot helpfully

provided information from his ac's data logger, it did not allow the positional and altitude data to be compared with the Mode C altitude data with any degree of certainty. Furthermore, in the absence of any positive radar data on the glider it was not feasible to determine independently the minimum horizontal separation that pertained either. Nonetheless, the radar did show an abrupt R turn by the Citation, followed by a gentle L turn back onto a SW'ly heading before the jet levelled at 5000ft QNH, which might have been significant. Once he spotted it, the PIK20B glider pilot always had the Citation in sight and could have dived if need be to increase the vertical separation. This, coupled with the Citation crew's avoiding action, convinced the Board that no risk of a collision had existed in the circumstances reported here.

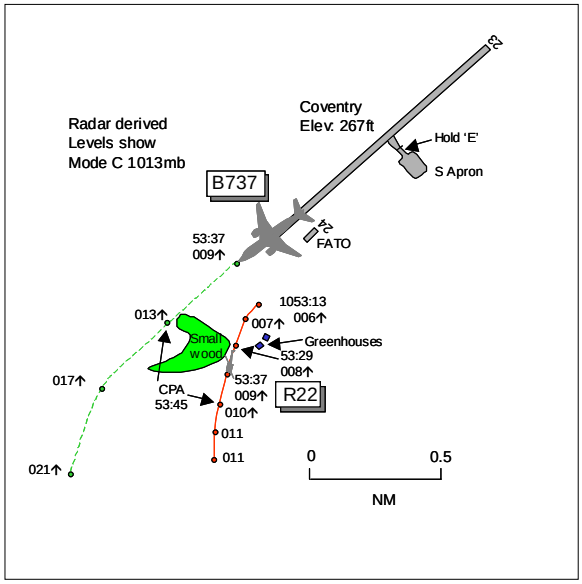
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace resolved by the Cessna 560 Citation crew.

Degree of Risk: C.

AIRPROX REPORT NO 098/07

Date/Time:	17 Jul 1054	
Position:	5221N 00130W (1nm SW Coventry Airport - elev 267ft)	
Airspace:	ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	B737-500	R22
Operator:	CAT	Civ Trg
Alt/FL:	900ft↑	↑700ft
	(QNH 1010mb)	(QFE)
Weather	VMC CLBC	VMC CLBC
Visibility:	10km	>10km
Reported Separation:		
	Nil V/0·2nm H	300ft V/400m H
Recorded Separation:		
	300ft V/0·4nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports on departure from Coventry IFR and in receipt of an Aerodrome Control Service from Coventry Tower on 119·25MHz [actually 124·8MHz] squawking 0351 with Mode S. Immediately after take-off heading 230° at 180kt about 200m beyond the upwind threshold, the Capt became visually aware of a light helicopter, the subject R22, slightly above and L of their track 500yd ahead. The R22 was tracking directly away and climbing also and TCAS generated a TA alert showing insignificant horizontal separation and 200ft above vertically. Had they turned their ac L at 750ft QNH as per noise abatement and departure procedure as cleared, the helicopter would have been lost from sight below the nose, owing to the high flightdeck angle, and he assessed they would have passed very close horizontally and at the same level. He elected to avoid the R22 by continuing to climb straight ahead on RW heading whilst keeping the helicopter in sight, which passed 1000ft horizontally away on their L as they climbed through 900ft QNH 1010mb and once 800-1000ft above it, they resumed their departure procedure. No traffic advice had been passed by ATC before departure and he assessed the risk as medium.

THE R22 PILOT reports flying a dual training sortie from Coventry and in receipt of an Aerodrome Control Service from Tower on 124·8MHz squawking 7010 with Mode C. The visibility was >10km flying 1500ft below cloud in VMC and the helicopter was coloured white/grey with strobe light switched on. Between 1010 and 1100UTC he was using the FATO (Final Approach Take Off) - RW24 grass – for training with a student involving cct flying. On

final approach from a cct they were given clearance to land on the FATO whilst a B737 was required to hold at holding point 'Echo' [hold from S Apron S side of RW at mid-point]. Once back on the FATO the student continued to practise hovering whilst the B737 lined up. He requested another cct and was given take-off clearance. Whilst the student transitioned from the hover into forward flight he heard the B737 flight being cleared for take-off also. On take-off from FATO RW24 he encourages his students to route between some greenhouses to the L of the climb-out track and a small wood which is on the climb-out track. This keeps the helicopter on a divergent track from the main RW23 and is also more neighbourly and safe. On hearing that the B737 flight was cleared for take-off he focussed on ensuring that his student flew this defensive track and warned his student to expect the B737 to pass them on their R. They became visual with the B737, 300ft above and 400m to their R, whilst they were turning L through heading 190° at 60kt still climbing to 700ft QFE in the cct. The student concentrated on flying as accurately as possible and they felt no effects from wake vortex. The flight continued without incident and after being held at the end of the downwind leg for about 6min, they landed and completed the sortie. Later he was informed by the SATCO that the B737 Capt was filing an Airprox against his helicopter.

THE COVENTRY ADC reports the R22 was in the rotary cct. He called Radar for a release on the B737 which was given to him climbing to 3000ft. When he was happy that the R22 was out of the way of the B737's climbout i.e. established on crosswind, he gave the B737 flight take-off clearance. As the B737 was on climb-out, he was told by Radar to keep the B737 climbing to FL50 and after doing this he transferred the flight to Radar.

THE COVENTRY APR reports that the ADC requested release on the B737. The release was requested from Birmingham and passed to the ADC '3000ft, released to 119.25MHz'. At 1053 he was passed the airborne time and duly identified the B737 on departure. The cct was active with helicopter traffic and this was observed just S of the B737. Further climb was obtained from Birmingham to FL50 and this was passed to the B737 crew by the ADC prior to transfer to his frequency. The B737 flight called and requested a R turn for weather avoidance, which was approved, and coordination was effected with Birmingham. At more or less the same time the B737 crew informed him that they were going to file an Airprox on departure and he asked the crew to pass brief details and they agreed to file the report on returning to Coventry. He then informed the ADC of this matter.

The Coventry METAR shows EGBE 1050Z 22005KT 180V270 9999 VCTS VCSH FEW016 SCT020CB SCT030TCU 16/14 Q1010 RETS RESHRA

ATSI reports that the Coventry ADC described his workload as moderate. He commented that an inexperienced trainee was plugged in alongside him, for familiarisation purposes. Although the controller was discussing the traffic situation with the trainee and answering questions, he did not consider that this distracted him from his task and did not believe it to be a causal factor to the Airprox. The Airprox occurred within Class G airspace of the Coventry ATZ.

The R22 helicopter was carrying out cct flying using the 24 Final Approach Take Off (FATO) grass strip. This is 100m long, situated in the SW area of the airport (150m south of the 05 end of RW05/23). The cct procedures for the 24 FATO (ccts using the FATO are only available to locally based operators) are a LH cct, unless otherwise instructed by ATC with a cct height of 700ft (QFE) or as directed by ATC. (Airport elevation 267ft.) Additionally, the Coventry MATS Part 2 states that: *'To assist helicopters in remaining clear of traffic going around from Runway 05/23 approach, the following circuit profile should be adopted; a) Turn crosswind at or before passing 500 feet (Aerodrome QFE). b) Do not level at or pass height 700 feet (Aerodrome QFE) until turning downwind.'* Simultaneous procedures, using the main RW and the FATO are approved under certain conditions, as stated in the Coventry MATS Part 2: *'All helicopters of the LIGHT vortex weight category utilising the grass FATO 06/24 are 'deemed' to be separated from LIGHT vortex wake category aircraft approaching/departing Runway 05/23, provided that: a) Flight profiles of aircraft using each runway are parallel and in the same direction. b) Traffic information is given.'* Consequently, this procedure does not apply in this instance [B737 MEDIUM vortex wake category]. The helicopter procedures are defined in a LoA adopted at Coventry Airport by authorised operators (including the R22's operator).

The B737 flight requested taxy clearance, following its push back from Stand One on the S apron, at 1047. The flight had been cleared on a COWLY 23 Tango departure from RW23. This is one of the trial Standard Routes for ac departing Coventry to join the Airways System to the S. These 'Tango' routes, which commenced operation on 1 March 2007, with an expiry date of 1 June 2007 (since extended for RW23 departures until 1 September 2007) are being trialled by all the B737-300/500 flights. For these ac only, the trial routes replace the Standard Routes, published in the UK AIP. The COWLY 23 Tango route is: *Straight Ahead to 770ft QNH, left turn to track 150M, to*

establish on WCO NDB QDM 148 then to intercept CPT 355 R to CPT, at CPT 30DME establish on HON 156 radial to COWLY'. At 1048, the flight was instructed to *"enter backtrack line up and wait Two Three"*. By this time the R22 flight was carrying out hover practice on the FATO.

Having lined up, the B737 flight was advised of a 3min delay to its departure (due to a Birmingham restriction). Straight away, the R22 pilot requested a LH cct. This was approved and at 1052:10, the R22 flight was cleared to lift. Shortly afterwards, the B737 was released by Birmingham, not above 3000ft. This restriction was passed to, and read back by, the pilot. At 1053:06, just under 1min from the R22 being cleared to lift, the B737 flight was cleared for take-off RW23. At 1054:28 a revised level was passed to the B737 flight and, following a read back by the pilot, it was then transferred to Coventry Radar. No other transmissions had been made to either of the subject ac up to that time. After contacting Radar the pilot of the B737 reported *"we'll be filing an Airprox on that departure"* adding *"It was against the Robinson I obviously delayed left turn in the circuit"*. He later reported that he became visually aware of a light helicopter, immediately after take off, slightly above and L of the ac track. He continued straight ahead to overtake the helicopter and climbed above it.

[UKAB Note (1): The Clee Hill radar recording at 1053:13 shows the R22 0·8nm SW of the airport tracking SW'ly climbing through FL006 (500ft QNH 1010mb). Sixteen sec later at 1053:29, approximately 20sec after the B737 had been cleared for take off, the R22 is 0·2nm S of the RW23 climbout, 1nm from the airport, passing FL008 (700ft QNH). Eight seconds later the B737 appears on radar just climbing out straight ahead, 0·2nm from the upwind end of the RW, with the R22 in its 1030 position range 0·4nm now tracking 195°, both ac at FL009 (800ft QNH). The next radar sweep at 1053:45 is the CPA, separation just under 0·4nm and 300ft, as the B737 climbs through FL013 (1200ft QNH) as the R22 climbs through FL010 (900ft QNH). The B737 rapidly overhauls the R22 on the next sweep, with separation showing 0·4nm and 600ft. 1000ft vertical separation was achieved at 1054:01, when the subject ac were 0·5nm apart, with the R22 tracking S and the B737 in its L turn en route.]

The ADC stated that he believed that the R22 had turned on to a crosswind leg before he cleared the B737 flight for take off. Consequently, he assessed that the two flights would not conflict and, therefore, did not consider it necessary to pass TI to the B737 flight or to ensure that it proceeded straight ahead initially. He added that he watched their relative tracks outbound and observed the B737 overtake and pass through the R22's level before turning on to the departure route. He did not realise that the B737 had continued straight ahead to avoid the R22. He only recognised the action taken by the B737's pilot following his comments after reporting, on the Approach frequency, his intention of filing an Airprox. It was only after observing a radar replay of the incident, he was aware that the R22 had not turned onto a crosswind track when he cleared the B737 for take off. The MATS Part 1, Section 2, Chapter 1, Page 1, 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 (amongst others): a) aircraft flying in, and in the vicinity of, the aerodrome traffic zone'.*

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.

Even though TI was not given to the B737 crew on the R22, some Members believed that as both ac were on the same frequency, the R22's presence could have been gleaned from the RT exchanges between ATC and the R22 pilot which would have improved the B737 crew's situational awareness. That said, the crew would have been busy carrying out their pre take-off checks whilst backtracking and lining up on the RW. After the 3min delay was passed to the B737 crew, the R22 pilot had called for lift-off into a LH cct, which was approved by ATC. Shortly after this the departure release from Birmingham arrived and this was passed to, and acknowledged by, the B737 crew. In the belief that the R22 had turned crosswind, the ADC had then issued take-off clearance to the B737 flight, about 1min after the R22 had departed. The ADC should have been aware that the COWLY 23 TANGO trial departure would place the B737 in potential conflict with the R22 in the FATO cct. As this traffic situation was not covered under the MATS Part 2 'deemed separation' criteria, the ADC should have ensured that the R22 was clear of the B737's departure route. Alternatively, the ADC could have given TI to the B737 crew who could then have departed fully cognisant of the helicopter's position and routeing or delayed their departure if unhappy with the situation. Members agreed that the cause of this Airprox was that the ADC cleared the B737 flight to take-off into conflict with the R22 without giving TI.

It was noted from the radar recording that the R22 pilot did not comply with the requirements of the 24 FATO procedures. By following his 'defensive' track, the R22 pilot did not turn crosswind at or before 500ft QFE (767ft QNH) and instead levelled his helicopter at 1100ft QNH (837ft QFE) before turning downwind. In so doing, the R22 pilot had delayed resolution of the situation but Members agreed that had the FATO procedure been followed, the Airprox would probably still have occurred. The R22 pilot's good situational awareness meant that he had heard the B737 flight being cleared for take-off and was expecting the B737 to appear to his R on the climb-out. As he expected, the B737 was then seen overtaking his helicopter 400m on the R and 300ft above climbing. However, he appears to have not been aware that the B737 could have been turning over the upwind end of the RW at 770ft QNH on the trial departure and approaching his helicopter from behind. Fortunately, the B737 Captain had visually acquired the R22, tail-on, slightly to the L of their track and 200ft above, whereupon TCAS generated a TA. The B737 crew then elected to delay their L turn out and climb through the R22's level whilst maintaining visual separation from it, before turning L onto their desired track after climbing 800-1000ft above the R22. Although this had had the potential for being a more serious incident, the Board agreed that the visual sighting and avoidance manoeuvre flown by the B737 crew had quickly and effectively removed any risk of collision.

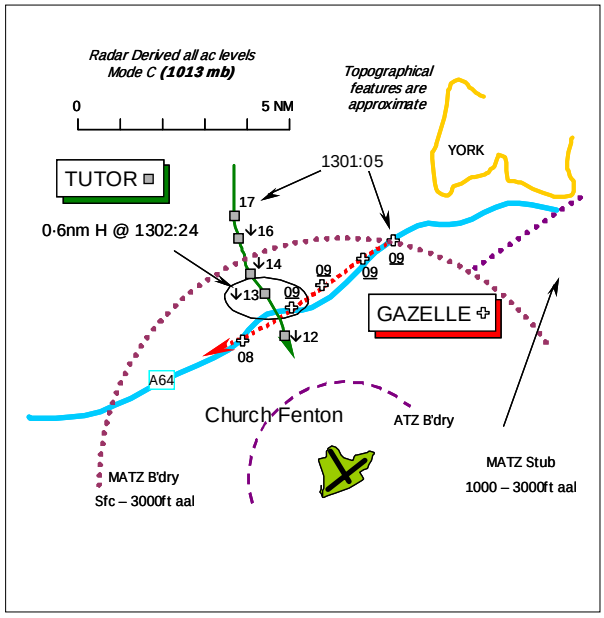
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Coventry ADC cleared the B737 to take-off into conflict with the R22 without giving TI.

Degree of Risk: C.

AIRPROX REPORT NO 099/07

Date/Time:	13 Jul 1302	
Position:	5354N 00114W (3½nm FINALS RW16 Church Fenton - elev 29ft)	
Airspace:	MATZ	(Class: G)
Reporter:	Church Fenton TALKDOWN	
	First Ac	*Second Ac*
Type:	Grob Tutor	Gazelle
Operator:	HQ AIR (Trg)	Civ Pte
Alt/FL:	1100ft↓ QFE (1009mb)	NR
Weather	IMC In cloud	NR NR
Visibility:	NR	NR
Reported Separation:	350ft V/¼nm H	NR
Recorded Separation:	400ft V/0·3nm Min H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CHURCH FENTON ATCO I/C reports that he was also manning TALKDOWN 2 towards the end of a busy recovery period in poor weather conditions. The latest actual weather promulgated was colour code GREEN conditions – 3/8th SCT cloud at 700ft agl; visibility: 3700m. The Tutor ac was on an IFR approach to RW16 at Church Fenton and its pilot had requested and received a RAS, which in accordance with SOPs, was downgraded to a RIS once inside the Final Approach Fix at 5nm from touchdown.

After completing a PAR for another ac the APPROACH controller drew his attention to previously called unknown traffic displayed in confliction with TALKDOWN (TD) 1's traffic – in the subject Tutor's L 10 o'clock at 1nm. Due to the narrow radar beam so close to touchdown the conflicting ac was not showing on the PAR display. He then

selected TD 1's frequency and landlines to listen in. A few seconds later the conflicting ac appeared on the PAR screen heading E-W on a course to cross the RW16 centreline and glide path at approx 3nm from touchdown. The TD controller again called the traffic to the Tutor pilot, at which time he – the ATCO i/c - instructed TD to stop the Tutor's descent, which was acknowledged. The Tutor pilot maintained 1100ft QFE until clear of the confliction. At 1302:32, inside 4nm from touchdown, the Grob Tutor came within ¼nm and 350ft vertically of the then unknown ac – the Gazelle. The Gazelle's estimated height was 650ft - these figures were derived from the PAR playback function. The approach was then continued without further incident.

He stressed that there are no surveillance radar displays in the Church Fenton ACR and the APPROACH/ DIRECTOR task is conducted from Linton-on-Ouse. Ac are then handed over via landline once visible on the PAR screen. Therefore, the PAR controller at Church Fenton is often not aware of the 'bigger picture' outwith his PAR display.

In hindsight, and certainly after reviewing the playback, he should have insisted on breaking-off and climbing the Grob Tutor in order to achieve as much separation as possible.

The pilot of the other ac - the Gazelle helicopter - did not contact Church Fenton on any frequency.

The Church Fenton 1250UTC weather was: Visibility: 12km in Moderate rain; Cloud: 3/8 – 900ft 5/8 - 1400ft, 8/8 – 2000ft. The pilot reported the cloudbase to be 900-1000ft at the Airprox location.

THE GROB TUTOR PILOT reports he was conducting an instrument approach under IFR for aircrew currency training at Church Fenton and was in receipt of a RIS from TALKDOWN, inside the FAF, heading 155° (M) at 100kt. He did not see the other ac as he was descending through 1100ft QFE (1009mb), in cloud, at the time. Flying in IMC, they were occasionally visual with the ground as the base was variable and they were approaching the reported cloudbase at the time. Had the controller not instructed him to maintain height, he would have initiated a MAP.

The ac has a white colour-scheme and the ac's landing lights, navigation lights and HISLs were all on.

THE GAZELLE PILOT declined to provide a report.

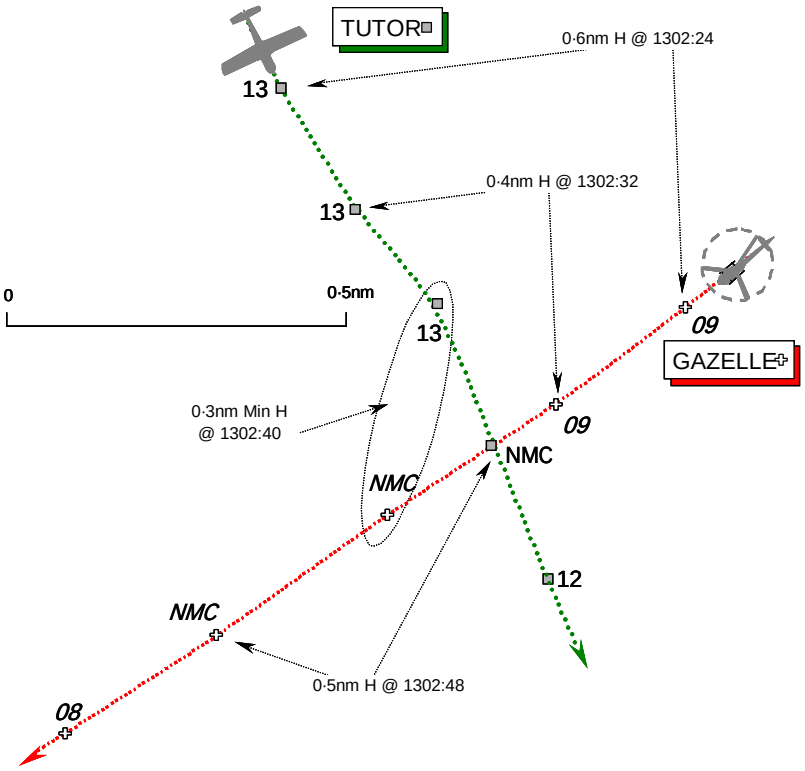
MIL ACC reports that the Grob Tutor pilot was conducting a PAR recovery in 'Azimuth only' to RW16 at Church Fenton. (Mil ACC Note: During an 'Azimuth only' approach, TALKDOWN gives instructions to the pilot to keep the ac on the centre-line, but advises pre-calculated heights at 1nm and ½nm intervals. It is the pilots' responsibility to 'meet' the heights read out at each range. Because it was a 'training' approach, TALKDOWN would still have the glide-path picture displayed and thus would have been able to see the Gazelle's contact on the elevation display.) The cloud base was 900ft in moderate rain and it was the 15th talkdown of the day. Two talkdown consoles were in use just before the incident. One was being manned by the ATCO i/c – TALKDOWN 2 and the other by the nominated talkdown controller - TALKDOWN 1 (TD). Talkdown is located within the Control Tower at Church Fenton airfield, along with the ADC and the ATCO i/c. However, the Approach Controller (APP) sits 13nm away in the ACR at Linton-on-Ouse. ATC in the Church Fenton Tower does not have a search radar display.

The Tutor was already established on PAR and in receipt of instructions from TD when, at 1300:48, TD was informed by APP, via landline, that the Tutor had *"..traffic left 10 o'clock, 3 miles, crossing left right, indicating 7 hundred feet below".* TD acknowledged the information and relayed it word-for-word to the Tutor pilot, now at 4½nm from touchdown. The Tutor pilot also acknowledged the traffic information. TD then gave the Tutor pilot several instructions relating to the ac's position relative to the centreline, as well as height read-outs. At 1301:59, TD transmitted to the Tutor pilot "*4 miles, 1 thousand 2 hundred feet'*. During this call, APP informed the ATCO i/c that the previously reported traffic was *"left, 10 o'clock, 1 mile"*. Just after this, at 1302:01, TD joined in on the landline and APP repeated *"crossing 1 mile"*. The Gazelle helicopter appeared on the narrow beam PAR display immediately after this call and TD and the ATCO i/c both saw it. At 1302:06, TD advised the Tutor pilot "..*traffic left, 10 o'clock, 1 mile, crossing left right indicating slightly below'*. TD still had the presence of mind to continue to pass centre-line information. However, having quickly assessed the situation, the ATCO i/c instructed TD to *'Stop descent mate'*. At 1302:20, TD transmitted *"..stop descent"*. The Tutor pilot responded at 1302:23, saying *"..stopping descent 1000 feet*". TD quickly followed up with "Tutor [C/S] *that traffic now in your left 11 o'clock half a mile crossing left right slightly below'*. Whereupon the Tutor pilot responded "..*india mike charlie"*.

TD re-iterated at 1302:33, *"Roger, maintain height"*, which was acknowledged before at 1302:42, TD informed the Tutor pilot that the "*..traffic has now passed, continue descent*".

This Command considers that TD, the ATCO i/c and APP worked very well as a team and took positive action to avoid this incident potentially becoming a mid-air collision. Without the benefit of a report from the Gazelle pilot, it is impossible to say what his in-flight conditions were. It is possible that the Gazelle pilot was flying just below the cloud base, which has been accurately reported as 900ft. The Tutor pilot reported that he was still IMC at 1100ft. Had the Tutor continued its descent, it would have reached 1050ft by 3½nm from touchdown, exacerbating the situation and giving the pilot very little time to see and avoid the Gazelle if he had 'popped-out' below cloud. The Gazelle pilot would, similarly, also have had very little chance of seeing and avoiding the Tutor. With APP acting as their eyes, TD and the ATCO i/c were aware of the threat. As soon as the Gazelle appeared on the PAR screen, the ATCO i/c, who was not directly involved with giving the Tutor control instructions, was able to quickly assess the situation and make the necessary decision to stop the Tutor's descent.

There appears to be no indication that the Gazelle pilot was lost or in difficulty. Whilst the Gazelle pilot is under no obligation to remain outside a Military Aerodrome Traffic Zone (MATZ), this Command considers that an information call to Church Fenton APP would have greatly increased his SA and safety.



UKAB Note (1): The Claxby radar recording shows the Grob Tutor inbound to Church Fenton FINALs for RW16 at 1302:24, indicating 1300ft (1013mb) – broadly 1180ft QFE (1009mb), with the Gazelle maintaining a steady SW'ly course indicating 900ft (1013mb) – about 780ft QFE (1009mb). The Gazelle appears to be broadly following the track of the A64 road and a course perpendicular to the FAT for RW16. Just before the Gazelle crosses ahead of the Grob Tutor in between radar sweeps the helicopter is shown at a minimum of 400ft unverified Mode C beneath the Grob Tutor maintaining 1300ft Mode C in conformity with the instructions issued by TD. Minimum horizontal separation occurs on the next sweep at 1302:40, when the Gazelle is shown at a range of 0·3nm as the Grob starts to draw astern of the helicopter; NMC is shown thereafter by both ac.

UKAB Note (2): The UK AIP at ENR 2-2-2-1 notifies the Church Fenton ATZ as a radius of 2nm centred on RW06/24, extending from the surface to 2000ft above the aerodrome elevation of 29ft amsl and active during the period of this Airprox.

HQ AIR (TRG) comments that it is disappointing that the Gazelle pilot declined to provide a report to help the investigation. Consequently, the investigation lacks the balance of information that comes when all those involved contribute and we do not know why the Gazelle pilot did not make an information call to Church Fenton. The ATC team reacted positively to this incident and reduced the risk of an actual mid-air collision.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was most unfortunate that the Gazelle pilot had declined to provide an account of his flight during the period of this Airprox. Clearly lacking the benefit of his report, the Board's assessment was, therefore, not balanced and did not provide as incisive an insight into events as might have been the case if he had followed established reporting guidelines. A commercial helicopter pilot Member was concerned that the Gazelle pilot might not be apprised of the outcome of this assessment, however, he was reassured to learn that, despite the Gazelle pilot's unwillingness to contribute, a copy of the final report will be sent to him. In the pilot Member's view, it was irresponsible of the Gazelle pilot not to provide an input to this flight safety investigation, which the Board agreed was indicative of a poor attitude to flight safety as a whole.

Clearly both pilots were legitimately proceeding about their respective tasks. However, the Grob Tutor pilot operating under IFR in cloud, executing an established instrument approach procedure (IAP), would have been entirely unaware of the presence of the Gazelle helicopter as it transited below the glide path in the vicinity of the final approach to RW16, until he was advised by TD following the prompt warning from APP. It was clear that despite the approach being executed 'in azimuth only' [a precision runway approach] the elevation PAR data was still displayed to TD who could thus see the position of the unknown ac – the Gazelle – relative to the Grob when it flew into the very narrow beam of the RPAR equipment. The comprehensive Mil ACC report made it plain that following the warning from APP, the ATCO i/c had instructed TD to stop the Grob's descent to avoid the Gazelle, which was a wise decision. The Board agreed that had he not done so, the Grob pilot would have been poorly placed to avoid the helicopter – assuming it was flying below the cloud base. The Mil ACC advisor emphasised that the TD controller was only obliged to call traffic information to the Grob pilot under the RIS that pertained. TD – prompted by the ATCO i/c - had in fact gone that extra step in providing a collision avoidance 'stop descent' instruction as the Grob descended towards the helicopter – a mandatory instruction for military pilots within a MATZ. This then led to a wide ranging debate about the efficacy of providing a RIS to pilots operating IFR in cloud who are unable to fulfil their responsibilities to 'see and avoid' other traffic in Class G airspace. To many it is difficult to rationalize the provision of a RIS – essentially a VFR radar service where pilots must sight the reported traffic and effect their own separation – whilst providing positive instructions to IFR traffic on recovery flying IMC in cloud. The Member from C-in-C Fleet commented that Naval ATSUs will more commonly afford a RAS to instrument traffic on a PAR recovery, where it is accepted that the responsibility to afford standard separation on unknown traffic is limited to that of collision avoidance, as the narrow beam of the PAR does not afford sufficient radar coverage to detect conflictors, whilst conducting the talkdown. The DASC advisor added sagely that this surveillance function is still within the purview of APP or DIRECTOR who, utilizing their SRE, can keep TD advised of any conflictions that might arise during the conduct of the approach – as occurred here. Thus for his part the Grob pilot merely followed the mandatory instructions issued to him by TD. It was interesting to note however, that if TD had not stopped the Grob pilot's descent, the latter reported he would have executed a MAP, which might well have afforded more separation against the unknown Gazelle.

Whilst it might be argued that the Gazelle pilot was unaware of the IAP to RW16, indeed the Church Fenton MATZ stub is aligned to RW24, it was clear that this conflict developed within the main part of the MATZ which extends out to a range of 5nm from the aerodrome from the surface to 3000ft aal and established for the increased protection of arriving, departing and circuit traffic. In the airspace outside the ATZ [outside a radius of 2nm here] observation of MATZ penetration procedures is not compulsory for civil pilots. However, the extant UK AIP entry at ENR 2-2-3-1 entreats civil pilots in the interests of flight safety and good airmanship: "…*it is strongly recommended that all pilots not previously receiving an ATS obtain a MATZ penetration 'approval' from the MATZ*

operating authority, prior to entering a MATZ." In the Board's view this advice is especially pertinent when passing beneath an instrument approach. The Gazelle pilot – presumably operating under VFR - was ultimately responsible for maintaining separation against other airspace users within the Class G MATZ. But he would have had little warning and might have been poorly placed to avoid the Grob – as was his responsibility under the 'Rules of the Air' in this crossing situation - had it descended out of the cloud in front of him. Whereas had the Gazelle pilot been in communication with Church Fenton on the frequency promulgated for the MATZ Penetration Service - 126·5MHz - then traffic information about the Grob might well have forewarned him of the potential for the conflict, which in a helicopter pilot Member's view was caused by the Gazelle pilot. A pilot Member opined that good airmanship would dictate that a call to ATC was far wiser than flying through the MATZ unannounced. Whilst this was a legitimately permitted, it is most unwise and it was fortunate that the conflict with the helicopter was detected by APP and the Grob pilot instructed to stop his descent by TD. This was the nub of the issue and the Board agreed that this Airprox was the result of a conflict in the vicinity of the final approach to RW16 at Church Fenton, resolved by ATC.

The Board commended the ATCO i/c, TD and APP for their good teamwork here in resolving this conflict, for it is clear that their prompt action had forestalled a close quarters situation and preserved what vertical separation there was in the final stages of the encounter. In the Board's view, despite the minimum indicated vertical separation of 400ft from Mode C as the Gazelle crossed ahead of the Grob Tutor, the combined actions of these three controllers coupled with the prompt reaction by the Grob Tutor pilot to TD's instructions, had effectively removed any risk of a collision between the subject ac.

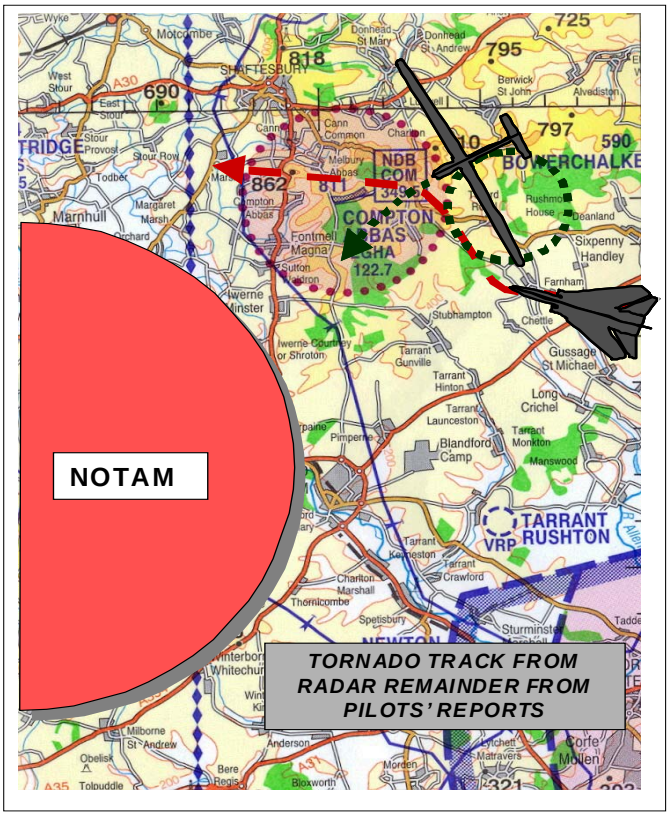
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the vicinity of the final approach to RW16 at Church Fenton, resolved by ATC.

Degree of Risk: C.

AIRPROX REPORT NO 100/07

Date/Time:	19 Jul 1205	
Position:	5058N 00209W (Compton Abbas - elev 811ft)	
Airspace:	Lon FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Duo Discus	Tornado F3
Operator:	Civ Pte	Air Ops
Alt/FL:	3800ft (QNH 1015mb)	3940ft (RPS 1015mb)
Weather	VMC CLBC	VMC CLBC
Visibility:	20km	>10km
Reported Separation:	100ft V/0m H	200ft V/0m H
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DUO DISCUS PILOT reports flying a cross-country flight from Lasham in a white two seat glider listening out on a glider frequency. They were thermalling to port over Compton Abbas airfield at about 3800ft amsl and 55kt and were just beginning to level the wings with a view to flying WSW on their route to Honiton which was a turning point. With a reduced angle of bank, his partner and he suddenly heard the sound of a jet engine and a few sec later a twin engine jet passed directly over their cockpit from L to R extremely close in a wide left hand turn and descending slightly. Once the ac had cleared away, still turning, its angle of bank and profile enabled him to identify it as a grey Tornado ac. After the incident he saw the ac twin exhausts departing slightly above their height. He recorded the time as 1305 BST.

They decided to continue their flight to Honiton, but noticed for several minutes that there were a pair of jet ac, he thinks they were Tornados, operating about 3-4nm away to the SSW of their position but after a few minutes they lost sight of them.

He assessed the risk as being very high.

THE TORNADO F3 PILOT reports that he was leader of a flight of 2 grey ac flying from Bournemouth on a close air support exercise which was the subject of a NOTAM [see UKAB Note (1)]. The area was promulgated as a radius 5nm centred on 5051N 00220W [9nm SW of the incident position]. They were flying as a 1.5nm battle pair formation heading 312° at about 4000ft amsl [3940ft from the mission recording tape] and 380kts, squawking 7000 with Mode C, when at 1204:30 UTC Tornado Ldr, who was on the L of the formation, saw a glider about 250m directly on his nose but about 200ft below. Due to the small separation it was not possible to avoid overflying the glider but once he saw it the risk of colliding with it was nil. After overflight, a hard turn L was initiated to facilitate exit from the exercise area. He then called his No2 and other ac in the area to warn of the presence of the glider and tell them to keep clear of it.

UKAB Note (1): NOTAM H2441/07 refers. It warned of a Forward Air Control exercise with multiple fast jet aircraft conducting high-energy manoeuvres within 5nm of position 5051N 00220W. It also warned that ac may be unable to comply with the Rules of the Air Regulations. Ac would remain clear of CAS and would operate between 250ft and 20000ft agl.

UKAB Note (2): The Tornado pilot provided a sketch map of the incident with accurate positions and timings taken from the mission tape. Although not obvious from his report form, it appears that they had just taken off from Bournemouth and were en-route to the exercise area when the incident took place.

UKAB Note (3): The recording of the 4 radars that cover the area showed the Tornados throughout the period; however, the glider is not seen at any time. At the incident time the lead Tornado displays a Mode C readout of FL039, which equates to 3960ft amsl [see pilot's report]. If the glider was at 3800ft as its pilot reported there was about 150ft vertical separation [see both pilots' reports].

THE TORNADO PILOTS UNIT comments that the extremely late sighting of the glider by the Tornado crew resulted in insufficient time for avoiding action to be taken – on this occasion, both crews were fortunate that no action was required to avert a collision. Nonetheless, the ac appear to have come close enough to suggest that a significant risk of collision did exist. This incident highlights 2 issues: primarily, the importance of maintaining an effective lookout (and not being lulled into a false sense of security when planning to operate in airspace subject to NOTAM action); and secondly, that the size of the NOTAMed area itself appears to have been insufficient for the air exercise taking place (given that the incident occurred outside of the published area). This incident serves as a useful reminder of the ever-present hazard when conducting VFR operations in Class G airspace and also of the difficulty in visually acquiring a small white glider against a cloud backdrop. This is especially true in airspace that is not the usual domain of Tornado crews. Both issues are receiving maximum publicity amongst other aircrew on this Unit.

HQ AIR (OPS) comments that it would appear to have been a short transit from Bournemouth to the exercise area. The F3 crew would have been busy throughout this period organising the ac for the task. However, this should not have allowed any compromise of lookout but it was a white glider against a bright sky.

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 Tornado operating authorities.

Both ac had been operating legitimately in Class G airspace and, although the F3 was proceeding to the area promulgated in the NOTAM, it had not yet arrived there. The Board was briefed by a specialist that the period leading up to any Forward Air Control (FAC) close air support (CAS) activity is very hectic and one crew member will necessarily be 'heads in' copying down the activity details which can take several minutes. Although the other crew member (normally the pilot) should be 'heads out' he will also be in a period of high workload where routine lookout can suffer if a determined effort is not made. Further, CAS is not a routine activity for the crew and this version (F3) of the Tornado, again placing further demands on them.

The Board did not accept the Tornado Unit comments regarding the NOTAM, as the ac had not commenced the CAS exercise at the time of the incident, but was still technically in transit. It does appear however, that the intended track of the glider after the incident directly towards Honiton, went through the middle of the area NOTAMed for the exercise which, due to the guaranteed high activity level, most Members considered to be unwise.

The poor conspicuity of white gliders against a light cloudy background is a well known issue, for which there seems to be no obvious answer other than awareness, including awareness by glider pilots themselves and increased lookout by aircrew in periods, areas and altitudes when high levels of gliding activity is likely. Lookout can be difficult for glider pilots while they are concentrating on orbiting in a thermal and getting the best lift. Nevertheless, given the lack of visibility of their ac to others and the lack of electronic conspicuity aids, a good lookout by glider pilots is considered by specialist gliding Members to be vital.

In this case, since the glider pilot was not able to take any evasive action and the F3 pilot reported that the lateness of his sighting precluded a turn away from the glider, the Board considered that safety had not been assured.

AIRPROX REPORT No 101/07

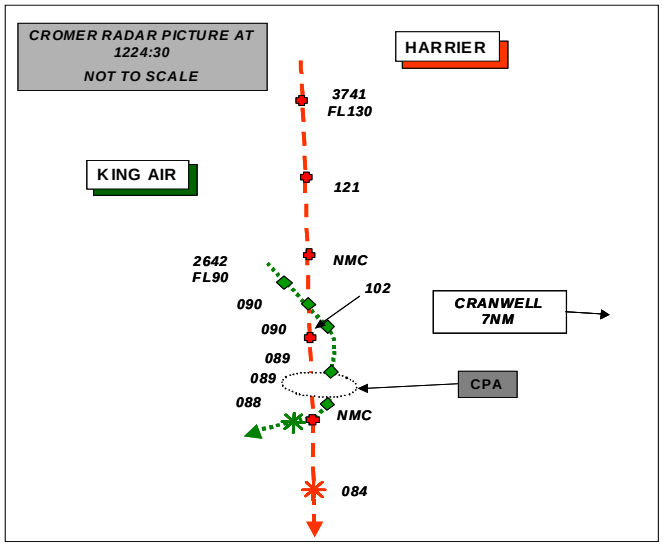
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: An effective non-sighting by the glider crew and a late sighting by the Tornado crew.

Degree of Risk: B.

AIRPROX REPORT NO 101/07

Date/Time:	23 Jul 1225	
Position:	5302N 00040W (7nm W Cranwell)	
Airspace:	Lincs AIAA	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	B200 King Air	Harrier
Operator:	HQ AIR (Trg)	HQ AIR (Ops)
Alt/FL:	FL90	FL150↓
Weather	VMC CLBL	VMC CLBL
Visibility:	>10km	5km
Reported Separation:	0ft V/200m H	NR
Recorded Separation:	500ft V/<0.1nm (interpolation) H	



(This is at the minimum horizontal separation. The ac are co-alt as the Harrier descends through the King Air's level but by this time the horizontal separation is increasing)

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BEECH KING AIR PILOT reports flying a local advanced training GH sortie from Cranwell with a student pilot in a blue and white ac with HISLs and nav lights switched on, operating on a quiet frequency but squawking the Lincs AIAA conspicuity code; TCAS was fitted. While heading 150° at 170kt during a GH exercise they received a TCAS TA which caused him to stop the exercise and monitor the vector of approaching traffic which was coming from his 8 o'clock. The TCAS showed a high ROD and a collision vector so he made a RH Avoiding turn and during the turn became visual with a Harrier in a steep descent. The Harrier continued on the same flight vector and came within 200m of his ac with no visible signs that he was taking any avoiding action although his own turn was taking him clear of the Harrier. He assessed the risk as being very high.

THE HARRIER PILOT reports flying a grey ac with HISLs selected on descending from FL150 to FL50 on recovery to Cottesmore in receipt of a RIS from them. While heading 180° at 300kt he was given TI on an ac in his 12 o'clock at a range of 1nm but he did not see the reported ac and continued unaware of the Airprox until he was informed of it by ATC after landing. Although the conditions were VMC there were multiple cloud layers. It was not practical to request a RAS and he considered that a RIS was sufficient.

MIL ACC reports that a Beech King Air was on an Advanced Flying Training GH exercise to the W of RAF Cranwell while a Harrier was recovering to RAF Cottesmore from the N, having previously been part of a three-ship formation, with Harrier B & Harrier C. Although all three ac were in receipt of a service from Cottesmore Director DIR, Harrier A was trailing Harrier B & C by about 11nm and was recovering as a single unit. DIR had just started a two-ship radar split with Harrier's B & C, by instructing Harrier C to turn right onto heading 210° and Harrier B was given own navigation to the TACAN hold. At 1223:33, Harrier A called DIR saying '*<unintelligible> Good afternoon Harrier A C/S, with you level 150',* DIR responds *'Harrier A C/S, er, Cottesmore Director, good afternoon, identified, descend report level flight level 50, radar information',* and Harrier A confirms the descend instruction and type of service. DIR then transmits an 'All Stations' broadcast at 1224:04, saying *'do any aircraft require the*

Western? Harrier A responds *'negative'* and immediately after the reply, DIR transmits *'Harrier C/S A, traffic 12 O'clock, 1 mile, manoeuvring, indicating FL90'*. Harrier C/S A acknowledges with his callsign and thereafter DIR gets *'negative'* replies to his earlier question from Harrier's B & C. At 1224:27, after the reported AIRPROX had occurred, DIR informs Harrier C/S A that he is *'clear of previously reported traffic, set Cottesmore QFE 984, descend report level 3000 feet'*.

Analysis of the Claxby Radar at 1223:38 shows the King Air 11.6nm due W of RAF Cranwell, in a right hand turn, passing through 160° and indicating FL090 with the Harrier in its 7 o'clock at a range 2.5nm and tracking 175° but the Mode C has dropped out. (It can be assumed that the Harrier is at FL150, as the pilot has only just been instructed to descend and the next sweep shows the ac still at FL150). At 1223:45 the King Air has rolled out tracking 165° and indicates FL090 with the Harrier in its 7 o'clock at 2.1nm, tracking 175° and indicating FL150. This is the only time that Harrier A shows a Mode C read-out until about 5nm after the Airprox. The 1223:53 radar picture shows the King Air steady on track, indicating FL090 with the Harrier in its 7 o'clock at a range of 1.6nm, tracking 175° and on the next sweep the King Air maintains its heading and level but the Harrier is now at a range of 1.2nm in its 7 o'clock having started a right-hand turn and is passing through 180°. At this point the Harrier has the King Air in its 12 o'clock at a range of 1.2nm. Two sweeps later the King Air is still maintaining a track of 165° and indicates FL089 with the Harrier in its 6.30 having closed to 0.7nm still tracking 180°. At 1224:16 the King Air's track and level are unchanged but the Harrier is now in its 6 o'clock at 0.3nm, tracking 180°. On the next sweep the King Air can be seen to have commenced a right hand turn and is passing through 190°, indicating FL088 with the Harrier in its 10 o'clock at a range of 0.2nm. At 1224:32 the King Air is in a right turn passing 190° and indicates FL086 with the Harrier in its 9.30 at 0.6nm now going away tracking 180° and thereafter the separation rapidly increases.

UKAB Note (1): The King Air can clearly be seen operating at around FL090 in the Harrier's 12 o'clock from well before the handover of the Harrier from London Mil to Cottesmore DIR. The handover occurred at about 1223, 1½ min before the CPA with the ac separated by 10nm.

UKAB Note (2): The recording of the Claxby radar shows the Harrier but with no Mode C at the CPA; the King Air is at FL088 and the ac 0.2nm apart.

UKAB Note (3). The rate of descent of the Harrier was 8000fpm and may have accounted for the drop out of its Mode C on the recording of the Claxby radar. The Cromer radar recording shows the incident more clearly but although the Harrier Mode C drops out on the sweep of the CPA it shows as FL102 on the previous sweep and FL84 on the subsequent sweep having passed through the level of the King Air. It can therefore be assumed that it was passing FL93 descending rapidly at the CPA with the King Air level at FL088. In addition the Cromer shows the minimum horizontal separation as being 0.1nm rather than 0.2 on the Claxby. Since it has a higher update rate it is assumed to be the more accurate. The actual CPA is however between sweeps as the Harrier overtakes the King Air so the distance at the CPA can be assumed to be less than 0.1nm.

Cottesmore DIR was operating within the requirements of JSP552.235.115.1, in that, under the rules of RIS:

'The pilot is wholly responsible for maintaining separation from other aircraft whether or not the Controller has passed traffic information.'

However, in this case it is not unreasonable for the DIR to have passed TI to the Harrier much earlier. The King Air was clearly showing on radar and had been for at least 4min before the Airprox and was clearly displaying FL090. Even though the Harrier was not displaying any Mode C, it is not unreasonable to expect the DIR to realise that descending an ac from FL150 to FL50 through the level of the King Air, showing FL90, had the potential to be unsafe. Moreover, the 'all stations' transmission could, in isolation, be seen purely as administration. One of the oldest ATC maxims is 'control before admin'.

It is probable that had DIR given TI on the King Air at 4nm or before, the Harrier pilots' SA would have been greatly enhanced and he would have had time to take any necessary action, reducing the probability of an incident. By giving TI at 1nm, DIR gave the pilot about 5sec to cognitively register the TI, look out of the cockpit, see the King Air, assess their relative positions, decide on any avoiding action and take that action. Notwithstanding that the pilot is wholly responsible for avoiding traffic under a RIS, it is considered that the DIR contributed to this incident by giving late TI and by not considering the possible implications of descending an ac through the (known) level of another ac.

HQ AIR (OPS) comments that it is disappointing that the TI on the King Air came so late considering that it had been on heading and height for some time. However, it is equally disappointing that the Harrier pilot did not see the confliction which was so close, albeit that the King Air is a light coloured ac.

HQ AIR (TRG) comments that the timing of the TI given to the Harrier pilot was late in the sequence of events and the King Air was not seen. With the threat coming from the 8 o'clock position the decision by the King Air pilot to turn right was perhaps not the best choice as the radar plot shows. With the benefit of hindsight, maintaining heading or turning left would have been a better option. TCAS is a useful tool for improving SA but caution must be applied when using TA information to formulate 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 Secretariat briefed the Board that, although there were small differences between the recordings of the Cromer and the Claxby radars, mainly but not exclusively in Mode C data, it was their opinion that, due to its higher data rate, the Cromer was the more accurate in this case despite that it was further away from the incident position.

Members noted that the incident had taken place in Class G airspace between heavily layered clouds. They also noted that the Harrier had been descending rapidly, through the layers, and had the pilot not opted for a radar service he would have stood little chance of seeing the King Air which was operating between the layers. The Board considered the part played by the 2 pilots and by ATC in turn.

While accepting that it is often difficult to fulfil instructional tasks and also listen out for information on another frequency, some Members considered that in such weather conditions, the King Air pilot might have been wiser to opt for a RIS, even though he was TCAS equipped. It was also pointed out by expert Members that, depending on the actual fit, TCAS can be very inaccurate in azimuth; however, the Board did not wish to over emphasise published advice that a TCAS indication may be very inaccurate in azimuth, and pilots using it in Class G airspace must be aware of its limitations whilst reacting appropriately. Taking account of the ac tracks and the small miss-distance, Members were perplexed as to why a TCAS RA had not been enunciated; some suggesting that the Harrier's rate of descent or incomplete Mode C data might have been a factor. The Board noted and concurred with the HQ AIR (TRG) comment regarding the King Air pilot's turn direction.

Notwithstanding the Harrier pilot's understandable desire for an expeditious recovery, it was suggested that in the prevailing weather, since the pilot had little opportunity to see and avoid other ac, opting for a RAS might have been wiser. Further, traffic ahead and below the ac (the major threat area in any descent), as in this case, would most likely be below his nose and not visible to the pilot even if it was in the same gap in the cloud.

While noting that under a RIS, pilots are responsible for collision avoidance, the Board considered that the Cottesmore DIR played a major part in this incident by not giving the Harrier pilot timely information regarding the King Air. Some Members thought that the controller might not have seen the King Air, even though it had been showing on radar for several minutes; the Mil ACC Advisor however, on consulting his notes, informed Members that this had not been the case and he had in fact seen it but simply had not prioritised his tasks correctly. Accepting that there was no requirement to do so under a RIS, experienced controllers suggested that stopping the Harriers' descent until they were all clear of the King Air would have been prudent on safety grounds. Indeed, one controller Member suggested that avoiding the King Air was more important than both splitting the formation and admin calls. One pilot Member suggested that Scottish Mil could have pointed out the King Air to the Harrier pilot before the handover to Cottesmore, but an experienced military controller Member pointed out that the King Air had been well below and not in any conflict before the descent, which was initiated by the Cottesmore DIR. It was suggested that some military controllers had been criticised during past standardisation checks for 'over-controlling'; specialist Members considered this not to be best practise as it could encourage controllers to provide the minimum service commensurate with the regulations. Should any (military) pilot consider that he is being over-controlled he can always discuss the matter with the staff/supervisor after he/she has landed safely.

Since the TI had been too late to allow the Harrier pilot to visually acquire the King Air and its pilot had turned right towards the Harrier thereby reducing the separation, the Board concluded that safety had not been assured.

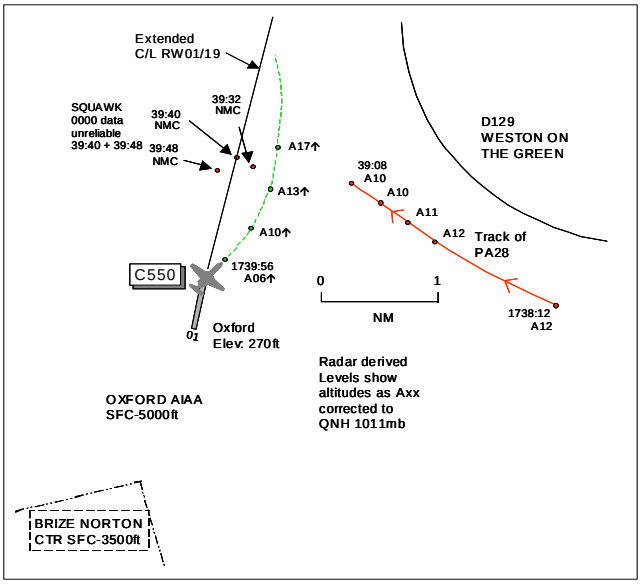
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Cottesmore DIR descended the Harrier into conflict with the King Air without giving timely traffic information.

Degree of Risk: B.

AIRPROX REPORT NO 102/07

Date/Time:	21 Jul 1740 (Saturday)	
Position:	5151N 00119W (1nm N Oxford/ Kidlington - elev 270ft)	
Airspace:	Oxford AIAA	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	C550	PA28
Operator:	Civ Comm	Civ Pte
Alt/FL:	GL↑	1100ft
	(QNH 1012mb)	(QFE)
Weather	VMC CLBC	VMC CLBC
Visibility:	>10km	8km
Reported Separation:		
	Nil V/500-600m H	NR
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C550 PILOT reports heading 010° at 118kt on departure from RW01 at Oxford/Kidlington IFR and in communication with Oxford Tower on 133·425MHz squawking 7773 with Mode S. The visibility was >10km below a 1500ft cloudbase and the ac was coloured white with red/grey stripes and the strobe, nav and landing lights were all switched on. During rotation the FO noticed a yellow low wing single engine ac turning final on the opposite RW (19) about 3nm out. After T/O an immediate R turn (20°) was initiated whilst keeping visual contact with this traffic which passed 600m to their L at the same level. At this time ATC told the conflicting traffic to turn R, he thought, and after passing 500ft clear of conflict they resumed the normal departure route. ATC told them that they were unaware of any traffic and would be filing a report. No TCAS alerts or warning were received. He assessed the risk as medium.

THE PA28 PILOT reports inbound to Oxford from Halton VFR at 1100ft QNH and 130kt and in communication with Oxford on 133·42MHz, she thought, squawking 7000 with Mode S. The visibility was 8km flying 100ft below cloud and the ac was coloured orange/black with strobe lights switched on. On leaving Halton she listened to the Oxford ATIS frequency 136·22MHz on Box 2 - there was no ATIS broadcast - with Oxford Tower 133·42MHz selected on Box 1. Being a Saturday when Oxford usually closes at 1700Z, she continued to broadcast 'blind' assuming that, as there was no ATIS, ATC had closed. She had taken off on RW19 a couple of hours earlier so she positioned for a L base for RW19 with complete cloud cover at 1200ft. Approaching Oxford heading 270° she could see the RW lights were on which surprised her as she had been making calls for at least 10min. She checked her radios and realised that she had not changed from Box 2 to Box 1 and had been erroneously broadcasting blind on the wrong frequency. It was then, when about 2nm out, she saw another ac lined up on RW01 in the opposite direction. She hastily called Tower realising her mistake but as the other ac was just about to take-off she didn't have time to do anything but take her own avoiding action which was to fly to the Western side of the RW to avoid the departing ac. The other ac departed and passed behind. She assessed the risk as low.

AIRPROX REPORT No 102/07

THE OXFORD ADC reports the aerodrome had remained available with services by prior arrangement, after normal promulgated hours, to facilitate specific movements including the IFR departure on the subject C550. Although the aerodrome had been utilising RW19 earlier in the day, the surface wind favoured RW01; all RW01 ground lighting was on. The C550 flight was given its 'SID' instructions, which incorporated a L turn after departure, and was given T/O clearance which was confirmed a short time later. A previously unknown flight called "Oxford traffic PA28 c/s", which he acknowledged and the pilot reported "PA28 c/s final for 19". The implication of this was apparent and as the ac appeared to be in front of (head-on to) the departing C550, the PA28 flight was immediately instructed "left turn, left turn now". Owing to the perceived proximity of the 2 ac, the urgency of the situation and as the PA28 pilot was the last one in communication, the PA28 c/s and phrase avoiding action were omitted. The C550 was seen to turn R and after passing behind the PA28 it turned L to regain the 'SID'. He apologised to the C550 flight adding that the PA28 was previously unknown to him and that reporting action would be taken. The PA28 pilot apologised and was subsequently cleared to land on RW19. Later it transpired that the PA28 flight was returning under the aerodrome indemnity arrangements.

ATSI reports that unofficial weather observation, as issued to the C550 pilot at 1718, was: "light and variable eight kilometres in rain, cloud guesstimated broken around about fifteen hundred feet maybe two thousand feet, QNH one zero one two QFE one zero zero two".

The UK AIP, Page AD 2-EGTK-1-5, states the hours of operation of the Oxford ATS Communication Facilities. For Saturdays in Summer the Tower frequency is operated 0730-1700 and by arrangement. The remarks column states: 'ATZ hours coincident with TWR hours, but **not** by arrangement'. The ATIS hours are 0630-1600. On the 21 July, prior arrangements had been made for the extension of services, up to the departure of the C550.

The C550 flight requested taxi clearance at 1730. The pilot was instructed to standby (presumably whilst the controller contacted Brize). Approximately 2min later, the pilot was informed *"surface wind's light and variable Brize are very busy at the moment so what I intend to do is launch you off runway Zero One on a standard Compton departure which is off runway Zero One and to come back through the Oxford overhead tracking towards Compton rather than go near Brize Zone are you happy with that"*. The pilot approved and was cleared to taxi to RW01. He was then given the London Control instructions to remain outside CAS, a squawk and a frequency. He was instructed to make a L turn out and *"come back through the overhead not above Flight Level Five Zero"*. The pilot reported ready for take-off and, at 1737:35, was cleared for take off, with a reminder about the initial routeing. At 1739, after the pilot queried whether he had take off clearance, it was issued again.

The recording of the ATIS frequency, not in use at the time, reveals that the PA28 flight transmitted, at 1738:09, *"Oxford traffic (three letter callsign) is left base runway one nine to land"*. Radar recordings show an ac, believed to be the PA28, 3nm E of Oxford Airport, at 1200ft. Some 50sec later another call was made *"Oxford traffic (full registration)"*. Another 40sec later, the PA28 contacted the Oxford Tower frequency, transmitting the same message. After being asked to *"pass your message"* the pilot transmitted *"Our apologies (c/s) er is on er final for One Nine to land erm I had the wrong radio on apologies"*. The radar timed at 1739:32 shows the PA28 bearing 023°, 1·3nm. Realising the significance of the call the controller responded, with words emphasised *"Immediate left turn now immediate left turn"*. A transmitter was switched with no modulation, after which the C550 pilot reported *"er we got him"*. In the event, the controller reported seeing the C550 turning R after take off, which was confirmed by its pilot.

UKAB Note (1): The radar recording does not capture the Airprox. The PA28 is seen approaching Oxford from the E squawking 7000 on a track of 300° indicating 1200ft unverified on London QNH 1011mb before fading from radar after the radar sweep at 1739:08 when the ac is 1·7nm NE of Oxford at 1000ft QNH. The PA28 reappears 24sec later at 1739:32 as a SSR only response 1·3nm NNE of Oxford just to the E of the FAT showing NMC. The next sweep 8 sec later on the PA28 shows the radar response displaying a squawk of 0000 (data unreliable) NMC as the ac appears to be on the extended C/L of RW01/19 but with a track displacement to the R. The next sweep at 1739:48, the last response received from the PA28, shows it now 1·2nm N of Oxford just slightly R of the FAT still displaying 0000 squawk. The C550 appears on radar on the next sweep at 1739:56 just under 0·5nm NNE of Oxford tracking 035° climbing through altitude 600ft QNH. The C550 is then seen to commence a slow L turn 8sec later whilst continuing its climb, climbing through 1300ft QNH at 1740:12 and passing 0·5nm E of the last displayed position of the PA28.

UKAB Note (2): Oxford Airport provided a copy of the Out of Hours Permit extant at the time of the Airprox. The Permit states *'Permission to use the aerodrome is subject to: 1. The requirements of the Air Navigation Order,*

Rules of the Air, and, in particular, Rule 20 [Notification of Arrival and Departure]*. 4. The use of the aerodrome during daylight hours only. 7. Circuit training outside normal airfield hours is strictly prohibited. 8. All movements must comply with the noise amelioration scheme in force at Oxford Airport – copy in Operations.*

UKAB Note (3): Post incident, in addition to the Out of Hours Permit, an Indemnity Procedures Out of Hours document was produced amplifying the requirements necessary to use Oxford in these circumstances. Included are further time restrictions to comply with local District Council noise abatement rules as well as RT procedures to be followed when using the indemnity procedure. Also, from January 2008, increased opening hours by ATC Mon-Fri have been introduced which should greatly reduce the number of flights that are undertaken under indemnity. The opening hours for weekends are also under review and it is hoped to extend those hours later in the year which should have a similar effect.

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.

Pilot Members noted that the PA28 pilot had made an assumption that having departed from RW19 earlier, the same RW would still be in use. This had led to her positioning onto a wide L base leg for RW19 when, unbeknown to her, ATC were open and using RW01 for the departing C550. By transmitting on the ATIS frequency instead of Tower as intended, the PA28 pilot's calls were not heard by ATC who were completely unaware of her presence. One Member wondered why the pilot had not established, either before departing Oxford earlier or by telephone prior to leaving Halton, whether ATC would be open at her ETA as this would have clarified the situation with respect to the necessity of using the indemnity procedure. Usually at airfields/airstrips with no ATC, AFIS or A/G in operation, pilots would be expected to carry out an O/H join in order to establish the RW in use and integrate safely, or establish, a traffic pattern. In this case, when flying just below a 1200ft cloudbase, Members acknowledged that an O/H join would have been 'difficult' but not impossible, the pilot needing to take due regard of any other traffic that might possibly be already in the cct. However, correct selection and use of the Tower frequency from the outset would have revealed the true situation at the time to all parties involved. Without ATC knowing about her inbound flight, the PA28 pilot had positioned her ac onto L base for RW19 in opposition to the C550 departing RW01. Thus the PA28 pilot did not integrate safely into the Oxford visual cct, which Members agreed had caused the Airprox.

It was only at a late stage that the PA28 pilot realised her erroneous frequency selection and noticed the RW lighting and C550 at the far end of the RW. When the PA28 pilot called on the Tower frequency the ADC had issued her with an immediate L turn to clear the extended C/L, mindful that he had issued the C550 flight with a L turn after departure. The PA28 pilot did not acknowledge this instruction and elected to turn R having seen the C550 taking-off. Fortunately the C550 crew had seen the PA28 during rotation on RW01 and elected to continue with their take-off before turning immediately R to avoid it. Whilst closely monitoring the PA28's flightpath, the C550 crew had then turned L, after passing clear of the PA28 to port by an estimated 500-600m, to regain their required departure routeing. These visual sightings and avoidance manoeuvres flown by both crews convinced the Board that any risk of collision and had been quickly and effectively removed.

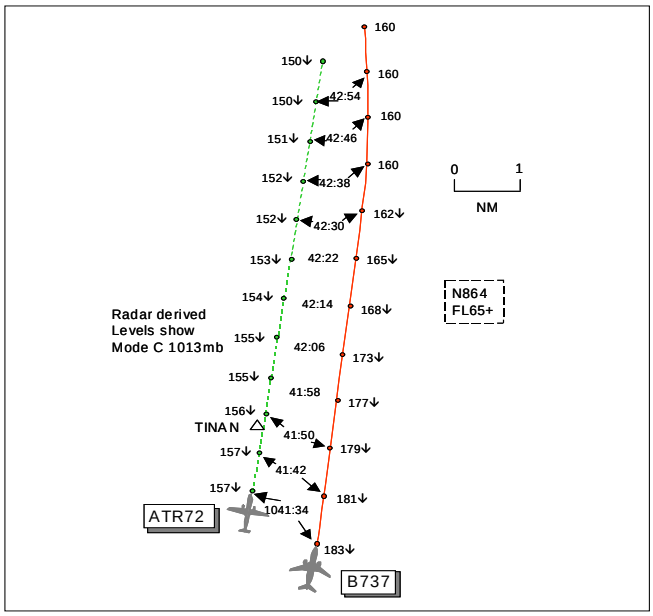
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA28 pilot did not integrate safely into the Oxford visual cct.

Degree of Risk: C.

AIRPROX REPORT NO 103/07

Date/Time:	21 Jul 1043 (Saturday)	
Position:	5040N 00327W (5nm N TINAN)	
Airspace:	N864	(Class: A)
	Reporting Ac	*Reported Ac*
Type:	ATR72	B737
Operator:	CAT	CAT
Alt/FL:	FL152↓	↓FL160
Weather	VMC	VMC
Visibility:	>10km	
Reported Separation:		
	800ft V/0·25nm H	800ft V/NK H
Recorded Separation:		
	800ft V/ 1nm H OR 1000ft V/0·8nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ATR72 PILOT reports inbound to Bristol IFR at 280kt and in receipt of a RCS from Cardiff squawking 1267 with Mode C. Cleared [by London] from FL160 to FL140 they actioned this immediately with a ROD of 500fpm. An ac was observed on TCAS approaching from behind above and descending with vertical separation reducing to 800-900ft, when they were descending through FL152, which generated a TCAS TA. He spoke to Cardiff ATC to query the traffic and then the other ac, a B737, came into view in their 1 o'clock about 0·25nm away to the R. The B737 came into view just before they were going to increase their ROD but they had no instruction from ATC, just information that the B737 flight had been cleared by the previous frequency, London, nothing else. He assessed the risk as low.

THE B737 PILOT reports that no ASR was completed immediately as all the involved parties agreed that no paperwork would be generated as a result of this incident. However, a subsequent request for a report 10 days later was received and actioned. In the vicinity of TINAN they were aware of the ATR below and ahead and they believed the ATR flight reported leaving FL160 and was handed over to Cardiff Radar by London. They were subsequently cleared to descend to FL160 by London and also handed over to Cardiff. A TCAS TA 'traffic, traffic' aural alert was generated, when they were about 1500ft from their cleared level and they carried out normal actions for a TA alert by trying to visually acquire the traffic but was unsuccessful. The TCAS warning softened as the ac went into 'ALT ACQ', minimum vertical separation was 800ft (TCAS). Throughout the event the lateral separation was such that he felt that there was no significant risk and at no point did he feel the safety of any ac had been compromised.

THE LACC S6/36 TACTICAL CONTROLLER reports the ATR was descended to FL140 and after seeing its Mode C show FL156 he cleared the B737 flight, which was level at FL180, down to FL160. The B737 was approximately 1nm behind the ATR at this time and he believed that the B737 had been level for 30sec prior to the descent clearance to FL160 and was unlikely to catch the descent profile of the ATR. The B737 flight was also given a radar heading to position the ac to the W of the ATR.

THE CARDIFF RADAR CONTROLLER reports mentoring a trainee on the bandboxed Radar 1 and Radar 2 positions. Active strips were held on the ATR72 and B737 both flights estimating EXMOR at approximately the same time. LACC S6 telephoned and requested a lower level for the ATR72 so the trainee gave FL140 whilst the standing agreed level is FL160. At about 1040 the ATR72 flight reported on frequency descending to FL140 and then another flight called on the LARS frequency which was dealt with. The ATR pilot then asked if there was traffic descending 800ft above and was told by the trainee that it was the B737 descending FL160 but they could not read its Mode C as the 2 ac were garbling. The ATR72 pilot reported passing FL150 descending FL140 and

as this transmission ended the B737 crew reported on frequency levelling at FL160. The trainee asked the ATR72 crew if it was a TA or an RA to which they replied that it was a TA 900ft above and 'that it was OK'. Both flights were vectored and when the ATR72 flight was transferred to Bristol the crew reported that they would be filing a report. During a subsequent telephone conversation the ATR72 Capt stated that he would be filing a TA report.

ATSI reports that the incident took place at TINAN, approximately 17nm N of BHD on Airway N864, Class A CAS. The B737 flight was inbound to Cardiff from Malaga and had, some 9min earlier, at 1033:35, established communications with the LACC Sector 6/36 Tactical controller. The pilot reported at FL300, inbound to BHD (from the S) and was instructed to route direct to EXMOR, a track that would take it just to the E of BHD, for a landing at Cardiff.

One minute later, the ATR72 flight made its first call to the Sector reporting maintaining FL160. This flight was approaching BHD from the SE some 25nm ahead of the B737. The flight was instructed to maintain FL160 and route BHD – EXMOR for an arrival at Bristol.

The 2 flights were converging as they approached BHD and, at 1036:32, the B737 was instructed to descend to FL180, above the ATR72, still at FL160. SSR Mode S and radar derived information, indicate that the B737's GS was about 160kt faster at this point and was descending at 2200-2400fpm.

Ultimately, both flights would be transferred to Cardiff Approach, as this Unit also provides an initial service to Bristol inbounds on this route. A Standing Agreement requires that these flights be transferred to Cardiff at FL160, but on this occasion, to simplify the handling of these 2 flights, the Sector 6/36 Planner co-ordinated FL140 with Cardiff for the ATR72. As a result, at 1040:39, the Sector Tactical controller instructed the ATR72 flight to descend to FL140. By this time, the radar recording shows, the ATR72 had passed BHD and adopted a NNE'ly track towards EXMOR. The B737, meanwhile, had crossed behind the ATR72 and was now in the latter's 5 o' clock position, range 2·5nm, on a shallow converging track. It was passing FL204 Mode C, for FL180, now with a GS advantage of about 100kt. A short while later, when the B737 was passing FL195, STCA activated against the ATR72, a product most probably of the relative dynamics of the 2 ac.

At 1041:37, the B737 flight was issued with descent to FL160. In his written report, the Sector controller stated that *'…after I saw his* (the ATR72's) *mode C show FL156 I cleared* (the B737) *who was level at FL180 down to FL160',* adding *"…I believe that he* (the B737) *had been level for a 30 seconds prior to a clearance to FL160…".* In issuing the descent, the controller was applying the criteria described in MATS Part 1, Section 1, Chapter 5 Page 12, para 10.3 Level Assessment using Mode C and specifically sub para 10.3.1, b), which states *"An aircraft which is known to have been instructed to climb or descend may be considered to have left a level when the Mode C readout indicates a change of 400 feet or more from that level and is continuing in the anticipated direction"*. However, a review of radar recordings taken from different sources, reveal that when the descent clearance was given, the ATR72's Mode C was showing only FL157, a finding shared by LACC in their Unit report. Thus, based on this evidence, the descent clearance was premature. Also, there is no indication that the B737 had stopped its descent and levelled at FL180. When cleared to FL160, the B737 was passing FL183 Mode C, tracking almost parallel to the ATR72 and in its 0430 position at a range of 1·3nm. According to Mode S data, the B737 was just starting to reduce its ROD from about 2300fpm to, briefly, 1000fpm as the ac was approaching FL180, its former cleared level. Then, in response to the new clearance, the ROD increased, once more, to around 2000fpm though at one point briefly reaching 4000fpm. In contrast, the ATR72's ROD was 500fpm, which although markedly slower, nevertheless met the requirements of the UK AIP ENR 1-1-3-1 Para 2.3 Minimum Rates of Climb and Descent which states *"In order to ensure that controllers can accurately predict flight profiles to maintain standard vertical separation between aircraft, pilots of aircraft commencing a climb or descent in accordance with an ATC clearance should inform the controller if they anticipate that their rate of climb or descent during the level change will be less than 500ft per minute, or if at any time during such a climb or descent their vertical speed is, in fact, less than 500ft per minute."* In addition *"This requirement applies to both the en-route phase of flight and to terminal holding above Transition Altitude. Note: This is not a prohibition on the use of rates of climb or descent of less than 500ft per minute where necessary to comply with other operating requirements."*

The B737 flight read back its descent clearance to FL160 and then, at 1041:46, the ATR72 flight was transferred to Cardiff Approach. Twenty seconds later the B737 flight was instructed to turn L 10° onto a radar heading and also transferred to Cardiff. Meanwhile, the ATR72 pilot was calling Cardiff, reporting descending to FL140. The flight was advised the landing RW at Bristol and after a brief pause, the pilot said, at 1042:37, *"..(ATR72 c/s) confirm have traffic on our TCAS at eight hundred above descending"* to which the Cardiff controller replied *"*

(ATR72 c/s) traffic above you is a seven three seven descending Flight Level one six zero". The pilot responded *"Okay we have him visual now we're just passing one five zero this time for flight level one four zero".* At 1043, the pilot of the B737 made his first call to Cardiff, reporting level at FL160 and on a radar heading of N. Examining this sequence of events on the radar recording, the 2 ac are descending on parallel tracks a mile apart. At 1041:50, when the ATR72 is between frequencies, the vertical difference is 2300ft, the ATR72 passing FL156 Mode C and the B737 FL179. At 1042:06, when the B737 is just leaving the LACC frequency and the ATR72 is making its first call to Cardiff, the difference is 1900ft: Mode C's being, respectively, FL154 and FL173. By the time the 2 ac are abeam, at 1042:22, there is 1200ft of vertical separation: FL153 versus FL165 Mode C. Then, at 1042:38 and coinciding with the ATR72 pilot's enquiry of Cardiff about traffic 'above descending', vertical separation is eroded below the minimum required: the ATR72 passing FL152 as the B737 levels at FL160 Mode C, 800ft above. By the next radar update there is 900ft vertical separation as the ATR72 descends through FL151 Mode C. Then, at 1042:54, the ATR72 reaches FL150 Mode C in its descent to FL140. A few seconds later the B737 flight makes its first call to Cardiff Approach, by which time it had established on its radar heading which placed it in the ATR72's 0130 position at 0·8nm range, the CPA.

The Cardiff controller explained in his report that the Mode C readouts were garbling at the time the ATR72 pilot enquired about 'traffic above'. This would explain why the controller's TI omitted detail. Later, both flights were asked if they had received any TCAS activity. The ATR72 pilot responded with *"Just a TA and the closest we saw was er nine hundred above I was just little concerned that he was cleared to the level that we hadn't vacated but er no problems"* while that of the B737 said *" (c/s)… we just got a er proximity traffic warning…".*

In the LACC Unit report, the S6/36 controller's reasoning and actions were explored "Although the controller was already fully aware of the potential for confliction between the two ac, he stated that the activation of STCA whilst vertical separation still existed, reaffirmed in his mind the requirement to ensure adequate separation. He cleared the ATR72 to descend to FL140 and once he had observed it descending through (he believed) FL156, cleared the B737 flight to FL160. He stated that he based the decision to do so on his expectation that descent rates, although observed to differ, would be sufficient to ensure that separation was maintained. The controller stated that as the B737 was levelling at FL180 when he cleared it to FL160, he believed this would have resulted in a short delay before descent was recommenced and since the ATR72 had only 600ft to descend and the B737 2000ft, this would allow for any differences in rates of descent."

One month before the incident, LACC ATC Operations issued Information Notice, number 24/07. It states that Investigations "... have identified several recent losses of separation where controllers have climbed/descended aircraft before achieving the required separation. In post incident interviews individuals have stated that they felt under pressure to 'keep things moving' and acted too soon. Waiting for just a few more sweeps of the radar and thinking defensively will help prevent this type of incident occurring.

In summary, the LACC S6/36 Tactical controller did not comply with the MATS Part 1 procedure for 'Level Assessment using Mode C' when he issued the B737 flight with descent clearance to FL160. However, even if the controller had complied with the procedure, it is by no means certain that the incident would have been avoided. In view of the apparent marked contrast in rates of descent between the subject ac, it would have been prudent for the controller to wait until, say, the ATR72 had reached FL150 before instructing the B737 to descend to FL160.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Pilot Members agreed that both crews were operating in accordance with the Rules of the Air, the ATR crew had commenced their descent from FL160 at 500fpm whilst the B737 crew had descended with a much higher ROD, their greater speed resulting in an 'overtaking' situation. The B737 crew's selected A/P descent mode would have allowed the ac's ROD to be maintained until about 200ft to go to its selected FL, before reducing its ROD. An ATCO Member opined that the current rules and regulations were sometimes misinterpreted when controlling flights based on when an ac is 'leaving' a level, 'has left', or when it has 'vacated' a level. The S6/36 controller reports he had waited until he had seen the ATR72's Mode C indicate FL156, and had therefore 'vacated' FL160 in accordance with established protocols, before issuing the B737 crew with clearance to FL160. The MATS Part 1 also allows the controller to descend the higher ac to the previously occupied lower level when the preceding

ac's pilot reports leaving that level on RT. However, both of these available techniques do not ensure that standard separation will be maintained during the level change phase. Another ATCO Member believed that the ATSI report was overly critical when judging that the ATR's label was showing FL157 at the time when the B737 was issued with descent clearance. Aware that both radar and RT timings had an acceptable tolerance of + or - 15sec, the Member was not convinced that the S6/36 had incorrectly assimilated the ATR72's Mode C readout as he would have been closely monitoring the situation, with STCA activated and had stated seeing FL156 on the display. However, LACC Investigations had also assessed this aspect, by reference to the 'workstation' recorded data viewing the radar as displayed to the controller coincident with the RT replay, and this concurred with the ATSI findings. That said, it was accepted that the S6/36 controller was mistaken in his belief that the B737 had levelled at FL180, as the radar data clearly showed that it was still in a descent approaching FL180 when further clearance to FL160 was issued - a momentary reduction in the ac's ROD being shown before it resumed its 2000fpm descent flightpath. With such disparate relative rates of descent - 500fpm for the ATR72 that was below the B737 – this had then resulted in a TCAS TA being generated, with both crews seeing 800ft vertical separation, leading to the Airprox being filed by the ATR72 crew. Members agreed that controllers should always take into account the subject ac's vertical flight profiles and make allowances before issuing clearances, to ensure that separation will subsequently be maintained. One Member opined that the S6/36 controller had been just a little too 'slick' in issuing the B737 flight with descent clearance, perhaps assuming that the 2 ac would remain separated without anticipating that the differing RODs would result in separation margins being slightly eroded. Two ATCO Members added that with applicable Mode C tolerances of +/– 200ft, it could be viewed that separation was not technically, lost. However, the radar data and TCAS equipment indications showed that the B737 had levelled at FL160 as the ATR72 was descending through FL152 for FL140, the B737 having already passed 1nm to the R of and slightly ahead of the ATR. These factors, when combined with the visual sightings by the ATR72 crew, were enough to persuade the Board that no risk of collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

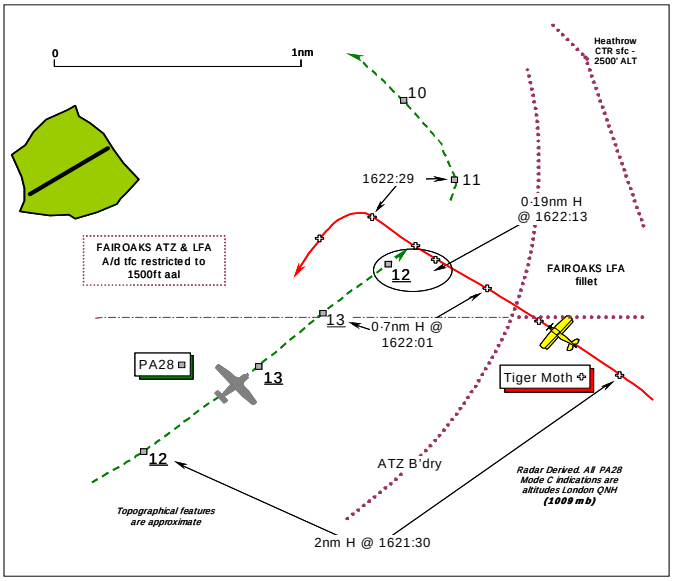
Cause: The relative rates of descent of the 2 ac resulted in a TCAS TA.

Degree of Risk: C.

AIRPROX REPORT No 104/07

AIRPROX REPORT NO 104/07

Date/Time:	22 Jul 1622 (Sunday)	
Position:	5120N 00031W (1·4nm ESE of Fairoaks Aerodrome RW24 Cct - elev 80ft)	
Airspace:	Fairoaks ATZ	(Class: A)
	Reporting Ac	*Reported Ac*
Type:	PA28	Tiger Moth
Operator:	Civ Trg	Civ Pte
Alt/FL:	1100ft	1500ft
	QNH (1012mb)	QNH
Weather	VMC COCISOS	VMC NR
Visibility:	10km+	10km+
Reported Separation:		
	100ft V/Nil H	60ft V/Nil H
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA28 PILOT, a flying instructor, reports that he was flying in the LH cct pattern to RW24 at Fairoaks Aerodrome and was in receipt of a FIS from Fairoaks INFORMATION on 123·425MHz. A squawk of A7000 was selected with Mode C on.

Flying level at 1100ft QNH (1012mb), heading 060° on the DOWNWIND leg, approaching a position abeam the RW24 threshold at 90kt, a single-engine yellow bi-plane – the Tiger Moth - was spotted in his 2 o'clock [he later opined it was <100yd away] as it approached his ac on a collision source at the same altitude. It was apparent that the bi-plane pilot had become visual with his PA28 first and taken avoiding action by climbing above his monoplane. He elected to descend below the Tiger Moth which passed 100ft directly above his PA28 with a *"very high"* risk of a collision.

The bi-plane pilot was not in radio contact with the Fairoaks FISO or Farnborough Radar as it turned and headed off WSW towards Farnborough Aerodrome.

THE de HAVILLAND DH 82a TIGER MOTH PILOT provided a very frank account reporting that his vintage aeroplane is coloured yellow and RT is not fitted. Whilst in transit under VFR from Redhill to a farm strip in a level cruise at about 1500ft amsl, he thought just to the S of Fairoaks heading 280°(M) at 75kt, the PA28 was spotted 100yd away in his 11 o'clock and at his altitude. To avoid the PA28 he initiated an immediate climb. The other ac passed 60-70ft below his Tiger Moth with a "high" risk of a collision.

Adding that he had flown too close to Fairoaks he freely admitted that he had infringed their ATZ. Cockpit distraction, whilst flying toward the Sun and maybe over-familiarity with the route were cited as significant factors. Candidly, he observed that this Airprox was a salutary "wake-up" call for him.

UKAB Note (1): In his original written submission, the Tiger Moth pilot reported descending immediately to avoid the PA28. However, after further discussion by UKAB staff with the pilots involved, the Tiger Moth pilot concluded that he might well have actually climbed to avoid the other ac and opined that he remembers seeing the PA28 below him after the Airprox as it drew aft in his 4 o'clock. Confirmation by the PA28 pilot that he instinctively descended below the Tiger Moth to avoid it coupled with the data from the radar recording also suggests this is what actually occurred.

THE LTCC SVFR controller at the time of the incident reports he was alerted to the ac by Fairoaks who called asking if he had any details on a yellow biplane which had just had a 'near miss' with one of their ac. He said he

had no details but saw a primary-only contact SW of their aerodrome. This ac started to track NW and cut the corner of the Heathrow CTR, following the Zone boundary albeit just the wrong side of it. The ac then disappeared from radar once outside the Zone so he could not track it any further.

UKAB Note (1): The UK AIP at AD 2 EGTF-1-3 para AD2-17, notifies the Fairoaks ATZ as a radius of 2nm centred on RW06/24, extending from the surface to 2000ft above the aerodrome elevation of 80ft amsl. An aerodrome FIS is provided on Sundays, in Summer, between 0800 – 1700.

Furthermore, it is specified within AD 2.22 – Flight Procedures that the ATZ lays partly within the [Class A] London CTR and a Local Flying Area (LFA) exists of 2nm radius with fillets to the east concomitant with the ATZ. That part of the ATZ above 1500ft aal is ceded to London Heathrow.

Within the LFA flights may take place without compliance with IFR requirements subject to the following conditions:

i Aircraft to remain below cloud and in sight of the ground;

ii Maximum altitudes: 1500ft QNH;

iii Minimum flight visibility: 3 km.

However, it is further specified at AD 2.20 - Local Traffic Regulations - para 1c that the aerodrome/ATZ is not available to ac unable to communicate by radio.

UKAB Note (2): The "Rules of the Air regulations 2007" at Rule 45 require that within an ATZ:

(2) An aircraft shall not fly, take off or land within the aerodrome traffic zone of an aerodrome unless the commander of the aircraft has complied with paragraphs..(4)..as appropriate.

(4) If the aerodrome has a flight information service unit the commander shall obtain information from the flight information service unit to enable the flight to be conducted safely within the zone.

(6) 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;

UKAB Note (3): The UK AIP at ENR 1.4 - 2.7.2.3 stipulates that pilots should be aware that in order to comply with the provisions of Rule [45] they must adopt the following procedures:

(a) ***Before*** *taking off or landing at an aerodrome within an ATZ or transitting through the associated airspace, obtain the permission of the air traffic control unit, or where there is no air traffic control unit, obtain information from the flight information service unit…to enable the flight to be conducted with safety.*

(c) Non-radio aircraft operating within a notified ATZ must comply with any conditions prescribed by the air traffic control unit, flight information unit or air/ground radio station prior to the commencement of the flight with any instructions issued by visual means.

Furthermore at 2.7.2.4,

Failure to establish two-way radio communications with the air traffic control unit, flight information unit or air/ground radio station during their notified hours of operation must not be taken as an indication that the ATZ is inactive. In that event, except where the aircraft is in a state of emergency or is being operated in accordance with radio failure procedures, pilots should remain clear of the ATZ.

UKAB Note (4): The Heathrow Radar recording does not illustrate this Airprox clearly as the PA28 is not shown at the critical point. However, the PA28 is shown squawking A7000 on the DOWNWIND leg for RW24 passing

abeam the UPWIND threshold at 1621:30, within the Fairoak's ATZ at an altitude of 1200ft London QNH (1009mb) unverified Mode C. At this point the primary contact associated with the Tiger Moth biplane is shown approaching the ATZ/LFA boundary from the SE at a range of 2nm from the PA28. The biplane crosses the ATZ/LFA boundary on a steady NW'ly track and closes on a steady relative bearing to a range of 0·7nm at 1622:01, when it is shown still in the PA28 pilot's R 1 o'clock as the latter indicates 1300ft London QNH. The last return evident from the PA28 before the Airprox was at 1622:13, when the ac's Mode C indicates 1200ft London QNH (1009mb) – about 1290ft (1012mb). At this point the Tiger Moth is still in the PA28 pilot's R 1 o'clock at range of about 0·19nm – just under 400yd. The Tiger Moth pilot broadly maintains his course until after the Airprox whence at 1622:29, the biplane turns sharply L SW'ly. It is at this point that the PA28 is shown again at 1100ft London QNH unverified Mode C as the aeroplane commenced a L turn onto BASELEG for RW24 and descended. Thus with only the biplane evident throughout the encounter it is not feasible to ascertain the minimum separation independently.

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 a report from an air traffic controller.

From the reporting pilot's perspective it was evident that he was legitimately operating in the cct at Fairoaks where the associated ATZ is designed to afford a measure of protection to ac in the critical stages of landing and take-off. Members also recognised that whilst instructing in the cct, an instructor's workload is significant. Clearly therefore, the focus of the PA28 instructor pilot's attention would have been on how his student was flying the ac DOWNWIND; his position in the traffic sequence preparatory to turning onto BASE LEG and thence to FINALS, perhaps concentrating somewhat on the runway to his L. It was not surprising, therefore, that the PA28 pilot had spotted the Tiger Moth approaching from his starboard side at a relatively late stage. Moreover, the PA28 pilot would naturally have expected any other pilots flying in the ATZ to announce their arrival on RT in accordance with normal practise at Fairoaks, where non-radio ac are not accepted. Nevertheless, this was a reminder to all pilots that ac are still operated without radios or can experience radio failure at awkward moments. Here was a salutary lesson and highly experienced pilot Members pointed out that maintaining an all-round scan – even into areas were ac might least be expected - was one of the principle tenets of sound airmanship. Nonetheless, the PA28 pilot's candid account had revealed that when he did spot the biplane he took robust action to avoid it, albeit that the latter's pilot was apparently already climbing above his ac, he said.

Whether it was still wise to operate without a radio – and here the Board was reminded that many pilots flying ac without generators use handheld devices - was debateable. A GA pilot Member opined that a high level of traffic can be encountered in this vicinity – outwith the ATZ beneath the London TMA - so arguably this is not a good place to be without a radio.

Whilst in transit under VFR it was plain that the Tiger Moth pilot was, therefore, entirely responsible for sighting and avoiding other ac in this 'see and avoid' environment. The Tiger Moth pilot's frank and honest account had revealed that whilst he had inadvertently strayed into the Fairoaks ATZ/LFA whilst in transit from Redhill, it was clear that he should not have done so. A navigational error seemed unlikely if he had flown this route before, with many prominent landmarks to help pilots pinpoint their location, or perhaps he had just flown closer to Fairoaks than he had realised. Whatever the reason the Tiger Moth pilot's honest account, coupled with the recorded radar data had revealed he had definitely infringed the Fairoaks ATZ. However, having entered this airspace unannounced, without authorisation, he should still have seen the PA28 a lot earlier than he did. As it was, the Tiger Moth pilot had reported that he had not spotted the PA28 to port until it had closed to a range of 100yd thereby flying into conflict at close quarters. Following this comprehensive debate, the Board concluded unanimously that this Airprox had resulted because the Tiger Moth pilot entered the Fairoaks ATZ in contravention of Rule 45 of the Rules of the Air Regulations 2007 and flew into conflict with the PA28.

Turning to risk, the highly experienced GA pilot Member – who was familiar with biplanes – explained the inherent limitations when endeavouring to conduct an 'all-round' lookout scan. Clearing the large blind-spots caused by the upper mainplane, fuel tank and the struts was essential and to do so meant moving the biplane around. This coupled with the limited forward visibility required a strict lookout regime and a routine decidedly different to that of a more conventional monoplane. Thus this Airprox was a salutary reminder of what can occur as a result of these difficulties and often those not regularly used to the 'eccentricities' of biplanes can unknowingly get out of practise quite quickly. The PA28 closing from the port side at the same relative altitude should have been apparent beforehand - for it was plainly there to be seen as was the biplane. But apparently both ac were on a steady

relative bearing to one another so the lack of relative movement had also masked their presence from each other's pilot until the last moments. Fortuitously, the PA28 pilot elected to descend clear below the Tiger Moth which, he recognised, had already started to climb. It was not clear from the recorded radar data if this descent made any appreciable difference to the separation at these close quarters, as the PA28's Mode C indications were lost for a short while, but this loss of contact itself might be indicative of the robust nature of the PA28 pilot's avoiding action. Both pilots agreed that there was no horizontal separation at all when the two tracks crossed and the vertical separation – reported to be between 60-100ft – clearly did little to assure safety at this height. However, this all happened at relatively low speed – the PA28 flying at 90kt and the biplane crossing at about 75kt. So whilst the sighting of each other's ac was at a very late stage, both pilots had time to accomplish sufficient avoiding action to avert an actual collision. Consequently, the Board agreed unanimously that the safety of the ac involved had indeed been compromised.

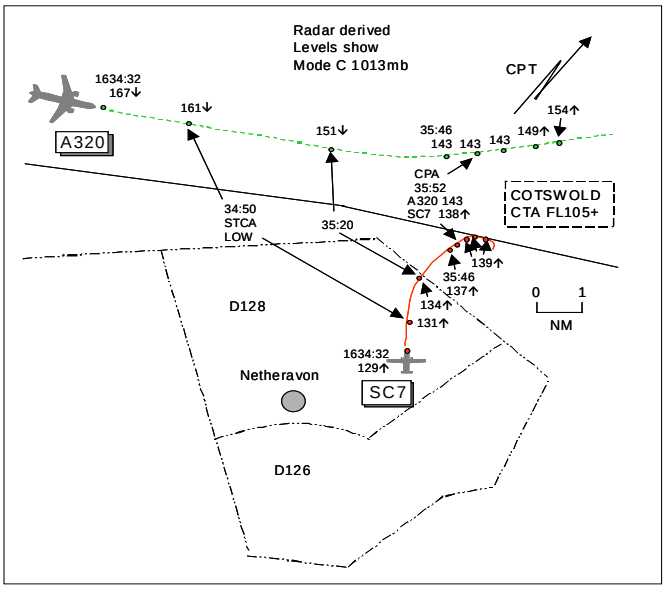
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Tiger Moth pilot entered the Fairoaks ATZ in contravention of Rule 45 of the Rules of the Air Regulations 2007 and flew into conflict with the PA28.

Degree of Risk: B.

AIRPROX REPORT NO 105/07

Date/Time:	21 Jul 1636 (Saturday)	
Position:	5120N 00139W (19nm SW CPT)	
Airspace:	Cotswold CTA/FIR(Class: A/G)	
	Reporting Ac	*Reported Ac*
Type:	A320	SC7 Skyvan
Operator:	CAT	Civ Club
Alt/FL:	FL150↓	NR
		(N/K)
Weather	IMC CLAC	VMC CLOC
Visibility:	6km	'unlimited'
Reported Separation:		
	500ft V/2nm H	Not seen
Recorded Separation:		
	500ft V/2·2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A320 PILOT reports heading 105° at 220kt inbound to Heathrow and in receipt of a RCS from London squawking with Mode S. They were cleared to FL140 to be level 40nm before OCK. Descending through FL170 they noticed traffic on TCAS in their 1 o'clock 3000ft below and climbing. They reduced their ROD but approaching FL150 they received a TCAS TA and informed ATC. They were instructed to take avoiding action 'L heading 085°, climb now FL160, expedite'. At the time they were 500ft above a cloud layer with 6km visibility so were unable to visually acquire the other ac but it was seen on TCAS to pass 2nm to their R and 500ft below. He assessed the risk as low.

THE SC7 SKYVAN PILOT reports carrying out paradrop sorties within 10nm radius of Netheravon and in communication with Netheravon squawking 0033 (paradrop ac conspicuity code) with Mode C. He was unaware of any Airprox until being contacted following tracing action but provided his recollection of the days activities. The visibility was unlimited in VMC conditions flying above few/sct cloud with tops 5000-6000ft. Various airliners had

been observed throughout the day but none seemed to have been particularly close at any time. In any case, his ac remained clear of CAS at all times, the ac being fitted with GPS moving-map navigation equipment with a current update.

THE LTCC SW DEPS/OCK SC reports mentoring a trainee when the A320 flight was transferred to his frequency descending to FL140. As the flight was passing FL150 a 0033 squawk was spotted at FL130 and climbing just outside the Cotswold CTA but on a heading to intercept. The 0033 squawk was expected to turn away but as a precaution TI was passed to the A320 flight and a L turn of 20° was issued. The A320 crew reported having the other ac on TCAS. The 0033 squawk continued on its track, penetrating, he thought, the Cotswold CTA whilst indicating FL133. The A320 flight was instructed to stop its descent at FL145 but the next radar sweep showed the A320 at FL143 and the 0033 squawk at FL135. The mentor issued an avoiding action expedite climb to FL160 to the A320 flight as there was another ac on a crossing track 10nm ahead, he thought [actually 20nm], at FL150.

ATSI comments that for an unexplainable reason the request for transcript was not followed through and the recordings are no longer available. However, the LTCC report covers the situation.

The LTCC SW DEPS/OCK sectors were being operated by a mentor and trainee. The A320 flight, inbound to Heathrow, established communication with the sector, at 1634:19, reporting descending to FL140. After talking to another flight the trainee informed the pilot (1634:35) it was standard speed with a delay of 10-15min. At the time there were three ac squawking 0033 (ac paradropping) in the Salisbury Plain Danger Areas D126 and D128 to the NE of Boscombe Down. The subject SC7 was 9nm SE of the A320, tracking N, climbing through FL129. STCA activated at 1634:50 when the subject ac were 7nm and 3000ft apart. At 1635:20, the trainee instructed the A320 flight to turn L heading 085° and passed TI about an unknown 3 o'clock, indicating FL135. The pilot reported sighting the traffic on TCAS and was instructed to stop its descent, if possible, at FL145. Shortly afterwards, the mentor issued the A320 flight with an avoiding action climb to FL160. By now (1634:46), the subject ac were 2·3nm and 600ft apart, the SC7 was tracking NE approaching CAS. The CPA occurred at 1635:52 with separation showing 2·2nm/500ft. The SC7 then turned R, at the CAS boundary, onto a S'ly track. The mentor/trainee spotted the possibility that the SC7 might enter CAS and took action to vector the A320 away from it but in the event, the SC7 did not enter CAS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

An ATCO Member familiar with LTCC operations opined that in his experience paradrop ac usually didn't fly so close to the edge of CAS during operations from Netheravon. Although the SC7 was operating legitimately in Class G airspace, Members believed that it would have been prudent for its pilot to manoeuvre his ac further away from the boundary to the Cotswold CTA, thereby giving CAS operations a wider berth. With the accuracy and confidence that the use of GPS equipment allows, the pilot had flown up to boundary of the Cotswold CTA with reference to his moving map display before turning away, which resulted in this incident. In cases like these, separation between GAT and traffic operating in the FIR is 'deemed' to exist with the ac in CAS – here the A320 - remaining at least 2nm from the edge (within) Class A airspace whilst the other traffic – the SC7 - remains outside CAS. Here the SC7 pilot's chosen flight path had generated a TA alert on the A320 flightdeck and activated STCA at LTCC. The SW DEPS/OCK SC was concerned by the SC7's flightpath as he had no way of knowing if the SC7 was going to penetrate CAS or when it was going to turn to avoid. The SC had acted defensively and initially given the A320 flight a L turn and TI, the crew reporting TCAS 'contact'. The SC had then stopped the A320's descent before wisely issuing an 'avoiding action' climb to FL160. This turn had ensured the A320 remained at least 2nm within CAS and increased the separation distance at the CPA and only after the subject ac has passed did the SC7 pilot turn away, unconcerned by the presence of any airliners he might have seen passing to the N. The A320 crew were undoubtedly concerned by the developing situation, as the approaching SC7 was eroding standard separation minima of 1000ft vertically and 5nm horizontally. The crew had followed the ATC instructions but were unable to acquire the SC7 visually owing to cloud. However, in light of the unknown intentions of SC7 pilot, the SC had acted promptly and effectively, so that 'deemed separation' was maintained throughout the encounter. This persuaded the Board that this had been a perceived conflict at the boundary of CAS and that safety had been assured throughout.

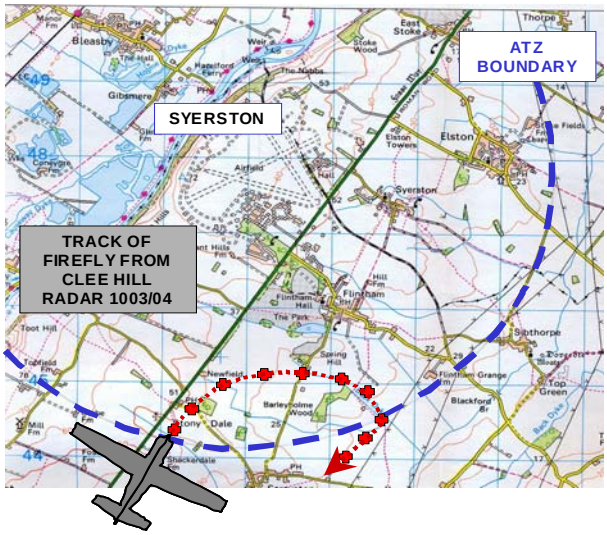
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Perceived conflict at the boundary of CAS.

Degree of Risk: C.

AIRPROX REPORT NO 106/07

Date/Time:	27 Jul 1003	
Position:	5300N 00054 W (1nm SE Syerston)	
Airspace:	Syerston ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	DR400	Firefly 260
Operator:	HQ AIR (Trg)	HQ AIR (Trg)
Alt/FL:	800ft	2500ft↓
	(QFE NR mb)	(RPS NR mb)
Weather	VMC CLBC	VMC Good Visibility
Visibility:	>10km	>10km
Reported Separation:		
	300ft V/300m H	300ft V/½nm H
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DR400 PILOT reports flying a leased yellow and white ac, operated under military regulations, on behalf of the Air Cadets Central Gliding School. He was flying under VFR, squawking 7000 with Mode C [he thought] and was rejoining the circuit from the SW, heading 070° at 90kt, when he saw a yellow Firefly ac approaching the circuit area from the SE. The Firefly manoeuvred and descended within the ATZ towards Newark and he then lost sight of it for about 30sec. He next saw it in his 1 o'clock position below his height flying in the opposite direction while he was downwind for RW25 at 800ft agl. The Firefly was later observed heading towards Bottesford VRP [6nm SE]. He reported the incident to the A/G Operator but did not take any avoiding action as he assessed the risk as being Low.

THE FIREFLY 260 PILOT reports flying a yellow and black ac on a student training flight with all lights switched on and squawking 2641 with Mode C. The student was flying a PFL into a field and due to their proximity to Syerston he called them on VHF but received no reply. He saw a glider/tug combination climbing out from Syerston and on release of the tow the tug broke to the right towards Syerston. The tug passed down their right hand side about 300ft above and half a mile to the West and there was no risk of collision therefore no avoidance was taken.

UKAB Note (1): Syerston is promulgated in the UKAIP ENR 2-2-2-4 as an ATZ circle 2nm centred on the longest notified RW up to 2000ft aal. It is active from 0830-sunset (1hr earlier in the Summer). It is a Government Aerodrome with an A/G service.

UKAB Note (2): Rules of the Air Rule 12 requires that ac conform to the traffic pattern or keep clear of the airspace in which the pattern is formed and make all turns to the left.

UKAB Note (3): Rules of the Air Rule 45 in theses circumstances requires that an ac commander shall obtain information from the A/G communication service to enable flight to be conducted safely within an ATZ.

AIRPROX REPORT No 106/07

UKAB Note (4): An analysis of the Claxby radar shows numerous ac squawking 7000, none with Mode C, in the vicinity of Syerston and the Firefly squawking 2641 with Mode C initially at FL015 but descending, operating just to the S of the Airfield. No ac can be seen with a track that matches that described by the Robin pilot so the Secretariat contacted him to verify the details, which he did, and provided further amplification. It is assumed therefore that the Robin did not show on radar. It is clear however that the Firefly did enter the Syerston ATZ, encroaching by just under ½nm, in a right hand orbit, probably during the PFL.

HQ AIR Trg comments that the Firefly crew tried to contact the A/G Operator at Syerston but had received no reply and subsequently continued to operate so close to the edge of the Syerston ATZ that they entered the Zone whilst flying a PFL profile. However, both crews saw each other and considered the risk of collision as low or none.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both ac, a radar video recording and reports from the appropriate operating authorities.

The Board was not able to resolve the apparent differences between the DR400 (reporting) pilot's report and the radar tape. It seemed that either the former was not accurate or the DR400 was not squawking, as the pilot reported, since other ac operating in the immediate area and at the same alt were visible on the recording. If the DR400 had not been squawking it was thought likely by some Members that the combination would not have showed on the radar due to their non-metal construction. The only unidentified 7000 squawk in the area appeared to join downwind right-hand for RW25 i.e. on the far side of the ATZ about 1-1½ nm from the position of the Firefly. The Board emphasised that non-receipt of a response to a request for information to enter an ATZ must not be seen by pilots as a sign that the ATZ is not active as this incident clearly shows; in such cases the ac must remain clear.

Since, however, both pilots considered the risk to be low/none and despite the Firefly entering the ATZ contrary to the Rules of the Air, the Board considered this to be a sighting report by the DR400 pilot.

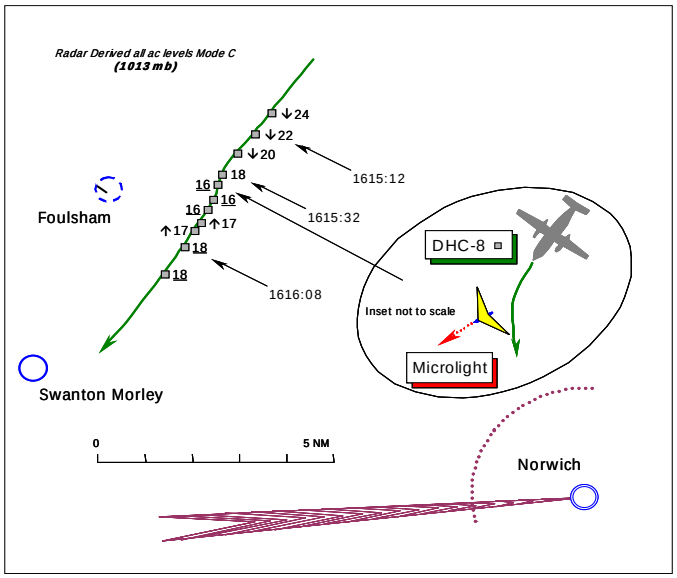
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A sighting report of traffic on the boundary of the Syerston ATZ.

Degree of Risk: C.

AIRPROX REPORT NO 107/07

Date/Time:	31 Jul 1615	
Position:	5248 N 00104 E (11nm NW of Norwich - elev 117ft)	
Airspace:	London FIR	(Class: G
	Reporting Ac	*Reported Ac*
Type:	DHC-8	Pegasus 912
Operator:	CAT	Civ Pte
Alt/FL:	2000ft	2500ft
	QNH (1019mb)	QNH (1016mb)
Weather	VMC CLBC	VMC CAVOK
Visibility:	10km	10km+
Reported Separation:		
	100ft V	NR
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE de HAVILLAND CANADA DHC-8 PILOT reports he was the PNF whilst inbound to Norwich IFR at 220kt and in receipt of a RAS from Norwich APPROACH (APR) on 119·35MHz. A squawk of A7352 was selected with Mode C. Following radar vectors to avoid other traffic, which resulted in them flying out over the N Sea, the APR issued a heading inland of about 250°. With the 1st Officer flying the ac level at 2000ft Norwich QNH (1019mb) [UKAB Note: The radar recording indicates the ac had just levelled at 2000ft QNH] at a position 313° NWI (NORWICH Locator) 10·6nm - still heading 250° - an unidentified microlight ac was first spotted 200m directly ahead on what he perceived to be a direct collision course at their altitude. He immediately took control of the ac, disconnected the autopilot and carried out an avoiding action descending L turn as the Microlight – it had a light coloured wing with a darker coloured body - passed about 100ft directly above them with a *"high"* risk of a collision. Norwich ATC was informed but they had no radar contact beforehand, however, they advised it was seen on radar intermittently after the incident. He added that his ac's windscreen was quite dirty at the time.

THE PEGASUS QUANTUM 15 912 MICROLIGHT (ML) PILOT reports his flying machine has a blue/yellow high visibility wing & blue 'trike'; SSR is not fitted. Flying VFR on a direct track between Cromer (Northrepps) and Sutton Meadows at 50kt in CAVOK conditions he was receiving a FIS from Marham as he was intending to cross their MATZ. Heading 240°(M), he thought abeam Swanton Morley, in a level cruise at 2500ft QNH (1016mb), the DHC-8 appeared from directly behind and some 500ft below his ac, thus by the time he saw the DHC-8 it had overtaken his ac and there was no avoiding action to be taken. He stressed that he could not have seen the other ac beforehand, as visibility to the rear in a microlight is "NIL".

Observing that at the point of the Airprox the DHC-8 had about 15nm to run to Norwich, he is unsure why the ac would have been vectored that low when the descent profile could have placed it much higher at that range. This is a very popular VFR route between Cambs/Herts/Essex and coupled with the amount of microlight and glider airfields in the vicinity he does not understand the requirement to place (high speed commercial traffic) that low 15nm out in uncontrolled airspace when there is a known potential of high density non-SSR, non-radio ac.

He opined that commercial crews should be reminded that non-SSR ac (of which there are many) will not be displayed on TCAS, therefore, a good lookout should be maintained - especially in uncontrolled airspace.

THE NORWICH APR reports that he was acting as OJTI whilst screening a trainee, who was vectoring the DHC-8 at 2000ft QNH (1019mb) for an 8nm FINAL to RW09. At a position some 10nm NW of Norwich the crew reported taking avoiding action against a microlight. The DHC-8 pilot advised that the microlight was at the same level coming straight towards him at a similar level. No contact that might correspond to the microlight was observed

on the radar consoles until after the event had occurred, when an intermittent return was shown. The minimum separation reported by the pilot was 100ft.

ATSI reports that a trainee and mentor were operating the Norwich APR position. From the time the DHC8 crew established communication with Norwich APPROACH at 1602, until it reported its close encounter with a microlight at 1615, no transmissions were made to, or from, any other traffic. The DHC8 was being provided with a RAS, outside CAS, on its approach to RW09 at Norwich and had been given avoiding action and traffic information concerning other traffic in its vicinity. At 1614, the DHC8 was heading 220° and was given descent to 2000ft. Just after 1615:30, the pilot reported *"we just had to…serious avoiding action sir a microlight just went overhead"*. At 1615:43, ATC responded *"roger nothing observed on radar"*. The pilot was informed 2min later, after asking if the microlight could be seen on the radar*, "affirm it's just..it's intermittently painting now since..since you passed that section we had a couple of..returns on it and it's dropped off again"*.

Although providing a RAS to the DHC8, it was not possible for the APR to issue any avoiding action instructions because the microlight was reported as not showing on the radar display.

UKAB Note (1): This Airprox is not illustrated by the Cromer Radar recording as the microlight is not shown at all. The DHC-8 is shown approaching the vicinity of the reported Airprox location heading 220° descending through 2200ft (1013mb) at 1615:12. Some 20sec later the DHC-8 is shown level at 1800ft Mode C (1013mb) – equating to about 1980ft Norwich QNH (1019mb). On the next sweep a sudden descent to 1600ft (1013mb) is evident at a position 11nm NW of Norwich, coupled with a L turn which is probably indicative of the DHC-8 crews reported avoiding action descending L turn that occurs at the reported Airprox location and broadly coincident with the timing of the RT report to the Norwich APR. This level is maintained for several successive sweeps until a climb is evident through 1700ft, before level flight is resumed at 1800ft (1013mb) from 1616:08, and maintained thereafter.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was evident to the Board that both pilots were operating legitimately in Class G airspace and, from the Pegasus ML pilot's account, that he was merely on a VFR transit when the DHC-8 crew encountered his flying machine as they approached it from astern. But Class G airspace is not the exclusive preserve of any airspace user and pilots should be prepared to act when they encounter any form of legitimate aviation activity within the FIR. Members noted that the ML pilot had commented about the supposedly low altitude of the DHC-8 whilst it was being vectored in the Norwich pattern, but the ATSI advisor to the Board contended that this was not unusual at all and provided it is in accord with the stipulated minimum vectoring altitudes for IFR traffic (generally 1600ft amsl within 16nm of Norwich) it is not uncommon at all for CAT ac to be vectored in the approach pattern at the levels illustrated here. It was plain from the Norwich OJTI's account that his trainee was vectoring the DHC-8 for an 8nm FINAL when the ac was descended to 2000ft QNH and the recorded radar data confirmed this was broadly the case. Furthermore, it was reported by ATSI that the APR and his trainee had not been presented with any radar returns which might have warned them of the presence of the small ML, which are especially difficult to detect on radar. Some Members considered it was unfortunate that the ML pilot had chosen to call Marham at this stage rather than Norwich, as his intended course lay through the FAT to RW09. If he had called on RT, the APR might well have been able to give a general warning to the DHC-8 crew as to the presence of the ML, furthermore the latter's pilot might also have deduced that the DHC-8 was being vectored at these altitudes. However, with no evidence displayed to them from the SRE that the ML was in the vicinity, the APR and his trainee were unable to proffer any avoiding action under the RAS provided to the DHC-8 crew whatsoever.

For his part, the DHC-8 pilot reported he had spotted the ML at a range of 200m. Some members postulated that this was a late sighting. However, other pilot Members commented that given the small cross-sectional area of the ML and the difficulties of detecting slow moving ac, viewed from astern through an apparently dirty windscreen, the DHC-8 pilot did well to spot it when he did. Evidently the ML was flying a similar course when the DHC-8 pilot spotted it, not flying towards him as he thought. In fact, the DHC-8 was overhauling the ML at a closing speed in the order of 170kt and the Board agreed that the ML pilot would have been hard placed to spot the DHC-8 approaching from directly astern. Thus there was little the Pegusus pilot could have done to forestall this close quarters encounter. Members agreed that the DHC-8 pilot's lookout scan had detected the ML just in time to

enable him to take control of his ac and take robust and effective avoiding action. Therefore, the Board agreed unanimously that this Airprox had resulted from a conflict in the FIR, which had been resolved by the DHC-8 pilot.

This avoiding action was replicated by the radar recording, but unfortunately without SSR data from the ML it was not possible to confirm the minimum separation that pertained here. However, there was no reason to doubt the veracity of the DHC-8 pilot's account, which stated that his ac passed 100ft below the ML at the closest point as the latter's pilot would not have seen it until it was passing clear below. It was indeed fortunate that the DHC-8 pilot spotted the small ML when he did, allowing him to turn away and descend thereby averting any actual risk of a collision. However, at the distances reported here with only one of the pilots involved able to take effective action, the Board agreed unanimously that the safety of the ac involved had certainly been compromised.

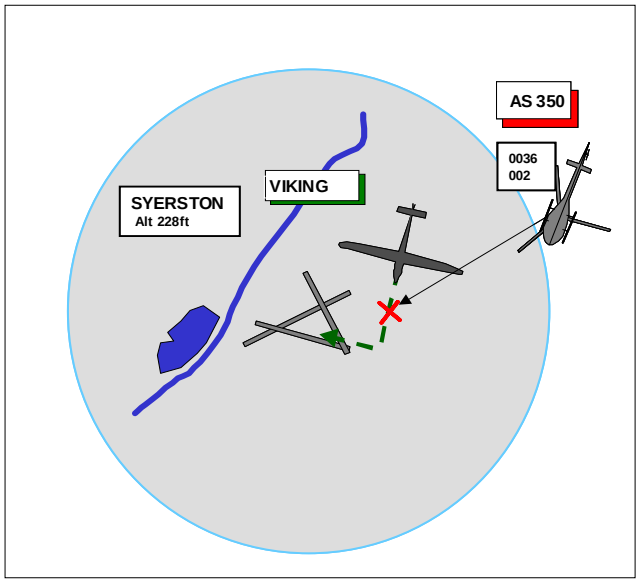
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in the FIR resolved by the DHC-8 pilot.

Degree of Risk: B.

AIRPROX REPORT NO 108/07

Date/Time:	2 Aug 1443	
Position:	5301N 00055W(¼nm APP RW30 RAF Syerston - elev 228 ft)	
Airspace:	Syerston ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Viking T1 Glider	AS350
Operator:	HQ AIR (Trg)	Civ Trg
Alt/FL:	350ft	50-100ft AGL
	(QFE NR)	(N/K)
Weather	VMC NR	VMC CLBC
Visibility:	>10km	>10km
Reported Separation:		
	300ft V/0 H	NR
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VIKING T1 GLIDER PILOT reports flying an instructor training flight from Syerston. While on the base leg for RW30 he saw a helicopter hovering at tree height about ¼nm out on the final approach. The Duty Instructor was talking to the helicopter and made repeated requests for him to vacate the area immediately, however it continued to manoeuvre directly in his path. He was at 350ft AGL and maintained this height until he was clear of the helicopter and delayed opening the airbrakes to ensure maximum vertical separation, which caused him to land long. Due to his manoeuvre he assessed the risk of collision as being low.

THE AS350 PILOT reports that while carrying out low-level power line patrols in the Newark area, he contacted Syerston Radio as he had a line to patrol that ran up to the airfield boundary from the NE. He passed his details and a brief description of his intentions which included his height on patrol as being generally 50ft agl but up to 200ft and his route as working along a power line towards the airfield from the NE right up to the airfield boundary. He requested airfield information and any traffic and a response came from someone who used an undecipherable call sign. He was passed the RW in use, the QFE, the fact they were cable-launching gliders to the W, that a motor glider had left the circuit to the W and that apart from that ac Syerston had *"no reported traffic in the circuit"*.

His workload was high but he continued to monitor the frequency as he worked his way very slowly to the ATZ boundary where he made another call, again stating his position and intentions in full but this was acknowledged only by a single click of the transmit button by Syerston Radio. At 1nm to the NE of the field he made yet another call stating his position level and intentions and continued his patrol inbound. At about ½ mile from the airfield he received an anonymous call stating, *"there is a glider behind you!"* which he acknowledged and looked but as it was behind him he was unable to see it. He was still at his patrol height of 50–100ft agl and flying at around 20kts and he continued a little further into an open area where he stopped and made a lookout turn and saw a glider passing over the threshold of RW25 [he thought]. He was S of the centre line and very low and at that point not in conflict to the glider. He cannot comment on how close the glider came to him, as he was unable to see it as it was behind him. He assessed the risk as being low.

He was then told by someone who would not identify himself on the Syerston Radio frequency that he was in an active ATZ without permission and he should have called the Tower (he had done so several times in the last 15min).

He is aware of the regulations in the ANO which state that an A/G operator cannot offer a clearance over the radio and therefore cannot refuse entry to an ATZ but had they told him that they were very busy (which they did not – quite the opposite) and that it was not suitable for him to conduct the inspection then he would not have inspected that part of the line or would have returned at more convenient time.

After being asked to leave the ATZ he did so and returned to Wickenby. He made several attempts to make contact with Syerston by telephone but got no answer so he left a message on their answer-phone.

In his opinion there were several things that lead to this situation, namely:

While talking to Syerston Radio after the first call he received no further information from them regarding inbound traffic; the last information passed was that the circuit was clear which was no longer accurate. Further he had made regular calls to them giving his position and intention but received no responses.

The glider pilot made no VHF transmissions.

As he had heard no other ac on the radio and he had received no further information from Syerston Radio despite his numerous calls, he assumed the airfield was quiet with no traffic. (No call such as 'No RT traffic operating in the circuit' was made in response to his calls to Syerston Radio.

He believes that his presence, level and slow speed was a surprise to the glider pilot who would not have expected him to be there.

The pilot has carried out very many low level power line patrols right up to the boundary of every military airfield in UK and most civil airfields, with no problems whatsoever and in accordance with company operating procedures, if anything he makes more radio calls than actually required because of the very slow progress while on such patrols.

He assessed the risk as being low.

UKAB Note (1): Syerston is promulgated in the UKAIP ENR 2-2-2-4 as an ATZ circle 2nm centred on the longest notified RW up to 2000ft aal. It is active from 0830-sunset (1hr earlier in the Summer). It is a Government Aerodrome with an A/G service.

UKAB Note (2): Rules of the Air (RoA) Rule 12 requires that ac conform to the traffic pattern or keep clear of the airspace in which the pattern is formed …

UKAB Note (3): Rules of the Air Rule 45 in these circumstances requires that an ac commander shall obtain information from the A/G communication service to enable flight to be conducted safely within an ATZ.

UKAB Note (4): CAA (FOI (H)) confirmed that Powerline Inspection Operators do not have any exemptions to the ANO in respect to Rule 12 or Rule 45.

UKAB Note (5): The recording of the Claxby Radar shows the Helicopter operating in the area of Syerston at very low altitude both inside and outside the ATZ. At 1443 it was operating just under 2nm NE of the airfield datum at FL002 (almost ground level (QNH 1014, elev 228ft)). The helicopter comes closest to the airfield at 1446 when it is just inside 1nm from the datum and then departs to the E after an orbit. The glider does not show at any time.

HQ AIR (TRG) comments that this incident was clearly the result of some confusing RT. Syerston airfield is a busy 7-day per week glider site operating motor gliders on one circuit, winch launched conventional gliders on a mirror circuit and often, an aerotow operation using the space between. While there is an Air Ground radio operator on the airfield, from an operational standpoint, the radio is only used for management purposes, and of course to advise transiting/visiting ac of the airfield operation. Although all ac based at Syerston are fitted with VHF radio equipment, it is Standard Operating Procedure (SOP) for circuit traffic to operate without radio calls with the Duty Instructor (A/G operator) monitoring. With up to 6 gliders and 6 motor gliders operating simultaneously, and by the very nature of glider ops, it is not possible to keep track of the conventional glider circuit, hence the SOP. Therefore it would be difficult to advise visiting ac on the whereabouts of individual gliders within the ATZ. The glider pilot was certainly surprised to find a helicopter on his approach, but was able to modify that approach and land elsewhere on the airfield. This is standard practice for glider ops when other gliders have had to return due to poor thermal activity.

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 Viking operating authority.

Members considered in turn the part played by the 3 parties in this incident namely the 2 pilots and the A/G operator(s).

The Helicopter pilot was engaged on a high workload but familiar and routine operation that required him to approach right up to the airfield boundary and this was necessarily conducted at very slow speed and at a very low height. Clearly he was cognisant that his very slow speed was a significant factor when passing information to other agencies and he did his best to make this clear to the A/G operator and made several accurate information reports in the period of his inspection (over 10min from his first call). Due to an inaccurate traffic report in response to his initial call the helicopter pilot was under the mistaken impression that there *'was no reported circuit traffic'* which, although it might have been technically accurate at that precise moment the transmission was made, did not give him a true picture of what was occurring or about to take place at the airfield. This led him to believe that it was safe to proceed with his task and, since there was no circuit traffic at the time, integration (as required by Rule 12 of the RoA) was not an issue since, in effect there was no traffic pattern (or indeed mirror patterns for powered ac and gliders as reported by HQ Air) to conform to. A helicopter pilot Member very experienced in powerline and pipeline surveys suggested that good practise would have been to telephone Syerston in advance to warn them and discuss the task, but it was noted that when the helicopter pilot attempted to call the airfield subsequently there was only an answer phone and he was unable to discuss the incident or identify the person who was supervising operations at the time of the Airprox. In summary, the Board considered that the AS350 pilot had acted in a thoroughly professional manner.

When considering the role played by the A/G operator(s) here, Members noted that Syerston is a very busy airfield located in an area where there are also many GA training and transit ac. The Board considered that the 'information' provided by the A/G service had been a major factor in this incident and had not been up to the normally high standards encountered at military airfields. It seems that there were several personnel acting as the A/G operator during the short period that the AS350 was in contact with them. There appeared to be no continuity, corporate cognisance of the helicopter and no updated information regarding the aerodrome traffic passed to the AS355 pilot as the situation changed. The Board was briefed that the A/G operator function is normally carried out by the Duty Instructor but, while not specifically criticising this procedure, specialist Members stressed the importance of the role and that continuity is vital so that up-to-date knowledge of airfield operations is maintained and the remit of an A/G Operator, [as described in CAP452 for civilian operators] can be fulfilled. Without an R/T transcript, [the recording of an A/G Station's radio traffic is not obligatory] it was not possible to be certain, but it was the unanimous opinion of Members that poor R/T technique had also been a factor. Members considered that airfields with an ATZ, whether civil or military, have an obligation to provide pilots with an appropriate level of service that enables the flight to be conducted safely within the Zone, either to transit safely through that ATZ or join the circuit. Furthermore, if the nature of aerodrome operations is so intense, then consideration should be

given to the provision of an Air Traffic Controller rather than an A/G Operator. Appropriately qualified Controllers can provide an increased level of positive 'Control' over aerodrome movements whereby permission to enter the ATZ would be necessary, thereby providing a higher level of safety over locally based, visiting and transit ac.

Members were briefed by a specialist glider Member that in itself, so long as it is predictable, the presence of a helicopter below 50ft at the airfield boundary does not present a significant problem in normal wind conditions. For a variety of reasons glider pilots may have to land 'long' and in this case the glider pilot had sufficient warning and speed to do so in a fully professional manner without endangering either ac.

Noting that both pilots agreed that the risk had been low and had also agreed the basic geometry, it seemed to the Board that this incident had been reported as an Airprox to make a point about 'infringements' rather than any collision risk. Unanimously, the Members attributed a cause of 'Sighting Report'.

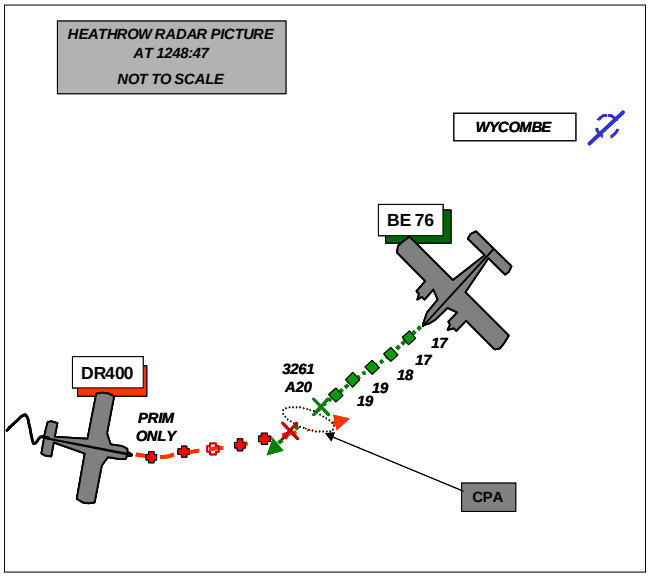
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting Report.

Degree of Risk: C.

AIRPROX REPORT NO 109/07

Date/Time:	4 Aug 1249 (Saturday)	
Position:	5135N 00050W (2nm SW of Wycombe)	
Airspace:	Wycombe ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	BE76	Robin DR400
Operator:	Civ Trg	Civ Club
Alt/FL:	↑1800ft	↓1500-1600ft
	(QNH 1020mb)	(QFE NR)
Weather	VMC CAVOK	VMC NR
Visibility:	>10km	NR
Reported Separation:		
	100ft V/30m H	NR
Recorded Separation:		
	NR V/250m H (as it passes through the BE76's 12 o'clock)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BE76 PILOT reports that he was flying a blue and white ac with lights and strobe switched on, squawking as directed by London ACC, with Mode C on a training flight from Wycombe in good VMC. He was passing 1800ft alt, [see UKAB Note (2)] heading 240° at 100kt and following the noise abatement departure when a Robin appeared high in his windshield in a descending right banked turn, coming from above and to his right. It passed 2-300m in front of him continuing its descent. He assumed it was a locally based glider tug returning from an aerotow after dropping a glider.

He queried it with Wycombe Air and reported the incident to them, but they were not aware of the other ac. He assessed the risk as being high.

THE ROBIN DR400 PILOT reports flying a red and white ac with the strobe switched on and with no SSR fitted on a local glider towing flight. While descending from an aero tow at about 95kts, after dropping off the glider, and

when between 1600 and 1500ft (QFE) he saw what appeared to be an all white twin piston ac about 400m away in approximately his 9 o'clock and about 1 to 200ft below him and climbing.

As he had an 180ft long tow rope attached he did not want to slow down, so he increased the throttle setting to check the rate of descent and put on about 10° of right bank to make himself more conspicuous in case the twin pilot had not seen him. He checked to ensure that the twin would pass well behind him and estimated that it did so by about 250 to 300m. He was not able to estimate the vertical separation as by that time he was concentrating on what was ahead.

He was not sure what time this incident occurred, as he did not note it at the time and there was subsequent confusion. He did not assess the risk, as he was visual with the other ac throughout.

UKAB Note (1): Initially there was confusion as to which tug ac was involved (the club operates two) and the colour reported by the BE76 pilot was more akin to the other ac which was airborne earlier on the same day, piloted by a different pilot. There was also a lack of understanding of BST/UTC by some personnel. With the benefit of the RT transcript however, there is little doubt that the DR400 involved in the incident was that being flown by the reported pilot. Both Robin pilots were on holiday during the period of the investigation which delayed an accurate reconstruction of events, despite the full co-operation of the gliding club involved.

UKAB Note (2): The recording of the Heathrow radar shows the incident. The DR 400, which was not SSR equipped, crosses from R to L ahead of the BE76 that is climbing through an alt of 2100ft on the London QNH of 1020. The DR400 disappears on the sweep before the CPA, but it is assessed that it passes 250m ahead (closing); the vertical separation cannot be calculated.

ATSI reports that Wycombe is situated within an ATZ, circle radius 2nm, up to 2000ft aal. (Aerodrome elevation 520ft.) and they were operating from RW24.

Radar recordings show that the CPA occurred 1.9nm SW of the airport, i.e. near to the lateral boundary of the ATZ, when the BE76 was at an alt of 2100ft. The DR400 was showing as a primary only contact but it was reported by the BE76 pilot to be at a similar alt and descending.

The Wycombe MATS Part 2 defines the allocation of the ATZ as follows:

'The ATZ is divided into two basic sections to separate glider operations from powered (fixed wing and rotary) operations. A Safety Buffer Zone has been established to provide separation between the Gliding Section and the Power Section airspace. The boundaries of the Safety Buffer Zone extend to the limits of the ATZ and are defined as follows:

When R/W 06/24 is in use:

The Power Section Boundary is defined as the southern edge of R/W 06/24 Grass. The Gliding section Boundary is defined as a line positioned parallel to and 30m south of the Power Section Boundary. Unless prior approval has been given, e.g. during gliding competitions, no Gliding Section traffic is permitted to enter the Power Section airspace **at or below 1400ft QFE (1900ft QNH)**. Similarly, unless specifically authorised by ATC and Gliding Co-ordinator, no Power Section traffic is to enter the Gliding Section airspace at or below 1400ft QFE (1900ft QNH).'

The Safety Buffer Zones map, in the MATS Part 2, shows the boundary diverging slightly to the left abeam the RW06 threshold. This reflects the Noise Abatement route for RW24 departures. Basically, this is *'after crossing the airfield boundary, turn left of runway centre-line by about 10° to track towards a point which is halfway between Parmoor and Rockwell End hamlets'.* There is also a warning *'beware of gliders and glider-tugs to the left of climb-out track'*.

Additionally, there are 'Warning Procedures' to assist ATC in the safe use of the tarmac taxiway and the associated hover-taxy route between "X" and "R". The MATS Part 2 states:

'When Runway 24 is in use: All powered aircraft, including glider tugs and motor gliders, together with gliders wishing to participate, will advise "late downwind" using the promulgated frequency of the day. The ATC response will be:-"c/s – Taxiway Secure".

This response will be made when the taxiway between points "A" and "B" is unobstructed. At the time of the Airprox both the Aerodrome and Ground positions were in use. In accordance with the local procedures the DR400 (the correct callsign) glider tug reported, on the **Ground** frequency, at 1249, "*Tug (c/s) late downwind"* and the controller responded *"Taxiway secure"*. Meanwhile, the BE76 had received taxi clearance on the Ground frequency at 1234 and had received its clearance, towards DTY remaining clear of CAS, at 1243. The BE76 was transferred to the Tower frequency at 1246 and received take-off clearance at 1247.

Both ac were operating in accordance with local procedures. The Airprox occurred virtually on the boundary line of the Safety Buffer Zone but reportedly above its upper altitude of 1900ft.

UKAB Note (3): The UK AIP at EGTB AD 2.22 – FLIGHT PROCEDURES – at f iii states:

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

UKAB Note (4): As a result of this incident the Wycombe MATS Part 2 has been slightly amended to clarify the procedures.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that, despite some confusion, the respective pilots and the gliding club had co-operated fully with the investigation thereby ensuring as accurate a reconstruction of events as possible.

Despite that the incident had taken place in the Wycombe ATZ, it took place outside the area of that ATZ where local glider/powered ac deconfliction procedures applied and the Board had no reason to question their appropriateness. Neither pilot was required to be, nor was, in receipt of an ATC information or deconfliction service (indeed no such service was available) and therefore both ac were being operated under the Rules of the Air (RoA) and the 'See and Avoid' principle as notified in the UK AIP (UKAB Note (3)). In this case, both pilots had seen the opposing ac and the reporting pilot had deemed that no avoidance was necessary as the tug pilot was already avoiding his twin. Under the RoA, as the ac approached one another, the Beech was required to give way to the tug however, since it was already in a right turn when the pilot of the twin spotted it, Members considered it understandable the pilot considered that further action was not required, even though the separation might have been less than ideal. Even bearing this in mind however, the Board decided that since the Robin pilot had seen the Beech throughout the incident and the Beech pilot saw the Robin in the later stages, there was no risk that the ac would have collided.

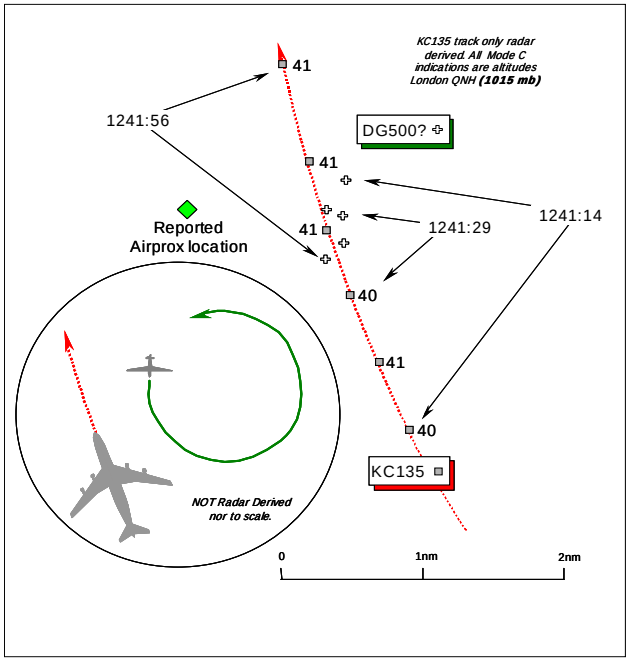
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sighting by both pilots.

Degree of Risk: C.

AIRPROX REPORT NO 111/07

Date/Time:	28 Jul 1241 (Saturday)	
Position:	5214N 00011W (2nm E St Neots)	
Airspace:	London FIR	(Class: G
	Reporting Ac	*Reported Ac*
Type:	DG500 Glider	KC-135
Operator:	Civ Pte	Foreign Mil
Alt/FL:	3200ft	4000ft
	QFE (1005mb)	QNH
Weather	VMC CLBC	VMC
Visibility:	15nm+	NR
Reported Separation:		
	500ft V/400m H	NK
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DG500 GLIDER PILOT reports he had departed from Gransden Lodge and was monitoring frequency 131·275MHz. After circling in a weak thermal he headed off to the S towards other clouds at 60kt in a level cruise at about 3200ft Gransden QFE (possibly 1005mb – Gransden elev: 254ft), flying some 2000ft below and 1-3nm clear of cloud with an in-flight visibility of 15nm+. About 1nm E of St Neots heading 180° at about 1245UTC, he sighted the other ac – a grey KC135 – about 1nm away some 50° R of the nose. He noted that it was definitely higher than him but estimated their paths would come close or cross. Concerned about possible turbulence from the turbofan ac, to avoid the KC135 he turned away to port and the jet passed behind his glider with a low risk of a collision. He estimated the minimum separation was about 400m horizontally and 500ft vertically and he saw it fly away as he came around the turn. It did not appear as though it's pilot had deviated from his course.

THE KC-135 PILOT reports that they executed 2 flypasts at Duxford prior to and on completion of AAR training in AARA 8. After the first flypast they departed from the vicinity of Duxford at about 1240UTC, operating in VMC heading NW, at an altitude of 4000ft under VFR at 250kt and were not in receipt of an ATS at the reported time of the Airprox. Although gliders were seen in the vicinity, none were close enough to require any avoiding action and they were unaware of any "close calls". The landing light and HISLs were all on.

Returning from a second flypast at around 1445, the crew observed gliders in the vicinity and actually took avoiding action on one glider in level flight, but made an uneventful return to base.

UKAB Note (1): This Airprox is not shown on radar recordings. The KC135 is shown NNW bound passing about 1nm to the E of the reported Airprox location, some 3½min before the approximate reported time at 4000-4100ft London QNH (1015mb). Several primary radar returns are evident in the vicinity - some 2nm E of St Neots - but none are completely consistent with the track reported by the DC500 glider pilot, hence they might not correspond to the glider flown by the reporting glider pilot.

US 3AF-UK comments that it looks reasonably certain, given the significant time difference, that the glider avoided by the KC-135 was not the glider flown by the reporting pilot. Either the KC-135 crew did not spot the reporting pilot's glider or saw it and judged it to be sufficiently far away not to require avoiding action.

AIRPROX REPORT No 111/07

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 operating authority.

The Board's HQ 3AF-UK Advisor observed that it was relatively unusual for a KC135 to be operating over South Cambridgeshire in the FIR at 4000ft amsl on a Saturday afternoon. Such large ac would not normally be encountered lingering at these altitudes, but it was evident that their participation in air shows clearly necessitates their legitimate transit through Class G airspace. The glider pilot Member was concerned that apparently no prior liaison about the transit of such a large ac through the 'Open FIR' had been effected with gliding clubs in the vicinity beforehand, which the Member thought might have been helpful. However, it was clear that the crew were legitimately proceeding about their VFR transit flight, outbound from their flypast to commence AAR training in AARA8. On a similar vein, a Member observed the increasing regularity with which large airliners might be encountered unannounced completing approaches to regional airports in unregulated airspace. The Member opined that, as a result, it is becoming more common to spot large ac in the lower altitudes of Class G airspace, where see and avoid predominates.

The KC135 crew's brief account revealed that although gliders were seen in the vicinity on their first northbound transit, none that they saw were close enough to require any avoiding action. The radar recording reflected that the subject KC135 had transited about 1nm to the E of the reported Airprox location some 3-4mins before the time reported by the glider pilot, so it seemed reasonably clear it was the ac involved. However, the absence of any consistent radar data on the glider made analysis of the geometry somewhat problematic. Thus it was not clear if the KC135 crew saw the subject glider, or not.

The glider pilot reported that he spotted the KC135 about 1nm away, but definitely higher than his glider's altitude at the time he said. The Board noted that the DG500 pilot had wisely elected to turn away from the large jet, which passed astern and no closer than about 400m horizontally and 500ft vertically above his glider at the closest point - with a low risk of a collision. Without complimentary SSR data it was not possible to confirm the glider pilot's assertion as to the minimum separation that pertained here independently, but there was no reason for the Board to doubt the veracity of the reporting glider pilot's account whatsoever. Whilst noting the DG500 pilot's concern about possible turbulence from the turbofan ac, the Board was charged with determining the risk of collision between the ac involved and not what might have resulted if the wake turbulence of the large ac had affected his glider in different circumstances. In the Board's view, the glider pilot had seen the KC135 in time to turn away from it and maintain his own separation well clear of the KC135, which passed 500ft above his glider thereby removing any risk of a collision. The Board concluded therefore, that this Airprox had resulted from a sighting of traffic operating in Class G airspace, where no risk of a collision had existed in these circumstances.

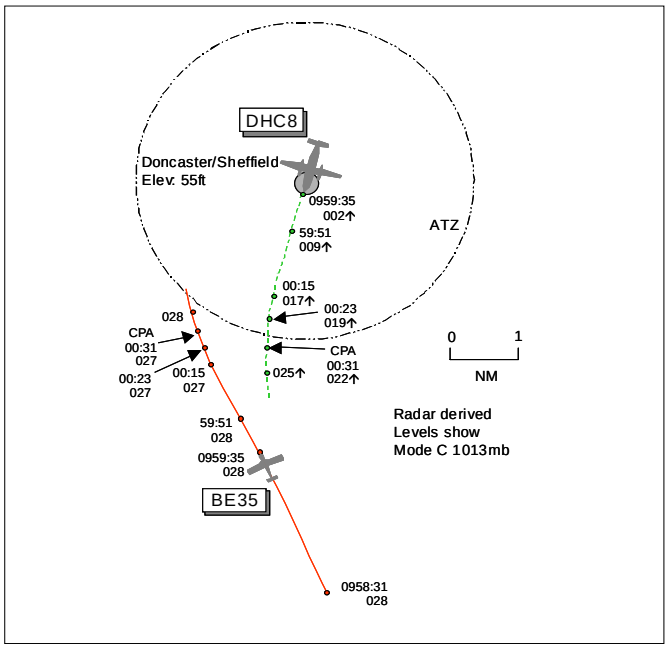
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting Report.

Degree of Risk: C.

AIRPROX REPORT NO 112/07

Date/Time:	7 Aug 1000	
Position:	5326N 00102W (2·5nm S Doncaster/ Sheffield - elev 55ft)	
Airspace:	ATZ/FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	DHC8	BE35
Operator:	CAT	Civ Pte
Alt/FL:	2100ft↑ (QNH 1016mb)	2500ft (QNH)
Weather	VMC CLBC	VMC CLBC
Visibility:	20km	50km
Reported Separation:	400ft V/1nm H	'Below'/500m H
Recorded Separation:	500ft V/1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DHC8 PILOT reports on departure from Doncaster/Sheffield Airport (DSA) IFR and in communication with DSA Tower then Radar squawking 4375 with Mode C. They were cleared for take-off RW20 with a departing King Air [actually a BE76] in sight leaving the cct on a R crosswind leg. This King Air was seen and was deemed not to be a factor so they commenced departure. Heading 200° at 170kt climbing through 2100ft (v/s 2500fpm) a TCAS TA alert was received with traffic +800ft in their 1 o'clock range 2nm. The visibility was 20km in VMC flying about 1000ft below cloud and they both, almost immediately, saw a white/orange coloured light ac flying straight and level in their 2 o'clock position considerably closer than 2nm and just above their level, but assessed it to be going down their RHS. At the time they were in the process of transferring to Doncaster Radar and within a couple of seconds of the TA they were given an avoiding action turn to the L as they saw the traffic. The traffic passed 1nm away abeam about 400ft above and was at the same level when separation was 1·5nm. No other actions were taken other than liaising with Radar and he assessed the risk as high.

THE BE35 PILOT reports en route to Perth VFR and in receipt of a FIS squawking an assigned code with Mode C. The visibility was >50km flying 1500ft below cloud in VMC and the ac was coloured white/red/blue; no lighting was mentioned. Heading 330° at 140kt and 2500ft QNH when well clear of the RW axis, he saw a wide-bodied jet taking-off and crossing upwind and then he crossed another small ac which was below passing down his RHS about 500m away. No avoiding action was necessary and he assessed the risk as low.

THE DONCASTER/SHEFFIELD RADAR CONTROLLER reports the DHC8 was released on a GOLES 20E departure. By the time the ac was airborne a 7000 squawk had reached a point whereby it was in confliction with the DHC8. On first contact he gave the DHC8 flight an avoiding action turn to the L which resolved the conflict. The BE35 flight had called on frequency just before the Airprox and was issued with a 6165 squawk and was in receipt of a FIS at A025. TI was passed on the departing DHC8. Subsequently the DHC8 Capt telephoned to advise that they had a TCAS TA on the other ac and much later he was advised that an Airprox had been filed.

UKAB Note (1): Met Office archive data shows the Doncaster/Sheffield METAR as EGCN 070950Z 28007KT 230V310 CAVOK 18/09 Q1016=

ATSI comments that the Airprox occurred close to the vertical and horizontal boundaries of the Doncaster ATZ i.e. a circle radius 2·5nm centred on the midpoint of the longest notified runway (02/20), vertical limits SFC to 2000ft aal. The BE35 remained outside the ATZ during its flight.

AIRPROX REPORT No 112/07

The Doncaster ADC requested the DHC8's IFR departure release from the APR, who is situated at Liverpool Airport, at 0955. The release, for a Standard GOLES 20 East Route, was issued 1min later. The Route, from RW20, is: *'Climb straight ahead to 500 ft or FNL D0.5 whichever is later then turn left on track 190°. At FNL D2.5 turn left to intercept GAM R017° outbound at D10 or FL60 (whichever is sooner). Turn left to GOLES'*. At about the time of the release, the BE35 flight established contact with Doncaster Approach. The pilot was requested to standby whilst the APR dealt with other flights. The pilot called again at 0959 and was asked to pass his message. He reported at 2500ft, routeing from Belgium to Perth, via Richmond (approximately 60nm NNW of Doncaster Airport) and Newcastle. The BE35 flight was instructed to squawk 6165, a Doncaster allocated squawk. Following the controller's enquiry of his position (0959:30), the pilot reported *"just er crossing the active of er Doncaster at er two thousand five hundred feet"*. The response was *"Roger traffic information is a Dash Eight who's er just airborne runway Two Zero he'll be making a left turn report if you get the traffic in sight he's about er three miles to the north you"*. Shortly afterwards, at 0959:50, the pilot of the BE35 was informed he was identified 3nm S of Doncaster Airport with the QNH, and responded he was visual with the traffic. No mention was made about the type of ATC service being provided to the flight or whether it was carrying out a VFR flight. (Pilot's written report confirmed VFR.)

The DHC8 flight had been transferred from Aerodrome Control to the Approach frequency at 0959:40. Thirty seconds later it established contact with Approach, reporting passing 1900ft for FL80, heading 190°. The APR replied *"DHC8 c/s turn left immediately er Three Three Zero degrees traffic to about half a mile to the southwest of you this time three thousand feet northbound"*. The pilot reported visual with the traffic passing down the L side (actually R). In view of the urgency in issuing the turn instruction, albeit not using the phrase 'avoiding action', it is understandable why the controller did not add the type of service being provided in the message. (In the event, the service was never passed.) Later, before leaving the frequency, the DHC8 pilot commented *"we had a T A when we were transferred to you and you vectored us away from it".* At the time the APR released the DHC8, the BE35 flight had contacted Doncaster Approach but had been instructed to standby. It was approximately 8nm S of the airport, tracking NNW, squawking 7000. By the time the DHC8 flight was cleared for take off, at 0958:30, the BE35 was 6·5nm S of the airport. The pilot of the BE35 reported crossing the *"active"* one minute later (about 4nm S). The APR did not contact the ADC to try and pass a message to the DHC8 about the BE35 but continued to transmit to the BE35 flight for another 30sec, during which time he informed the pilot he was identified. Consequently, the first time that the DHC8 pilot was advised about the BE35 was on its initial call to Approach, when it was given an immediate L turn. The subject ac were then 1·4nm apart, on slightly diverging flightpaths. The radar recording, timed at 1000:15, shows the DHC8 climbing through FL017, to the NE of the BE35 at FL027. At 1000:23, the ac were 1·1nm apart and about to pass each other. At the time, the DHC8 was 2·2nm from Doncaster Airport, passing FL019 (1990ft QNH 1016mb) and the BE35 was at FL027, 800ft higher, 3·1nm from the airport. The CPA (1000:31), occurring just after the DHC8 had passed E of the BE35 at FL027, was 1nm, when the vertical separation was 500ft. The DHC8 was now 2·7nm S of the airport, passing FL022.

Although no agreement of the type of ATC service being provided was made with the pilots of the subject ac, it would appear from the information and instructions issued, and the controller's report, that the BE35 flight was receiving a FIS and the DHC8 flight a RAS, whilst they were on the Radar Controller's frequency. Ideally, although the BE35 was not identified at the time, the DHC8 pilot should have been warned about its presence, either prior to, or shortly after, departure. However, the APR did take immediate action when the flight contacted his frequency. The BE35 flight was issued with TI about the departing DHC8, just after it had taken off and became visual with the ac.

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 initially focussed on the controlling aspects of this incident. The DSA APR had released the DHC8 but then about 4min elapsed before the flight was airborne. The BE35 pilot had called for a service at about the same time as the release but 2-way communications were not established for a further 3min. This had delayed the APR from establishing the BE35's flight details until it was very close to the ATZ boundary but the ac would have been showing on the APR's radar display and would have been, up to this point, unknown traffic. Although there was no requirement to separate the subject ac (IFR v VFR), DSA ATC should have ensured that both crews were aware of each other's presence. The APR had passed TI to the BE35 pilot on the DHC8 but had not alerted the ADC to the BE35 so that TI could be passed to the DHC8 crew, either prior to departure or during the climb-out phase.

Even though the BE35's details were not obtained until very late in the evolution of this Airprox, generic TI on the ac could have been passed to the DHC8 crew, which would have allowed them to decide on the best course of action to be taken. This led Members to agree that the cause of this Airprox was the DHC8 crew was released to depart without TI on the conflicting BE35.

An ATCO member opined that although not ideal, the resolution of the conflict was prompt. The APR had passed TI on the DHC8 to the BE35 flight after its position was established, its pilot reporting visual with the DHC8 shortly afterwards and passing 500m clear to his R and below. However, it appears that this RT exchange had effectively blocked the frequency which would possibly account for the 30sec delay in the DHC8 crew calling on the APR's frequency. On first contact, the DHC8 crew was given an immediate turn and TI on the BE35. Fortunately, the DHC8 crew had already been given an earlier 'heads-up' of its presence by a TCAS TA alert and this facilitated their visual acquisition of the BE35 as ATC intervened, later reporting it passing 400ft above 1nm clear to their R. These separation distances were borne out from the radar recording, the CPA occurring after the BE35 had already passed ahead of the DHC8's projected track as the acs' tracks were diverging. These visual sightings by both crews, combined with the geometry of the event, allowed the Board to conclude that safety had been assured during the encounter.

Following this Airprox and 149/07, ATSI was tasked by the Chairman to contact DSA to follow up progress of proposed changes to the departure release procedure, as Members were minded to issue a safety recommendation that a review was needed owing to the length of time between Tower ATCO requesting a departure release and the ac presenting itself to radar.

[Post Meeting Note: An SI 09/08 was issued at Doncaster effective 22 March 2008 entitled Departure Instructions covering coordination between ADC and APR for outbound ac. ADC must not request a departure release from radar more than 2min before expected time of departure. If for any reason the ac is not going to be airborne within the 2min period, ADC must inform radar who will then issue a revised departure clearance if required.

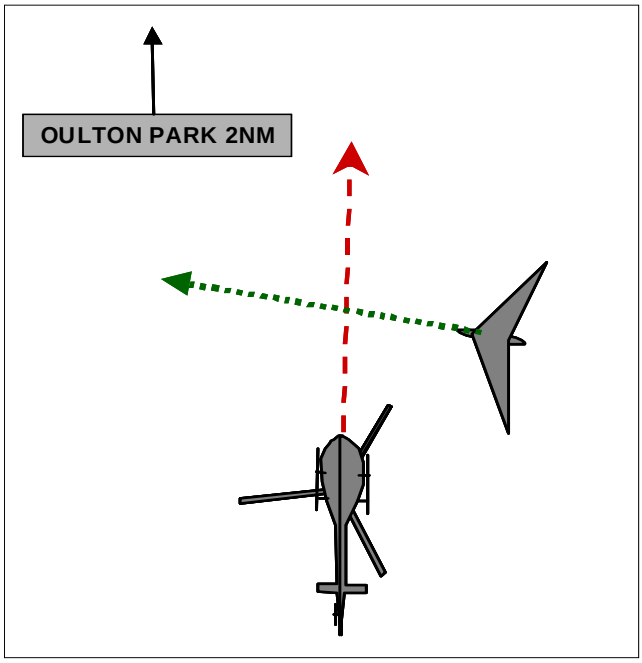
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The DHC8 crew was released to depart without TI on the conflicting BE35.

Degree of Risk: C.

AIRPROX REPORT NO 113/07

Date/Time:	2 Aug 0845	
Position:	5307 N 00236 W (2nm S Oulton Park VRP)	
Airspace:	Lon FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Quik M/Light	AS355N
Operator:	Civ Trg	Civ Pte
Alt/FL:	1600ft (QNH 1012mb)	↓1000ft (N/K)
Weather	VMC NR	VMC NR
Visibility:	20km	10km
Reported Separation:	200ft V/100m H	NR
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE QUIK GT450 M/LIGHT PILOT reports flying a yellow and white flexwing microlight while instructing a student pilot on a local area training flight from Arclid. He was not in contact with any unit and neither lights nor SSR were fitted. He was tracking 280° at 60kt, following a railway and canal on his left and at a point 1nm N of Calveley Disused Airfield he saw a blue helicopter, possibly a JetRanger he thought, heading N at almost the same altitude (about 50ft lower) in his 10 o'clock at a distance of about 300m. He immediately took control from the student and entered a full-power climb. The helicopter took no avoiding action and passed about 200ft below and about 100m ahead. He assessed the risk as being medium.

THE AS355N PILOT reports flying a blue and silver helicopter on a private flight from Southwater, Sussex to Oulton Park Race Circuit, Cheshire squawking with Mode C. He had left Shawbury APR frequency some minutes before the reported time of the incident. At the time he was heading 345° at 130kt but he was not aware of any Airprox during the flight. During the day he flew several flights and as normal, he saw the occasional ac, one or two probably within 1000m range, but nothing that he considered to be a collision risk and there was therefore nothing notable. As he flew nearly 7 hours that day he really cannot recall any detail of each ac he saw. He regrets that he was therefore unable provide much detail and apparently did not see the reporting ac.

UKAB Note (1): An ac initially squawking 0241 (Shawbury) then changing to 7000, presumably the AS355 can be seen on the recording of the Clee Hill radar. The ac tracks NNW and the squawk change takes place 5.1nm SSE of the reported position of the incident with the contact indicating FL021. The contact descends slightly and passes directly over the reported point at 0845:06 at FL016 (1600ft amsl) departing to the N and disappearing in the vicinity of Oulton Park at 0846:41.

UKAB Note (2): The nearest available METAR was Liverpool where the 0850 was:

METAR EGGP 020850Z VRB01KT 9999 FEW013 SCT030 16/09 Q1013=

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted that this incident had taken place in Class G airspace where pilots have an equal and shared responsibility to see and avoid other ac. Until he ran out of radar cover the AS355 pilot had opted for a radar

service to assist with this responsibility, but the Microlight did not and in any case would probably not have showed since it was not transponder equipped. This incident was therefore largely a sighting issue. The AS355 pilot did not see the small light coloured Microlight which from the latter pilot's report may well have been on a constant bearing. Fortunately however the Microlight had seen the helicopter and had been able to initiate apparently appropriate avoiding action.

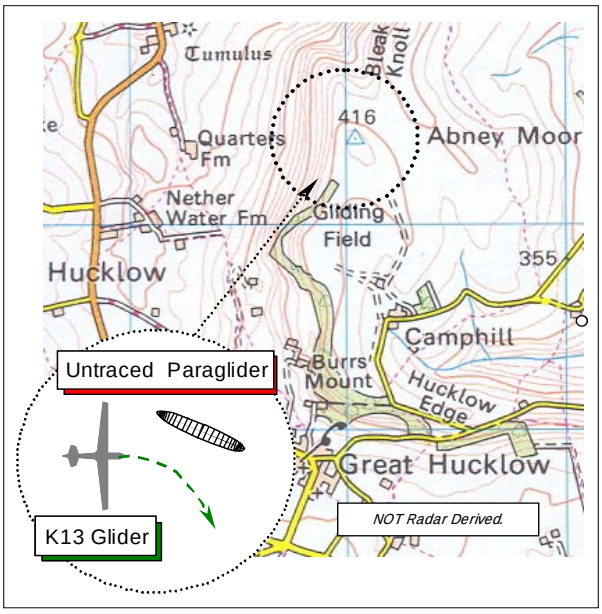
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the helicopter pilot and a late sighting by the microlight pilot.

Degree of Risk: C.

AIRPROX REPORT NO 114/07

Date/Time:	1 Aug 1441	
Position:	5318N 00144W (200m N of Camphill Gliding Site - elev 1350ft)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	K13 Glider	Untraced Paraglider
Operator:	Civ Club	N/K
Alt/FL:	450ft↓	NR
	QFE	(N/K)
Weather	VMC Clear Air	NK NR
Visibility:	25nm	NR
Reported Separation:		
	20ft V/40m H	NR
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE K13 GLIDER PILOT reports he was conducting an instructional sortie from Camphill Glider Site and in communication with Camphill RADIO on 129·975MHz. Circuiting to the site at 55kt – landing southerly - in good VMC under a blue sky with 3/8 of CU at 3000ft and an in-flight visibility of 25nm, he was giving his pupil a longer BASE-LEG to allow him more time to "settle down". Two paragliders were observed to be operating from what he understood to be an "unauthorised" site about 500m to the N of the boundary to Camphill and the paragliders were drifting to the S towards his normal cct pattern for southerly winds. At first he believed that there would be sufficient clearance to complete their RH cct safely. However, heading 090° about 250m from their intended FINALS turn, it became apparent that one paraglider had travelled faster than he had expected and was soaring at their normal FINALS turn area, so he instructed his pupil to turn 45° to the R so as to avoid this paraglider. The pupil was so "spooked" by the paraglider that he "froze" on the controls, so descending through 450ft QFE above the sites elevation of 1350ft, he took control and turned his glider R to pass about 40m to the R of the paraglider and some 20ft above it at the closest point. He then had to complete the approach to Camphill himself, as his glider was by then too close in to the site for his pupil to complete a normal approach. Moreover, his pupil was still distressed by the incident. He assessed the risk as *"very high"*.

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

AIRPROX REPORT No 114/07

THE RADAR ANALYSIS CELL (RAC) AT LATCC (MIL) reports that despite exhaustive enquiries through known operators and local clubs in the area, they have been unable to identify the reported paraglider pilot. As tracing action has ultimately proved fruitless, it has not been possible to obtain a report from the paraglider pilot.

UKAB Note (2): The UK AIP at ENR 5-5-1-1, promulgates that Camphill Glider launching site is active during daylight hours for winch launches, which may attain a height of 2000ft agl, above the site elevation of 1350ft amsl.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report solely from the K13 Glider pilot.

The Board was briefed on the measures undertaken to identify the paraglider pilots involved, but which proved finally to be to no avail. Whilst a local paraglider club had been very helpful, the limited information available frustrated attempts to trace the paragliders concerned who might well have been lone individuals from far afield, perhaps not associated with any organization that regularly operates there. Thus with only one side of the story available, Members recognized that this was a rather unsatisfactory situation. Nevertheless, it was determined that sufficient information was available upon which to base an assessment, albeit that any lessons gleaned from this encounter would be very limited.

This is plainly Class G airspace and those wishing to enjoy sport flying to the full must take the legitimate rights of all airspace users into account. The Glider Member commented that liaison is clearly necessary between interested organizations that might wish to share the same ridge and such paragliding sites as used here are not regulated by any single body he believed. He stressed that other sites such as Nympsfield, Parham, Long Mynd etc, all have similar issues. These are normally resolved by linking up with the paragliders/hanggliders to discuss and agree a method of operation. The conduct of perhaps seemingly incompatible activities in close proximity is clearly also matter of airmanship when airborne, but he stressed that Camphill does not “own” the ridge as such and those with a legitimate reason to fly there should be accommodated by mutual agreement. However, it behoves paraglider pilots to take due account of conventional gliding activities when operating close to such sites and not to encroach into the cct area or impede a glider pilot’s ability to manoeuvre safely. This is most unwise and any apparent disregard for other flying operations, as suggested by the K13 instructor here, gave Members cause for concern. However, the absence of any report from the other pilots on their paragliding activities made further speculation meaningless.

It was clear from the K13 glider instructor’s description that paragliding had affected the FINALS turn area for the RH cct, but it was unclear if it would have also affected a LH cct, or whether this option might have been available to him and might have allowed him to keep further away from the paragliding activities of which he was aware. However, once established RH DOWNWIND at the time it seemed that he had little option but to turn in early. The Board recognized that this clearly impacted on the airspace available to him to instruct and within which he could allow his student the freedom to fly the glider himself to practice his cct. However, it was fortunate that the K13 instructor had kept an eye out for the paragliders, so in the Board’s view, he was wise to take control when he did and complete the approach himself. The K13 instructor had evidently sighted the paragliders, determined that a conflict existed and taken action to resolved it by turning out of their way. Whilst this might have been disruptive to his instructional flight, it was nevertheless the correct course of action. The Board agreed unanimously that this Airprox had resulted from a conflict in the vicinity of Camphill Glider Site resolved by the K13 instructor.

Turning to risk, the K13 instructor had reported this to be *“very high”*. Whilst the Board recognized the difficulties here when his student “froze” at the controls, it was evident from his account that the K13 instructor had time to take control himself, turn away and still achieve 40m of horizontal separation. Whilst this might be less than ideal, the K13 instructor’s prompt action had effectively removed any risk of a collision in the circumstances reported here.

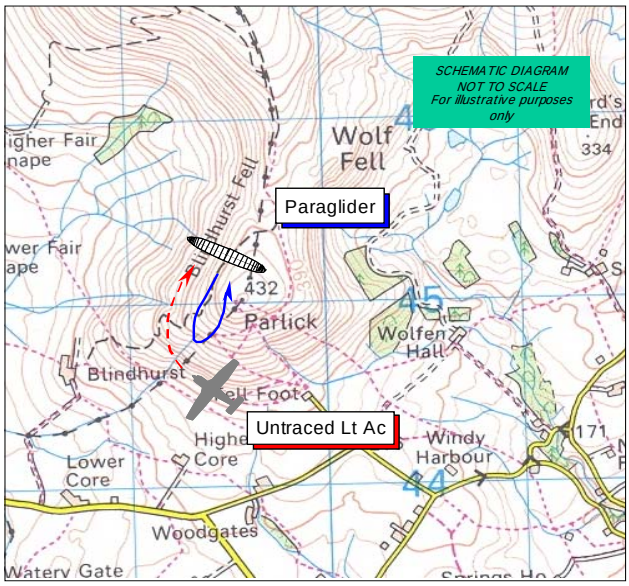
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in the vicinity of Camphill Glider Site resolved by the K13 instructor.

Degree of Risk: C.

AIRPROX REPORT NO 115/07

Date/Time:	1 Aug 0900	
Position:	5354N 00237W (Parlick)	
Airspace:	London FIR	(Class: G
	Reporting Ac	*Reported Ac*
Type:	Paraglider	Light Ac Untraced
Operator:	Civ Pte	N/K
Alt/FL:	1400ft amsl	NR
Weather	VMC CLBC	NK
Visibility:	100km	NR
Reported Separation:	Nil V/20yd H	NR
Recorded Separation:	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GIN ZULU PARAGLIDER PILOT reports he was soaring the hill at Parlick on his own, parallel to the western facing slopes in a southerly wind, at about 420-430m [~1377-1410] just level with the top when he heard a light ac (LA) coming around the corner to the S. He expected it to cut straight across the bowl away from the ridge to the W, but the LA just turned N and contoured the hill at about his level or slightly higher. Knowing about the 'rotor' wash a paraglider can take from a LA he became very worried as the ac headed "straight for him" with no avoiding action. He had two choices, try and ride the 'rotor' and risk a collapse or turn into the hill onto a downwind leg, which he did. He turned L NNE'ly at 10-20kmph and landed hard, taking quite a knock. At the closest point the LA passed about 20yd to the W. He assessed the risk as *"high"*.

THE RADAR ANALYSIS CELL (RAC) AT LATCC (MIL) reports that the absence of any detailed information, coupled with no recorded radar data on the LA to assist the trace have prevented the RAC from identifying the reported LA. Therefore, despite exhaustive enquiries the LA remains 'untraced'.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available was unfortunately, only a report from the paraglider pilot.

Clearly the absence of any other amplifying information had prevented the RAC from identifying the reported LA here. Consequently, without a report from the LA pilot the investigation was very unbalanced and it was therefore difficult for the Board to come to any meaningful conclusions. However, there was no reason to doubt the veracity of the paraglider pilot's report and it seemed at face value to be a very close call. The paraglider pilot's account reflected that the LA had been masked by the terrain until he spotted it approaching from around a hill. Members deduced from the paraglider pilot's account that he was poorly placed by the sudden appearance of conflicting traffic and with few options available, his elected recourse was then to turn downwind and land. The glider pilot Member cited this Airprox as an example of what can happen if aeroplane pilots fly too closely to windward facing slopes where paragliders can be encountered at any time. Wiser airmanship would be to give such likely sites a wider berth until it could be clearly established that no other ac are around. Some Members suggested that the cause might be that the untraced LA pilot flew sufficiently close to the paraglider to cause it's pilot concern, but this presupposed that the LA pilot might have seen the paraglider, which could not be determined. In assessing Cause and Risk the Board could only base their assessment on what had actually happened rather than what might have occurred if circumstances had been slightly different. Here, the paraglider pilot saw the LA and elected to turn towards the hill and land to avoid it, thus on the limited information available the Board could only conclude that this Airprox had been the result of a conflict with an untraced LA, which had been resolved by the paraglider pilot.

Clearly, in effecting a downwind landing the paraglider pilot was increasing the potential risk of injury to himself from a fast, hard landing - a risk that had to be balanced against a possible collision. Here it was worth pointing out that the Board was under remit to assess an Airprox on the basis of risk of collision with another ac, which did not encompass the overall compromise to a pilot's safety by having to land downwind, with all that this potentially entails; nor would it necessarily encompass any potential for the collapse of his wing from the effects of turbulence induced by the LA's passage. Fortunately, the paraglider survived the hard landing relatively unscathed but he should not have been placed in that situation by the LA pilot in the first instance. However, it was clear that the paraglider had limited time to detect and sight the LA, deduce where it was going and decide what to do. Having elected wisely to get out of the way of the LA and forestall a collision by turning downwind to land, this still apparently resulted in a mere 20yd horizontal separation at the closest point as the LA flew past. On this basis the Board concluded unanimously that the safety of the paraglider and the untraced LA had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict resolved by the Paraglider pilot.

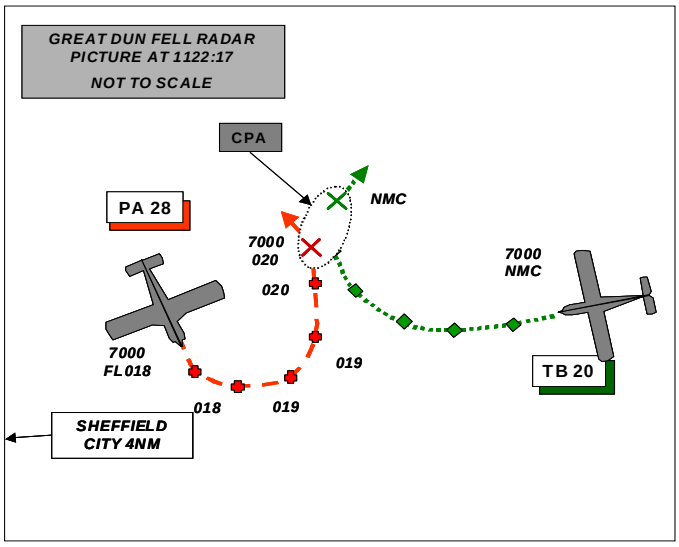
Degree of Risk: B.

AIRPROX REPORT NO 116/07

Date/Time: 11 Aug 1123 (Saturday)
Position: 5324N 00127W (Sheffield VRP)
Airspace: Lon FIR (Class: G)

	Reporting Ac	*Reported Ac*
Type:	TB20	PA28
Operator:	Civ Pte	Civ Club
Alt/FL:	1950-2000ft (QFE)	1500-1800ft (QNH 1015mb)
Weather	VMC CLOC	VMC NR
Visibility:	>20nm	10km

Reported Separation: 100ft V/100ft H Level V/1nm H
Recorded Separation: NR V/0.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TB20 PILOT reports that he was flying a transit from Gamston to Sheffield accompanied by a friend. He had all lights on and was squawking 7000 with Mode C [he thought]. He was heading 280° at 105kt having just left Doncaster Radar and switched to Sheffield Radio (A/G). When they were about 5-8nm from Sheffield VRP, he saw a white ac to the N and tracking S. He asked his friend to check with Sheffield about the traffic and they said they were the only ac on frequency. They continued to watch the ac and it appeared to track between VRP and Sheffield City, then headed E towards the VRP and commenced orbits around the VRP. (See radar analysis at UKAB Note (1)) Again Sheffield was asked about traffic and they repeated that they were the only ac on frequency. He set the landing configuration and became further concerned as the ac's orbit seemed to vary and as they approached the VRP the ac was in their 10 o'clock just above them heading directly towards them but in a slight left turn. He then made an avoiding action right hand descending turn and reconfigured the ac bringing the gear and flaps up. They then called Sheffield again to advise them of avoiding action and if they were in contact with the ac as they had not heard it on the frequency.

They advised Sheffield that they were going to conduct 1 orbit whilst they tried to locate the other ac and failing to do so they then advised them they would commence a second RH orbit.

During the second orbit they then heard a PA28 call Sheffield with a partial callsign and advise Sheffield that they were *"2 mile final land"*. They then contacted Sheffield again to confirm their request to land and began the approach whilst also advising Tower that they thought that the other pilot had not seen them.

The PA28 ac landed ahead of them but was very slow to backtrack and vacate the RW.

After landing he contacted the other pilot and advised him that this was a serious incident and he offered his apologies and added that this was his first solo flight from Sheffield.

He assessed the risk as being very high.

THE PA28 PILOT reports flying blue and white ac on a training flight (his first solo from Sheffield), with all lights selected on and squawking 7000 with Mode C. On recovery, he arrived at the Sheffield City VRP earlier than anticipated and as a result was late changing frequency from Doncaster APR to Sheffield Radio. In order to give himself time he decided to make one orbit at 95kt over the VRP so that he could make his initial call to Sheffield. He was initially told that he was number 2 to land but he could not see any ac ahead of him. As he was turning through a heading of 180° he saw the other ac approximately 1–1.5nm to the W of the VRP and he reported visual with it and said that he was ahead of it. The other ac said he would hold whilst he landed, which he subsequently did. He considered that no Airprox had occurred at any time during the evolution since the other ac was never closer than 1-1.5 nm and neither pilot took any avoiding action; accordingly he considered the risk to be none.

UKAB Note (1): The recording of the Great Dun Fell radar shows the incident. As the recording starts at 1119 the PA28 is squawking 6162 (Doncaster Sheffield) and indicating FL019 (1700ft alt) and the TB20 with no Mode C and both ac are tracking 300°. They both turn left in turn onto a W track and approach the VRP from the E on very similar ground tracks with the PA28 now having changed to a squawk of 7000, 2nm directly ahead of the TB20. At 1121:23 the PA28 commences left hand orbit at the VRP (one only), while indicating FL017. At 1122:06 the TB20, still on a Westerly track, is in the PA28's 12 o'clock at a distance of 0.4nm, the former having completed ¾ of his orbit and the latter having just started an orbit to the right. The PA28 rolls out on a heading of 360° briefly (2 sweeps) before turning left inbound to Sheffield at 1122:47 while the TB20 continued the orbit (one only) to the right before also turning inbound at 1123:55 now 3nm behind the PA28 and following the same ground track.

UKAB Note (2): The Doncaster Sheffield METAR for 1120 was:

240/13 9999 FEW 2000 SCT 3500 19/10 1007

UKAB Note (3): The investigation revealed that there were inconsistencies and inaccuracies in the notification of the Sheffield VRP. This has been addressed by the CAA and the management of Sheffield City Airport.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Although this incident may technically have taken place while both ac were approaching Sheffield City Airport, it was well away from the ATZ and in reality was in the open FIR where no restrictions were in place and the 'see and avoid' principle applied.

Some Members were surprised that this occurrence was reported as an Airprox as it was not readily evident where the safety of either ac may have been compromised since the reporting pilot saw the other ac throughout, was in complete control of the positioning of his own ac and could, and in the view of some GA Members should, have avoided the PA28 by a larger margin had he chosen to do so.

Specialist GA Members considered that the inexperienced PA28 pilot reacted in an entirely appropriate manner by conducting an orbit when he found events unfolding rather more quickly than he had anticipated, something that happens to almost all inexperienced pilots. Far better, they thought, to make an orbit and take stock rather than to fly off into the unknown well 'behind the drag curve'. Although his estimation of the separation was shown by the radar analysis to be inaccurate, so was that of the more experienced TB20 pilot and, as is often the case in such incidents, the correct answer lay midway between the two estimates.

AIRPROX REPORT No 117/07

Members agreed unanimously that there had been no risk of collision and that this had been a sighting report by the TB20 pilot.

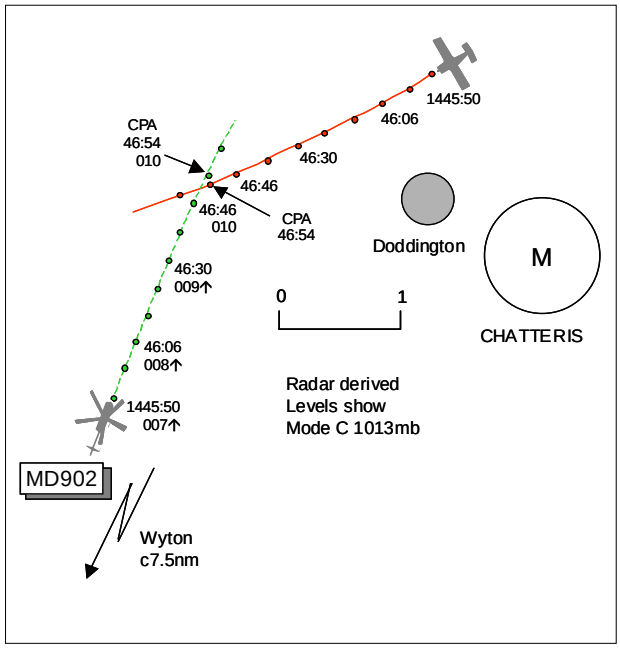
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT NO 117/07

Date/Time:	10 Aug 1447	
Position:	5230N 00001E (9nm NNE Wyton)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	MD902	Untraced
		Light ac
Operator:	Civ Comm	N/K
Alt/FL:	1000ft	
	(QNH 1017mb)	(N/K)
Weather	VMC CLNC	NK
Visibility:	30km	NK
Reported Separation:		
	150-200ft V	
Recorded Separation:		
	<0·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MD902 PILOT reports heading 025° at 125kt at 1000ft QNH 1017mb and not in communication with any ATSU squawking a discrete code with Mode C. The visibility was 30km in SKC VMC and the helicopter was coloured blue/yellow with anti-collision, nav and strobe lights all switched on. Passing 1·5nm W of Doddington he and his 2 observers were all 'eyes out' maintaining a good lookout in the cruise with A/P engaged, when a low-wing white-coloured single-engined ac was seen at the very last minute in their 1-2 o'clock about 0·5nm away converging. An immediate descent was made to avoid the red-nosed light ac which was seen to pass 150-200ft above flying straight and level. This target was not showing on TCAS and he assessed the risk as 'B'.

RAC MIL reports that despite extensive tracing action the identity of the reported ac remains untraced. The radar recording first shows the reported ac non-squawking about 10nm NE of the Airprox position tracking SW before fading about 2nm SE of Peterborough/Connington tracking W. Peterborough furnished the RAC with their daily movement log but there were no ac entries that would correlate to the reported ac's description or landing time. A wider procedural search of adjacent airfields and landing strips did not identify any ac that matched the reported ac's description.

UKAB Note (1): Met Office archive data shows the Wyton METAR as EGUY 1450Z VRB04KT CAVOK 23/10 Q1018 BLU=

UKAB Note (2): The Claxby and Debden radar recordings were both analysed owing to track jitter being exhibited by the both subject ac's primary and secondary radar returns. The MD902 is clearly seen at 1445:50 approaching the Airprox position tracking 035° climbing through FL007 (850ft London QNH 1018mb) with a primary only radar

return in its 1 o'clock range 3·7nm tracking 245°. The 2 ac continue to converge on a line of constant bearing, the MD902 in a slow climb until levelling at FL010 (1150ft QNH) at 1446:46 with the unknown ac in its 1 o'clock range 0·4nm. The CPA occurs on the next sweep as the unknown ac passes just to the R and behind of the MD902 at <0·1nm, the MD902 at FL010 (1150ft QNH).

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the MD902 pilot and radar video recordings.

It was disappointing that the reported ac went untraced which left Members with only one viewpoint of the incident. This had occurred in Class G airspace where there is equal onus on both pilots to provide their own separation from other traffic through 'see and avoid'. However, to comply with the Rules of the Air, the MD902 pilot was responsible to give way to the other ac approaching from his R. The MD902 pilot had seen the other ac late, pilot Members opining that it may have been obscured by the front door pillar for some time as it approached on a line of constant bearing, only entering his field of view when close-by. That said, these blindspots associated with particular ac types, are known and are normally overcome by the pilot weaving the ac's nose or by moving his head during his lookout scan to 'uncover' those previously obscured areas. Some Members believed that this late sighting had been the cause of the Airprox. However, this view was not shared by the majority who thought that the MD902 pilot had seen the other ac in enough time to discharge his responsibilities adequately, and that this had been a conflict resolved by the MD902 pilot whose avoiding action had quickly and effectively removed any risk of collision.

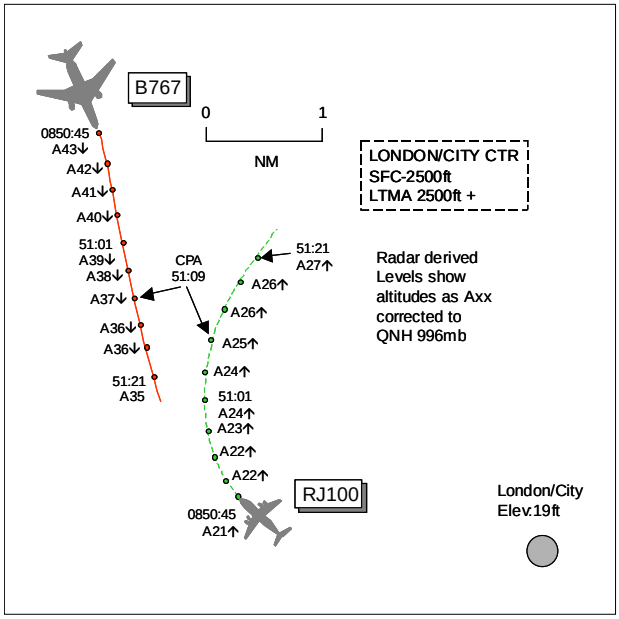
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace resolved by the MD902 pilot.

Degree of Risk: C.

AIRPROX REPORT NO 118/07

Date/Time:	15 Aug 0851	
Position:	5132N 00002W (4nm NW London/City - elev 19ft)	
Airspace:	City CTR/LTMA	(Class: D/A)
	Reporting Ac	*Reported Ac*
Type:	RJ100	B767-300
Operator:	CAT	CAT
Alt/FL:	2000ft↑	↓4000ft
	(QNH 996mb)	SAS
Weather	IMC KLWD	NK
Visibility:	10km	NR
Reported Separation:		
	500ft V/1nm H	NR
Recorded Separation:		
	1200ft V/0·7nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE RJ100 PILOT reports carrying out a DVR 3T departure from RW28 at London/City and in communication with Thames Radar on 132·7MHZ squawking 5242 with Mode C. Tracking 050° at 190kt to intercept the 083° radial from the LON VOR and climbing through 2000ft a TCAS contact was noted as proximate traffic 3nm away 1700ft

above descending towards O/H. This became a TA alert approximately +1300ft then proximate traffic again, always descending, to +500ft before finally passing 1nm behind. At the time of the incident, their ac entered a cloud layer at 1500ft and was IMC in cloud. They advised Thames and were informed that the other ac was descending into Heathrow and had 'level bust'.

THE B767 PILOT provided a brief report. On radar vectors for RW27L to Heathrow they were given clearance to descend from FL80 to 4000ft but they did not set altimeter from SAS 1013mb to 996mb at time of the clearance. They descended approximately 500ft below their cleared altitude which was pointed out to them by ATC and regained altitude and continued their approach. The FO was going to change the altimeter at the time of clearance but he, the Capt, had it in his mind that the transition level and transition altitude were both at 6000ft.

THE THAMES RADAR CONTROLLER reports that at 0849 the RJ100 departed London/City RW28 climbing to 3000ft. On first contact he asked the flight to squawk 'ident' and maintain 3000ft as Heathrow inbounds descend to 4000ft above. This was the only flight on his frequency at the time but 3 more departures required release and several inbounds were about to call. At about 0851 the Heathrow INT N alerted him to the fact that the B767 had 'level bust' by descending through its cleared level of 4000ft. At the same time the RJ100 crew reported he had a TCAS RA, he thought, but the traffic had already passed behind. No avoiding action was necessary as the B767 descended through 4000ft as the subject ac passed abeam each other.

THE HEATHROW FIN DIR reports the B767 was heading 180° on a base leg for RW27L from the N with the ac's Mode S selected flight level (SFL) showing 40 and his fps showing it had been cleared to 4000ft on QNH 996mb. He saw a London/City departure climbing out. As the 2 blips merged on radar it was difficult to see the actual altitude but as they separated slightly the B767 was at 3600ft descending with the outbound [the RJ100] showing 2600ft climbing; by this time the ac were on diverging tracks. He asked the B767 flight to confirm he was descending to 4000ft on QNH 996mb as there was traffic on their LHS, which he had just passed, climbing to 3000ft. The crew replied they were descending on 'standard setting' i.e. 1013mb. He had already given the B767 crew TI on the other ac and they were diverging so there was no avoiding action he could give other than tell the crew to maintain 4000ft on QNH 996mb which he did. The B767 then climbed back up to 4000ft and established on the ILS before landing normally.

ATSI comments that the B767 flight was inbound to Heathrow and, having been given descent clearance to 4000ft, was transferred from INT to FIN. The unit investigation confirmed that the correct QNH of 996mb was passed by INT and read back by the B767 crew. The crew called FIN at 0849:20 and reported passing 6600ft for 4000ft. The radar pictures shows that 4000ft was the SFL, however, the Mode C indicated the ac passing 6100ft rather than 6600ft as reported. The FIN instructed the crew to turn R onto 140° before a further R turn onto 180° and a speed reduction to 180kt.

The RJ100 flight departed London City and contacted the Thames Radar controller at 0850:45. The crew reported passing 2200ft for 3000 on a Dover 3T departure. At this time the B767 was NNW of the RJ100 by 3·4nm with the B767 passing 4300ft in descent. At 0851:15, FIN instructed the B767 crew to turn R heading 195° which they correctly read back. The FIN immediately instructed them to maintain 4000ft, as their Mode C indicated 3500ft. The crew acknowledged this and FIN informed them of their Mode C read out together with the fact that they had passed traffic on their LH side (the RJ100) at 2800ft. The B767 crew then transmitted "*Say the altimeter again nine nine six*?" to which the FIN replied "*Affirm, nine nine six*". Meanwhile, the RJ100 crew asked the Thames controller what the traffic was that they had on TCAS which passed "*…just above us and pretty close really*". The Thames controller advised that it was traffic that had 'bust its level' whilst inbound to Heathrow.

The FIN asked the B767 crew what QNH setting they had set. This question had to be put several times due to other flights transmitting but the crew did reply advising: "*We had standard (B767 c/s)*".

The radar recording shows that the B767 was S'bound on its heading whilst the RJ100 was turning R following the SID. The two ac passed port-to-port at a range of 0·7nm with the B767 1200ft above the RJ100. At 0851:21, the RJ100 was in the B767's 7 o'clock at a range of 1·4nm and 800ft below. As the two ac were heading away from each other lateral separation was quickly restored.

UKAB Note (1): STCA did not activate.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Pilot Members agreed that the B767 crew did have 2 options available as to when to set the QNH. Firstly, as recommended by the UK AIP, when the flight vacated a FL descending to an altitude the pilot would set the aerodrome QNH unless further FL vacating reports had been requested by ATC, in which case, the QNH would be set following the final FL vacating report. A second option would be to set the QNH after descending through the transition altitude. In either case, company SOPs should detail which procedure the crew would be expected to follow and a crosscheck within the B767 cockpit should have detected that the crew still had 1013mb set. Members agreed that the cause of the Airprox was that the B767 crew did not set the QNH and had descended below their cleared altitude.

Looking at the inherent risk, the RJ100 crew had seen the B767 approaching on TCAS as proximate traffic, well above them but descending, and had wisely monitored its progress. The B767's TCAS computed flight path had then generated a TA on the RJ100's TCAS display before moderating to proximate traffic once more; the B767 was reported as passing about 1nm away and descending to within 500ft vertically at the closest point. Whereas the radar recording reveals the subject ac passing abeam each other by 0·7nm with over 1000ft vertical separation after the tracks diverge, with the vertical separation only reducing further as the B767 levels-off at 3500ft and the RJ100 continues to climb to 3000ft. The good situational awareness shown by the RJ100 crew when combined with the actual geometry of the incident convinced the Board that safety had been assured during this encounter.

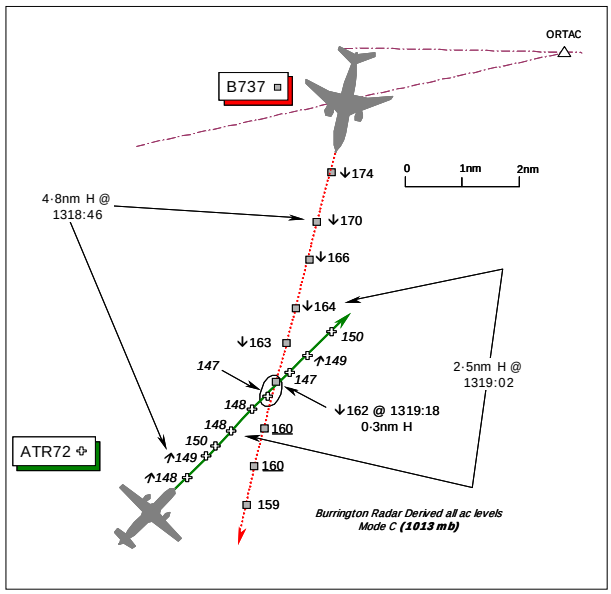
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The B767 crew did not set the QNH and descended below their cleared altitude.

Degree of Risk: C.

AIRPROX REPORT NO 119/07

Date/Time:	30 Jul 1319	
Position:	4953N002 08W (8nm SW of ORTAC)	
Airspace:	Chl Islands CTA	(Class: A)
	Reporting Ac	*Reported Ac*
Type:	ATR72	B737-300
Operator:	CAT	CAT
Alt/FL:	↑FL150	FL160↓
Weather	VMC CLOC	VMC Good
Visibility:	40km	>10km
Reported Separation:		
	1000ft V/nil H	1000-2000ft V
Recorded Separation:		
	1500ft V @ 0·3nm H	
	900ft V @ 2·9nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ATR72 PILOT reports he was outbound from Guernsey to Gatwick under IFR and in receipt of an ATS from Jersey ZONE on 125·2MHZ. Heading 040° some 10nm SW of ORTAC at 160kt, upon levelling-off at FL150, to

commence a level cruise, another ac – the callsign of a B737-300 that he recognised - was displayed on TCAS flying a reciprocal heading 2000ft above their level and descending. A brief TA appeared on the TCAS, followed by an RA to "DESCEND DESCEND". The autopilot was disconnected and the TCAS RA was complied with. ATC was informed of their "TCAS DESCENT" and at the same time the B737 crew reported a "TCAS CLIMB" to ATC, he thought. The RAs in both ac were quickly resolved and they returned to their assigned level of FL150 as the B737 crew reported returning to FL160.

Minimum vertical separation was assessed as 1000ft as the B737 passed directly above them. He added that the TCAS RA caused them to descend about 300ft to FL147 prior to climbing back to FL150. The flight was then continued uneventfully. He assessed the risk as "low".

THE B737-300 PILOT reports he was inbound to Jersey under IFR in "good" VMC, albeit flying 'into sun', whilst in receipt of a RCS from Jersey ZONE, also on 125·2MHz and squawking A7762.

Just after commencing the JERSEY 1X-RAY STAR, flying southbound at 350kt cleared to FL160, during the descent whilst passing FL170, TCAS enunciated a TA and then an RA of "reduce descent" [more probably "ADJUST VERTICAL SPEED"]. An intruder was detected on the TCAS display at 12 o'clock 5nm but no traffic information had been passed by ATC beforehand. The RA was followed and the "TCAS event" reported to Jersey ZONE. Minimum vertical separation was 1000-2000ft at a range of 5nm but he was unable to assess the Risk. Stressing that this was a high workload situation with both pilots monitoring the progress of the flight, he added that the ac's EHSI's was set to a longer-range scale at the time which therefore was cluttered with track information at close range.

THE JERSEY ZONE CONTROLLER reported on a TCAS event form that the ATR72 was at it's cruising level of FL150 with the B737 descending in the opposite direction to FL160. Both flights simultaneously reported a TCAS RA but he received a 'crossed' RT transmission. The B737 had a CLIMB RA and the ATR72 a DESCEND RA. Thereafter both flights soon reported returning to their ATC assigned levels. The RAs were obviously caused by the B737's rate of descent. At the crossover vertical separation was approximately 1300ft.

ATSI reports that he ATR72 departed Guernsey and made contact with the Jersey ZONE controller at 1306:40. The crew reported they were following an ORTAC 2W SID and climbing to FL40. The controller instructed the crew to climb to FL150 and route direct to ORTAC, which was acknowledged. At 1316:40, the B737 crew called the ZONE controller and reported maintaining FL200. At this time the B737 was 11nm NW of ORTAC, whilst the ATR72 was passing FL133 for FL150, 16½nm SW of ORTAC. The B737 crew was advised to expect a standard arrival to Jersey with RW09 in use. This was acknowledged and the B737 crew advised that they were standing-by for descent.

At 1317:00, the controller instructed the B737 crew to descend to FL160, which was acknowledged and, shortly afterwards, '160' appeared in the Selected Flight Level box of the B737's Mode S SSR [as displayed on the Pease Pottage radar recording but not available to the Jersey ZONE controller]. At this time, the B737 was in the ATR72's 11 o'clock at a range of 20nm. Fractionally after 1318:50, the controller heard simultaneous transmissions from the two ac, one of which was the B737 crew reporting a TCAS RA.

The **Pease Pottage** radar shows that at this time the ATR72 was level at FL150 with the B737 in its 11 o'clock at a range of 4·2nm with the B737 descending through FL168 for FL160. The next sweep shows the ATR72 commencing a descent, subsequently determined to be in response to a TCAS RA, whilst the B737 is passing FL165. At 1319:14, the radar shows the B737 still in the ATR72's 11 o'clock at 0·7nm, with the ATR72 indicating FL148 and the B737 FL162. The B737 crosses from L – R, through the 12 o'clock of the ATR72 and at 1319:21, the ATR72 has descended to FL147 with the B737, now indicating FL161, in its 4 o'clock - 0·2 nm. The only point that the B737's Mode C indicates less than FL160 is at 1319:37, when it indicates FL159; but at that time the 2 ac have passed each other and are 2·9nm apart.

UKAB Note (1): Following a request from the UKAB, NATS Operational Analysis and Support very helpfully provided an a TCAS performance assessment using the **Pease Pottage** single radar source data with downlinked Mode S data and an Interactive Collision Avoidance Simulator (InCAS).

This simulation indicated that both ac received TCAS Traffic Alerts (TAs) at 1318:42, as the ATR72 was passing FL149 climbing towards FL150 and the B737 was descending through FL171 towards FL160. At the time of the

TA the ac were on convergent lateral headings. As the ac continued to climb and descend respectively, at 1318:49 when the downlinked Mode S ROD was 2880fpm, the B737 crew was issued with an "ADJUST VERTICAL SPEED" Resolution Advisory (RA) instructing the pilot that the B737's rate of descent should not exceed 1000fpm whilst the ATR72 was issued with a "DESCEND" RA at 1318:50 at a range of 4·09nm. Downlinked Mode S data from the B737 shows that the instantaneous ROD on the radar sweep timed at 1318:53 was 3456fpm, moderating on the next return at 1318:59 to 2240fpm, and to 1344fpm at 1319:05. However, overall from 1318 - 1319 the B737's average ROD is about 2000fpm. The analysis of this simulation indicates that the ATR72 began to descend and the RA weakened to "ADJUST VERTICAL SPEED" at a range of 2·6nm, instructing the pilot of the ATR72 that he should not climb. The ac crossed laterally and were subsequently issued with "CLEAR OF CONFLICT".

The pilot of the B737 filed a report stating that they had received a TA followed by an "ADJUST VERTICAL SPEED" RA requiring them to reduce their ROD, as supported by the simulation. The pilot of the ATR72 filed a report stating that they had received a TA followed by a "DESCEND" RA, but did not explicitly state the subsequent weakening of the RA, although it appears that they were aware that the ATR72 should not climb. The ATR72 pilot reported that they descended 300ft to FL147 before "CLEAR OF CONFLICT" was received.

TCAS RA encounters between two ac approaching levels, intending to level off with 1000ft separation are not uncommon. These are generally caused by one or both of the ac approaching their intended levels with a relatively high vertical rate, triggering the RA. TCAS uses time-to-go to CPA based on the combined closure rate of ac, rather than distance, as the primary trigger for an RA.

It has been observed that this type of encounter can lead to misleading "ADJUST VERTICAL SPEED" alerts potentially causing the ac to follow the RA through the intended level, possibly leading to a level bust. Development of TCAS logic which aims to alleviate this problem is currently being conducted, however, this development is still at an early stage.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, radar video recordings and an analysis of the TCAS data, together with a report from the air traffic controller involved and the appropriate ATC authority.

It was clear to the Members that ATC had issued instructions to both flights that would ensure that standard vertical separation would be provided from the outset. Evidently the ATR72 crew were just levelling at their assigned outbound level of FL150 and the B737 had been instructed to descend to FL160. This was all before the TCAS equipment in both ac sensed that the respective vectors of the two ac would potentially result in an erosion of safety margins if these vectors were maintained. However, it was plain that the electronic eye of TCAS was unaware that the B737 crew would be levelling off at their assigned level some 1000ft above the ATR72 – hence the co-ordinated RAs. Whereas some reports have stated that the B737 crew received a TCAS CLIMB, it would appear from the INCAS and Mode S data that the RA was a MONITOR VERTICAL SPEED, requiring the crew to moderate their ac's ROD as no interruption to the ac's continuous descent is evident from the radar recordings. Whilst not mandated in these circumstances, a controller member thought that it was unfortunate that traffic information had not been provided to the respective crews, which might have allayed the ATR72 pilot's concern. Nevertheless, once the RA was enunciated, the crews themselves had little choice but to follow the TCAS guidance. In the Board's view this incident had resulted from a sighting of traffic displayed on TCAS, where no risk of a collision existed at all in these circumstances.

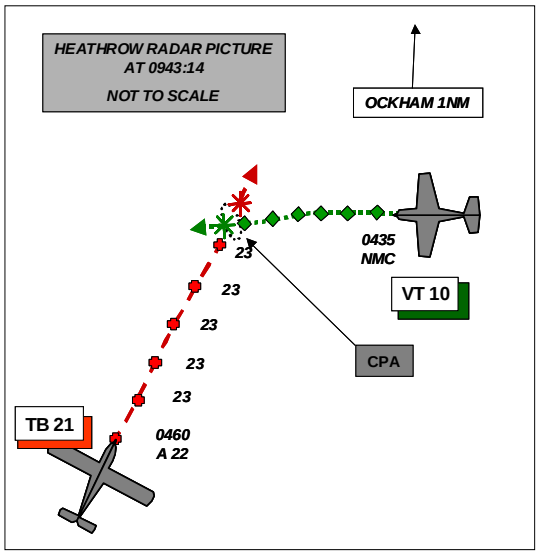
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report (TCAS).

Degree of Risk: C.

AIRPROX REPORT NO 120/07

Date/Time:	5 Aug 0943 (Sunday)	
Position:	5117N 00027W (2nm S Ockham OCK)	
Airspace:	LON FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Victa Airtourer	TB21
Operator:	Civ Club	Civ Pte
Alt/FL:	2400ft (QNH 1011mb)	2300ft (QNH NR)
Weather	VMC CAVOK	VMC CAVOK
Visibility:	>10km	>10km
Reported Separation:	<50ft V/0 H	NR
Recorded Separation:	(estimated 0 H)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VICTA AIRTOURER (VT10) PILOT reports flying a red and white ac with the red beacon switched on, on a private flight from Rochester to Compton Abbas. SSR was fitted but with no Mode C. After leaving Rochester to the W he contacted Biggin Hill for a FIS and he passed Biggin Hill to the S along the M25 at 105kt and then to the N of the London Gatwick TMA at 2400ft. He continued on a heading of 270° and once S abeam Kenley he contacted Farnborough Radar who told him to squawk 0435. He was identified and given FIS, passed his route and was 'cleared' direct to OCK, remaining at 2400ft on the London QNH of 1011mb.

En-route to OCK he was advised by Farnborough Radar of a Helicopter travelling in the opposite direction which he saw slightly to his right and beneath him by about 1000ft. He then passed about 1.5nm to 2nm to the S of OCK still at 2400ft.

When he was S of OCK he looked down at his map momentarily to check his next track which was 255° and took him direct to Compton Abbas. After a few sec he looked back to his front and saw an ac immediately in front of him 200ft away and about 50ft higher and heading straight towards him. Within a second the ac passed above him and continued on its track. There was no time to react and take any avoidance.

The other ac was a low wing; single engine ac with a retractable undercarriage, he thought possibly a Piper Arrow or a TB10; it was white underneath and had a registration mark on one wing but it passed too quickly to read it.

Once S abeam Farnborough he called Radar to clarify his clearance into the Odiham MATZ and was again given the same transponder code and told was on receipt of a FIS as though he had made an initial call. He thought this was strange since he had already been given this service a few minutes earlier so he thought that there had been a change of controllers between his calls.

He assessed the risk as being high.

THE TB21 PILOT reports that he was contacted by West Drayton ATC who advised that an Airprox had been reported. He was flying a private flight from Jersey via OCK and Eastwards to Biggin Hill in a grey, red and white ac with strobes and nav lights switched on. He was squawking as directed with Mode C and was cruising at 2300ft on the London QNH [1011] and at 130kt, in receipt of a RIS from Farnborough RADAR. He recalled that the weather was good with very clear visibility and the traffic was heavy. Rather than flying directly over the beacon he normally routes slightly off the beacon for good practice as many others route directly over the beacon just below the CAS; on that flight he routed 1nm SW of the beacon.

He does not recall seeing any other ac in close proximity and was not given any avoiding action or TI by ATC at that location.

UKAB Note (1): The recording of the Heathrow Radar showed the incident. The Airtourer, squawking 0460, routes 1nm to the S of OCK tracking 260° but shows NMC, while the TB21 tracks about 030° towards the beacon. The CPA occurred between sweeps as the ac cross but the minimum horizontal separation is projected as being zero; the TB21 indicates an alt of 2200ft. As the diagram shows the ac approach on a line of constant bearing with the Airtourer slightly slower than the TB21 and maintaining a position in its 1 o'clock.

ATSI reports that the pilot of the Airtourer called Farnborough Radar at 0936:10, and reported routeing via OCK and SAM at 2400ft, present position 11nm E of OCK and requesting a FIS. The controller confirmed that a FIS would be provided and allocated a squawk of 0435. At 0937:10, the TB21 pilot called and was asked to standby. Shortly afterwards the controller requested the pilot to pass his details and he stated that he was abeam MID at 2500ft and "*….request Flight Information Service er Radar Information Service*".

The controller advised that it would be a FIS and allocated a squawk of 0460. At 0938:25, the controller advised the Airtourer pilot that he was identified 8nm E of OCK and reiterated that he was in receipt of a FIS. At 0940:10 the TB21 pilot was informed that he was identified 3nm N of Dunsfold, in receipt of a FIS, and passed TI on two nearby contacts. Shortly afterwards a change of controller took place and the position was manned by a mentor and a trainee.

The new controller advised the TB21 pilot that on his initial call he was actually within the London TMA (just E of MID at 2500ft) and to check his routeing, which the pilot acknowledged. There were no further transmissions from either of the subject pilots until shortly after 0944:30, when the controller informed the TB21 pilot that he was about to enter the Heathrow CTR and to turn right at least 20º.

UKAB Note (2): An analysis of the radar recording which was similar to that at UKAB Note (1) was provided.

It is evident from the RTF that the controller was busy at the time and, in accordance with the terms of a FIS, as specified in MATS Part 1 Section 1, Chapter 1, page 2, para 6.2: '*…..controllers will, subject to workload, provide pilots with information concerning collision hazards to aircraft operating in Class C, D, E, F and G airspace where self evident information from any source indicates that a risk of collision may exist. It is accepted that this information may be incomplete and the controller cannot assume responsibility for its issuance at all times or for its accuracy*'.

The pilot of the TB21 made no mention of routeing towards OCK and it might reasonably have been assumed that once clear of the Gatwick CTR a track of approximately 070º would have been followed to take the ac direct to its destination of Biggin Hill, thus remaining well S of OCK.

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 controllers involved and reports from the appropriate ATC authorities.

This very serious incident took place in a very busy portion of the London FIR where many GA aircraft route, in both directions, around the London CTR and below the TMA, where the 'see and avoid' principle applies. The congestion is exacerbated near navigation beacons. Both pilots had, in the view of the Board, wisely opted for an ATC Information Service and both had again wisely avoided the overhead of the beacon, thus minimising the collision risk; in this case unfortunately neither proved to be successful. Fortunately however, they had opted to fly at differing altitudes, albeit by only 100ft or so, as this had almost certainly been the only factor that had prevented the ac from colliding.

Although Farnborough Radar can be very busy indeed, specialist GA Members strongly urged that pilots make use of it where possible but also emphasised that it is only an aid to good lookout and, like any other such unit, they can become loaded to the extent that controllers do not see or warn pilots of every confliction.

AIRPROX REPORT No 121/07

As witnessed in this incident navigating in that complex area can also be difficult, time consuming and can reduce the time available for look out; specialists again wished to remind pilots that good practise is to interrupt tasks such as map reading, frequency and squawk changes and intersperse short spells of lookout.

Since the Airtourer pilot did not see opposing ac in time to react and the TB21 pilot did not see the Airtourer at all, Members agreed unanimously that there had been an actual risk that the ac would have collided.

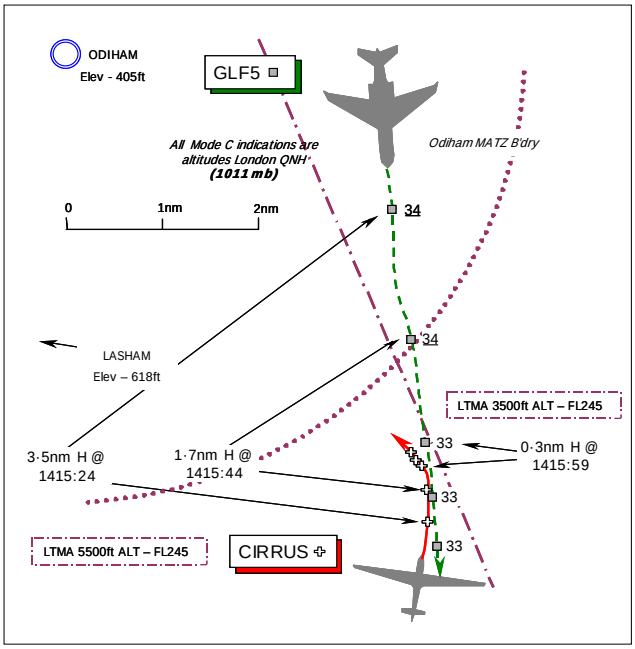
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the TB21 pilot and effectively, a non-sighting by the Victa Airtourer pilot.

Degree of Risk: A.

AIRPROX REPORT NO 121/07

Date/Time:	16 Aug 1416	
Position:	5109N 00050W (7½nm SSW of Farnborough - elev 238ft)	
Airspace:	London FIR	(Class: G
	Reporting Ac	*Reported Ac*
Type:	Gulf 5	Cirrus Sailplane
Operator:	Civ Exec	Civ Pte
Alt/FL:	3500ft↑ QNH	4500ft amsl
Weather	VMC CLBC	VMC NR
Visibility:	>10nm	50km+
Reported Separation:	200ft V/Nil H	500-1000ft V ¼-½nm H
Recorded Separation:	V NR/<200yd H track displacement	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GULFSTREAM 5 (GLF5) PILOT reports he had departed from Farnborough outbound for Nice and was in receipt of a radar service from Farnborough RADAR. When the Airprox occurred he was flying in VMC, some 1500ft clear below cloud with an in-flight visibility of >10nm. After receiving "climb clearance" from RADAR to climb from 3400ft to 4400ft on a radar vector of S, climbing through 3500ft QNH, at 250kt, a white glider was suddenly spotted dead ahead 5sec before the CPA. To *"avoid impact"*, he - the PNF - together with the PF pushed the nose down and passed 200ft beneath the glider with a *"high"* risk of a collision. He added that limited traffic information was received about the glider but no altitude was given.

THE STANDARD CIRRUS SAILPLANE PILOT reports he was gliding at an altitude of 4500ft amsl [see Note (1)] in VMC some 6nm E or SE of Lasham, in straight and approximately level flight at 70kt, he thought on an E to SE'ly heading [radar indicates it was a northerly course]. In his 2 o'clock he saw a white low-wing, rear engined business jet – the GLF5 - pointing straight at him, at a range of 1nm or more. To avoid the jet he pulled up, gaining about 200–300ft, as he watched the jet, which appeared to be in a descending R turn, pass about 500-1000ft below and about a ¼-½nm away with a "medium" risk of a collision. He added that his white glider has no radio.

UKAB Note (1): In a subsequent telephone conversation with the glider pilot he stated that as a licensed commercial pilot he is cognisant of the base of the LTMA in the vicinity of Lasham. Consequently, he stated that he was more probably operating clear below CAS in this vicinity at 3500ft or below. He was not familiar with a GLF5 and therefore unsure of its size in comparison to his glider, therefore, he agreed that the separation could have been somewhat less than he reported 8 weeks after the Airprox had occurred.

THE FARNBOROUGH APPROACH RADAR CONTROLLER (APR) reports operating on the RAD2 position with frequency 134·350, utilizing the Heathrow SSR coupled with the Farnborough primary data, when the subject GLF5 [he thought it was a Gulfstream 4] departed Farnborough towards Goodwood VOR. Upon identification the flight was placed under a RIS due to the intensity of traffic and the workload at the time. Traffic information was passed to the GLF5 crew about a [primary] contact in their 12 o'clock at about 2nm range, with no type or level information available and instructed the crew to climb stating there was no known traffic to affect the climb. The GLF5 pilot then stated he was visual with the other ac and that it was too close and quote "dangerous" to do so. This was acknowledged and the traffic called until the ac were clear. At about 1416, the flight was then transferred to London CONTROL.

ATSI reports with RT transcript that the GLF5 departed from Farnborough's RW24 at 1414. The crew had been instructed to climb straight ahead to an altitude of 3000ft QNH (1011mb) and to squawk A2233. The ADC instructed the crew to contact Farnborough RADAR at 1414:05, which they did. The APR instructed them to climb to 3400ft and to turn L onto a heading of 180º as well as advising them that they were identified on radar. The GLF5 crew acknowledged this at 1414:30, whereupon the APR stated that he would provide a RIS and traffic information was passed to the GLF5 crew on a calibration flight that was to the SW.

To the S of the GLF5 were two primary returns and, at 1415:25, the APR transmitted "[GLF5 C/S] *traffic 12 o'clock 2 miles opposite direction, no height information believed to be low level*". This was acknowledged and then the APR transmitted "[GLF5 C/S] *no known traffic to affect your climb altitude 4000 feet there is (unintelligible word) traffic 12 o'clock 2 miles*". This, it is believed, related to the primary contacts mentioned earlier, one of which was heading N towards the GLF5 [the subject Cirrus glider]. The GLF5 pilot started to read this back and then made a comment on RT: "*..er he is higher than us and conflicting right now it's a glider very very dangerous*". At the time the GLF5 pilot made this comment – just before 1416:00 - the primary return, as displayed on the Heathrow 23cm radar, is in the GLF5's 12 o'clock at 1·4nm. The APR advised, *"roger I had no height information on that traffic you're under radar information you maintain your present altitude and own separation if you wish"*, ending the transmission exactly at 1416:00. The two ac passed each other on reciprocal tracks and, at 1416:05, the APR informed the GLF5 crew that *"..when that traffic's..passed you and you're clear and visual with that climb to altitude 4400 feet".* The pilot confirmed he was clear and that the other traffic was a glider.

The APR had provided a RIS in accordance with the provisions of MATS Part 1 and so there are no ATC causal factors.

Analysis of the Pease Pottage, Gatwick 10cm and Heathrow 10cm radars revealed no other contacts in the area at the time.

UKAB Note (2): Analysis of the Heathrow 23cm Radar source shows the GLF5 southbound level at 3400ft London QNH (1011mb), before descending marginally to 3300ft QNH. The primary contact associated with the Standard Cirrus glider [which was tracked to landing at Lasham] is shown on a broadly northerly track as the GLF5 closes from the N beneath the LTMA on a broadly reciprocal course. No deviation below the indicated 3300ft is evident from the GLF5 as the two tracks pass each other with about 0·1nm – 200yd - horizontal displacement. The glider contact turns L onto about 340° after the ac pass and the GLF5's Mode C indicates a climb from the indicated 3300ft about 1nm S of the Airprox location.

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, together with a report from the air traffic controller involved and the appropriate ATC authority.

From the outset it was clear to the Members that the GLF5 pilot was passed traffic information on the unknown primary contacts by the APR under the RIS that pertained here. The subject Cirrus glider was the closest of two primary contacts, northbound at the time and not heading E as it's pilot thought. A controller Member postulated

that perhaps the APR might have called it to the GLF5 crew earlier, before instructing their southerly turn, but advisors pointed out that the traffic information was probably passed as soon as was practicable. Other controller Members speculated that the traffic information transmitted had been potentially misleading, insofar as the APR had said that the unknown contact – the Cirrus - was *"… believed to be low level*". Although the Cirrus pilot originally thought he was flying somewhat higher, the Board agreed that given the reported geometry it seemed far more probable that he was gliding below 3500ft amsl in that position, with the 3500ft base of the LTMA just to the E of his track. Whilst the controller might reasonably have surmised that the primary contact was operating beneath the base of the LTMA in this vicinity he had no Mode C data or any other information that the contact was at *"low-level"* as he had advised the GLF5 crew. Furthermore, some Members thought the phrase "..*no known traffic to affect your climb.."* might also have been confusing to foreign pilots. Whilst clearly the traffic information provided gave the crew warning about an unknown ac, some controller Members were of the view that 'if you don't know for certain don't say it' – a salutary lesson here. The debate moved on to whether the GLF5 pilot had recognised that he was operating in the 'see and avoid' environment of the Open FIR before he climbed up through the base of the LTMA into Class A CAS. Here there was no inherent responsibility on ATC to separate the GLF5 from the observed 'unknown' contact. The RIS provided by the APR here is fundamentally a 'VFR' service to assist pilots to sight other reported traffic and, despite operating in conformity with their IFR FPL, the GLF5 crew were responsible for maintaining their own visual separation from other ac acquired visually in this 'see and avoid' airspace. The white colour of the glider possibly seen against a white cloudscape, coupled with little crossing motion to draw attention to it, all apparently conspired to mask the glider's presence until the last moment. The GLF5 pilot reported that he spotted the white glider dead ahead 5sec before the CPA, which Members agreed was a late sighting by the GLF5 crew and part of the cause. The glider pilot saw the GLF5 1nm away, without the benefit of a radar service to help him, but had later said that his unfamiliarity with this ac type, and thus its size, might have affected his own assessment of the minimum separation. Nonetheless, the GLF5 was there to be seen in the relatively good visibility that pertained and the Members concluded that this had also been a late sighting on his part. Members agreed unanimously that the cause of this Airprox was a late sighting by both pilots, of each other's ac.

Turning to risk, the GLF5's Mode C indicated an altitude of 3300ft moments before the CPA and the glider pilot had subsequently reported that he would more probably have been below the 3500ft base level of Class A LTMA in this vicinity. It seemed logical to Members therefore, that the minimum vertical separation had been closer to the 200ft seen by the GLF5 pilot who possibly had a better view of the underneath of the glider flying above him as he and his colleague pushed to avoid it. This was less than the 500–1000ft V the Cirrus pilot originally reported, but he was unfamiliar with the overall size of the GLF5, which would have been beneath him as he pulled up. The Gliding Member added that the Cirrus pilot was flying about as fast as the ac could, thus he would have been well placed to execute his avoiding action climb and it was clear that both the GLF5 crew and the glider pilot were able to take prompt and effective avoiding action as soon as the situation became clear to them. The robust nature of the GLF5 crew's avoiding action suggested this was only just in time, but their action combined with the Cirrus pilot's climb had mitigated the actual risk of collision. However, the Board agreed that the safety of the ac involved had certainly not been assured in these circumstances.

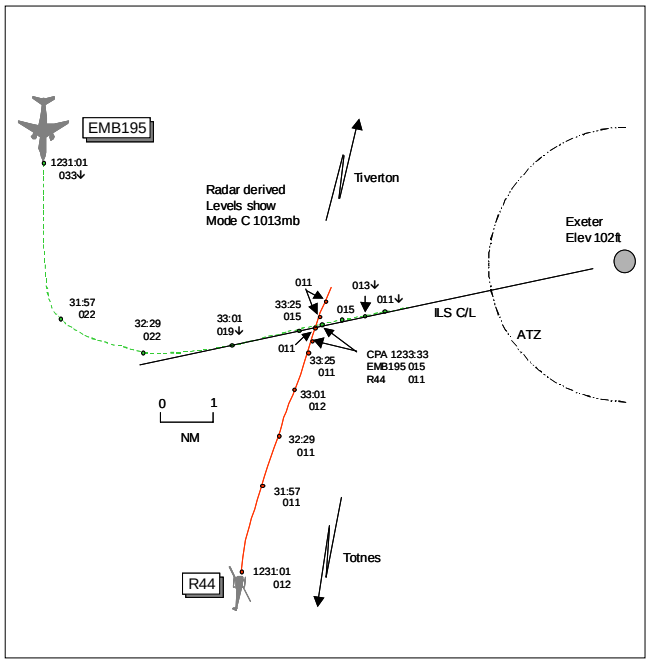
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sighting by both pilots.

Degree of Risk: B.

AIRPROX REPORT NO 122/07

Date/Time:	25 Aug 1234 (Saturday)	
Position:	5043N 00333W (5nm FIN APP RW08 Exeter - elev 102ft)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	EMB195	R44
Operator:	CAT	Civ Pte
Alt/FL:	2000ft↓ (QNH 1029mb)	1500ft (QNH)
Weather	VMC CLBC	VMC CLBC
Visibility:	30km	30km
Reported Separation:	400ft V/<1nm	2000ft V/1·5nm H
Recorded Separation:	400ft V/0·3nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EMB195 PILOT reports inbound to Exeter IFR and in receipt of a RAS from Exeter Tower on 119·8MHz squawking 1067 with Mode C. The visibility was 30km flying 500ft below cloud in VMC and the ac was coloured white/blue with landing, nav and strobe lights all switched on. On approach to RW08 a TCAS contact was noted to the S of the FAT below them but they were not visual. Whilst checking with Tower at about 5nm final RW08 at 2000ft QNH heading 080° at 180kt they became visual with a dark coloured light helicopter, possibly an R44, very close on their R, <1nm away, about 400ft below. A TA alert was received and then a brief RA 'adjust v/s' which was followed and reported to Tower. Once clear of the traffic they returned to the ILS and landed. He assessed the risk as medium.

THE R44 PILOT reports flying a local sortie with a passenger from Tiverton VFR and in receipt of a FIS from Exeter Radar squawking 7000 with Mode C. The visibility was >30km flying 1500ft below cloud in VMC and the helicopter was coloured black with red strobes switched on. Earlier he had lifted from Tiverton and requested a FIS routeing Dawlish, Dartmouth, Totnes returning to Tiverton. A FIS was given and when S of Exeter he was given a frequency change. He operated low-level after Teignmouth below 1500ft towards Dartmouth taking photos before turning back towards Tiverton. About 7-8nm SW of Exeter heading 360° at 110kt at 1500ft he heard ATC giving to an airline c/s flight instructions from 10000ft inbound to Exeter for RW08. He saw the ac about 10nm away, turning, 5000ft above descending before it eventually crossed 1·5nm ahead from L to R and 2000ft above. He assessed that there was no risk of collision as the airliner was quicker, higher and fully visible throughout.

THE EXETER RADAR S CONTROLLER reports the EMB195 was radar vectored onto the ILS RW08 and once clear of traffic [not the reported R44], was transferred to Tower on 119·8MHz established at 8nm from touchdown. At approximately 5nm the EMB195 crew reported to Tower a TCAS RA and at the same time a 7000 squawk appeared on the radar display. The EMB195 crew reported a helicopter below, the only helicopter on frequency was an R44 last reported at Dartmouth low level on a photo sortie. He asked the R44 pilot if he was N'bound to which he replied 'affirm, just passing underneath an ac on final approach'. He told the pilot that the EMB195 crew had reported a TCAS RA.

UKAB Note (1): Met Office archive data shows the Exeter METAR as EGTE 251220Z 21003KT 9999 FEW035 22/15 Q1029=

ATSI reports that the R44 flight was operating VFR on a return flight to Tiverton, routeing via Dawlish and Dartmouth, carrying out a low level detail in the Teignmouth/Dartmouth area. The helicopter, squawking 7000,

was being provided with a FIS from Exeter Approach. At the time of the Airprox it was routeing N'bound towards Tiverton, which resulted in it tracking to pass W of the airport.

The EMB195 flight established communication with Exeter Approach at 1219, when it was some 50nm S of the airport. The pilot reported descending to FL80, direct to Berry Head and he was informed it would be radar vectoring to the ILS RW08. Shortly afterwards, the flight was identified and placed on a RAS. Subsequently, at 1222, the EMB195 flight was instructed to descend to FL60 but further descent was precluded because of other traffic. Because of this traffic, the pilot was warned that he might be vectored N'bound through the ILS before making a L turn to establish. Accordingly, the flight was placed on a heading of 360° and, at 1228, was instructed to descend to 2600ft. At the time, it was about to pass approximately 9·5nm W of the airport. The radar recording, timed at 1228:40, shows a flight squawking 7000 tracking N at FL015 (1980ft QNH 1029mb), 7·5nm S of the EMB195. This was later determined as the subject R44. In accordance with the plan, once N of the ILS, the EMB195 flight was initially instructed to turn L heading 180°. The radar recording at 1231:01 shows it routeing S, passing 10·8nm W of the airport at FL033 (3780ft QNH), with the R44 8·3nm SE of it indicating FL012 (1680ft QNH). This was followed by a L turn heading 110°, to establish on the LLZ from the L.

The pilot of the EMB195 reported established on the ILS at 1232:30. He was informed his range was 8·25nm and was cleared to descend on the ILS. In the same transmission he was transferred to the Tower frequency. The radar recording, timed at 1232:29, shows the EMB195, 9·1nm W of the airport at FL022 (2680ft QNH). The R44, at FL011 (1580ft QNH), is on a conflicting track, 2·9nm SE of the EMB195. After making his initial call on the Tower frequency, the EMB195 pilot reported *"visual with the traffic"*. The ADC asked if it was traffic reported to him by radar. The pilot responded *"negative helicopter in our right just gone underneath us had a TCAS RA"*. The flight was cleared to land, the pilot reporting *"just recovering back to the glideslope"*. After landing the pilot commented that *"the helicopter passed under us separation was about five hundred feet we had a TCAS climb"*.

As a result of the EMB195 pilot reporting the presence of a helicopter, the APR called the pilot of the R44, requesting if he was routeing N'bound. He confirmed the routeing and reported the *"(company's) just gone over the top of us"*. Following a request from the controller, the R44 reported at 1500ft, QNH 1029mb. The radar recording, timed at 1233:25, shows the EMB195 at FL015 (1980ft QNH), 0·4nm NNW of the R44, which is maintaining FL011 (1580ft QNH). The next return timed at 1233:33, the CPA, shows the subject ac still maintaining FL015 and FL011 respectively, the EMB195 is 0·3nm from the R44, having just passed through its 12 o'clock. Although the radar recordings of the Airprox were obtained using the same Burrington source as is supplied to Exeter Approach, the APR reported that the R44 was not showing on his radar display until after the EMB195 had reported the presence of the helicopter. NB Burrington provides SSR information, primary returns are supplied by a local radar. Additionally, the ADC, who is provided with the same radar information on the Aerodrome Traffic Monitor in the VCR, confirmed he also did not see the R44's radar return until after the confliction had occurred.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

ATCO Members initially expressed surprise that the R44 was not showing on the Exeter ATC radar display system, as incoming data was available from 2 independent sources. The R44's flight profile was thought to be well within the equipment parameters for detection by the PSR at Exeter and Burrington SSR was clearly detecting the helicopter for some considerable time before the Airprox. Although this incident had occurred in Class G, where there is equal responsibility on both crews to maintain separation from other traffic through 'see and avoid', the EMB195 crew were in receipt of a RAS flying under IFR and were expecting assistance from the Exeter APR to inform them of conflicting traffic and offer traffic avoidance. One Member opined that the circumstances would have been different if the incident had occurred in CAS, a known traffic environment, whereas in Class G airspace radar is a valuable tool to detect unknown ac in potential confliction. The APR was vectoring the IFR EMB195 towards the ILS and the instructions given had unfortunately positioned the ac into conflict with the R44, which was not seen by the Exeter APR nor the ADC on their equipment. Members agreed that this equipment shortfall had contributed to the incident and proposed that a Safety Recommendation be made to the CAA that the functioning of Exeter radar display system be reviewed in light of this incident. Pilot Members wondered why the R44 pilot did not inform ATC that he had set course N bound from his low-level photo detail at Dartmouth. This would have updated the APR's traffic picture and highlighted the potential confliction with the EMB195. Moreover, it was thought that the flight profile chosen by the R44 pilot to cross the ILS FAT was less than ideal. Although the

helicopter's track was apparently passing just to W of the Exeter City built up area, in situations such as this, pilots should take due regard of the IAP profile and not choose to fly at a range/height which is close to the nominal 3° G/P. A wiser option would be to fly further out from the threshold or to descend under the approach to provide far greater separation from IFR ac flying an approach. In the end, the EMB195 was transferred to the ADC when established on the ILS and had encountered the R44 crossing the FAT, unbeknown to the APR/ADC, and this had resulted in a conflict which had caused the Airprox.

Noteworthy was the disparate separation distances reported by both crews. The R44 pilot believed the EMB195 had passed at a greater range and with more vertical separation than that reported by EMB195 crew, whose estimation was more closely aligned to that borne out from the radar recording. That said, the R44 pilot had gleaned from the RT that the EMB195 was inbound, had seen the ac as it manoeuvred to the W and NW of Exeter and had watched it positioning on the ILS before then passing ahead and above. The R44 was squawking with Mode C and fortunately this brought the helicopter's presence to the EMB195 crew's attention through its TCAS equipment and they had monitored its progress, before a TA then an RA was generated. The EMB195 crew had visually acquired the R44 <1nm away some 400ft below and had adjusted their ROD before continuing their approach and landing. These visual sightings and the actions taken were enough to allow the Board to conclude that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace on the Exeter RW08 FAT resolved by the EMB195 crew.

Degree of Risk: C.

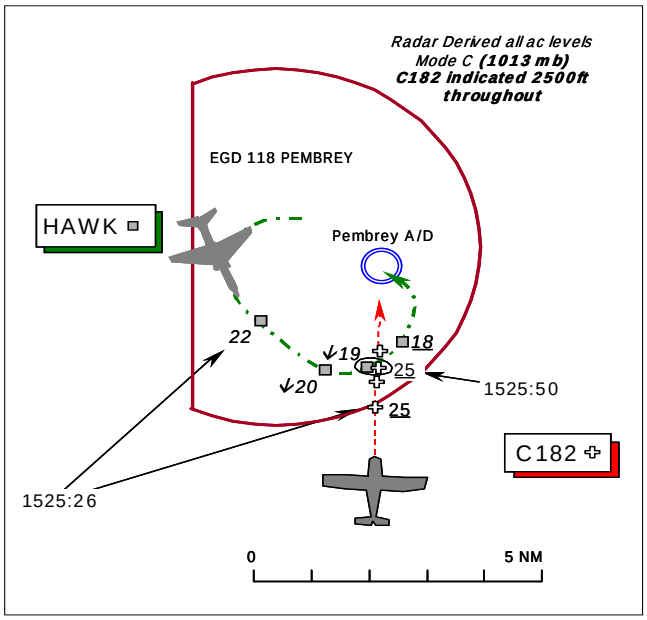
Contributory Factors: The R44 was not displayed on the Exeter ATC radar display system.

Recommendation: The CAA initiate a review of the Exeter SRE display system to ascertain why neither primary nor secondary radar data from the R44 helicopter was displayed to the controllers at the Approach Radar or Tower positions.

AIRPROX REPORT No 123/07

AIRPROX REPORT NO 123/07

Date/Time:	22 Aug 1525	
Position:	5141N 00419W (Pembrey Range)	
Airspace:	EGD 118	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Hawk T Mk1A	C182
Operator:	HQ AIR (Trg)	Civ Pte
Alt/FL:	2000ft	2500ft
	QFE (1014mb)	(N/K)
Weather	VMC NIL	NR
Visibility:	15km	NR
Reported Separation:		
	500ft V/Nil H	NR
Recorded Separation:		
	600ftV @ 0·2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BAe HAWK T Mk1a PILOT, a QWI, reports he was instructing on his student's first gun strafing detail at Pembrey Range – EGD 118 – whilst in communication with Pembrey Range Primary on 241·55MHz. A squawk of A7002 was selected with Mode C; neither TCAS nor any other form of CWS is fitted.

Turning L DOWNWIND in the range cct through 100°(M) flying at 2000ft QFE (1014mb) in VMC at 400kt, some 5000ft clear below cloud with an in-flight visibility of 15km, a civilian ac was first spotted by his front-seat student in their 1o'clock position and slightly high inside the Pembrey Range Danger Area boundary. The other ac - a C182 - passed about 500ft directly above his jet with a *"medium"* risk of a collision. No avoiding action was taken as the height between the ac was sufficient and his Hawk was already turning below the Cessna when seen.

He informed the Range Safety Officer about the ac as they descended to pass beneath it and elected to file an Airprox via Swanwick (Mil). The pilot of the C182 was not in radio contact with the Range and not only was this ac just above the range pattern but it was heading directly for the recovery lane from the 'HOT' strafing target area where ac routinely climb to a height above 2000ft QFE. His ac is coloured black and the HISLs were on.

UKAB Note (1): In a later telephone conversation, the Hawk QWI stressed that ac are routinely climbed up to 2500ft QFE 'off-target' to escape any danger from ricochets.

THE CESSNA C182S PILOT reports he had departed from Guernsey bound for Weston in Ireland under VFR and was in receipt of a FIS from London INFORMATION, whilst also in communication with Swansea RADIO on 'Box 2'. Flying at 2500ft QNH (1014mb) in VMC, heading 350° at 135kt, he thought whilst 4nm E of Pembrey, he spotted the Hawk jet manoeuvring about 1nm in front of his aeroplane and 1000ft below. The Hawk then took up a westerly heading passing out towards the coast where he pulled-up hard into the vertical. Due to the high wing design of his ac he then lost sight of it. At no time did he feel concerned at the proximity of either ac to the other. His ac is white overall and the HISLs and anti-collision beacon were on.

UKAB Note (2): In a subsequent message the C182 pilot advised he would have been using a 1:500,000 VFR chart and also referring to GPS equipment, which is integrated in the avionics suite of his ac. EGD118 is clearly marked on the chart, he reports. However he accepted that if the radar recording showed that the Airprox occurred about 2nm due S of Pembrey a/d within EGD118 as he headed N, he was not 4nm E of Pembrey as he thought. On spotting the Hawk ac he was naturally aware that he was close to a training area and that he should check his position. Continuing in a northerly direction knowing the Hawk, which by now had passed beneath, was

somewhere S of his position seemed to be the safest option, bearing in mind that the northern edge of the EGD118 could not be too far away.

UKAB Note (3): The extant UK AIP entry for EGD118 Pembrey at ENR 5-1-3-7 dated 21 Dec 06, notified the lateral and vertical limits of the Range from the surface to an altitude of 23000ft amsl for Bombing/Air to Surface Firing, under the control of the Air Force Dept. Active 0800-1600UTC Mon-Thu; with a DAAIS available from Pembrey Range on 122·750MHz. Remarks included a Caution: "Associated aircraft operations outside area boundary". With an added note: "Aircraft operating in these areas are unable to comply with Rule 17 (Rules of the Air Regulations 1996). Pilots in the vicinity of these areas are strongly advised to make use of a Radar Service."

Additionally, the range is notified active outside main activity operating hours to an altitude of 5000ft for unexploded ordnance demolition within the on-shore area from Sunrise to Sunset.

UKAB Note (4): The UK AIP at AD2-EGFP-1-2 notifies that the ATZ to the civilian licensed Pembrey Aerodrome is only active on Saturdays and Sundays 0900 –1630, it was thus not active when this Airprox occurred - Wednesday 22 Aug.

MIL ACC reports that the Hawk T Mk1 was conducting training over Pembrey Range under VFR, flying at 2000ft Pembrey Range QFE (1014mb) at 400kt. The Hawk crew was in receipt of a FIS from the Pembrey Range Control Officer (RCO) on 241·55MHz, squawking A7002 [Danger Areas General] with Mode C. Analysis of recorded radar data reveals the C182S was squawking A1177 [LACC FIS] with Mode C.

Pembrey Range does not have a search radar capability or slave radar monitor. The Range Control Tower radio fit provides only 122·75 MHz for VHF RT. Moreover, there is no capability to select either 121·5 MHz [VHF aeronautical emergency] or Swansea RADIO A/G Station on 119·7MHz. When ac are using dive patterns, as in this case, the RCO's main focus is towards the target area to the N of the Pembrey Range Control Tower.

Analysis of the 15nm range Burrington radar recording shows at 1525:20, the Hawk starting to roll out of a LH turn passing through 160° onto the DOWNWIND leg of the range cct. The C182 is shown tracking 005° indicating 2500ft Mode C (1013mb). At 1525:26, the 5nm range radar data shows the Hawk has steadied on the DOWNWIND leg indicating 2200ft Mode C (1013mb), tracking 155° with the C182 in the Hawk's 12 o'clock - 2·6nm maintaining track and altitude some 300ft above the jet. At 1525:42, the Hawk is just starting a LH turn and has descended slightly to 2000ft Mode C, with the C182 in the Hawk's 11 o'clock at a range of 0·9nm, steady on track maintaining altitude at 2500ft Mode C. The Hawk crew transmitted to the RCO at 1525:48, *"..tally one aircraft over the range 2500 feet civilian Cessna, probably in breach"*. Some 2secs later at 1525:50, the radar recording on 1nm range, shows that the Hawk has continued the L turn, through 090°, and has descended further to 1900ft Mode C, with the C182 at 12 o'clock - 0·2nm maintaining a track of 005° throughout. At 1525:57, the RCO told the Hawk crew *"we're looking probably is most definitely will be"*. At 1525:58, the Hawk has flown underneath the C182, whilst the jet was in a L turn passing through 050°. The Hawk continued to descend, indicating 1800ft Mode C now in the C182 pilot's 2 o'clock, at a range of 0·4nm, the latter having maintained heading and altitude. Thereafter, separation increases. At 1526:01, the Hawk crew advised the RCO, *"Suggest he clears the range area on 243 we will be operating at those heights he will probably be listening out on 121·5 or Swansea 119·7"*. At 1526:18, the RCO transmitted "*light aircraft to the south East of Pembrey Range this is Pembrey Range 122·7",* but the RCO did not receive a reply.

Subsequent discussions with OC Pembrey Range reveal that the RCO assessed that there was no point in telephoning Swansea to "chase" the C182 because it was about to clear the range airspace to the N. The OC added that it is unlikely that the RCO would spot the Cessna approaching from behind him from the S of the range because the RCO's main focus is towards the target area to the N of the Control Tower. Therefore, the Hawk crew was the first to see the C182 and alerted the RCO to it when the C182 entered the range from the S.

THE HAWK PILOT'S STATION comments that this incident is a salient reminder for all crews to remain vigilant during every stage of flight. Carrying out a comprehensive lookout scan is standard good airmanship and must be continued even when the cockpit workload is high or when the risk of encountering another ac is perceived as low. This Airprox was made relatively benign by the good lookout of the Hawk crew, coupled with a lucky height deconfliction between the two ac. If some of the variables were only slightly changed then the outcome could have been very different. It is worth considering that many of the 'avoids' and Danger Areas that are marked on our charts are 'self imposed' by the military and do not apply to our civilian counterparts. The next time you operate

with a high workload in your 'sanitised' area, remember: you are probably still in Class G or 'free airspace' and may not be alone.

HQ AIR (TRG) comments that operating inside an active danger area does not guarantee total protection against other ac and the effectiveness of look out, as reported in this Airprox, cannot be underestimated.

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 range and ac operating authorities.

It was evident from the recorded radar data that the track of the C182 had taken the ac directly overhead Pembrey airfield and not some 4nm to the E as its pilot had suggested in his written report. It would appear that the GPS installation in the C182 had led the pilot astray somewhat, for whilst he was aware of EGD 118, it seemed he was not aware that he had entered the Danger Area until the Hawk was spotted 1nm ahead, which was when he realised what had happened. It would seem that this was after the Hawk crew had spotted his ac, under flown it and cleared ahead. The GA Member was disappointed that this navigational error had occurred, for it was clear that the C182 pilot had the appropriate charts available to him. Moreover, Members familiar with this area observed that the terrain in this vicinity is quite distinctive which should have helped the C182 pilot make an accurate landfall after crossing the Bristol Channel. The lesson here, a GA member observed, was that when planning to fly in the vicinity of live firing ranges, accurate navigation is critically important and the utmost caution should be exercised to ensure clearance from the boundary. Indeed, fast-jet ac will be commonly encountered entering and leaving the range and also holding outside the Danger Area boundary, so a good lookout scan is essential. Moreover, the consequences of entering a Danger Area where live air-ground firing is taking place were readily apparent to the Members. Whilst recognising that the RCO's view was toward the impact area some were concerned that range personnel had not spotted the C182 earlier. Fortunately, the alert student in the front seat of the Hawk spotted the C182 at a relatively benign stage of the gunnery exercise as they turned downwind in the range cct and the astute instructor ensured they not only remained 'guns tight' until the C182 was clear, but descended to ensure separation beneath the C182 thereby resolving any conflict. The C182 pilot's entry into EGD118 was seemingly entirely inadvertent and once he realised what had happened maintaining his track did make his flightpath predictable. Members concluded unanimously that the cause of this Airprox was that the C182 pilot unknowingly entered a promulgated Danger Area active with live firing and flew into conflict with the Hawk.

The Board commended the alert Hawk student for sighting the C182 early and alerting his instructor to the danger posed by the light ac when it infringed Pembrey Range. This enabled the instructor pilot to ensure his jet was descended below the level of the C182 and thus kept well in sight as they did so. The potential for a more serious incident was clear and the QWI's point about the track of the C182 taking the light ac through the area at a height to which jets routinely pull up to avoid any danger from ricochets was entirely valid. However, the Board could only base their assessment of risk on what actually occurred, not what might have happened if the circumstances had been slightly different. Here the Hawk crew detected the C182 and took prompt and effective avoiding action, this had resolved the conflict and the Members agreed unanimously that the QWI's actions had removed entirely any risk of a collision in the circumstances conscientiously reported here.

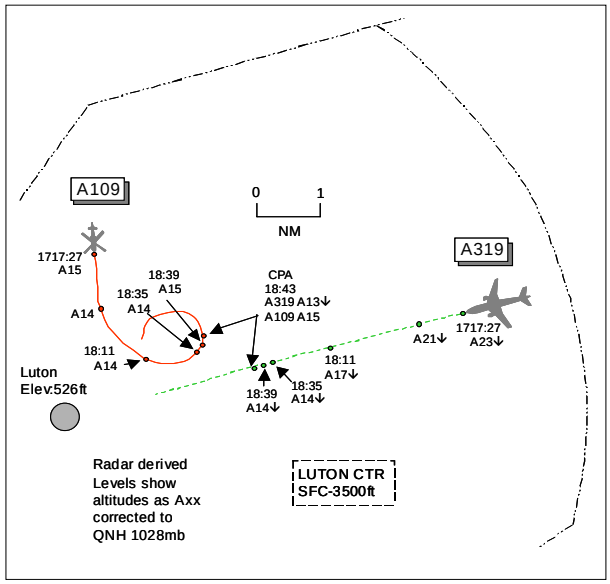
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The C182 pilot unknowingly entered a promulgated Danger Area active with live firing and flew into conflict with the Hawk.

Degree of Risk: C.

AIRPROX REPORT NO 124/07

Date/Time:	26 Aug 1719 (Sunday)	
Position:	5153N 00018W (2·5nm FIN APP RW26 Luton - elev 526 ft)	
Airspace:	CTR/ATZ	(Class: D)
	Reporting Ac	*Reported Ac*
Type:	A319	A109
Operator:	CAT	Civ Pte
Alt/FL:	1250ft↓ (QNH 1028mb)	500ft (agl)
Weather	VMC NR	VMC
Visibility:	1·5nm	
Reported Separation:	Nil V/1nm H	NR
Recorded Separation:	200ft V/0·9nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A319 PILOT reports inbound to Luton IFR and in communication with Luton Tower on 132·55MHz squawking 5471 with Mode S. Just prior to transfer to Tower, the Radar controller told them of an Agusta 109 helicopter which they may pick up on TCAS but will remain clear holding NE of the FAT. They acknowledged that they had the traffic on TCAS (a normal intruder target to the L of the C/L 1000ft below) and contacted Tower who never made any reference to the traffic. As they continued their approach the intruder disappeared from the ND display. At 1350ft QNH (850ft Rad Alt) heading 257° at 135kt they received a TCAS TA 'traffic, traffic' with a solid amber square at –01 (100ft below) range 1·5nm directly on the FAT. They continued their approach with no visual contact (looking straight into the setting sun) as TCAS showed no vertical separation at 1nm range. The intruder started to move to the NE of the FAT and only then did they make visual contact on it, the A109, in their 1 o'clock <1nm away at about 1000ft. They contacted Tower immediately who were unaware of the exact position of the other ac and to the best of their (ATC's) knowledge the other ac passed above and behind them, which was not the case. They continued their approach for landing whilst still receiving TA aural calls until 400ft Rad Alt with the traffic remaining displayed on the ND until actual landing. After discussing the incident with the Luton ADC and the Airports Supervisor post landing, the Capt was not happy with the account of events given. Subsequently he was told the next day by another controller that the helicopter had passed directly in front of their ac and carried out a LH orbit on the FAT before moving to the NE and carrying out a second orbit. He assessed the risk as high.

THE A109 PILOT reports 8 weeks after the incident flying between 2 private sites VFR and being in receipt of a RCS from Luton Radar on 129·55MHz squawking with Mode C; TCAS was fitted. He couldn't recollect exactly the details of the incident but he believed that he was heading S'ly at 100kt and after reporting visual with the A319 about 5nm away on final approach, he slowed to a hover as instructed by ATC. Once the A319 was well clear he continued to cross the threshold once cleared. During the encounter a TA alert was generated; he did not report separation distances nor the risk. He apologised if his recollections were not factually correct but he was not contacted until about 6 weeks after the incident as was unable to complete the CA1094 form for a further 2 weeks.

UKAB Note (1): The Capt was contacted 4 months post incident as his recollections were not borne out from the geometry shown on the recorded radar or the RT transcript. He commented that he really couldn't remember much of the incident as he flew the route regularly and the ATC instructions vary and these are always followed.

THE LTCC LUTON RADAR CONTROLLER reports he was applying standard VFR procedures to the A109 flight crossing the CTR against the IFR A319 on an ILS approach to RW26. The A319 flight, under SOPs, was working Tower and subsequently expressed concern about the close proximity of the A109 and filed an Airprox report.

UKAB Note (2): Met Office archive data shows the Luton METAR as EGGW 261720Z 01005KT 330V070 9999 FEW049 20/09 Q1028=

ATSI comments that the A109 flight established communication with Luton Approach at 1709. The pilot was asked to standby and further communication took place 2min later. The A109 pilot reported routeing from Middlesbrough to Potters Bar and was N of Bedford, flying VFR, at 2500ft. The pilot requested to transit the Zone routeing through Pirton, just to the E. The flight was issued with a Luton squawk 4670. One minute later the pilot was informed *"identified just north of Cardington or just northeast of Cardington in fact give you Flight Information Service. Clear you to enter the Luton's controlled airspace hold to the northeastern side of their airfield and expect when cleared to cross our Two Six threshold."* The pilot replied *"Clear enter controlled airspace and then hold at the northeastern side of the airfield wilco and I'll be descending to not above fifteen hundred feet"*.

In the meantime the A319 flight had contacted Luton Approach and was being vectored for an ILS approach to RW26. At 1713, the flight was instructed to turn L heading 185° for R base. At the time, the A109 was 14nm N of Luton Airport and the A319 was 17nm NE. The A109 pilot was updated on the controller's proposed action *"just to keep you in the picture what I'm gonna do is hold you in northeast corner and cross you between IFR traffic got quite a few little bit of a stream coming inbound at the moment"*. The A319 was vectored to the ILS RW26 and at 1716 the crew reported established. It was cleared for the ILS to maintain 160kt to 4 DME. The pilot was then given TI *"it's an Agusta One Oh Nine entering the Zone from the north (A319 c/s) I'm gonna hold him to the right of the final approach for Two Six you may see him there he'll cross behind you"*. The pilot replied *"No problem we have him on TCAS fine thanks (A319 c/s)"*. The A319 flight was then transferred to the Tower frequency. At 1716:38, the controller transmitted to the A109 pilot *"just hold in that position I was talking about there's a Seven Three Seven on a short final just bout to go through your twelve o'clock look out on your ten o'clock about six miles let me know when you see an Airbus Three Nineteen there please should be wearing (company) colours"*. The radar shows the A109 just entering the Luton CTR to the N of the airport, at 1500ft. (The A109 pilot was not informed he was entering CAS or the ATC service had necessarily changed.) The B737 is on short final to its S and the subject A319 is on the ILS at 8nm, 3000ft. The A109 pilot did then report 'visual' with traffic. However, this was the B737 ahead of the A319 (same company).

[UKAB Note (3): The RT transcript reveals that after the A109 pilot's 'visual' report, the following exchange took place: -

ATC: *"Okay copied thanks behind the landing Airbus three nineteen cross and report the Southside keeping Luton on your right at all times"*.

A109: *"Keeping Luton on the right clear cross behind the one that's landing now"*.]

TI was updated about the subject A319 *"No the no that's not the one that's the one I was talking about earlier the other three nineteen I'm looking at out on your left ten o'clock let me know when you see him at about four miles"*. At 1717:27, the A109 pilot was instructed to *"Just hold the northeast until you've got the Airbus Three Nineteen visual"*. The helicopter is now 2·5nm NNE of the airport still tracking south at 1500ft, with a G/S of 170kt. The A319 is just inside 6nm, passing 2300ft. Shortly afterwards the A109 pilot reported visual and was cleared *"behind that landing Airbus Three Nineteen cross and report southside"*. The pilot acknowledged *"Roger behind the Airbus wilco"*. Twenty-Five seconds later the A109 pilot transmitted *"I'll just do one quick orbit if that's okay just want to stay clear of the wake turbulence"*. *"Yes that's fine."* No further comments were made to, or from, the A109 pilot until he reported clear to the S at 1719:50.

The A319 contacted the Tower frequency at 1716 and was informed it was just becoming No 1 with a departure to go ahead. The ADC noticed the A109's squawk on his ATM and queried its type with the INT DIR. He was informed it was a helicopter and it was confirmed that the A319 pilot was aware of it. Subsequently, at 1718:40, the controller passed information *"the helicopter traffic you were told about by radar is in your right one o'clock has you in sight and will be passing behind"*. The radar recording at 1718:39, shows the A109, at 1500ft, in a L turn 1nm NW of the A319, which is at 1400ft.

[UKAB Note (4): The CPA occurs on the next sweep as the A109 turns through N at altitude 1500ft with the A319 passing 0·9nm to it SE descending through altitude 1300ft, 200ft below.]

The A319 pilot replied *"we've just got a TCAS there looked at nine hundred feet he was level flight"*. Adding afterwards *"just a little too close but not to worry"*. The radar recordings show the A109 in its LH orbit turning just N of the 26 C/L. Both flights were at the same altitude, 1400ft at 1718:35, when they were 1·2nm apart but by this time the A109 was turning through a NE'ly track. It continued its orbit and passed 0·2nm behind the A319.

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. In Class D '(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, both flights were informed of the presence of the other ac. The A109 pilot reported visual with the A319 and the latter's pilot had a TCAS return on the A109. The A109 was not given a specific VFR clearance to enter the CTR but there is no reason to suggest that it was not continuing its flight VFR. The MATS Part 1, E (Attach), Page 2, states the phraseology for crossing clearance "Cleared from (place) to (place) VFR via (routeing) not above (level), maintain VMC while in the (name) control zone".

It was surprising that the ADC was not informed about the details of the traffic overflying the CTR in close proximity to the airport and the A319 flight had to ask for its details. The LTCC MATS Part 2, Page LTN-20, under the heading *'VFR Overflights/Non Airways Inbound Flights'* states *'Details of VFR overflights in the Luton ATZ, for which Luton AIR require details or non-airways arrivals will normally be passed to the Luton AIR ATSA. Subsequent coordination of such flights is effected with Luton AIR'*. It would appear that helicopter overflights are handled differently at Gatwick and Stansted (both Class D CTRs) in comparison with Luton. At both TC based units the Air Controller is advised of the helicopter routeing O/H and would have to agree to its movement and to work the ac through the O/H. Additionally, there are specific points for helicopters to route towards and to hold at, if necessary, before crossing.

LTCC ATSI made a recommendation which SRG ATSI endorses: - 'It is recommended that LTCC Ops consider a more comprehensive MATS Pt 2 entry on the handling of VFR overflights and in consultation with Luton Tower include advice on coordination and transfer of communications in appropriate circumstances.'

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 NATS Advisor informed Members that as a result of this and a previous incident, procedures have been published specifying coordination that needs to be effected between Tower and Approach controllers at Luton and Stansted. In summary, all traffic routeing within 3nm of the aerodrome, at or below 3000ft will be notified to the Tower and coordination agreed as required.

Pilot Members understood the A319 crew's dilemma during this incident. The TI given on the A109 stated that it would be holding NE of the FAT whereas the TCAS equipment indicated that the helicopter was on the C/L. The TA alert had heightened their concerns as the A109 was displayed straight ahead and just below their level, but they were unable to see it visually owing to the prevailing visibility whilst flying into sun. Undoubtedly, the TA would have been distracting to the A319 crew during a critical phase of flight and its continued presence on TCAS would have been a continued concern until just before landing. An ATCO Member opined that in circumstances like these where the A319 crew were concerned about continuing their approach, one option would have been to execute a 'go-around'. It appears that the A109 pilot had initially set up his flightpath to pass behind the B737 which was the preceding ac in the landing sequence ahead of the A319 but, following updated TI from ATC, the A109 pilot saw the A319 but by now was probably closer to the FAT than he would have liked. Helicopter Members opined that the A109 pilot would have been 'hard-pressed' to have slowed down to a hover and remain N of the FAT by that stage, which probably led to the pilot asking for approval to carry out an orbit to the NE of the airport to position behind the A319. ATC approved this request and during this manoeuvre, the A109 pilot had executed a tight LH turn and remained N of the FAT, eventually rolling out on a S'ly track before passing behind the A319. Members noted that ATC had fulfilled their responsibilities within Class D airspace by passing TI to both crews and it was the VFR A109 pilot's responsibility to remain clear of the A319. However the A319 crew were unhappy with the situation when on short finals. Taking all of these factors into account, Members agreed that the cause of the this Airprox was that the A109 pilot flew sufficiently close to the RW26 FAT to cause the A319 crew concern.

AIRPROX REPORT No 125/07

ATC had ensured that both crews were aware of each other's presence but the A319 crew had only visually acquired the A109 at a late stage as it cleared to their R in its LH orbit. Meanwhile, the A109 pilot had seen the approaching A319 and turned away which had resolved the potential conflict, the CPA occurring whilst the helicopter was turning through a N'ly heading with the subject ac's tracks diverging. This element was enough to allow the Board to conclude that any risk of collision had been quickly and effectively removed.

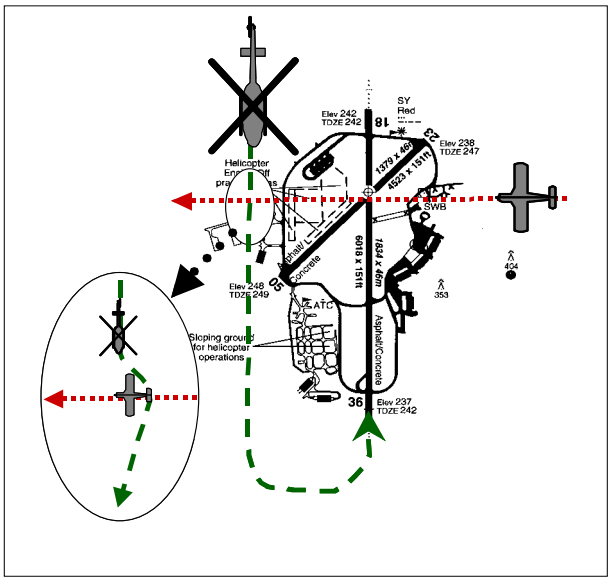
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The A109 pilot flew sufficiently close to the RW26 FAT to cause the A319 crew concern.

Degree of Risk: C.

AIRPROX REPORT NO 125/07

Date/Time:	30 Aug 1400	
Position:	5248 N 00240W (Downwind RW26 LH Shawbury - elev 249 ft)	
Airspace:	Shawbury ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Griffin HT1	PA28
Operator:	HQ AIR (Trg)	Civ Pte
Alt/FL:	950ft	1100ft
	(QFE 1015mb)	(QFE 1015mb)
Weather	VMC SHRA	VMC CLBC
Visibility:	>10km	8km
Reported Separation:		
	0ft V/50m H	100ft V/200m H
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GRIFFIN HT1 PILOT reports flying a black and yellow ac with all lights switched on, on a training flight from Shawbury. They were heading 180° at 90kt and, while established on the downwind leg of a standard LH circuit, in communication with Shawbury TWR on UHF, but were maintaining 950ft QFE due to the proximity of small amount of cloud when the student who was the handling pilot (HP), saw a small fixed wing ac about 75m ahead of them, crossing from L to R; the HP rolled left and descended immediately to avoid the ac. After returning to the normal downwind position the HP contacted Shawbury TWR to inform them that the ac believed to be a MATZ crosser was at approx 950ft on the QFE; an earlier RT call stated that the ac was at 1300ft QFE. The HP reported the incident on the RT and spoke to the Shawbury SUP on the ground after landing and established that the ac had been handed over to Shawbury TWR and had descended below 1300ft QFE but the information was not passed or heard on UHF. He assessed the risk as being Medium.

THE PA28 PILOT reports flying a private flight from Tatenhill to Sleap with all lights switched on. He initially made contact with Shawbury Radar on 120.775 overhead Stafford and was given a FIS, a squawk 0241 and clearance for a MATZ penetration at 2100ft QFE, heading 275° at 100kt. At the MATZ boundary he was unable to maintain VMC so he commenced a descent to 1600ft and informed Radar, who confirmed that he was still clear through the MATZ. A second descent to 1100ft QFE was required later and was also approved by Radar. At this point they had drifted slightly S of their planned track and so they were asked to call TWR on 122.1. Contact was made with TWR and later they informed them that they were passing overhead the airfield but no TI was received regarding any circuit traffic. They then saw a helicopter converging with them but it did not appear to be on TWR frequency. He did not take any avoiding action as a R turn would have resulted in a collision and if he had turned L they would

have lost visual contact. Further, the circuit below prevented any descent and the cloud above prevented a climb. Shortly after, TWR told them to freecall to Sleap but no reference to the incident was made by either Radar or TWR.

UKAB Note (1): The Shawbury METAR for 1350 was:

EGOS 301350Z 31014KT 9000 -DZ FEW012 OVC016 15/14 Q1024 WHT TEMPO 6000 -DZ SCT014 GRN=

MIL ACC reports that a Griffin helicopter was conducting military training within the boundaries of RAF Shawbury airfield and was operating on a quiet frequency, 262.875MHz, which was one of three being used by the Shawbury ADC [ACC Note (1): The RT transcripts show that the Griffin switched to 378.450 MHz at 1353:57]. The Griffin was operating VFR, was squawking 0221 with Mode C switched off. Meanwhile a PA28 was conducting a private flight from Tatenhill to Sleap in VMC, Squawking 0241 with Mode C.

The ADC was controlling 5 ac and was using and/or monitoring:

378.450 MHz (Stud 3)

262.875 MHz (Stud 2)

122.100 MHz (ADC VHF)

The Hi-brite radar display on the ADC position was serviceable. The reported Airprox occurred at 1400Z and the weather was changeable before and after the incident with local Met reports giving:

1350Z: 9km, Drizzle, FEW 1200ft, OVC 1600ft

1405Z: 6km, Drizzle, SCT 1300ft, BKN 2000ft

1431Z: 5km, Drizzle, FEW 1200ft, BKN 1800ft

Approval for the PA28 to transit the Shawbury MATZ and ATZ was been given by ZONE, initially at 2100ft QFE, 1015mb but a descent was requested to 1600ft QFE to remain VMC and this was approved, as was a further descent to 1300ft QFE; when a descent to 1100ft QFE was requested, ZONE transferred the PA28 to the ADC.

Analysis of the Clee Hill radar assisted the investigation only in that it confirmed that the PA28 was at 1100ft at 1357:04 3nm to the E of the airfield. While the track of PA28 was clearly visible until about 3nm E of Shawbury, the radar recording does not show any other ac that could have been the Griffin. The PA28 disappeared from radar shortly after 1357:04.

The RT and landline transcripts however, painted an accurate picture of how the situation developed. Shawbury TWR had an experienced Controller as U/T in the ADC position, being monitored by an experienced Screen Controller with an Asst close-by. There were 248 separate transmissions surrounding this Airprox however, to keep the report as succinct as possible, the investigation has focused only on those necessary to portray accurately the sequence of events relating to the Airprox. ZONE approved the PA28's '*MATZ penetration at 2100ft QFE 1015*' at 1350:00, which the pilot read back correctly. At 1350:44 the PA28 pilot asked ZONE for clearance to transit at 1600ft to remain VMC and ZONE replied '*PA28 C/S if that's the highest you can go then that's approved'* and at 1350:55 the PA28 pilot responded *'Roger, PA28 C/S staying at 1600'*. At 1352:04, ZONE asked for permission from the ADC for an ATZ-crosser, *'East to West, through the overhead 1600 feet QFE'*, which was granted and the ADC immediately transmitted on 378.45 *'Shawbury all stations, ATZ crosser, east to west, through the overhead 1600 feet QFE'*. Between 1352:25 and 1353:31 the U/T and Screen ADC discussed various training points. At 1353:15 the PA28 reported to ZONE *'descending to 1300 feet to remain* VMC' and 20sec later ZONE said to the ADC: *'The ATZ crosser now requires 1300 feet. Do you want to speak to him or you happy for me to take him?'* and the ADC replied *'1300 feet QFE is approved report clear'*. The ADC then dealt with another couple of routine calls, including one from the Griffin, before transmitting on 378.450 MHz, at 1354:01, *'Shawbury all stations ATZ crosser previously reported east to west through the overhead at 1600 feet now transiting east to west through the overhead 1300 QFE'*. At 1354:45, ZONE called the ADC and said *'now descending to 1100 feet. Shall I send him across 122.1 …….or are you still happy?'* Following advice from the Screen Controller, the ADC

agreed to take the PA28 on the frequency. Thereafter the U/T queried whether or not specific TI regarding the PA28 should be passed to circuit traffic but the Screen advised that this was not required. At 1356:00 the PA28 called the ADC on 122.0 MHz and the ADC replied *'PA28 C/S, Shawbury Tower roger, transit through the overhead 1100 feet QFE 1015 approved, report 2 miles to the west'* and the PA28 repeated the instructions and, after a couple of other routine transmissions, the ADC informed the PA28 that the read-back was correct. There then followed about 4min of routine CCT R/T and discussion between the Screen and the U/T and at 1359:19 the PA28 pilot informed the ADC that he is *'overhead the airfield at 1200* feet'. The U/T ADC stated *'1200 feet?'* to the Screen, then transmitted *'PA28 C/S roger'*. At 1400:21 the Griffin pilot called the ADC, however, he was busy and the pilot called again 11sec later and at 1400:52 the Screen Controller acknowledged his call and there follows an exchange:

From	To	Transmission
Griffin C/S	ADC (Screen)	*Griffin C/S believe the MATZ crosser who just came through I was at er……about 950 feet on the QFE and he was about 100 yards in-front of me at the same height.*
ADC (Screen)	Griffin C/S	*Yeah we watched you. We did actually broadcast he was coming through. He descended from 1600 to 1300 and then we think he went to 1100.*
Griffin C/S	ADC (Screen)	*Yeah copied, I heard 13 but didn't hear any lower.*
ADC (Screen)	Griffin C/S	*Er….roger I was watching him in fact and I thought he was going to be quite close to you. He may have been lower than he er actually told us he was going to be.*
Griffin C/S	ADC (Screen)	*Yeah, just below a thousand I think on ten fifteen.*

The ADC Screen submitted an open and honest report, accurately describing a complex and busy aerodrome situation; he stated that they were keeping a good lookout for the PA28, which is confirmed by the recordings of discussions between the Screen and the U/T. In the time that the Screen & U/T had spent looking for the PA28 the Griffin had lifted, joined the visual cct and was turning downwind (all without calling ADC); however, having called that he was established in 'Area Left', this was permitted by current SOP's.

It is considered that there was one Mil ATC-related contributory factor to this Airprox: although the PA28's first level (1600ft) was transmitted on all the relevant frequencies, as was the second (1300ft), the third level (1100ft) was not transmitted on the Griffin's frequency (378.45 MHz) which meant that Griffin pilot's situational awareness was incomplete. When the Griffin lifted for a visual circuit the pilot thought that the MATZ-crosser was at 1300ft QFE and stated that, due to the proximity of small amounts of cloud, a visual cct height of 950ft QFE was chosen therefore he thought that there would be adequate separation. However, the combination of the PA28 pilot apparently descending below his cleared height and the omission to transmit the third cleared height resulted in both ac being at a similar altitude.

HQ AIR (TRG) comments that the lack of accurate TI to both the Griffin and the PA28 pilots reduced their ability to build good SA; the Griffin pilot thought the MATZ crosser was at 1300ft and the PA28 pilot was not aware of any circuit traffic. However, it seems that the PA28 was below its cleared height of 1100ft QFE as it passed in front of the Griffin that was at 950ft QFE. The actual risk of a collision was reduced by the pilot of the Griffin who saw the PA28 and was able to fly an avoiding manoeuvre.

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.

Notwithstanding the deteriorating weather, Members were surprised that ATC allowed the circumstances leading up to this Airprox to develop to an extent that the ac came into conflict.

The PA28 pilot did not have the benefit of a UHF radio which would have revealed the presence of circuit and other local traffic and ATC did not pass him any information; he therefore believed that there was no traffic when in fact there were 5 ac in the circuit operating on 2 different UHF frequencies. A Military Controller Member informed the Board that it was usual for MATZ crossers to be passed information on circuit activity regardless of the frequency on which they were operating and further, with a 1000ft circuit height, a MATZ (ATZ) crosser would normally be allocated 1500ft (QFE) or above thus ensuring that separation existed with circuit traffic (or traffic that may climb into the circuit). This may explain why he considered, with hindsight incorrectly, that continuing to the airfield overhead in a decreasing cloudbase did not present any problems, provided that he kept ATC fully appraised of his route and height, as he did. Another ATC Member suggested that, due to the cloudbase (which the controller(s) should have been aware of) and the circuit traffic, it would have been wiser to route the PA28 to the N or S of the ATZ thus keeping it clear of the airfield area; an experienced GA pilot Member added that he considers it unwise to plan to overfly Military training airfields as they are generally very busy.

The Griffin crew, although aware of the PA28's presence, were not aware of the final descent that brought it into conflict at 950ft aal (QFE). Members could not explain why the PA28 was at that height (950ft) as the transcript clearly showed that, despite requesting clearance to descend to 1100ft (QFE) the pilot called overhead at '1200ft' very close to the incident time. Whether this was due to an incorrect altimeter (QFE) setting or simply his not being at the height stated, could not be determined; however, a Member noted that such inaccuracies are not uncommon and that tolerances for an Instrument Rating are ±100ft (en route); planning to allow a MATZ crosser at 100ft above the normal downwind height was considered by specialist controller Members to be most unwise.

While accepting the circuit is essentially a visual environment where pilots see and take suitable spacing on other ac, the purpose of ATC in that scenario is to give pilots enough information to build a picture of the known situation so that they can effect separation and sequence correctly. In this incident the PA28 pilot was given no information and, notwithstanding that the PA28 was not at his stated height, the Griffin pilot was not passed the final change approved to the former's height. The Board unanimously thought that the Screen controller had been unwise in telling the U/T controller that updated TI to circuit traffic regarding the ATZ crosser was not required.

While accepting that operations at Shawbury present a special case and the silent ops may be necessary to achieve the training requirements, some Members questioned the appropriateness of the SOP that apparently allowed the Griffin to operate on a quiet frequency and climb up to circuit height without informing ATC.

In assessing the risk Members noted that the griffin pilot had seen the PA28 75m away which gave about 1.5sec for him to react and for the ac to change flightpath by a distance sufficient to avoid a collision; the PA28 pilot, due to the circumstances, had not been able to take any avoidance. Notwithstanding that the avoidance taken by the Griffin pilot had most likely been effective, the Board unanimously considered that safety had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

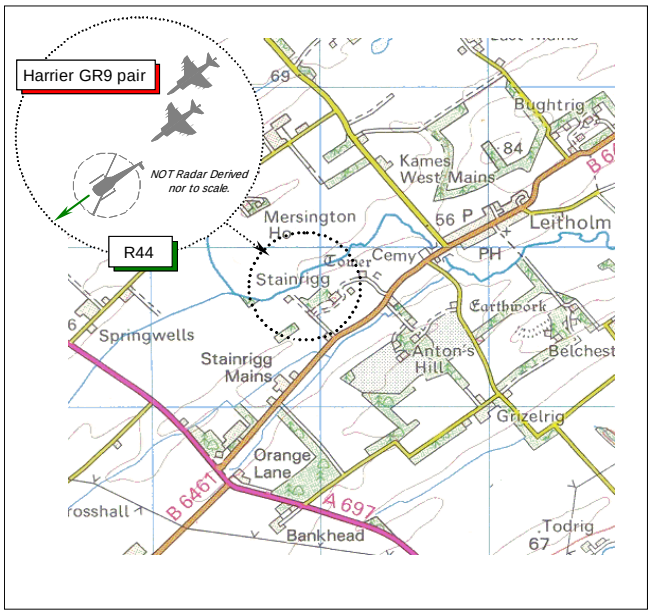
Cause: A lack of TI and positive control by the Shawbury ADC resulted in a conflict in the visual circuit, which was resolved by the Griffin pilot.

Degree of Risk: B.

AIRPROX REPORT No 126/07

AIRPROX REPORT NO 126/07

Date/Time:	30 Aug ~ 1200	
Position:	5541N 00221W (6nm NE of Kelso)	
Airspace:	Scottish FIR/LFA16 (Class: G	
	Reporting Ac	*Reported Ac*
Type:	Robinson R44	Harrier GR9
Operator:	Civ Pte	HQ AIR (Ops)
Alt/FL:	50-80ft↑ agl	250ft msd
Weather	VMC CLOC	VMC NR
Visibility:	10km+	50+km
Reported Separation:	100-150ft V/nil H	Not seen
Recorded Separation:	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ROBINSON R44 HELICOPTER PILOT reports he was departing from a private HLS in the vicinity of Stainrigg House, bound for Glenrothes. He was not in receipt of any ATS; both Mode S & Mode C is fitted and was selected on, but his helicopter is not equipped with TCAS. Operating clear of cloud, with an in-flight visibility of 10km+, he was carrying out a towering climb from the HLS which is a confined area surrounded by trees. As he climbed through 50–80ft agl to clear the trees on a heading of 240° at a speed 15kt, a Harrier jet was first spotted as it flew directly overhead after approaching from above and astern with a *"very high"* risk of a collision. To avoid the jet, he immediately lowered the collective "dropping to ground level". He judged the Harrier's were flying at a height of about 200-250ft agl, so their vertical separation above his R44 was less than 150ft.

In his view, if he had started to climb 2–3sec earlier, taking into account the speed, height and heading of the Harrier jet, he has no doubt, that it would have resulted in a fatal collision. Previously, he had contacted various authorities to notify them about his daily helicopter activity - including the Low-Flying Booking Cell (LFBC) - in the interest of promoting air safety, but to his amazement both the civil and military authorities were "not interested". Ironically, his last attempt to notify the LFBC was less than 90min prior to the incident, but only after the Airprox had occurred was a NOTAM issued. His helicopter has a yellow & black colour scheme.

THE HARRIER GR9 PILOT reports he was leading a formation of 2 Harrier jets flying at 250ft msd during a low-level evasion sortie, with a third Harrier aggressor as the 'bounce'. A squawk of A7001 was selected with Mode C, but neither TCAS nor any other form of CWS is fitted. The formation was not in receipt of an ATS but listening out on a private squadron frequency whilst operating VFR in the UKDLFS.

Flying a heading 260° in the vicinity of 55°41'N 002°21'W – some 6nm NE of KELSO - at 420-450kt, they were operating under a high workload, but both pilots were looking out of the cockpit for over 90% of the time in order to spot the incoming Harrier 'bounce' ac. The R44 helicopter flown by the reporting pilot was not seen by the formation pilots, but he stressed it would have been very difficult to see due to its low-level and very slow speed. However, in his view there was no risk of a collision because of their height. His ac has a grey camouflage scheme, but the HISLs were on.

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

UKAB Note (2): AIC 120/2006 (Yellow 223) - LOW-LEVEL CIVIL AIRCRAFT NOTIFICATION PROCEDURES (CANP) - dated 9 November 2006 was in effect at the time of the Airprox. This AIC entreats civilian pilots

conducting the following civil commercial aerial activities at and below 1000ft agl with an expected duration in excess of 20minutes at a specific location, to notify the LFBC:

(a) Aerial crop spraying;

(b) Underslung aerial load lifting;

(c) Aerial photography and filming;

(d) Aerial survey/air surveillance.

Pre-notification of intended operations should be communicated, by E-mail or fax if possible to the LFBC not less than 4 hours before commencement of the activity.

MoD LOW-FLYING OPS comments that a review of the recorded telephone conversations with the R44 pilot revealed that he contacted the LFBC at 0938UTC after initially contacting AIS Heathrow. His conversation with the LFBC was very long and the R44 pilot initially requested that his take-off/landing site be protected by a NOTAM/CANP. It was explained to him that this was not possible due to the nature of his flight – he was reticent about what he was doing - but eventually stated that it was transit flying to/from Edinburgh. He then requested that his flight route or general area be subject to NOTAM/CANP. Once again he was told that his flight did not fit into a category that could be protected by a low-flying 'avoid' or 'warning' status. The LFBC booking clerk, who is very experienced, confirmed all of his actions with the LFBC Supervisor. The R44 pilot spent a considerable time trying to initiate NOTAM status and seemed quite aggrieved that his flight did not qualify.

The R44 pilot indicated that he would be flying at up to 500ft agl. This would place the helicopter in the middle of the military low-flying height block and contrary to the heights recommended for civilian operators to fly. This private HLS is located between Charter Hall light ac landing site (LA15) and the town of Coldstream.

UKAB Note (3): After the incident a NOTAM was issued by AUS the <u>following day</u> relating to this activity from this LS:-

Q)EGPX/QWELW/IV/BO/W/000/015/5541N00221W002

B)07/08/31 13:09UTC

C)07/12/31 22:59 NAVW (H3609/07)

D)HJ

E)DAILY HEL ACTIVITY. SITE WI 2NM RADIUS 5541N 00221W (STAINRIGG HOUSE, LEITHOLM, BERWICKSHIRE).

OPS CONTACT 07721735363. AUS 07-08-0663/3795/AS2.

F)SFC

G)1500FT AGL

HQ AIR (OPS) comments that the R44 would appear to have been operating from a site not indicated on the LFC. Therefore, the Harrier formation would have had no indication that any activity was taking place at that location. We would agree with the Harrier pilot that the R44 would have been very difficult to see as it climbed clear of the trees with the Harrier almost overhead.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, together with comment from the Harrier operating authority and the MoD.

The Board discussed at length the issue of notification of the R44 pilot's flight to the LFBC. The Military Low Flying Advisor stressed to the Members the conventions for the notification of civil flights, which the landline recording revealed had been clearly reiterated to the R44 pilot in his call to the LFBC. It was not practicable to notify individual helicopter flights under the CANP on a daily basis, Often, as in this case, they involve a single departure from a remote HLS, to land away, and then return to the same HLS. Such a notification would be contrary to the established practice promulgated in the AIC, as described in the extract at UKAB Note (2). The civilian helicopter pilot Member concurred that it is impractical to notify each single transit helicopter flight that occurs in the surface to 2000ft height band where military ac operate within the LFS. Moreover, an entry on the military low-flying chart for the HLS would only be warranted if the number of movements at the HLS exceeds 4/hour and, in any case it would only be a warning, not a mandatory avoidance of the area. The Board agreed that the R44 pilot's flight did not fulfil the criteria for notification under the CANP; it was not therefore clear on what basis AUS had promulgated their NOTAM. Furthermore, it is clear that any NOTAM would not afford exclusive use of the promulgated airspace to the user, merely provide a warning that other pilots should take into account in their flight planning. The Military Low Flying Advisor also reiterated that any warning notified under the CANP, requires a minimum of 4 hours notice to the LFBC so that it can be distributed to military crews before they take off from their home base for a flight into the LFS.

It is unfortunate that the HLS is surrounded by trees, which would naturally have concealed the presence of the small R44 helicopter from the Harrier pilots until it was sky-lined, thus it was not surprising to the Members that the lead Harrier pilot reported that the R44 was not sighted at all. Without the benefit of radar data, it was not evident if it was the wingman or the lead ac that the R44 pilot had reported sighting, but it was significant that he had only mentioned one Harrier in his account. The helicopter pilot Member pointed out that a clearing turn at treetop height is neither practical nor safe in a single-engined piston-powered helicopter, where any mechanical malfunction at that height could prove fatal. Thus, with a clearing turn not practicable, and the R44 pilot unable to spot Harrier approaching rapidly from astern, there was little he could have done to prevent this encounter, which the helicopter pilot Member explained had occurred at a difficult point in the take-off from this confined area, just as the R44 was just transitioning to gain forward speed in the climb.

From the respective pilots' reports it was evident that both were legitimately proceeding about their various tasks when this encounter in Class G airspace occurred. Noting the Command's comments, the restricted visibility of the helicopter pilot from his confined HLS and the obscuring effect of the trees this all had an impact on the ability of both pilot's to see and avoid each other's ac in this part of the FIR/LFS. It seemed clear to the Board that the Harrier was not spotted by the R44 pilot until it was almost overhead his ac; at that point his helicopter had been climbing through 50-80ft, which was when he took avoiding action by lowering the collective and descending back to ground level. It was therefore clear that the R44 pilot took action as the Harrier was clearing his overhead to the W. Therefore, the Board concluded that this Airprox had been the result of a conflict in the FIR/LFS.

The lead Harrier pilot reported that he was operating at 250ft msd – minimum separation distance - i.e. clear of any object by a minimum of 250ft; hence the ac should have been 250ft above the tops of the trees and thus somewhat higher than the 200-250ft agl reported by the R44 pilot. Without the benefit of recorded radar data it was not possible to determine positively the heights of the individual ac and thus the actual vertical separation that existed; therefore, the apparent disparity between the two pilot's reports could not be resolved. This was not intended to cast any doubt as to the veracity of either pilot's account, merely a statement of fact. Moreover, the Board could only assess Airprox on the basis of what actually happened, not what might have occurred if circumstances had been different. Critically however, it seemed that in the order of 150ft of vertical separation existed at the closest point when the R44 pilot saw the Harrier and elected to descend. So having seen the jets and avoided them any conflict that might have arisen was resolved by the R44 pilot's prompt and effective descent. The Board agreed therefore, that no risk of a collision had existed in these circumstances.

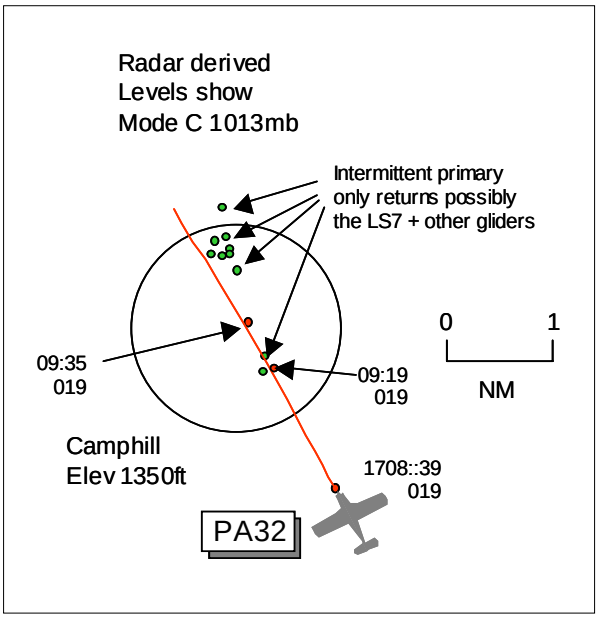
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in the FIR/LFS.

Degree of Risk: C.

AIRPROX REPORT NO 127/07

Date/Time:	26 Aug 1710 (Sunday)	
Position:	5318N 00144W (0·5nm NW Camphill G/S - elev 1350ft)	
Airspace:	FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	LS7 Glider	PA32
Operator:	Civ Pte	N/K
Alt/FL:	1000ft↓	
	(QFE)	(N/K)
Weather	VMC CLBC	NK
Visibility:	>5nm	
Reported Separation:	50-100ft V/60m H	
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LS7 GLIDER PILOT reports flying a local soaring sortie from Camphill and in communication with Camphill Launch Point on 129·975MHz. The visibility was >5nm flying 2000ft below cloud in VMC and the ac was coloured white with red marking on the nose, wing-tips and rudder. He had been flying for about 3·25hr in a mixture of hill lift and thermal the cloudbase was 3300 QFE and the wind was 300° at 15kt. He was tracking S along Bradwell Edge, just upwind of the airfield boundary, approximately 0·5nm NW of the gliding club's hangar and descending slowly from 1000ft QFE at 50kt. Two club 2-seat gliders were also flying somewhat below and well clear of him. He noticed a powered ac approaching from the SE flying about 1·5nm away directly towards the G/S at about the same altitude. He paid careful attention to the ac's track relative to his and determined that it would pass ahead of him without collision so he maintained his course and speed without deviation. He looked for any signs of recognition that the ac's pilot had seen his glider, perhaps a rocking of its wings as it went past, but there was none. The ac passed about 300ft ahead and slightly above and there was a momentary twitch of the ac's wings as it was dead-ahead which would have been when the other pilot saw his glider. As it passed he looked up and read its registration letters clearly on the starboard side of its fuselage. He estimated at the CPA the other ac was 200ft (60m) away horizontally and 50-100ft vertically above. It continued on a NW'ly heading without deviation whilst he continued S bound eventually landing 15min later. The powered ac had directly overflown the middle of the G/S at no more than 1100ft QFE on a day when launches were taking place to between 1200 to 1400ft with cables. No gliders were launching at the time of the overflight but flying was in progress which continued for another hour afterwards. The approaching ac had been seen by the launch point team but they were unable to read its registration letters at the time but it was clearly seen by one of the others airborne glider's instructor as it passed directly O/H his glider. He assessed the risk as medium.

THE PA32 PILOT declined to submit a report.

UKAB Note (1): The UK AIP at ENR 5-5-1-1 promulgates Camphill as a Glider Launching Site centred on 531818N 0014353W where winch launched gliders may be encountered during daylight hours up to 2000ft agl; site elevation 1350ft amsl.

UKAB Note (2): The Claxby radar recording does not capture this Airprox. At 1708:39 the radar shows a 7000 squawk, believed to the PA32 2nm SE of Camphill tracking 330° indicating FL019 (2350ft QNH 1028mb), which is maintained throughout, with intermittent primary only returns, possibly at least 2 gliders manoeuvring 0·5-0·75nm NW of Camphill. Forty seconds later at 1709:19 when the PA32 is 0·5nm SE of Camphill, another primary return appears 0·2nm ahead of it which then fades after the next sweep to the S of the PA32's track. The PA32 then passes O/H Camphill at 1709:35 with the same 2 primary contacts, 1 of which is believed to the LS7, 0·5nm

and 0·75nm ahead both tracking S. However, both primary contacts then fade completely as the PA32 tracks close to where the primary radar returns disappeared. The LS7 pilot reported tracking S during the Airprox and flying at 1000ft QFE which equates to 2350ft QNH.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included only a report from the LS7 pilot and radar video recordings.

Members were disappointed that the PA32 pilot had declined to submit a report. The radar recording reveals the PA32 tracking O/H the Camphill Glider Site, which is clearly shown on the 1:250000 and 1:500000 topographical charts promulgating winch launching activity up to 3400ft amsl. By routeing through this area at about 1000ft agl, thereby below the maximum winch cable launch height with the inherent danger of a possible cable-strike, the PA32 pilot had displayed poor airmanship and a disregard for his own safety. Fortunately, on this occasion no glider launching was taking place when the PA32 overflew the G/S, but there were 3 gliders already airborne and operating in the immediate vicinity, 1 of which was the LS7. The PA32 pilot's chosen route had placed his ac into conflict with the LS7 and this had caused the Airprox. A slight deviation of track to the L or R, thus avoiding the G/S, would have greatly reduced the risk of encountering a glider. The salutary lesson to be learnt from this event was that if you overfly an active winch launch glider site you are more than likely to meet a glider, possibly on the end of a high tensile steel cable!

From the very comprehensive report given by the LS7 pilot, Members were able to assess the risk. Fortunately, he had seen the approaching PA32 about 1·5nm away and monitored its flightpath, judging that a collision was unlikely provided the existing geometry was maintained, and watched it pass just ahead and slightly above. Although the reported separation distances appeared to be reduced below acceptable margins, the Board agreed that the LS7 pilot was always in a position to manoeuvre his ac to avoid the PA32 by a greater margin if necessary, which ensured that safety was not compromised during this encounter.

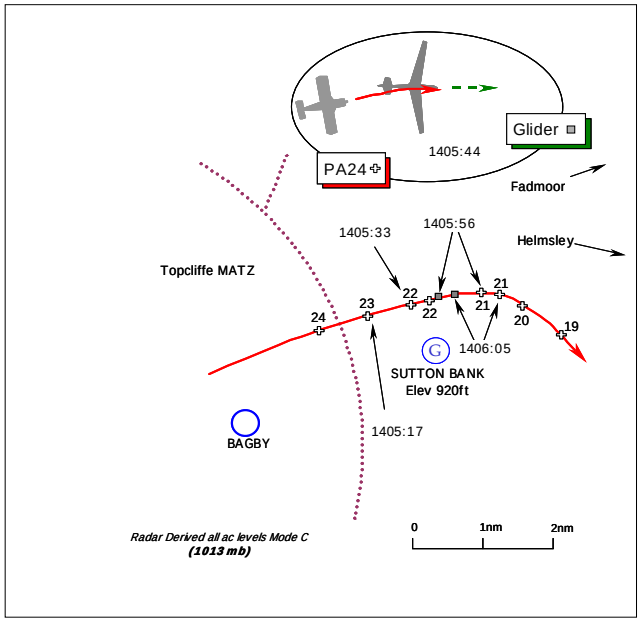
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA32 pilot flew overhead a notified and active glider site into conflict with the LS7.

Degree of Risk: C.

AIRPROX REPORT NO 128/07

Date/Time:	29 Aug 1405	
Position:	5414N 00112W (1nm N of Sutton Bank - elev 920ft)	
Airspace:	London FIR	(Class: G
	Reporting Ac	*Reported Ac*
Type:	Glider	PA24
Operator:	Civ Club	Civ Pte
Alt/FL:	1750ft	NR
	QFE	amsl
Weather	VMC CLOC	VMC CLOC
Visibility:	10km+	"Reasonable"
Reported Separation:		
	50-100ft V/nil H	NR
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GLIDER PILOT, a gliding instructor, reports he was flying from Sutton Bank Glider Site as the pilot-in-command during a qualified glider pilot's 'check' flight - who is also a PPL holder.

Whilst conducting general handling some 1000ft clear below and 2-3nm clear of scattered Cumulus cloud with an in-flight visibility of 10km+, they were operating in a position about 2nm N of Sutton Bank at about 1750ft Sutton Bank QFE. Heading E at 47kt, the other ac – a low-wing single-engined monoplane – was first seen after it had flown directly underneath their glider from astern heading E and was not, therefore, seen until it appeared in front of the nose of their glider, although its engine noise was heard by him a fraction of a second before it was seen opening ahead. Assessing the risk as *"very high"*, it was only 50-100ft below them as it maintained it's heading, he thought in level flight, towards the town of Helmsley, about 4nm away, before turning onto a southerly heading. Astonished at this occurrence, they did not recognise the type of ac, which was light brown or golden in colour.

THE PIPER PA24 PILOT reports he was in transit under VFR from Kilbride in Co Wicklow to Fadmoor and was in receipt of a RIS, probably from Leeming, whilst flying clear of cloud and in reasonable visibility.

Heading E at 155kt maintaining VMC, whilst executing an en-route descent he recalls seeing and avoiding a glider to the N of Sutton Bank in the reported position and at a location he expected and had been advised to see gliders. It was just another glider that he dodged around, as he does many, at that time of year. Adding that he flies past Husbands Bosworth and other glider sites further S several times each week, this flight was nothing exceptional and he does not recall any robust avoiding action being necessary. His ac is coloured beige with maroon stripes.

UKAB Note (1): Investigation revealed that the PA24 pilot was in receipt of an ATS from Topcliffe APPROACH during the period of the Airprox.

UKAB Note (2): Neither the Claxby nor the Great Dun Fell Radar recordings illustrate this Airprox clearly. However, the PA24 in shown squawking A0427 with Mode C as the ac transits eastbound towards a position about 1nm N of Sutton Bank and thus about 1nm S of the reported Airprox location. After clearing the Topcliffe MATZ boundary the PA24 is shown descending gently through 2300ft (1013mb) at 1405:17. The Airprox probably occurred just after 1405:33, when the PA24 has levelled momentarily at 2200ft (1013mb) – about 2320ft BARNSLEY RPS (1017mb) – which is maintained as the PA24 passes N abeam Sutton Bank. At 1405:44, a primary contact is shown in the PA24's 11 o'clock at a range of 0·2nm, however, it is impossible to determine accurately if this is the glider in question. The Glider pilot reports flying at a height of 1750ft above Sutton Bank on QFE (elev 920ft), thus at an altitude of about 2670ft. Notwithstanding the tolerances applicable to Mode C, this

would suggest the PA24 flew about 250-350ft below the glider at this point. A primary contact, which might or might not be the glider flown by the reporting pilot, is shown at 1405:56 after the PA24 has passed by and again at 1406:05 and thus after the Airprox. However, it should be noted that Topcliffe APPROACH had warned of heavy glider activity in the vicinity and this primary contact might by another glider.

UKAB Note (3): The UK AIP at ENR 5-5-1-1, promulgates that Sutton Bank Glider launching site is active during daylight hours for winch and aerotow launches which may attain a height of 2000ft agl, above the site elevation of 920ft amsl.

MIL ACC reports that the PA24 pilot called Topcliffe APP on 125·0MHz at 1400:56, giving only his C/S; almost 1min later APP asked the pilot to *"pass message"* and the PA24 pilot responded *"Hello am a PA24 er descending through your MATZ er crossing from er west to east am er presently two eight zero zero feet."* APP instructed the PA24 pilot to "..*squawk 0427 route no closer than 3 miles to the south of Topcliffe",* the pilot repeated the squawk and informed APP that his track will take him through the Topcliffe overhead so APP replied, at 1402:30 *'If you're going through the overhead you must climb to 3000 Barnsley 1018.* The PA24 pilot correctly repeated the instruction *"3000 on 1018 PA24 C/S".* At 1403:17 the pilot asked APP *"do you have any traffic?"* and after being asked to repeat his question, APP responded '*affirm we've got one inbound from Linton'*. Over the next 2min APP asked the PA24 pilot to confirm his height *(given as two seven zero zero)* and talked to another light ac unconnected with the Airprox. At 1405:11, APP informed the PA24 pilot that *"Sutton Bank appears to be heavily active with gl…heavily active with gliders"*, which the PA24 pilot acknowledged. APP's R/T exchanges were then routine until 1410:51 when the PA24 pilot informed APP that he was *"descending into Fadmore"* and APP replied *"…that's copied squawk 7000 and..en-route as required"*.

This Command considers that, although never stated, the PA24 pilot was receiving a FIS from APP; which is backed up by the fact that, although a squawk was issued, the PA24 was not 'identified' at any stage. APP passed traffic information about gliding activity at Sutton Bank some 30sec before the Airprox took place; it is therefore considered that APP fulfilled the requirements of a FIS and there were no Mil ATC causal or contributory factors.

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 and reports from the appropriate ATC authority.

It was evident to the Members that since the light ac approached from below and astern of the glider, the reporting pilot would not have been able to spot the PA24 until it flew into his field of view ahead. Thus, neither he nor his colleague, were able to affect the outcome of this encounter in Class G airspace. The gliding Member pointed out that the elevation of Sutton Bank is quite high at 920ft; at the altitudes considered here, with some 70 gliders based at this location, the potential for a conflict with circuiting gliders is significant. Whilst accepting entirely that each of the pilots involved here was legitimately proceeding about their flights in the 'Open FIR', it should be recognised that Sutton Bank is one of the larger glider sites in the UK. Moreover, the danger from the winch wire extends to an altitude of nearly 3000ft amsl and 'ridge soaring' often involves 20-30 gliders at once on a good day, so Members agreed that it might have been wiser to have given Sutton Bank a wider berth.

The glider pilot reports that the PA24 flew directly underneath some 50-100ft below his ac, whereas the PA24 pilot did not recall taking any robust avoiding action against a glider, although he did remember sighting and avoiding a glider to the N of Sutton Bank in the reported position, which might well have been that flown by the reporting pilot. Since gliders have a very poor radar signature the recorded radar data here did not capture the encounter at all. Therefore, it was impossible to confirm whether the few primary returns shown were the subject glider, another glider or clutter, thus it was not possible to establish the horizontal separation that pertained here independently. Furthermore the glider carried no SSR, so in the absence of any Mode C data the vertical separation could not be ascertained with any degree of certainty either. If the PA34 pilot had indeed seen the subject glider at an altitude of about 2670ft based on the latter pilot's report, then comparison with the PA24's Mode C would suggest the light ac flew about 250-350ft below the glider when the Airprox occurred. This was at variance to the glider pilot's report of 50-100ft, but it was not possible to resolve this anomaly from the available data. The gliding Member opined that in order to hear another ac's engine in a glider, the powered ac would usually have to be quite close. Thus as training gliders are noisier than most and the glider pilot actually heard the PA24 moments beforehand, the PA24 might feasibly have been 250ft below them. Whatever the vertical clearance, only the PA24 pilot was able to affect the outcome; he would have had the glider in his field of view, chosen his own flight path

and the resultant separation was, it would seem, sufficiently close to cause the glider pilot concern, which the Board agreed was the cause of the Airprox. But as the PA24 pilot apparently had the glider in view throughout and would have been able to manoeuvre if needed, in the Board's view, no risk of a collision had existed in the circumstances conscientiously reported here.

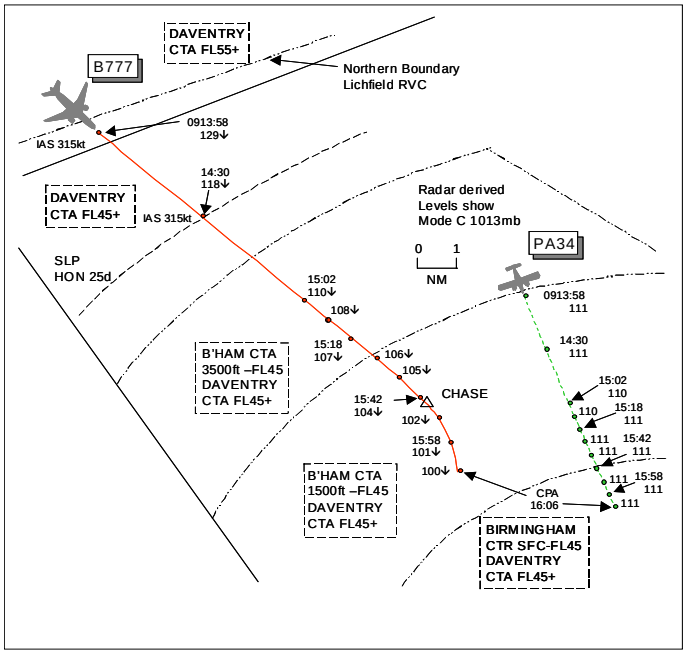
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA24 pilot flew sufficiently close to cause the glider pilots concern.

Degree of Risk: C.

AIRPROX REPORT NO 129/07

Date/Time:	6 Sep 0916	
Position:	5236N 00151W (11nm NW Birmingham)	
Airspace:	Daventry CTA	(Class: A)
Reporter:	Birmingham RAD 1	
	1st Ac	*2nd Ac*
Type:	B777-200	PA34
Operator:	CAT	Civ Pte
Alt/FL:	NR	FL110
Weather	IMC NR	VMC NR
Visibility:	NR	>10km
Reported Separation:	RAD 1 - 400ft V/4nm H	
	Not seen	Not seen
Recorded Separation:	700ft V/4·8nm H OR 1100ft V/4·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BIRMINGHAM RAD 1 reports that owing to the volume of inbound traffic to Birmingham and Coventry, ac had been holding at CHASE and GROVE. The B777 flight called with about 2-3nm to run to CHASE descending through FL110 for FL90 and showing a G/S of 386kt. At this time there was a radar contact, the subject PA34, 2-3nm E of CHASE at FL111 which was tracking S with a G/S of 173kt. He told the B777 flight to turn R onto heading 200° then immediately gave it again as avoiding action along with TI. He estimated that separation was 400ft and 4nm at the closest point. The PA34 had not been coordinated and he believed it was working MACC, his colleague informed MACC that he was taking avoiding action with the B777.

THE MACC SE TACTICAL CONTROLLER reports that Birmingham APC had been busy with traffic holding at GROVE and CHASE (above FL110) but subsequently the CHASE stack had cleared. He had 2 S'bound ac, the B777 and the PA34. The B777 flight was transferred to him from MACC S29 descending to the standard FL200 and then, following coordination with MACC WAL, was descended further. The PA34 was cruising at FL110 and was already on the sector when he took over. Owing to the stack activity at CHASE the PA34 was vectored away but when FL110 became available as an overflying level the flight was told to resume its own navigation to HON. The B777 was descended on top of the PA34 and when he considered there was no confliction he descended the B777 to FL90 to be level by CHASE. Because Birmingham APC were busy he knew that there was little chance of a non-standard downwind vector and as his traffic level was light he continued to closely monitor the progress of the B777 against the PA34. When the B777 vacated FL110 on Mode C and the PA34 was 5nm from CHASE

(the B777 still N of CHASE) he transferred the B777 to Birmingham. The B777 flight was observed to slow its ROD despite being told to be level by CHASE but he did not consider that the B777 had bust its level rather that Birmingham APC had given a further instruction to the flight. Because of the proximity of the PA34 he used the ERBM function to monitor separation and as the B777 passed FL100 the distance was measured 5·2nm. About 5min later, Birmingham APC telephoned to advise that they had taken avoiding action with the B777 against his traffic (the PA34).

THE B777 PILOT reports inbound to Birmingham IFR and in receipt of a RCS from Birmingham on 118·05MHz squawking with Mode S. He was unaware of an Airprox at the time but was telephoned after the incident. He had been given a radar turn during their descent when about 11nm NW of Birmingham but did not receive any TCAS warnings or see any other traffic; the Wx conditions were IMC.

THE PA34 PILOT reports cruising at FL110 and 160kt on an IFR flight to France. He was unaware of an Airprox, only being informed of it by the ac's owner post flight. He was on radar vectors for 90% of the flight in UK airspace and did not see any conflicting traffic; the Wx was VMC.

ATSI reports that the controller was operating as the MACC SE Sector Tactical Controller. He commented that he had only recently achieved a Certificate of Competence for the sector, although he had been valid on other MACC sectors for several years. He described his workload as light at the time of the Airprox. He commented that it had been busy before he took over the sector, about 15min prior to the incident, because Birmingham and Coventry inbound traffic was having to hold at CHASE.

The PA34 flight established communication with the SE Sector, at 0853, reporting heading 130° at FL110. This was previous to the controller taking over the sector. The flight was given headings of 100° and 155°, before the handover of the sector was carried out. This was to route it clear of CHASE because of the Birmingham holding traffic. Shortly after this, at 0903, the PA34 flight was instructed, by the subject controller, to turn L heading 130°. At 0907, it was instructed to resume its own navigation for Honiley, which would route it to the E of CHASE. The radar recordings show that, at the time the PA34 was approximately 20nm N of CHASE at FL110. The B777 flight, still not in contact with the SE Sector, is 45·8nm to the NW of the PA34, passing FL249. No further transmissions were made to, or received from, the PA34 flight, until after the Airprox had occurred.

The Tactical Controller remarked that he was aware of the B777's details and in accordance with normal procedures he had extended the range of the radar display to confirm its position. He recollected it was in the Anglesey area when he first observed it. He realised that it would be necessary to descend this ac through the PA34's level but he assessed that he would be able to achieve vertical separation before horizontal was lost. The B777 flight contacted the SE Sector, at 0908, reporting descending to the Standing Agreed Level, with Sector 29, of FL200, 25nm before CREWE. The pilot was informed to expect further descent in about 7 or 8 miles. This was to ensure that the ac remained within the SE Sector's airspace. However, the Wallasey Sector telephoned the SE Co-ordinator to coordinate its descent to FL150. This level was issued to the B777 as *"descend at your discretion Flight Level One Five Zero"*. By now, the B777 was passing FL212, 35·4nm from the PA34. At 0910, the B777, passing FL200, was instructed *"at your discretion descend Flight Level One Two Zero expect Nine at CHASE"*. This was correctly read back by the pilot. Having issued the expected level at CHASE, the Tactical Controller was content to allow the B777's pilot to descend when convenient to him. Although he did not anticipate any problem with the 'drop-through' against the PA34, he decided to ensure vertical separation initially and then monitor the situation before issuing further descent.

At 0911:25, the B777 flight was instructed *"direct to CHASE descend Flight Level Niner Zero be level at CHASE please"*. The MACC MATS Part 2, Page SEa-27, states: 'Traffic inbound to CHASE shall be descended to FL90 and transferred to Birmingham Radar without the need for coordination under the 'Silent 9' procedure'. The pilot read back the instruction, including the level clearance at CHASE, correctly. The radar shows the B777 passing FL189, 23·7nm NW of the PA34 and 29·5nm from CHASE, at the time. The SE Tactical Controller said that he still believed vertical separation would exist between the subject ac before horizontal separation was lost but he would continue to monitor the situation. During the next 3·5min he transmitted to three other flights, before, at 0915, he transferred the B777 flight to Birmingham Approach. He recollected that he believed he had observed the B777's Mode C SSR return showing the ac descending through FL106. The radar photograph, timed at 0915:02, shows the B777, approximately 4·5nm NW of CHASE, passing through the PA34's level, the two ac being 7·2nm apart. The latter is about 3·5nm E of CHASE. The G/S of the B777 is indicating 200kt faster than the PA34. The MACC MATS Part 2, same page as quoted above, states: 'All traffic inbound to CHASE are to be transferred to

Birmingham Radar 'clean' of all known conflictions and on its own navigation to CHASE unless otherwise coordinated'. Additionally, 'Traffic may be transferred at any time prior to CHASE. Traffic is to be transferred to Birmingham Radar no later than the northern edge of the Lichfield RVC [10nm before CHASE] and clean of all conflictions. If this is not possible then co-ordination shall be affected with Birmingham Radar and/or Radar/Full Releases should be passed'. The controller explained that he believed separation would exist by the time the B777 arrived at CHASE. His concern was to transfer the flight to Birmingham, as soon as possible, because it had crossed the northern edge of the RVC. Consequently, he did not wait until vertical separation was provided before transferring the flight. He agreed that he could have coordinated its arrival with Birmingham but although the situation was tight he still did not consider there would be a loss of separation. He added that he activated the Electronic Range and Bearing equipment provided on the radar display, which, he believed, showed that separation remained in excess of the required 5nm/1000ft, throughout the event.

Although not issued with a specific Birmingham STAR, the B777 was in fact following a CHASE 1D/1E STAR. The Speed Limit Point for these STARs is Honiley DME 25nm [7nm NW of CHASE]. Under the General Information section on Page AD 2-EGBB-7-2 of the UK AIP, it states 'Cross SLPs or 3 MIN before holding fix at 250KT IAS or less'. Additionally, the 'Maximum holding speed at CHASE up to and including FL140 is 210KT IAS'. The Mode S recordings, not available to MACC or Birmingham, show that the B777's IAS had decreased but it was still at 283kt as it passed CHASE. The MACC MATS Part 2, Page SEa-29 states: 'Because the speeds are published there should be no need for MACC controllers to become involved in notifying holding speed to inbounds'. Although it is possible to show G/Ss on the MACC radar, they were not displayed at the time.

The B777 flight contacted Birmingham at 0915:16, reporting descending to FL90 level by CHASE. The Birmingham APR responded *"turn right heading Two Zero Zero degrees"*. Although the controller did not use the term avoiding action on the first call, as soon as the pilot read back the instruction the controller continued *"affirm it's avoiding action traffic in your left eleven o'clock at a range of four miles indicating Flight Level One One Zero tracking southbound"*. The pilot replied *"yes we've got him on TCAS not visual"*. The radar recording, timed at 0915:16, shows the B777 passing FL107, 2·6nm NW of CHASE. The PA34 is 3·8nm ESE of CHASE, 6·2nm from the B777. Subsequently, the B777, passing FL104, is seen commencing its R turn at 0915:42, just as it is approaching CHASE (IAS283kt), 4·8nm from the PA34. As it turns, the horizontal separation reduces as the vertical increases i.e. 4·5nm/900ft. The B777 passes 1000ft below the PA34 when they are 4·2nm apart.

UKAB Note (1): The CPA occurs on the next sweep when horizontal separation reduces to 4·1nm as the B777 descends through FL100, 1100ft below the PA34.

UKAB Note (2): The UK AIP at AD2-EGBB-7-2 shows the STAR chart for a CHASE 3A, 1C, 1D and 1E arrival. A text box on the chart titled Warning states *'**Do not** proceed beyond **CHASE** without ATC Clearance'.* A further text box below titled Descent Planning states *'When determining top of descent point, pilots should anticipate possible clearance to FL80 by the SLP. Pilots unable to comply must notify ATC as soon as possible'.* ***Actual descent clearance will be as directed by ATC***.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted that the B777 crew had arrived at CHASE without complying with the ATC instruction to be level at FL90. Pilot Members opined that SOPs for a STAR should include a crew-brief on expected levels and speeds from the appropriate arrival charts prior to commencing descent and this should have resulted in a profile that allowed for a descent to 1000ft below (FL80) the actual cleared level (FL90), and by a point 7nm before CHASE (the SLP). From the radar recording it appears that the crew were reducing the ac's IAS but the ac's ROD had reduced as a consequence. In these circumstances, the crew should have informed ATC that they were unable to comply with the STAR speed restriction and the CHASE FL90 level restriction. That said, ultimately ATC did have a responsibility for ensuring that separation was afforded between the subject ac. The MACC SE Tactical had made a judgement that his plan would work but had not altered this when the evolving situation did not follow the plan. He should have coordinated with Birmingham because the B777 crew did not comply with 'Silent 9' procedure, the ac was not clean of conflictions and it had passed the N edge of the Lichfield RVC before being transferred. The MACC SE Tactical controller had then transferred the B777 late to Birmingham on the

assumption, but not ensuring, that standard separation would be maintained, based on ac performance. This had caused the Airprox.

Turning to risk, the Birmingham RAD1 had quickly seen the potential confliction and gave the B777 crew a R turn onto heading 200° on initial contact, further reinforcing this by using 'avoiding action phraseology. The crew had reported a TCAS contact and had executed the turn, resulting in the B777 passing W of the PA34 with a minor loss of separation. These 2 elements were enough to persuade the Board that safety had been assured during the encounter.

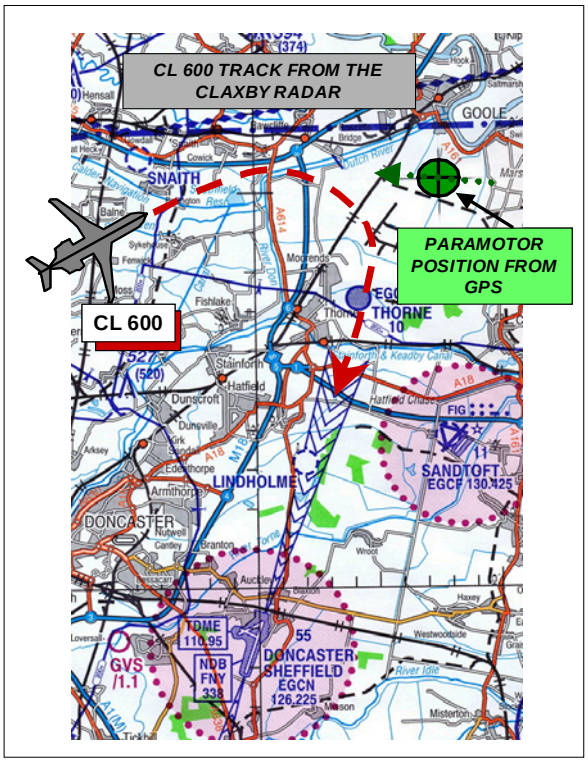
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The MACC SE Tactical did not ensure that standard separation would be maintained before transferring the B777 to Birmingham ATC.

Degree of Risk: C.

AIRPROX REPORT NO 130/07

Date/Time:	4 Sep 0825	
Position:	5340N 00053W(2nm S Goole)	
Airspace:	Lon FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Powered Paraglider	CL600
Operator:	Civ Pte	Civ Exec
Alt/FL:	2017ft (QFE)	3000ft (QNH NR mb)
Weather	NR	VMC CAVOK
Visibility:	>20nm	Unlimited
Reported Separation:	0 V/25m H	0 V/5nm H
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PARAMOTOR PILOT reports that he was making his way back to his departure field at Wormley Hill just SE of Goole after his morning flight and he was heading 275° at 23kt and at 2017ft agl. He was not radio equipped and was looking around when he noticed a shinny object just S of Eggborough Power Station, about 10nm away. The visibility was excellent and at first he thought it was a helicopter, but very soon afterwards he saw that it was a fixed wing ac which seemed to be at about 2000ft and coming towards him. The ac was a small two-engined executive jet which was white in colour and a short time after he confirmed that it was heading towards him, he started to make himself more visible by manoeuvring the paraglider and rocking it from side to side. When the ac was about 400/500ft away it seemed as though the pilot had seen him and the ac appeared to move slightly to the right and it passed in front of him at a distance of around 100ft or slightly less. He prepared for the turbulence by

holding the 'brakes' and making sure that he could see and reach his reserve parachute however, in the event he did not experience the expected turbulence. He did not take any avoiding action and did not assess the risk.

THE CL600 PILOT reports flying an executive flight from Manchester to Doncaster Sheffield under VFR. They were squawking as directed with Mode S and in receipt of a RIS from Doncaster. They were at about 12nm on the approach for RW20 at an alt of 2000ft and 230kt when a motorised parachutist transited through the ILS approach lane outside the ATZ. The visibility was good and he saw the parachutist at about 7nm and they passed behind the parachutist, consequently there was no risk of a collision. Their ac may have appeared suddenly to the parachutist due to their relative speed and size. He suggested that if parachutists wish to fly in busy airspace they should fit a transponder to make themselves visible to controllers and TCAS.

UKAB Note (1): The recording of the Claxby radar shows the CL600 squawking with Mode S throughout the incident; the ground track is as shown above; as it turns onto the localiser it is at an alt of 017. The paramotor does not show at any time; the plotted position and alt are that reported by the pilot presumably taken from his GPS.

ATSI reports that there were no ATC aspects to this incident.

THE BHPA did not comment.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were not able to resolve positively the differing estimations of the separation in the reports by the two pilots. It was suggested that the paramotor pilot might have seen another jet or the CL600 pilot a different paramotor; both were however, discounted due to the time and positional information. The track and alt of the CL600 were displayed clearly on the radar recording but the paramotor did not show at the incident time. It was assumed that the time was correct and, since it was reported to a high degree of accuracy (possibly from the GPS), the paramotor position was correct and that mapping projections was not a significant issue.

The only explanation suggested was that the paramotor pilot reported seeing a 'small two-engined executive jet' and the CL60 is in reality medium sized with a wingspan of almost 20m. If he thought it was small and in reality were larger it would appear to be closer. In any case had the ac been 25m away, as reported by the paramotor pilot, he would have experienced severe turbulence as it passed; he reported that there was no turbulence.

Accepting the CL600's track and the paramotor pilot's reported position, it was therefore concluded that the separation had been of the order of 2nm as depicted on the diagram. It was therefore agreed unanimously by the Board that this had been a sighting report and that there had been no risk.

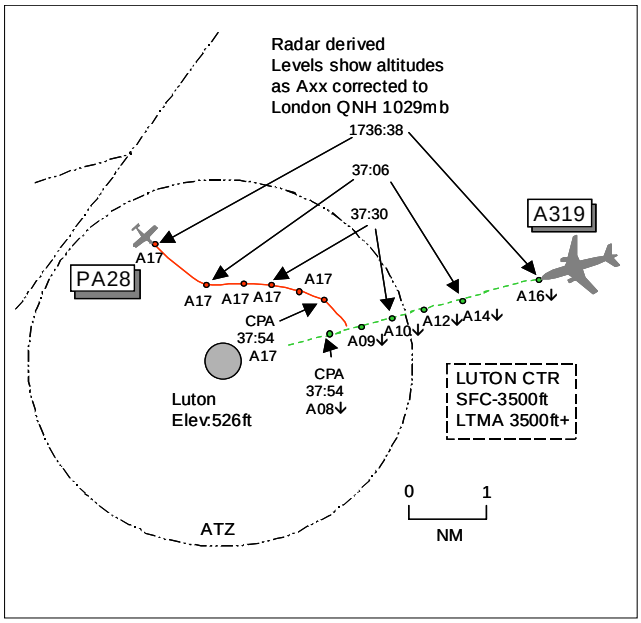
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT NO 131/07

Date/Time:	5 Sep 1738	
Position:	5153N 00019W (2nm FIN APP RW26 Luton - elev 526ft)	
Airspace:	CTR/ATZ	(Class: D)
	Reporting Ac	*Reported Ac*
Type:	A319	PA28
Operator:	CAT	Civ Trg
Alt/FL:	1400ft↓ (QNH 1029mb)	1500ft (QNH)
Weather	VMC CLBC	VMC CLOC
Visibility:	<10km	>10km
Reported Separation:	500ft V/0·5nm H	NR
Recorded Separation:	500ft V/2·4nm H OR 900ft V/0·4nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A319 PILOT reports inbound to Luton IFR and in communication with Luton Tower on 132·55MHz squawking with Mode S. On short final during an ILS approach to RW26 heading 265° at 135kt descending through 1400ft QNH 1029mb they received a TCAS TA. A white coloured PA28 was seen approaching from the N and passed 500ft (according to TCAS) above them and 0·5nm clear to their R on a S'ly track. No TI was given by Luton Tower. In the event of a 'go-round' they believed they would have hit the traffic. He assessed the risk as high.

THE PA28 PILOT reports flying a dual training sortie transiting the Luton CTR VFR towards Denham at 1500ft QNH and 100kt in receipt of a RCS from Luton Approach squawking 4670 with Mode C. Having been cleared into the CTR she remembered the frequency being busy. The Luton controller gave TI so they turned L 1nm N of the RW extended C/L to avoid getting closer to it, having seen the traffic about 4nm away at the same level, and then they turned R to cross behind the much lower ac.

THE LTCC LUTON RADAR CONTROLLER reports mentoring a trainee when a PA28 flight requested VFR transit of the Luton CTR from N to S. The PA28 flight was cleared into CTR VFR not above altitude 2400ft to hold N of Luton and to report aerodrome in sight. The A319 flight was being vectored for an ILS approach to RW26 and was told, he thought, that traffic was approaching the airport from the N whilst the A319 made its approach. The PA28 pilot was told about A319 on final and was asked to report it in sight. When this was reported, the pilot was instructed to transit S bound behind the A319 (he usually adds the phrase 'not too close' but he could not recollect if this passed). As per the usual procedure for VFR transits, Luton Tower was not informed about the S bound transit of the PA28.

ATSI reports that the A319 flight established communication with Luton Approach, at 1726, reporting descending to 5000ft, heading 275°. The flight was advised it was No 4 in traffic for landing RW26 at Luton. Subsequently, it was issued with descent and heading instructions to position it RH downwind. The PA28 pilot then contacted the Approach frequency, requesting a Zone transit and was instructed to standby, to remain clear of CAS. Approximately 1min later, a trainee took over the RT. After passing heading and descent instructions to the A319, he requested the PA28 flight to pass its details. The PA28 pilot reported en route from Meppershall to Denham, again requesting a Zone transit. The flight was instructed to squawk 4670 and issued with the QNH. The A319 flight was then given a heading to report established on the LLZ RW26. At 1734, the trainee transmitted to the PA28 *"you are identified five miles to the north of Luton you're clear to enter controlled airspace VFR not above altitude two thousand four hundred feet to route to the northern aerodrome boundary expect to transit via the runway two six threshold"*. The pilot replied *"Cleared inside VFR not above two thousand four hundred feet and route via the two six threshold"*. Shortly afterwards, the A319 crew reported established and was cleared to

descend on the ILS, maintaining 160kt until 4DME. At 1735:10, the PA28 pilot was requested to *"report visual with Luton airfield"*, which she did straight away. The trainee answered *"Roger"* and then transferred the A319 flight to the Tower frequency. No mention was made to its pilot about the overflying PA28.

As the PA28 entered the Luton CTR to the N of the airport, at 1736, the pilot was informed *"entering controlled airspace Radar Control Service"* responding *"Entering erm control area radar service"*. At the time, the A319 was on the ILS at 6nm. At 1736:40 the PA28 pilot was informed *"Traffic for you is a (company) a Three Nineteen on a four mile final report visual with that traffic"*. The pilot reported visual and was instructed *"then after the landing a Three Nineteen on that four mile final you're clear to cross the final approach track from north to south"*. She replied *"Cross the centreline after the Four One er after the Airbus"*.

When on the Tower frequency, the pilot of the A319 commented, at 1737:50, *"there's just a P A Twentyeight just passed above us at five hundred feet"*. Following the controller's request he confirmed he was happy to land.

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. In Class D *'(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, the A319 flight was not informed of the presence of the PA28, albeit the latter had been advised of, and reported visual with the A319. It is understood that the mentor believed such TI had been issued.

It is surprising that the local procedures do not specifically require the ADC to be informed about the details of traffic overflying the CTR in close proximity to the airport and to flights on the ILS e.g. the A319. The LTCC MATS Part 2, Page LTN-20, under the heading *'VFR Overflights/Non Airways Inbound Flights'* states *'Details of VFR overflights in the Luton ATZ, for which Luton AIR require details or non-airways arrivals will normally be passed to the Luton AIR ATSA. Subsequent coordination of such flights is effected with Luton AIR'.* In comparison, the fixed-wing procedures for Gatwick and Stansted are stated in the relevant MATS Part 2 as: Gatwick; *'VFR fixed-wing traffic may only penetrate the Gatwick ATZ with the prior approval of Gatwick AIR'*. Stansted; *'Stansted FIN will identify all VFR/SVFR traffic in the vicinity to Stansted AIR whether the traffic is inbound to Stansted or transiting the zone. Stansted AIR has procedures available to provide reduced and ATM based separation in the vicinity of the aerodrome. Where these procedures permit a more effective service Stansted FIN will transfer SVFR/VFR traffic to AIR'.*

LTCC ATSI made a recommendation which SRG ATSI endorses: - 'It is recommended that LTCC Ops consider a more comprehensive MATS Pt 2 entry on the handling of VFR overflights and in consultation with Luton Tower include advice on coordination and transfer of communications in appropriate circumstances.'

UKAB Note (1): The Stansted radar recording at 1736:38 shows the PA28 squawking 4670 just under 2nm NNW of Luton tracking 130° indicating altitude 1700ft QNH 1029mb with the A319 5nm to its E established on the ILS tracking 260° descending through 1600ft QNH. Just under 30sec later as the A319 descends through 1400ft QNH, the PA28, maintaining 1700ft QNH, has turned L onto a 090° track towards the A319 with lateral separation now 3·4nm. Lateral separation reduces to 2·4nm as the A319 descends through 1200ft QNH, 500ft below the PA28, before the PA28 commences a slow R turn at 1737:30 towards the FAT when separation is 700ft/1·6nm. This turn quickly reduces lateral separation until the CPA occurs at 1737:54, when the A319 crew is informing the ADC of the PA28's presence, the A319 now having crossed ahead of the PA28, is 900ft below and 0·4nm to its S.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The NATS Ltd advisor reported that discussions had taken place within the company with the aim of standardising the coordination of VFR transit traffic through the CTR, taking into account workload considerations and potential go-around situations. A meeting is due to take place in the very near future to finalise arrangements for Luton and these would then be used as a basis for discussions at Stansted and Gatwick. Pilot Members sympathised with the A319 crew's predicament when a TA alert first drew their attention to the PA28 approaching them from their R, about which they had no knowledge and therefore would not have known that the PA28 had been instructed to pass behind their ac. After the initial element of surprise, this would also have been distracting to the crew during

a critical phase of their approach, immediately prior to touchdown. Contrary to the Luton APR mentor's recollection, TI was not passed on the crossing PA28 to the A319 crew, which had caused them concern, and this had caused the Airprox. However, several Members opined that even if TI had been passed to the A319 crew, the outcome would have probably been the same, but it would have gone a long way towards allaying the crew's concerns.

The A319 crew saw the PA28 to their R and above their ac, TCAS indicating +500ft, and watched it pass 0·5nm to their R before it drew astern. The PA28 pilot was given TI and, after visually acquiring the airliner, had turned L to remain N of the FAT to comply with the ATC instruction to pass behind. This turn onto a slowly converging track was probably the catalyst for triggering the TCAS TA on the A319's flightdeck. That said, the PA28 pilot had monitored the A319's approach and chosen a flightpath which provided, from her viewpoint, adequate separation as she passed above the A319, to the R and then behind. The radar recording shows the PA28 500ft above the A319 when lateral separation was 2·4nm before the PA28 turned slowly R. Vertical separation increased as the subject ac closed to the CPA when 900ft/0·4nm pertains as the PA28 is abeam. Bearing this in mind, Members also believed that the PA28 pilot's flightpath would have ensured adequate separation in the event that the A319 crew had had to execute a go-around. The Board concluded, therefore, that the visual sightings and action taken by the PA28 pilot were enough to ensure that safety was not compromised during this encounter.

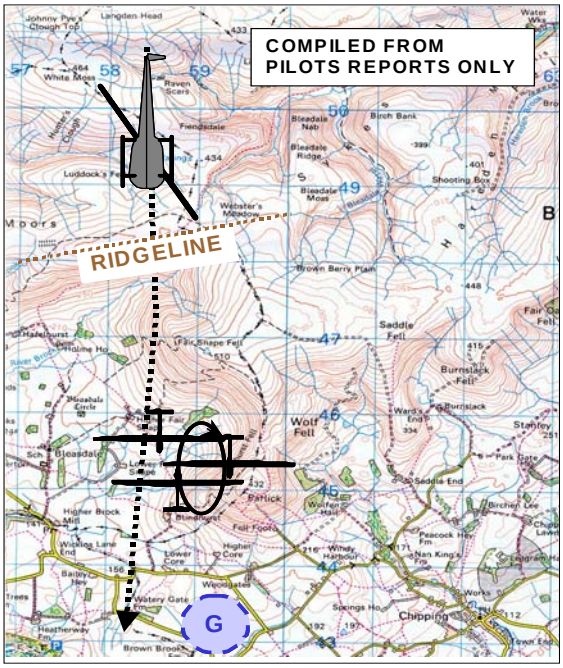
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LTCC Luton Radar Controller did not pass TI on the crossing PA28 to the A319 crew, which caused them concern.

Degree of Risk: C.

AIRPROX REPORT NO 132/07

Date/Time:	7 Sep 1308	
Position:	5354N 00237W (1nm N Bowland Forest Gliding Site - elev 600ft)	
Airspace:	Lon FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	SZD Junior Glider	R44
Operator:	Civ Club	Civ Pte
Alt/FL:	900ft	1200ft
	(QFE NR)	(N/K)
Weather	VMC CLBC	VMC NR
Visibility:	>30nm	10k
Reported Separation:		
	100ft V0 H	NR
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SZD JUNIOR GLIDER PILOT reports that he was soaring at 40kt on a ridge just to the N of the gliding site when a blue Robinson helicopter with rotor tip markings passed 100ft directly below him, heading about 170° in level flight. The helicopter was below hilltop height in an area that is well known locally as being heavily used for hill soaring by gliders and other forms of motor-less ac. This area is also used for local training including spinning

and stalling exercises. After the Airprox the helicopter continued on track and passed he estimated, within 100m of the airfield boundary, below the height that gliders were launched to by winch.

He assessed the risk as being medium but, due to the lateness of the sighting, he was not able to take any avoiding action.

The Gliding club always informs Blackpool ATC when they are operating so that incidents such as these are avoided and the local Air Ambulance contacts the club by radio when they are operating in the area.

THE R44 PILOT reports flying a blue helicopter with all lights on on a private IFR [he thought] flight at 105kt from Carlisle to Winchester, via the Manchester Low Level Corridor. The weather was good and he was squawking 7000 with Mode C and in receipt of a FIS from Warton Information. While heading 190° just after crossing a ridge 3nm NW of the Chipping (Bowland Forrest) glider site, he saw 2 gliders that were soaring on a N/S axis along the ridge. One of the gliders was significantly closer to their helicopter than the other, he estimated about 400-500ft away and on assessing the situation he made a gentle turn to the right to clear the area in which the gliders were flying by a greater margin. He did not assess the miss-distance but considered the risk to be medium.

UKAB Note(1): The recording of the Great Dun Fell radar shows a slow moving ac, squawking 7000 with Mode C, tracking from the Carlisle area towards the area of the incident. It disappears from radar however, at 1304:24 about 6nm N of the incident area while still heading in a Southerly direction. There is another ac in the area squawking 3644 (Warton) but it remains about 2nm clear of the area to the E at the time of the incident.

UKAB Note (2): Chipping is promulgated in the UKAIP ENR 5-5-1-1 as a glider launch site up to 3000ft agl (winch ground tow and tug/motor glider) with a site elevation of 600ft.

UKAB Note (3): The gliding club records show that there were 4 gliders airborne at the time of the incident. As far as the reporting pilot can recall, although he cannot be specific about their position, 3 gliders were soaring on the ridge at the time of the incident and the other was slightly further away.

ATSI reports that there are no ATC aspects to this incident.

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 appropriate ATC authorities.

Members noted that the incident had taken place on the ridge some distance to the N of the glider site but nonetheless, stressed the dangers associated with flying close to winch launch sites. Although the helicopter had been below the top of the ridge being used by the gliders there was no suggestion that it was being flown in contravention of Rule 5 of the ANO (Low Flying). Study of the OS map of the area showed that, had the helicopter been following the ridge slightly displaced to the W and heading S, it would most likely have avoided the glider site by about 1km.

Since there was no radar information available and the pilots' descriptions of the incident differed, there was discussion amongst Members as to whether or not the R44 pilot had seen the reporting glider or had only seen and avoided two other gliders also soaring the ridge. A helicopter pilot Member informed the Board that, unlike in some other helicopters, the forward and upward visibility from a Robinson is uninterrupted and therefore he thought it likely that the pilot would have seen all the gliders; having seen them he would have avoided them by a margin that he considered safe. He conceded though, that it was possible that the pilot did not see or avoid the reporting ac and that this would go some way to explaining the differing descriptions of the event. When they weighed up all the facts, a majority of Members thought that the Helicopter pilot had seen the correct glider, but he might not have avoided it by a wide enough margin to prevent its pilot from being concerned.

The Gliding Member, in a written note, considered that there is a need to inform aviators which of the 30 or so commonly used ridges in UK are likely to be busy on any particular day, so that they can be given a wide berth when flights are being planned. Although the helicopter pilot involved had been aware of the gliding site itself, Members thought it unlikely that he would have known that the ridge to the N was widely used by gliders and paragliders.

AIRPROX REPORT No 134/07

It was pointed out that the R44 pilot was in receipt of an FIS from Warton, the LARS providing unit in that area and one Member suggested that it would be wise for the gliding club also to notify them of their activity (if they are open).

Members were satisfied that, since the R44 pilot had most likely seen the glider and considered further avoidance unnecessary, there had been no risk of collision but his selected flightpath had clearly caused the glider pilot some concern.

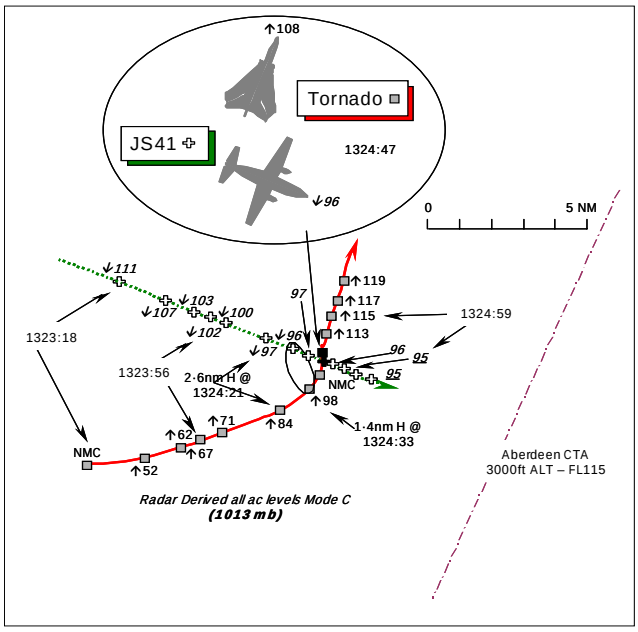
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The R44 pilot flew sufficiently close to the gliders to cause the SZD pilot concern.

Degree of Risk: C.

AIRPROX REPORT NO 134/07

Date/Time:	11 Sep 1324	
Position:	5718N 00251W (18½nm W of ADN)	
Airspace:	Scottish FIR	(Class: G
Reporter:	ScACC MORAY/HEBRIDES T&P	
	1st Ac	*2nd Ac*
Type:	Jetstream 41	Tornado F3
Operator:	CAT	HQ AIR (Ops)
Alt/FL:	↓FL95	↑VFR
		RPS
Weather	VMC Clear air	VMC VMC
Visibility:	>20nm	10km+
Reported Separation:		
	NR	Not seen
Recorded Separation:		
	200ft V/1·4nm H @ 1324:33	
	1200ft V/0·2nm H of @ 1324:47	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SCACC MORAY/HEBRIDES COMBINED TACTICAL & PLANNER CONTROLLER (MORAY) reports that the JS41 was inbound to Aberdeen from Stornoway under IFR and had passed the INS on course for the ATF under a RIS, with an allocated squawk of A6461. The JS41 crew requested descent, which was approved from FL175 to FL95 and he advised that there was no known traffic. With the JS41 at approximately 40nm from the ATF, he passed traffic information to the crew on an ac displaying a 7000 squawk that was 15-20nm "on his nose" heading SW, which on this heading was "no danger" to the JS41. After passing behind the JS41, the 7000 squawk turned through180° and flew a parallel course to the JS41 displaced some 7nm to the S. Traffic information was passed to the JS41 crew, however, the Mode C of the 7000 squawk was intermittent. With less than 10nm to go to the Aberdeen CTR boundary, with both tracks on parallel headings, the 7000 squawk made a 90° L turn in one sweep of the radar. Traffic information was passed again, however, the JS41 crew was not VMC, he thought, although the pilot said he had the other ac on TCAS. The targets merged with the 7000 indicating the same FL as the JS41, which was at FL95. When both ac had passed each other, the JS41 pilot said he had a TCAS RA and was going to file a report on landing.

THE JETSTREAM JS41 PILOT reports he was inbound to Aberdeen under IFR and in receipt of a RIS from Scottish CONTROL, with Mode S on and squawking their allocated squawk. At the time of the Airprox they were

flying in VMC, some 500ft above and more than 10nm horizontally clear of cloud, in clear air, with an in-flight visibility of >20nm. HISLs were on.

Heading 145°(M) descending to FL95 at 264kt, traffic was intermittently observed on TCAS during the descent from a range of 20nm. Scottish CONTROL advised that they were only receiving the contact's Mode C intermittently. The contact appeared to be flying at high speed with high rates of climb and descent. As they levelled at FL95 the contact appeared to be approaching from below when TCAS enunciated an RA - 'MONITOR VERTICAL SPEED'. The TCAS contact was very intermittent, frequently disappeared and with the 20nm range display selected the contact's level display merged with the TCAS symbol for his ac. After a few seconds the RA stopped and the contact appeared to be above their level. The other ac was not acquired visually and he was unable to assess either the risk or the minimum separation. He advised the controller that he would file a TCAS report, but was subsequently requested to complete an Airprox form when advised the controller had filed an Airprox.

THE TORNADO F3 PILOT reports that she was conducting a VFR training sortie and operating autonomously on a UHF training frequency. They were not in receipt of either an Air Defence or Air Traffic Control service whilst operating in VMC, with an in-flight visibility of 10km+, carrying out practice intercepts against another Tornado F3 at low-level.

After completing the third and final practice intercept, all of which had been carried out in approximately the same block of airspace, she turned N and climbed out of low level in order to initiate an independent recovery to Kinloss. She elected to stay below cloud and carried out a visual recovery to Kinloss, remaining under VFR throughout. At no point during the sortie was she aware of another ac's presence in close proximity, other than the second Tornado. TCAS is not fitted.

ATSI reports that at the time of the Airprox the controller was operating the HEBRIDES and MORAY Sectors in a bandboxed configuration and fulfilling the roles of both the Tactical and Planner controllers. He had two radar displays and used the right hand picture, which was set to a range of 120nm with the Aberdeen Radar as his main display whilst the left hand display, also set to 120nm range, was showing the Sumburgh Radar.

The JS41 crew established contact with the controller at 1314:30, and reported passing FL171 climbing to FL175. The controller acknowledged this and advised the crew that they would be provided with a RIS [in Class G airspace] after passing Inverness, i.e. when the aircraft exited the Class F ADR, W6D. One minute later the controller informed the crew that they could route direct to the ATF (an NDB located approximately 8nm SE of Aberdeen airport). At 1317:40, the crew requested descent and were advised that there was no known traffic to affect their descent to FL95.

At 1320:40, when the JS41 was approximately 45nm NW of Aberdeen, the controller passed traffic information in respect of a 7000 squawk which was in the JS41's 12 o'clock at a range of 15nm, turning R through W, indicating FL138 unverified Mode C and descending. The crew acknowledged this and shortly after, the controller advised that he had lost radar contact with the traffic. He decided to reduce the displayed range on his left hand tube from 120 to 80nm and changed to the Allanshill Radar (situated approximately 30nm N of Aberdeen) in order to get a more accurate picture of the two returns. Meanwhile the crew advised that they could see the traffic on TCAS indicating 2000ft beneath them and surmised that the other ac was descending at a high rate. The controller informed the crew that he had regained contact with the traffic, which was passing FL100. The crew advised that they were VMC at the moment but requested that they be kept advised.

The return initially continued descending on a southerly track before, some 20sec later, the controller saw that it was now in the 2 o'clock position of the JS41, at a range of 7nm, heading W but with no Mode C displayed and at 1322:20, he informed the crew accordingly. [Just under 1min later, MORAY reported at 1323:10, *"…that traffics now sitting parallel to you..7 miles..in your..3 o'clock and there's no Mode Charlie readout at all on him",* which the crew acknowledged. At 1323:50, the crew advised that *"…we have the traffic 4000 feet lower than us on TCAS at the moment and coming around towards the front"*.] For the next 80sec there was almost a continuous dialogue on the RT with the controller attempting to update the traffic information and the crew reporting what they could see on TCAS. STCA activated at 1323:56, as the JS41 was passing FL102 and the other traffic was climbing though FL67. [At 1324:00, MORAY reported *"..it's just popped up on radar again it's ..converging with you should..pass underneath you in a minutes time however it is indicating it's passing flight level 75".* The JS41 crew advised *"…roger..we see him on TCAS"*, whereupon the controller added, *"..it's now..converging it's..3 miles south*

of your position..". At 1324:20, the JS41 crew advised *"..roger see him* [on TCAS] *climbing up through our level..".* MORAY responded at 1324:30, *"…that traffic's now indicating your level and still climbing in your 1 o'clock range of 2 miles turning in.."*.] During this the crew reported at 1324:50 that they were now, once again, descending to FL95. The exchange ended at 1325:00, with the controller advising *"..that traffic just passed overhead I've lost mode Charlie on him as he passed over it's now going north of you now indicating flight level 115 and climbing",* away to the N.] At 1325:10, the controller instructed the crew to contact Aberdeen RADAR, which was acknowledged and the crew stated that they would be filing a report due to having received a TCAS RA.

UKAB Note (1): A review of the ScACC radar recording shows the Airprox relatively clearly until the tracks cross. The JS41 is shown maintaining a steady track and descending as the Tornado F3 sets course ENE and gently turns L more northerly. As the two ac close to a range of 2·6nm the JS41 is shown passing FL97 and approaching its assigned level, as the F3 climbs through FL84 unverified Mode C. The next sweep indicates that the two ac have crossed in the vertical plane at 1·4nm separation the F3 now indicating FL98 some 200ft above the JS41 at 1324:33, before the tracks crossed in 'plan'. No Mode C is evident from the Tornado for one sweep as the JS41 momentarily indicates FL97 and then FL96 as the Tornado appears to cross astern but the scale of the recording makes this difficult to determine with certainty. Moreover, as STC has now triggered the brightness of the pulsating SSR label on the recording makes determination of Mode C level difficult. Close examination reveals this was FL108, moments after the tracks have crossed and the F3 maintains its steady climb above the JS41.

HQ AIR (OPS) comments that the initial manoeuvring of the F3 gave the controller and the JS41 crew some difficulty in predicting a best course of action. However, it appears from the radar recording that, notwithstanding the reported lack of Mode C, the F3 was in a continual climb through the JS41's level and on a crossing track. Both crews also report cloud with one above and one below. This could also have reduced the chances of a visual pick-up.

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

Plainly each of the crews involved here were proceeding about their respective flights in the 'Open FIR' quite legitimately. From the ScACC MORAY controller's perspective it was clear to the Members that he had conscientiously provided a comprehensive picture of the situation regarding the 'unknown' Tornado F3 to the JS41 crew based on the radar data displayed to him. Moreover, as the JS41 was operating in Class G airspace outside the normal CAS structure it was fortunate that the controller had been able to devote so much attention to this flight and the traffic information provided had kept the JS41 crew closely appraised of the F3's position and level throughout this encounter. In this case there was no inherent responsibility on ATC to separate the JS41 from the observed 'unknown' F3 contact. The RIS that was being provided is fundamentally a 'VFR' service to assist pilots to sight other reported traffic and, despite operating in conformity with their IFR Flight Plan, the JS41 crew were equally responsible for maintaining their own visual separation from all other ac in this 'see and avoid' airspace. Whereas MORAY might not have believed that the JS41 crew was operating in VMC at the time, the ac Captain's written report stated that they were flying in VMC, more than 10nm horizontally clear of cloud, in clear air, with an in-flight visibility of >20nm. Whilst the JS41 pilot had also reported they were some 500ft above cloud at the time of the Airprox, they might have been potentially flying in IMC above a cloud layer just as they levelled at FL95 at the end of the encounter. To some Members it seemed that under the ATS provided MORAY could have done little more to assist the JS41 crew, who nevertheless were unable to sight the F3 visually, even with the added benefit of the jet being displayed too them at a range of 20nm on TCAS and a TA. The radar recording revealed that the F3 was just forward of the JS41's starboard beam as the jet crew climbed up and turned in towards their base, remaining clear to the W of the Aberdeen CTA. Thus the F3 may have been beneath the JS41's starboard wing until the jet climbed through the JS41's level just over 1·4nm away. After the Tornado turned NNE'ly, thus flying almost perpendicular to the JS41's track from R-L, the radar data suggests the F3 crossed just astern, further explaining why the JS41 crew did not see it. By that stage however, the JS41 crew were levelling their ac as they received the RA from their TCAS of 'MONITOR VERTICAL SPEED', a 'preventative' RA requiring no change in their vertical speed. But this RA lasted only a few seconds the JS41 pilot reported. At these levels TCAS is generally endeavouring to achieve with its RA commands of the order of 350-400ft of vertical separation on transponding 'intruder' targets. Consequently, with the F3 climbing rapidly above the JS41 and exhibiting about 1200ft of separation as the jet opened from 0·2nm off the port quarter, it was understandable therefore, that the

RA would have lasted no more than a few seconds following the JS41 crew's compliance with any commanded TCAS guidance.

Here it seemed that the jet's RoC had taken it clear above the airliner but the F3 pilot's report caused several Members concern. It was evident that although the F3 pilot had reported flying in VMC and that they were operating under VFR throughout the sortie, without any form of ATS, the JS41 was not seen at all throughout the period of this Airprox. Some Members contended that the F3 crew might have climbed up around some cloud that was apparently below the JS41's level and had thus masked its presence. Whilst there was no reason to doubt the veracity of the F3 pilot's report at all, it could explain why neither of the jet's crew members saw the airliner. Although TCAS is not fitted to the Tornado F3, Members were keenly aware that the jet is an air defence variant fitted with AI radar, which could potentially have alerted the crew to the JS41, but it was not clear why this equipment did not detect the airliner, if indeed the AI radar was in use at that stage as they set course for their base. Thus the F3 crew were completely unaware of the JS41 as they climbed above it and therefore could do nothing more to avoid it. In the absence of any sighting therefore, the Members agreed that this Airprox had resulted from a conflict in Class G airspace.

Whilst the JS41's TCAS had detected the conflict with the F3 and enunciated an RA to ensure that its safety margins were not eroded, it was only of very short duration, suggesting that the JS41's crew's compliance with the commanded 'MONITOR VERTICAL SPEED' was effective. This, coupled with the F3's RoC, unbeknown to its crew, had fortunately played its part in forestalling any actual risk of a collision. Vertical separation immediately before the tracks crossed could not be determined, as the F3 indicated no Mode C at that point. Nevertheless, separation in excess of 1200ft existed moments after the F3 crossed above the airliner. However, the absence of any actual sighting of each other's ac by either of these two crews at these close quarters and in this rapidly changing scenario convinced the Board that safety had not been assured in these circumstances.

The DAP advisor reiterated that the responsibility for separation within Class G airspace lay squarely with the pilots involved, but it was clear that in this case the principle of 'see and avoid' had not worked. He pointed out that as part of the Airspace and Safety Initiative (ASI), coupled with the wider discussions that centred on current and future ATSs outside CAS, there is a move to improve standardisation of the ATSs being provided by Air Navigation Service Providers (ANSPs) outside of CAS; this will ensure a greater degree of commonality in the ATC radar services pilots receive.

PART C: ASSESSMENT OF CAUSE AND RISK

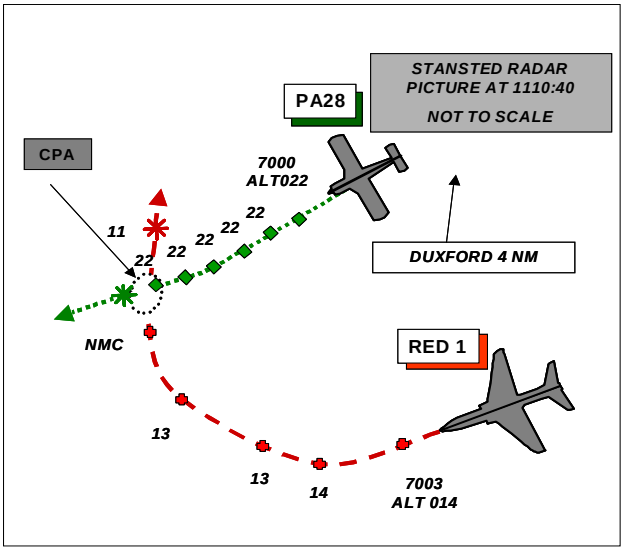
Cause: A conflict in Class G airspace.

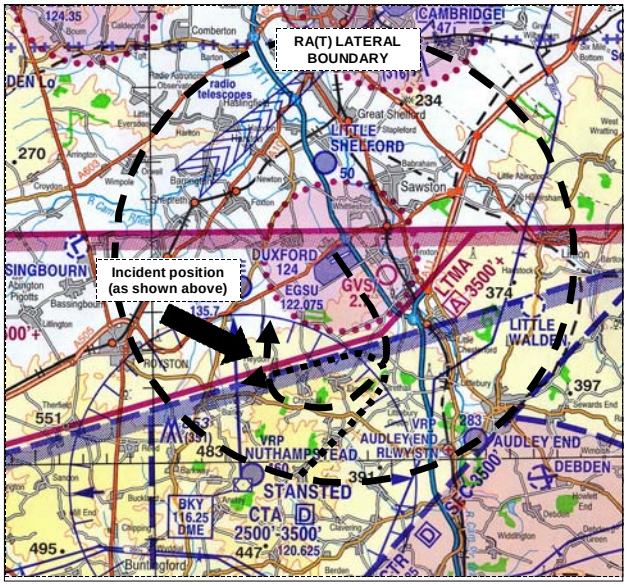
Degree of Risk: B.

AIRPROX REPORT No 135/07

AIRPROX REPORT NO 135/07

Date/Time:	8 Sep 1110 (Saturday)	
Position:	5205N 00007E(4nm SSW Duxford)	
Airspace:	London FIR/RA(T)(Class: G)	
	Reporting Ac	*Reported Ac*
Type:	Hawk	PA28
Operator:	HQ AIR (Trg)	Civ Trg
Alt/FL:	1000ft	2200ft
	(QFE 1021mb)	(QNH NR)
Weather	VMC Haze	IMC KLWD
Visibility:	20km	1km
Reported Separation:		
	500ft V/0 H	NR
Recorded Separation:		
	Est 1000ft V/0.0nm H	





PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK PILOT reports flying a notified 9-ship display at Duxford in an RA(T) of 6nm radius. Nearing the mid way point of the display Stansted ATC called a contact, with no range, to the S of the Duxford. At 1111, as the team split into the second half of the display, the contact was called at 4nm directly S. Unfortunately, the main formation had already split and was rejoining on the leader as he headed S for the pre-briefed rejoin. Shortly thereafter Leader became visual with a white single engine light ac in his right 1 o'clock, at a range of 1.5nm and at about 1500ft, appearing to be turning onto W. Leader maintained his height at 1000ft, heading due S and speed of 340kt mindful of the 4 other ac closing on him at the rejoin point. Leader elected to maintain height to remain de-conflicted from numbers 2–5 and maintaining a predictable flight path. At the pre-briefed time Leader commenced a R turn onto NE with the ac now in close formation. Hawk Leader passed 500ft below the intruder while rolling out on a NE heading towards the datum and continued the display whilst the intruder continued on his W'ly track out of the RA (T).

The risk was assessed as low as Hawk Leader was visual with the intruder and he continued on his predictable flight path to ensure safest possible rejoin with the other 4 ac. Had Leader not seen the ac the risk would have been assessed as high, against 5 of the ac not just himself.

THE PA28 PILOT reports flying an IF training flight from Stapleford with a student who was a qualified pilot with his own ac, but it was not being flown on the day of the incident. The sole purpose of the flight was to confirm his ability to ADF track for an IMC rating, following an extensive rebrief. The student was detailed to plan the flight as discussed following the normal procedures and this was dully completed. Subsequently, when asked prior to departure, if the relevant items had been done as required he answered yes however, the Duxford NOTAM[s] had not been taken into account.

UKAB Note (1): The display at Duxford was the subject of 2 AICs and 2 NOTAMs as follows:

Q)EGTT/QWALW/IV/M/AW/000/045/5205N00008E005

A)EGSU B)07/09/08 10:40 UTC C)07/09/09 16:40 NAVW (H3575/07)

D)SEP 08 1040-1625, SEP 09 1235-1640

E)AIR DISPLAY AND ASSOCIATED INTENSE AERIAL ACTIVITY WI 5NM RADIUS

5205N 00008E (DUXFORD - CAMBS). AIC 31/2007 (MAUVE 216) DATED 26 APR

07 REFERS. SEE SEPARATE NOTAMS FOR DISPLAY RESTRICTED AREA

(TEMPORARY) AND RED ARROWS RESTRICTED AREA(TEMPORARY).

AUS 2007-09-0007/3760/AS1

F)SFC G)4500FT AMSL

Q)EGTT/QRTCA/IV/BO/AW/000/083/5205N00008E006

A)EGSU B)07/09/08 10:55 UTC C)07/09/09 13:33 NAVW (J4070/07)

D)SEP 08 1055-1133, SEP 09 1255-1333

E)RESTRICTED AREA (TEMPORARY) AT DUXFORD - CAMBS FOR A RED ARROWS

DISPLAY WI 6NM RAD 520525N 0000756E. AREA ESTABLISHED UNDER ARTICLE

96 OF THE ANO 2005 (MIL ACFT SHOULD COMPLY WITH JSP552.201.135.9).

AIC 64/2007 (MAUVE 238) DATED 19 JULY 07 REFERS.

SEE SEPARATE NOTAM FOR DISPLAY RESTRICTED AREA (TEMPORARY) TO WHICH

AIC 31/2007 (MAUVE 216) DATED 26 APR 07 REFERS.

AUS 2007-09-0007/3765/AS1

F)SFC G)8300FT AMSL

The first NOTAM (H3575/07) refers to AIC 31/2007 (MAUVE 216) issued on 26 Apr 07 which listed all the displays at Duxford and associated Airspace Restrictions for the 2007 season. This promulgates a RA(T) radius 2.2nm from surface to 4000ft from 12-1700.

In addition AIC 64/2007 (MAUVE 238) issued 19 July 07 lists all the Red Arrows display dates, venues and associated RA(T)s with dimensions (6nm and top varying Alts). It goes on to say that each individual event, with the associated airspace closure, will be further notified by NOTAM. In this case NOTAM J4070/07, being of greater dimensions, took precedence over H3575 for the period of the Red Arrows display only.

AIRPROX REPORT No 135/07

ATSI reports that this incident took place at 1110:38 UTC, within a Temporary Restricted Area (RA (T)) that had been established (predominantly) in class G airspace to protect a display at Duxford airfield by the Red Arrows aerobatic team. Under a Restriction of Flying Regulation made under Article 96 of the ANO 2005 ("Power to prohibit or restrict flying"), no ac was permitted to fly within the RA (T) between 1055 and 1133 UTC. The RA (T) was an area bounded by a circle of 6nm radius centred on Duxford and extended vertically from the surface to 8300ft alt.

At 1049, the leader called Duxford and requested the cloud base and the QFE and was advised that an unofficial observation gave the cloud as SCT 2500ft, a BKN layer between 2000-2500ft, to the W of Duxford; the QFE was 1024mb and surface wind was 330°/05kts.

Five minutes later, at 1054:40, Leader established communications with Stansted Radar, reporting *"…zero three zero at eight miles from Wyton"* (approximately 24nm NNW of Duxford) at 1000ft, squawking 7003 and requested a RIS. Identification was achieved by requesting the flight to IDENT with 7003, the discrete code assigned to the Team Leader only (the subject Hawk), for transit and displays. The controller did not inform the flight that it was identified, neither did he issue an appropriate pressure setting. The MATS Part 1, Section 1, Chapter 6, Page 2, para 6, 'Vertical Position' states "*A pilot normally assesses the vertical position of his aircraft above obstacles by using an accurately set altimeter. It is imperative, therefore, that controllers always issue the correct pressure setting and that they check the readback from the pilot."* In view of the flight being some 37nm N of Stansted at the time, it would probably have been appropriate to issue it with the current RPS, Chatham in this case. While it is clear from written reports that both the Leader and the Stansted Controller were of the understanding that a RIS was being provided at the time, the Controller did not however, advise Leader that this was the case, as required by MATS Part 1, Section 1, Chapter 5, Page 2, para 1.2.4 *Pilots must be advised if a service commences, terminates or changes when:*

they are operating outside controlled airspace; or

they cross the boundary of controlled airspace.

The Stansted Controller could not approve use of the full vertical extent of the RA(T) for the display (8300ft alt) for traffic reasons; instead a ceiling of 4500ft alt was imposed. A few moments before the start of their display at 1100, Leader requested that traffic position reports, resulting from the RIS, should be given relative to the centre of the RA (T) i.e. Duxford.

The display had been underway for just under 9min when, at 1108:46, the Stansted Radar Controller transmitted to the team *"…there is unknown traffic to the south-west of you at the moment heading north-east indicating two thousand feet unverified mode Charlie ",* though omitting its range. The response was *"Red Arrows copied".* The radar recording shows 'unknown' traffic was the subject PA28 and was approximately 2nm inside the RA (T) tracking NE, displaying a SSR conspicuity code of 7000 and indicating at 2100ft. At the time the Hawk, squawking 7003, had just started a right turn, with the unknown in its 2 o'clock position at a range of 3.4nm.

Thirty seconds later a traffic update was requested, the Controller replying *"Okay yeah that traffic is south of Duxford at the moment appears to be tracking towards Duxford indicating two thousand two hundred unverified"* and this was acknowledged. Once again it is noted that the Controller omitted to provide the range, in this case from Duxford. By now the Hawk had rolled out onto a NWly track towards Duxford, the unknown, meanwhile, had turned N and was about 3nm astern. Twelve sec later the Hawk had turned through 180 degrees and was tracking SE again at 1600ft. By this time the unknown had started a turn to the W and was in the leader's 12 o'clock position at a range of 2nm, still indicating at 2200ft. The RTF transcript shows there followed some brief exchanges between Red Arrows team ac and a request for an update on traffic. Before there was an opportunity to respond, a team ac, 'Red 4', reported '*visual'* with the traffic. Apparent also from the radar recording, at this time, are primary returns from other ac in the team, both to the port and starboard of the leader. ATC were then requested to commence tracing action on the traffic and an intention was declared to *"..file against.."* the pilot.

Maintaining the same track, the Hawk passed 0.5nm astern and to the E of the unknown traffic, which was still in the left turn and passing through W. Mode C readouts indicate the Hawk was 1100ft below the unknown, which was still at 2200ft. [This was not the CPA which occurred later] The Hawk then commenced a R turn and approached the unknown traffic from the S, the latter meanwhile, having stopped the turn on SW. The controller asks the Leader if they were still visual, but the reply was unintelligible. At 1110:39, a message addressed to

Duxford is transmitted on the Stansted frequency *"Duxford Red Arrows er he's right above us now looks to be going to the west clearing he's at 1500ft".* The radar recording shows that as the Hawk is turning through NW at 1300ft with the unknown still at 2200ft, in its 1 o'clock position. Moments later the radar targets merged though only the unknown's Mode C is displayed at that point. After they cross and the Hawk was 0.5nm to the N, its Mode C reappeared showing 1100ft.

Although the unknown eventually exits the RA (T), to the SW of Duxford, it did briefly re-enter the Restricted Area by 0.5nm while executing an orbit. Again, the Controller provided TI with the range, to the Red Arrows, but this time the unknown was never less than 4nm from the subject Hawk. Thereafter the unknown traffic tracked S remaining outside the RA (T).

MATS Part 1, Section 1, Chapter 5, Page 3, para 1.5, describes a RIS as "…an ATS surveillance 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 ac whether or not the controller has passed traffic information."

The Stansted Radar controller did not wholly meet his responsibilities in the provision of a RIS to the display team. An initial warning of the direction and level of the unknown ac was provided, albeit after this ac had penetrated the RA(T) by 2nm however, the element of range was omitted from the TI, both on this occasion and in a subsequent update. Notwithstanding these shortcomings, the cause of the incident lay outwith civil ATC.

HQ AIR (TRG) comments that this is the second similar Airprox infringement of a Red Arrows display RA (T) this year. The promulgation of the Duxford Air Display was timely and was followed up with NOTAMs. If pilots do not assimilate the detail of NOTAMs that affect their planned sorties this type of incident will continue to occur, needlessly increasing the risk to those involved.

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 was the second Airprox submitted by the Red Arrows recently; they were also briefed by the HQ Air (Trg) Member that there had been several other less serious penetrations of the RA (T)s put in place for their displays in the 2007 season.

The GA specialist Member stated that obtaining and fully understanding the NOTAMs and any airspace restrictions is a vital part of the planning for any flight. Further, on an instructional flight, it is his opinion that the instructor should clearly demonstrate 'best practise' and positively check that this is done. The PA28 was based near Duxford and a knowledge and understanding of the events throughout the summer season should be second nature to all GA aviators in that area. Members discussed the relative responsibility for NOTAM checking and concluded that the ultimate responsibility lies, as always, with the ac captain (the instructor in this case) although they agreed that there was no objection in principle to his delegating this responsibility and checking before flight that it has been done. Nonetheless, in this case it was not done at all and the captain had allowed the ac to operate within the RA (T) for the beacon tracking exercise. Further, the GA Member considered it poor practise to operate IMC in cloud in Class G airspace without using a radar service; in this case that too would most likely have revealed the RA (T) to the crew.

Members noted the relatively minor ATC shortcomings outlined in the ATSI report but considered that largely they had constituted poor procedure, rather than contributing materially to the incident. One Member thought that Stansted (the controller) might not have been given prior notice of the Red Arrows intentions but it was pointed out that ATC had limited the airspace to 4500ft which indicated they were aware of the nature of the display and presumably therefore the team's requirements.

Notwithstanding that the TI provided by the Stansted Controller had not been iaw MATS Part 1, it had alerted the team members to the presence of a 'stranger' which their subsequent lookout had revealed and internal transmissions had broadcast its position and heading to other team members thus ensuring that they cold take timely (just) avoiding action if needed to mitigate any risk. In the event, the (vertical) separation had been sufficient

to allow the formation leader to continue as planned, to remain predictable in time and space and to facilitate a formation rejoin enabling the display to continue safely. Members therefore, considered unanimously that in the event, since the leader had continued without deeming it necessary to take any avoidance, there had been no risk although clearly there had been an unauthorised penetration of the RA (T) by the PA28 pilots.

PART C: ASSESSMENT OF CAUSE AND RISK

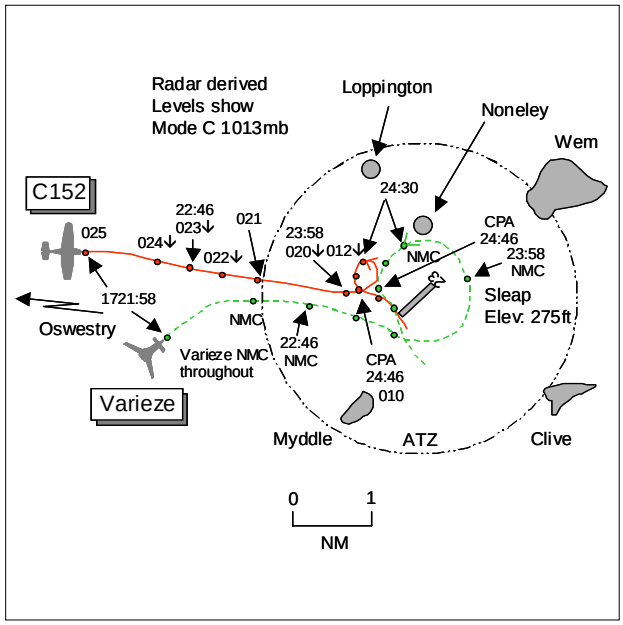
Cause: The PA28 pilots penetrated an active RA (T), of which they were unaware, resulting in a conflict with the Hawk formation, which they did not see.

Degree of Risk: C.

The DASC Advisor provided the following post meeting Note: Because of the increase in infringements of RA (T)'s, DASC was asked at the RAFAT 2007 end-of-season wash-up to stage, in conjunction with the Red Arrows and RAF Scampton, a Mil/Civ Air Safety Day. Members of the GA aviation Press, Execs of Clubs, CFIs, etc, were invited to act as ambassadors to the rest of the aviation community and publicize the issues and dangers - such as 'Read the NOTAMS'. Ninety-one delegates attended the event held at RAF Scampton on Friday 14 March. Feedback received so far has been very positive.

AIRPROX REPORT NO 136/07

Date/Time:	13 Sep 1725	
Position:	5250N 00246W (O/H Sleap A/D - elev 275ft)	
Airspace:	ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Rutan Varieze	C152
Operator:	Civ Pte	Civ Club
Alt/FL:	1700ft↓	1000ft
	(QFE 1013mb)	(QFE 1013mb)
Weather	VMC CLNC	VMC CLNC
Visibility:	>20km	>30km
Reported Separation:		
	150ft V+H	150ft V/100m H
Recorded Separation:		
	<0·25nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE RUTAN VARIEZE PILOT reports inbound to Sleap VFR and in receipt of an A/G service from Sleap Radio on 122·45MHz squawking 7000; Mode C not fitted. The visibility was >20km in VMC and the ac was coloured white with landing light switched on. At 1816A he made initial contact with Sleap Radio on 122·45MHz and was told the RW in use was 23 LH on the QFE 1013mb and that there was an ac [AC3, not the subject C152] carrying out a procedure O/H at 3000ft, which he acknowledged. Shortly after this he heard another flight call, the C152, and report inbound to the field from Oswestry [due W of Sleap]. During his approach to Sleap he heard the pilot of AC3 that had been carrying out procedures overhead call complete and was then positioning for an O/H join at 2000ft. Approaching the O/H he heard AC3 pilot call O/H descending deadside for 23 LH and observed the ac on the deadside in his 3 o'clock low position. As he turned L at 2000ft above the aerodrome prior to descent a helicopter pilot called inbound and when this transmission was complete and when he was about to give his O/H call, he heard *"C152 c/s descending overhead"*. He immediately called *"Varieze c/s also descending deadside*

from overhead 2000ft for 23 left" to which the A/G operator replied *"Roger"*. He was now confused as to why he could not see the C152 and assumed that it must be behind him but, with hindsight, he should have asked for a position report. As he was making his descending L turn through 1700ft QFE and turning through 200° at 120kt both he and his passenger were surprised to see a white/blue coloured high-wing ac, the C152, slightly (150ft) below and 150ft to their R tracking about 140°; the C152 pilot banked steeply R and he tightened his L turn to avoid a collision. The C152 pilot called on the radio that an Airprox had occurred and he replied *"I know"*. The instructor of the C152 then exchanged views on the RT about his incorrect joining procedure which he refuted. He assessed the risk as high. A further exchange of views took place post flight with the instructor accusing him of flying outside the ATZ whilst joining, lecturing him on the noise abatement over Wem, stating he commenced descent outside the aerodrome boundary, not crossing the upwind (05) end of the RW in the correct position and at the correct height 1000ft. He denied all of these accusations, having followed the AIP arrival procedures but could not understand how the C152 could have been in that position if its pilot had followed the procedures and made his radio call at the time his ac [the C152] was in the O/H position.

THE C152 PILOT reports carrying out a local sortie from Sleap VFR and in receipt of an A/G service from Sleap Radio on 122·45MHz squawking with Mode C. He was PPL holder undergoing IMC training with an instructor but the incident occurred during the visual rejoin. The visibility was >30km in VMC and the ac was coloured white/blue/red; lighting was not mentioned. When joining O/H and calling *"...descending deadside from 2000ft QFE"*, he could not recall hearing another flight call descending deadside as he would have not commenced descent without obtaining visual contact first. He first saw the other ac, a low wing rear-engine type coloured white, as he completed his descent and was crossing the 'numbers' at approximately 1000ft QFE and 80kt when it was about 250ft above and about the same distance in front and to his L (11 o'clock). He immediately turned R to avoid, a natural reaction having seen the ac in flight so close, the other ac passing 150ft above and 100m away. He was concerned that had he been further along and to the L of his actual track and the other ac had descended to the correct height before crossing the numbers, a collision could have occurred. He assessed the risk as low.

UKAB Note (1): The UK AIP at AD 2-EGCV-1-3 AD 2.17 promulgates the Sleap ATZ as a circle radius 2nm centred on the longest notified runway (05/23) 525002N 0024618W from the SFC-2000ft agl; aerodrome elevation 275ft amsl. Section AD 2.3 Operational Hours states Summer Fri-Wed 0830-1600; Thu 0830-2015; Remarks 'This aerodrome is strictly PPR by telephone (briefing must be obtained). Section AD 2.18 ATS Communication Facilities Remarks states the ATZ hours are coincident with the A/G hours [as stated in Section 2.3, incident occurred on a Thu]. Section AD 2.20 Local Traffic Regulations Para 4 Warnings states a) Glider launching takes place on the aerodrome. b) Aerodrome used by RAF Shawbury for helicopter training Mon-Fri. Section AD 2.22 Flight procedures states a) Circuits variable. b) Pilots of inbound aircraft on weekdays are to contact Shawbury Approach on 120·775MHz. c) Arriving Procedures i) When RAF helicopters are not operating, all arriving aircraft to carry out standard overhead join at 2000ft QFE; ii) When RAF helicopters are operating, all arriving aircraft are to carry out a centre-line join at 2000ft QFE. Note: A full briefing must be obtained by telephone prior to departure.

UKAB Note (2): The UK MIL AIP AD 2-EGOS-1-1 Section 2.3 Operational Hours states Summer 0730-1630 Mon-Thu, 0730-1600 Fri. Shawbury ATC confirmed that flying operations ceased at 1600Z and restarted at 1825Z.

UKAB Note (3): The Pooleys Flight Guide states that the aerodrome is operated in conjunction with RAF Shawbury during weekdays. PPR and briefing essential for centreline joining procedures. airfield situated within Shawbury MATZ. Following Procedures apply during weekdays only: -a) Pilots must contact Shawbury Approach 120·775MHz for MATZ clearance. b) No deadside. Join overhead centre line at 2000ft QFE. c) Civil Fixed/Rotary Traffic – all circuits to east of aerodrome. d) Beware of intensive military helicopter activity. Standard overhead joins at 2000ft QFE at all other times. Circuits should be contained within the ATZ. Avoid overflying Wem, Clive, Myddle, Loppington, Noneley and Burlton.

UKAB Note (4): The Clee Hill radar recording at 1721:58 shows a primary return squawking 7000, believed to be the C152 4·25nm W of Sleap tracking 095° indicating FL025 GS of 95kt with an SSR only response squawking 7000, believed to be the Varieze, 1·5nm to its SE tracking 045° showing NMC GS135kt. Over the course of the next 2min, the C152 gradually descends, reaching FL020 (2000ft QFE) 0·9nm W of Sleap whilst the Varieze turns R towards Sleap and pulls away from the C152, passing 0·5nm SW of Sleap tracking SE'ly before then turning L into an orbit O/H on the live side of the cct, reaching a position 0·6nm to the ENE turning through 350° at the same time. The next radar sweep reveals the C152 turning L eventually into a tight LH orbit centred about 0·7nm NW of Sleap on the deadside of RW23 and descending rapidly (1500fpm) but primary radar is lost thereafter on it, the ac on showing on SSR. Meanwhile the Varieze continues its orbit, crossing onto the deadside until 1724:30 when

it is passing through 250° with the C152 0·5nm to its WSW indicating FL012 (1200ft QFE). Sixteen seconds later at 1724:46 the Varieze is passing through about 190° with the C152 passing through about 150° now displaying a 0000 (data unreliable squawk) level at FL010 (1000ft QFE) 0·25nm to its WSW. The Varieze is seen to deviate slightly L on the next sweep and pass 0·25nm ahead of the C152 now squawking 7000. The Varieze pulls ahead owing to its faster speed with both ac then crossing the upwind end of RW23 adjacent to the RW05 threshold before turning downwind into the LH cct. As both ac show on SSR only during the later stages of their O/H joins with the C152 response displaying unreliable data as the Airprox occurs, it is not possible to accurately state the CPA at 1724:46. However, with the separation being 0·25nm on the next sweep as the Varieze pulls away, it is estimated to be a maximum of 0·25nm during the unreliable radar data phase.

UKAB Note (5): The Sleap Aerodrome Operator provide the UKAB Secretariat with a copy of the Aerodrome Traffic Zone Operation brief, a 2 page document. Page 1 top half lists 7 bullet points with a map on the bottom half showing the ATZ with noise avoidance areas and cct patterns. The points stated are: -

Circuit height 1000ft QFE

Caution must be exercised on weekdays due operations by military helicopters.

Circuits left hand, **EXCEPT** during periods of operation of military helicopters, when all circuits must be to the **EAST** of the airfield.

Circuits should be contained with the ATZ (large dashed circle below). Circuit patterns shown below are the required maxima.

Avoid overflying Wem, Clive, Myddle, Loppington, Noneley and Burlton (marked below by shaded circles).

Arriving aircraft should carry out a standard 2000ft overhead join except during the weekdays when only a centreline join is permitted.

Aircraft, **especially high powered singles or twins**, departing runway 36 should make a 10° right turn after take-off to avoid Noneley.

Page 2 entitled Weekday Procedures (When RAF Shawbury is Active) gives further explanation of the procedures to be used as well as background information on the arrangement with RAF Shawbury. Of note are the Hours of Operation for the helicopters which are stated as weekdays only between 0800 and 1700 local. Circuit patterns are explained further, describing how the Sleap fixed wing ac are de-conflicted from the helicopters flying opposite direction ccts. The next para entitled Joining Traffic states: - During the operation period of 0800 and 1700 hours each weekday the deadside of the airfield will be inactive. It is not possible to carry out standard 2000ft deadside join during this time as to do so will place fixed wing and helicopter traffic in opposition within the ATZ. Only a centreline join is permitted (which is described in the next para). Radio Procedures states: - No air/ground services are provided during the weekday operation. Aircraft both fixed wing and helicopter must select Sleap A/G frequency 122·45 before entering the circuit. Blind positive call must be made at all times in the normal positions. Each pilot must maintain a careful listening watch and develop an awareness of the position of all other traffic within the ATZ.

The A/G Operator confirmed that the SOP after 1700A are for normal operations to be resumed with arriving ac carrying out standard overhead joins into the cct.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

With the benefit of the radar recording the evolution of the incident became clear. The Varieze flight had initially approached Sleap from the SW and, when W of the airfield, turned onto an E'ly track ahead of the C152. The Varieze's faster speed resulted in the ac arriving O/H Sleap well before the C152, from where it is seen to follow a standard pattern for an O/H join, passing onto the live side of the cct before turning onto the deadside to commence descent to cct height. Meanwhile the C152 flight approached Sleap in a slow descent until a point 0·9nm to the W of the aerodrome when a tight LH orbit is flown at a high ROD on the deadside. Members agreed

that the C152 pilot's manoeuvre did not conform to the normal joining pattern, the C152 descending deadside in a position that would conflict with another ac descending in accordance with the normal joining pattern. This would account for why the Varieze pilot could not see the C152 as he was expecting it to be following his established pattern. Members agreed that the cause of this Airprox was that the C152 pilot did not integrate safely into the Sleap visual cct.

Fortunately, both pilots saw each other as they manoeuvred towards the upwind threshold prior to the crosswind leg although these sightings had occurred later than ideal as the Varieze was approaching the C152 from above and behind whilst turning 'belly-up'. Both crews had then reacted quickly, the Varieze pilot tightened his L turn whilst the C152 pilot banked R with vertical separation estimated by both pilots to be 150ft with some horizontal separation. The Board agreed that the actions taken by both pilots had been enough to remove the actual collision risk but safety had been compromised during the encounter.

During the discussion, Members were concerned about the anomalies published in the AIP, Pooleys Flight Guide and Operation Brief regarding when standard O/H joins are permitted on weekdays. The Board therefore charged the Director with writing to the Aerodrome Operator requesting them to review the relevant documentation with the aim of ensuring commonality amongst the various documents.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The C152 pilot did not integrate safely into the Sleap visual cct.

Degree of Risk: B.

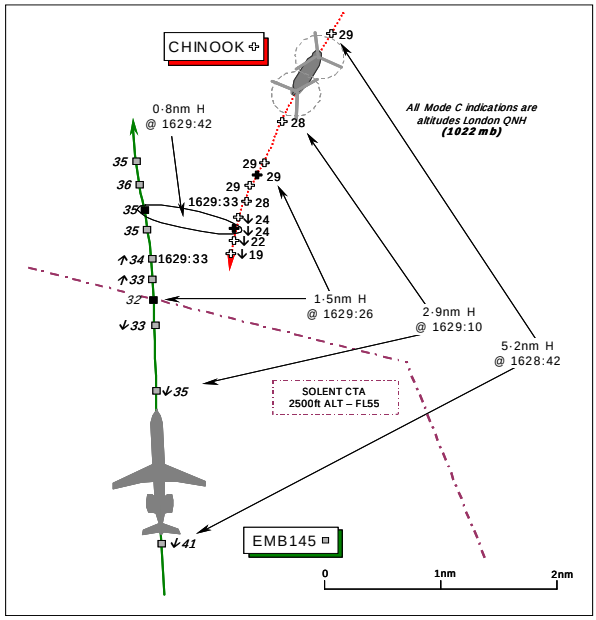
AIRPROX REPORT NO 137/07

Date/Time: 13 Sep 1629

Position: 5108N 00111W (13nm NNE Southampton Airport - elev 44ft)

Airspace: SOLENT CTA/FIR (Class: D/G)

	Reporting Ac	*Reported Ac*
Type:	EMB145	Chinook
Operator:	CAT	HQ JHC
Alt/FL:	↓3000ft	3000ft
	QNH (1020mb)	amsl (1023mb)
Weather	VMC Haze	VMC CLOC
Visibility:	10km	10+km
Reported Separation:		
	300ft V/nil H	500ft V/1½nm H
Recorded Separation:		
	300ft Min V@ 1·5nm	
	0·8nm Min H @1100ft V	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EMBRAER 145 PILOT reports he was inbound to Southampton under IFR and in receipt of a RCS from Southampton RADAR on 120·225MHz. Flying out of the Sun, some 3000ft above the haze with a visibility of 10km, his ac's HISLs and landing lights were selected on.

RADAR vectored them LH DOWNWIND for the approach heading N. About 12nm NE of the Airport descending wings level to 3000ft QNH (1020mb) at 180kt, TCAS enunciated a TA followed by a 'CLIMB' RA. The AP was

disconnected and an immediate climb initiated in conformance with the RA. 'CLEAR OF CONFLICT' was enunciated at about 3500ft and the 1st Officer saw a Chinook Helicopter – dark in colour with no lights displayed - pass below their EMB145, just under their starboard side. TCAS indicated the helicopter was 300ft below them at the closest point and after the Airprox they descended back to their cleared altitude and continued the approach in accordance with ATC instructions. He assessed the risk as *"high"* and added that he was conducting line training on this flight.

THE CHINOOK HC1T PILOT reports he was conducting a local sortie under VFR from Odiham and in receipt of a FIS from Odiham. A squawk was selected with Mode C; neither Mode S, TCAS, nor any other form of CWS is fitted.

Heading 240°(M) at a position 250° ODI at 8DME, in a level cruise at 120kt at an altitude of 3000ft whilst setting-up for a practise auto-rotative descent, he was informed by ATC of another ac to the SW above his helicopter. His crewman first saw the CAT ac, determined it was not affecting them and so he continued to set the ac up for the auto-rotative descent. The EMB145 passed 1½nm away to starboard some 500ft above his helicopter with a *"low"* risk of a collision.

THE SOUTHAMPTON APPROACH RADAR CONTROLLER (APR) reports that the EMB145 was on a heading of 360° to extend DOWNWIND to allow for a departure when the crew was instructed to descend from 3500ft to 3000ft. As the EMB145 approached a position 11nm NE of Southampton a contact was observed outside CAS heading towards the EMB145, so he instructed the crew to stop descent at their present level and advised them of the other traffic. A L turn onto 270° was issued but by this time the EMB145 was outside Class D CAS. The EMB145 pilot then reported a TCAS RA and said that he was climbing to 3500ft. He advised the EMB145 pilot that he was outside CAS, so he changed the ATS to a RAS. When the EMB145 pilot reported 'clear of conflict', he instructed him to maintain 3500ft. As the ac was still tracking N he told the EMB145 crew to turn again onto 210°, which the pilot acknowledged and eventually made the turn. During this turn the ac descended to 3000ft. The ac re-entered CAS on this heading, before being turned L onto 180° to close on the ILS. The ATS was changed back to a RCS, the ac established on the ILS and the approach continued without further incident.

Before he transferred the EMB145 to the TOWER he asked the pilot if he wished to file an Airprox, who said he would sort it on the ground. The pilot later telephoned and advised the controller he was filing an Airprox.

MIL ACC reports that the Chinook crew was conducting routine training flying under VFR at an altitude of 3000ft (1023mb). A squawk of A3641 was allocated and the crew was receiving a FIS from Odiham on 372·375MHz. The Odiham APPROACH and INFORMATION Controller (APP) reports that Odiham's Watchman, Tacan and ILS were u/s, so an SSR feed from the Heathrow Radar was being used at the time of the Airprox.

Analysis of the Heathrow Radar shows that at 1628:42, the two ac were about 5·2nm apart. At this point, APP asked the Chinook crew to "*..confirm operating altitude"*, to which the response was *"3000 feet no higher"*. This was acknowledged by APP, who then instructed the Chinook crew to change squawk to A3641 [from A3646]. By 1629:33, both ac appear to have maintained their respective courses and are 1nm and 600ft apart, so as the EMB145 had exited Class D CAS, APP passed traffic information to the Chinook crew, "*..traffic south west 1 mile tracking north indicating 300 feet above"*. At 1629:37, the Chinook crew reported "*visual"*, which was followed by APP advising "*..you also have controlled airspace on your nose 1 mile 500 feet below"*. The Chinook crew responded with "*Copied, we will turn left now'*. At 1629:42, the Chinook is shown indicating 2400ft the ac are passing each other on the starboard side, with the EMB145 maintaining track and altitude. By 1629:59, the Chinook had turned and horizontal separation between the two ac had increased to 1·6nm.

The pilot of the Chinook reported visual with the EMB145 at 1629:37, when the ac were 0·9nm apart [but the Chinook displays NMC]. Also, APP prompted the Chinook crew that the CTA was 1nm ahead and the pilot turned and descended to avoid it, thus, the Chinook's flight path remained outside CAS at all times. This Command considers that APP gave the Chinook crew a good service under a FIS; there were no Mil ATC causal or contributory factors relating to this reported Airprox.

ATSI reports that at the time of the Airprox, the EMB145 was in communication with the Solent Radar controller (APR). The Solent APR described both the workload and traffic loading as light. The Pease Pottage SSR feed to the airport was u/s, so use was being made of SSR data from the Heathrow Radar. The APR was operating with the SOLENT RADAR and Southampton APPROACH RADAR positions combined. At Southampton the division

of responsibility is that SOLENT RADAR handles traffic outside CAS whereas the Southampton APPROACH RADAR position controls traffic within CAS. All the ac, with one exception, were operating within CAS and so the APR opined that splitting the positions would have made no material difference to his workload.

The EMB145 crew made contact with the APR at 1622:10, level at FL80 and tracking to the SAM. The APR updated the crew with the latest ATIS and asked them to confirm their ac type. At 1625:20, the EMB145 crew reported approaching the overhead and was instructed to descend to 3500ft QNH (1023mb) and to fly a heading of 110º. At 1626:50, when the ac was 5nm NE of Southampton Airport, the APR instructed the crew to turn L heading 360º. Shortly afterwards, as the ac was passing 4400ft, the crew was instructed to descend to 3000ft.

Just after 1629:10, when the EMB145 was passing 3500ft, the APR instructed the crew to turn L heading 270º, which the crew acknowledged. The ac was now only 0·8nm from the northern edge of the Solent CTA and in the 1 o'clock position of the EMB145 was a southbound contact displaying an Odiham squawk indicating 2800ft. Immediately after the crew of the EMB145 had acknowledged the new heading the APR transmitted at 1629:20, "[EMB145 C/S] *stop descent now at your present level*". There was no reply and so the APR transmitted again "[EMB145 C/S] *stop the descent at present level there's traffic north of you by three* [nm] *three thousand feet*". Some 10secs later the crew transmitted "*Yeah* [EMB145 C/S] *we got Rad out there so er Radar Advisory we're climbing up to three and a half but we have now cleared it*". Analysis of the radar shows that the northbound EMB145 passed starboard to starboard with the traffic (later identified as the Chinook) at a range of 0·8nm. The Mode C readout of the Chinook disappeared from the Heathrow radar [for 1sweep] between 1629:34, when it was 2800ft until 1629:42, when the ac had just passed abeam each other, when it showed 2400ft. By this time the EMB145 had climbed to 3500ft. However, the Clee Hill radar showed the Mode C of the Chinook as 2800ft and that of the EMB145 as 3400ft at 1629:40, when the aircraft were 1·1nm apart.

The APR advised that the EMB145 had been subject to the 'Silent Handover' procedure between LTCC and Southampton. The flight was transferred at FL80 and was released. The APR advised that his initial plan was to vector the EMB145 for a LH circuit towards an 8nm FINAL before instructing the crew to turn L heading 290º and then a further L turn onto 240º to establish on the ILS. Soon after the crew of the EMB145 established contact with the APR, they advised; "*Okay and if it becomes available we could accept radar advisory for early descent*". The APR responded "*Roger*" but he explained that a NATS Airports' Safety Notice (ASN 03/07 dated 05/03/07) had stated that flights which had planned to remain within CAS should not be offered a routeing outside unless the pilot specifically requests this. Furthermore, controllers were not to prompt pilots to request or accept a routeing outside CAS. He considered that the pilot's comment was not a specific request and if he went back to clarify the crew's intentions then this could be interpreted as prompting.

The base of CAS from N of PEPIS, S to the edge of the Solent CTA, is FL65. The APR advised that he did not descend the EMB145 to FL70 N of the CTA, as he preferred to provide the crew with a continuous descent. At 1627:00, when the EMB145 had been instructed to turn L heading 360º, the APR co-ordinated the flight with the Southampton ADC advising that the EMB145 had 15 track miles to touchdown. The ADC enquired as to whether he could line up a departure and the APR agreed that he could. At 1629:00, another ac, a B737 inbound to Bournemouth, called the APR (as is standard practice) and advised that they were descending to FL50 inbound to NEDUL. The APR frankly admitted that this was when he made his major error as, rather than instructing the crew of the EMB145 to turn L onto 270º, thereby keeping the ac within the CTA, he responded to the B737 crew. The delay, albeit of some 10 - 15sec, meant that the EMB145 continued towards the edge of the CTA and closer to the southbound Chinook. Although the crew of the EMB145 acknowledged the instruction to turn L from 360º onto 270º at 1629:15, analysis of the radar recording shows that the ac's heading did not change until 1630:02, by which time it was outside of CAS. The APR advised that, with the benefit of hindsight, he should have used the prowords 'avoiding action', which he did not, in order to expedite the turn. The APR was conscious of the fact that when he instructed the crew of the EMB145 to stop their descent at their present level, the EMB145 was only 300ft above the Chinook, however, it was his intention to try and preserve some degree of vertical separation. At the time he passed the traffic information [just before 1629:30] he was unaware that it could have been construed as ambiguous, however, it would seem that this coincided with the crew reacting to their TCAS RA. He had not noticed the presence of the Chinook until he instructed the EMB145 to turn L heading 270º. Here, the Solent APR responded to another ac when his priority should have been to instruct the crew of the EMB145 to turn L, thus keeping it within CAS. This was compounded when the crew of the EMB145, having acknowledged the instruction to turn L, continued straight ahead for some 45sec before complying with the L turn instruction. The APR was required to keep the EMB145 within the limits of CAS, which he did not fulfil. Had the instruction for the EMB145

to descend to 3000ft been coupled with the instruction to turn L heading 270º, then it is probable that the ac would have remained within the boundaries of the Solent CTA.

HQ JHC had nothing further to add.

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 comprehensive Mil ACC report showed that the Odiham APP controller had conscientiously gone one step further in the provision of a FIS, warning the Chinook pilot firstly about the proximity of the EMB145 to his own helicopter as the airliner crossed the northern boundary of the Class D Solent CTA, and secondly advising of the Chinook's range from CAS. The succinct report provided by the Chinook pilot, coupled with the recorded radar data, had made it plain that the helicopter was about to descend clear below the base of the CTA in Class G airspace. Thus forewarned to the other ac's proximity and in visual contact with the EMB145 following his alert crewman's sighting, the Chinook pilot carried on with his practise autorotation and descended out of the way as the airliner passed clear above and to starboard.

The Board commended the Southampton APR for his frank account and his open admission as reflected within the ATSI report. That he had not turned the EMB145 at the appropriate moment, as a result of answering an RT call from another flight was a simple mistake and more often than not of little consequence in other circumstances. However, it was plain that in this instance his delayed L turn instruction allowed the EMB145 to cross the northern CTA boundary into Class G airspace. It was plain to the Members that this was the catalyst to this Airprox, for if the APR had issued the L turn onto W earlier the developing conflict with the Chinook helicopter outside the CTA in the Open FIR would not have occurred, as plainly the Chinook crew had no intention of entering CAS. Indeed, ATSI reported that it was not until the APR issued this instruction that he had spotted the helicopter and realised there was a potential conflict. As the EMB145 exited CAS into Class G, the ac's TCAS having detected the proximity of the Chinook had plainly determined that its own intrinsic safety margins would be breached and therefore triggered the TCAS Climb RA. This was all unknown to the Chinook pilot, who moments later initiated his practise autorotation descent, as evinced by the radar recording, which shows the helicopter in the descent one sweep after the EMB145 is shown to have commenced a climb. The Board examined the relative timing of the L turn transmission at 1629:10 and the ATSI report made it plain that no turn was evident till after the encounter at 1630:02, despite the crew's RT acknowledgement. To some it seemed that the EMB145 crew had not reacted as promptly to this L turn instruction as they might have; however, it was plain that the EMB145 crew had been reacting to the TCAS RA at the time. The rather confused transmission at about 1629:30 in response to the APRs instruction to stop descent "*…we got Rad out there so..Radar* [perhaps meaning to say Resolution] *Advisory we're climbing up to three and a half but we have now cleared it*" evinced a climb in response to an RA and that the crew were subsequently 'Clear of Conflict' as they levelled at an altitude of 3500ft. This climb was evident on the radar recording just after the EMB145 crossed the northern boundary of the CTA, the minimum horizontal separation of 0·8nm being reached as the ac ascended through 3500ft London QNH (1022mb), some 1100ft above the Chinook, which was by then descending. Whilst it was the APR's responsibility to ensure that the EMB145 remained within the CTA, clearly the EMB145 crew's first priority was to follow the TCAS RA and this they apparently did, but Members agreed that the conflict would not have arisen if the EMB145 crew had been instructed to turn earlier thus keeping the ac within CAS. In the Board's view the cause of this Airprox was that the Solent APR vectored the EMB145 outside the Class D Solent CTA into conflict with the Chinook. Nevertheless, the EMB145 crew's prompt compliance with the TCAS 'CLIMB' RA, coupled with the Chinook crew's own sighting of the airliner and simultaneous descent, led Members to conclude unanimously that no risk of a collision had existed in these circumstances.

The Board was briefed that subsequent to this Airprox, NATS Division of Safety has worked closely with the Unit to develop improved application of speed control and the use of standard radar patterns to maximise the use of existing airspace, thereby retaining ac under their control within the available CAS structure.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Solent APR vectored the EMB145 outside the Class D Solent CTA into conflict with the Chinook.

Degree of Risk: C.

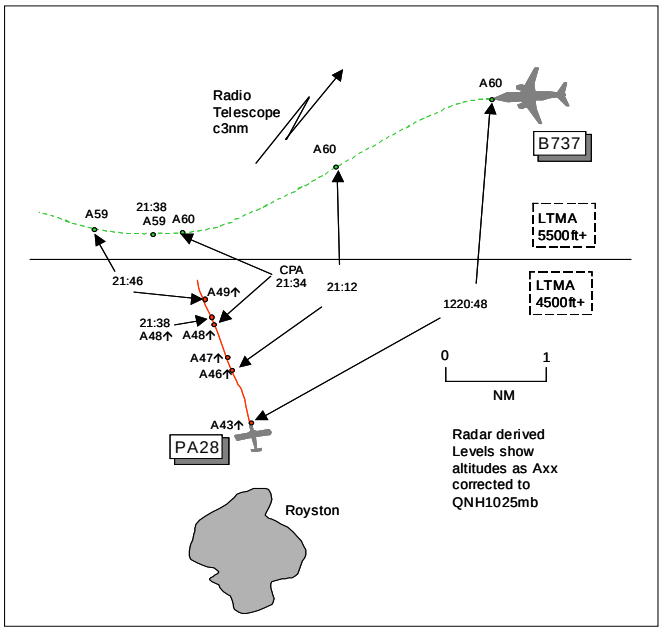
AIRPROX REPORT NO 138/07

Date/Time: 15 Sep 1222 (Saturday)
Position: 5206N 00002W (18nm NE Luton)
Airspace: LTMA (Class: A)
Reporter: LTCC SS INT DIR

	1st Ac	*2nd Ac*
Type:	B737-700	PA28
Operator:	CAT	Civ Trg
Alt/FL:	6000ft (QNH)	>4500ft↑ (QNH 1026mb)
Weather	IMC CLBL	VMC CLBL
Visibility:	NR	10km

Reported Separation:
INT DIR - 1000ft V/1nm H
800ft V/NR H 1000ft V/2-3nm H

Recorded Separation:
1200ft V/1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LTCC STANSTED INT DIR reports that the B737 was nearing the 'Luton Gate' at 6000ft on a heading of 240°. He saw a 7000 squawk N'bound under CAS climbing through 4300ft where the base of CAS is 4500ft. The unknown ac continued to climb through the base level (ultimately reaching 6000ft) into confliction with the B737. He issued avoiding action to the B737 flight – turn R heading 290° - and passed TI on the infringing ac, the crew reporting seeing the ac on TCAS. Separation was estimated to be 1000ft vertically and 1nm horizontally. Once the B737 had passed the infringer he turned it L onto a base leg for Luton and descended it to 5000ft. The unknown ac then squawked 0013 (ac outside CAS and monitoring Luton/Essex Radar frequency) so he made a blind transmission on 120·625MHz but there was no reply. He asked the Luton Radar controller to also try a blind transmission and the PA28 pilot identified himself on that frequency. The PA28 was subsequently identified and informed that he had entered CAS, conflicted with the B737 and informed that reporting action would be taken.

THE B737 PILOT reports inbound to Luton IFR at 220kt and in receipt of a RCS from Luton on 129·55MHz squawking with Mode S. Positioning for the ILS RW26 about 10nm NE of LUT NDB a TCAS TA alert occurred approaching from the S about 2nm away. Radar commanded an avoiding action turn to the R, the other ac's advisory changed to solid white and came within 800ft. The other ac was not seen visually as they were IMC between layers at 6000ft flying 1km clear of cloud.

THE PA28 PILOT provided a frank report of his dual training sortie from Panshanger, initially in communication with Panshanger Radio on 120·25MHz squawking 7000 with Mode C. The visibility was 10km flying clear of cloud (about 4oktas at 2500-6000ft) and the ac was coloured white with red/orange/yellow stripes and the strobe lights were switched on. After passing E of Royston, he started a climb from 2000ft on a N'ly heading towards the telescopic antennae (5nm SW of Cambridge) as he has done many times. The difference this day was that he was teaching this lesson, exceptionally, in an Archer (181bhp) instead of the usual Cherokee (140bhp). The Archer climbs at 1000-1200fpm at 75kt whilst the Cherokee climbs at only 500-600fpm. They levelled-off every

500ft to maintain a good lookout, to steer well clear of clouds and keep in sight of their reference point and lookout for other traffic. Because of the higher climb rate of the Archer they reached 4500ft sooner than expected and inadvertently entered the Luton CTA, he thought [actually the LTMA]. When reaching 5000ft he spotted a B737 to his R (1-2 o'clock) on a W'ly heading about 2-3nm away and 1000ft above. He thought this strange as he was convinced that the airspace in front of him was uncontrolled. As he was well clear of the B737 he continued his climb to 6000ft and decided to check with Luton Approach as to what was going on, still unaware of his airspace infringement. He selected frequency 129·55Mhz and 0013 squawk and immediately the controller asked him to identify himself, informing him that he had infringed Luton airspace and that avoiding action had to be taken. After apologising to the controller he was cleared to squawk 7000 and leave the frequency. He has been instructing from Panshanger for 1·5yr without any incidents or airspace infringements. With hindsight he realises that he should have been more careful in assessing his position, as he had underestimated his distance to his reference point because of the perfect visibility that afternoon.

ATSI comments that the incident took place approximately 8nm NNW of BKY VOR in Class A CAS of the LTMA. The B737 was inbound IFR to Luton Airport from Palma, Majorca, and at the time of the incident, was in receipt of an Approach Radar Control service from the LTCC Stansted Intermediate Director (INT DIR), operating as 'Essex Radar'.

At 1215:40, the B737 flight established communications with Essex Radar, reporting descending to FL80, to be level by BKY. The controller instructed the flight to continue on its present heading, with no (ATC) speed restriction. At this point, the radar recording shows, the B737 is tracking NE towards BKY, passing FL114. Three minutes later, at 1218:40, the flight was instructed to descend to altitude 6000ft on the Luton QNH 1025mb. By now, the B737 had passed BKY, on the radar heading.

At 1219:27, when the B737 is about 4nm NE of BKY, the flight was instructed to turn L onto a radar heading of 240°, to position the ac towards Luton, prior to its handover to the Luton Director. The radar recording shows the B737 reach 6000ft whilst in the L turn. By this time, the B737 was within an area of the LTMA (London Terminal Control Area), where the base of Class A CAS is 5500ft. Therefore, at 500ft above the base, the ac was within the MATS Part 1 criteria, which, in Section 1, Chapter 6, Page 4, Para 9 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".*

In his written report, the controller recalls observing unknown traffic to the S of the B737, tracking N, squawking 7000 and climbing through 4300ft, unverified Mode C. This traffic was, at the time, below the LTMA, where the base of Class A CAS is 4500ft. Continuing to monitor this traffic (later identified as the subject PA28), the controller noted its Mode C indicate a climb into CAS and into potential conflict with the B737 at 6000ft, which by now was heading 240°. Without delay the controller took action, transmitting to the B737, at 1221:14, *"(B737 c/s) avoiding action turn right heading two nine zero degrees",* which the pilot read back immediately. TI then followed *"…unknown traffic a mile south of your position looks like its climbing through the base of controlled airspace",* to which the pilot responded *"Yeah traffic on our left side looking (B737 c/s)".* TI was then updated, at 1221:45, *" (B737 c/s) that traffic now to the south-east of you by a mile continuing northbound indicating four thousand nine hundred feet climbing",* this time the pilot commenting *"Ah he's behind us (B737 c/s)".*

It is apparent from the radar recording that when the controller issued the avoiding action instruction, the unknown traffic was indicating just above the base, at 4600ft Mode C unverified. It was then in the B737's 10 o'clock position, range 2·4nm. However, despite the prompt action by the controller, the 2 ac continued to converge.

[UKAB Note (1): The CPA occurs at 1221:34, moments before the controller issued the updated TI when the unknown ac is in the B737's 9 o'clock position, range 1nm and passing 4800ft (CAS base 4500ft), unverified Mode C, 1200ft below the B737 at 6000ft Mode C. From this point, the B737's avoiding action turn started to take effect and the range between them increased. The next sweep shows the B737 at 5900ft Mode C just over 1nm to the NW of, and 1100ft above the unknown ac.]

Although the Mode C differential did erode further, as the unknown ac continued its climb, reaching 5300ft Mode C, unverified, it was, by then, beneath CAS (CAS base 5500ft), with the B737 at 5900ft Mode C, 3·6nm to the W.

Guidance to controllers on the action to be taken when presented with '*unknown aircraft'* in various types of airspace appears in MATS Part 1, Section 1, Chapter 5, Page 13, Para 14.2. For Class A airspace (and others)

it states that *"If radar derived, or other information, indicates that an aircraft is lost, has experienced radio failure or is making an unauthorised penetration of the airspace – avoiding action shall be given and traffic information passed."* On this occasion, the 'Essex Radar' controller's vigilance enabled an early detection of the unauthorised penetration and took action in accordance with this guidance with commendable speed.

Additional guidance, in Para 14.3, states that *"Controllers providing a Radar Control Service are required to provide standard separation between aircraft in accordance with the table at Section 1, Chapter 2, Page 1. When avoiding action is issued to an aircraft under a Radar Control Service, controllers must seek to achieve the required minima and pilots must comply with the instructions given. In these circumstances, pilots must comply with avoiding action even if they report visual with the other aircraft."* In this incident a RCS was being provided to the B737 flight, consequently the 'required minima' to be aimed for was 5000ft vertically and/or 5nm horizontally from the unknown. Attempting a climb of this magnitude in the LTMA would have been impractical and potentially unsafe. Consequently, the controller adopted a solution in the horizontal plane. Although this minima was not achieved in the short term, the action taken by the controller was intended to achieve this with the minimum of delay. In the meantime, his action served to dissipate the immediate risk to the ac under his control.

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 commended the PA28 Instructor's open and honest report. Having misjudged his ac's performance and underestimating the distance from his next navigational reference point, the PA28 pilot made an unauthorised penetration of the Class A LTMA, which had caused the Airprox. An ATCO Member familiar with Luton/Stansted operations opined that the Stansted INT DIR was a busy position handling flights from 2 holds and carrying out initial vectoring for both Stansted and Luton airports. It was not unusual to position flights through the area just N of Royston at 5000ft which would have led to a much closer encounter had this routeing been followed at the time of the incident. As it was, the INT DIR had monitored the PA28's flight path, waiting to ensure that the ac was not going to level-off at the base of CAS, so that when the ac's Mode C had indicated a climb above 4500ft into CAS he immediately issued an avoiding action R turn and TI to the B737 crew. This had led to what seemed like a late resolution of the confliction but had the PA28 levelled-off at the base level, no action would have been necessary as the ac would have been 'deemed' separated. The B737 crew followed the INT DIR's instructions and 'saw' the PA28 on TCAS passing clear to their L and well below. The PA28 pilot had seen the approaching B737 and watched it cross ahead from R to L and 1000ft above. Members commented that the selection of Mode A and C by the PA28 pilot had played a major part towards the recognition of the incident, and is a vital element enabling early detection and resolution by ATSUs and ac ACAS equipments. Although this had had the potential for a more serious incident, in the end the 2 ac passed with 1200ft and 1nm separation without STCA or TCAS generating any alerts/warnings. The timely action taken by the INT DIR and the visual sighting by the PA28 pilot were enough to allow the Board to conclude that safety had been assured during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: An unauthorised penetration of Class A LTMA by the PA28 pilot, who flew into conflict with the B737.

Degree of Risk: C.

AIRPROX REPORT NO 139/07

Date/Time:	27 Aug 0915	
Position:	5128N 00010W (Apr to 27L Heathrow)	
Airspace:	Heathrow CTR	(Class: A)
	Reporting Ac	*Reported Ac*
Type:	B737	Balloon (Untraced)
Operator:	CAT	N/K
Alt/FL:	2500ft	NK
	(N/K)	(N/K)
Weather	VMC	NK
Visibility:	NR	NK
Reported Separation:		
	10-20m V/0 H	NK
Recorded Separation:		
	NR	

No Diagram

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports that he was inbound to Heathrow, established on the ILS for RW 27L when a dog-shaped balloon, with a string below it, passed directly below them. He reported the incident to LHR.

UKAB Note (1): This report was originally received by post as an air safety report from an overseas airline. It contained no incident time, but when contacted by the Secretariat the airline provided an incident time, that was incorrect by over 2 hours. The correct incident time was established by the Secretariat 1 month after the event and later confirmed by the airline.

UKAB Note (2): Nothing other than the airliner is seen on the recording of the Heathrow radar.

UKAB Note (3): The incident occurred over the Battersea area. No captive or other balloons were reported missing or NOTAMed on that day. There are no Met Balloons launched in that area. The day of the incident was a Bank Holiday with very many people and events in the area. The local authority was very helpful but stated that there were no planned events in the parks under their jurisdiction in that area. Further, they stated that they invariably contact the CAA and Battersea Heliport before authorising any events with aerial activity. The Battersea Dogs home stated that they had no events on that day and they do not use, sell or release balloons due to previous occurrences.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Members noted that although no formal studies could be located, best expert advice is that it is most unlikely that an untethered balloon will impact an ac due to its 'bow wave' and even if it does will not cause any damage. Equally however such incidents can be very startling to aircrew when they are in a period of maximum concentration having just commenced the final approach. The Board noted the cooperation by the local authority.

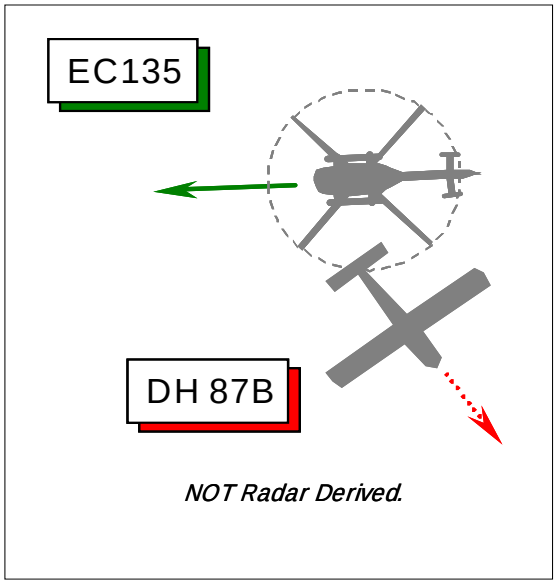
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT NO 140/07

Date/Time:	18 Sep 1217	
Position:	5131N 00229W (4nm E of Filton - elev 226 ft)	
Airspace:	London FIR	(Class: G
	Reporting Ac	*Reported Ac*
Type:	EC135	DH87B
Operator:	Civ Trg	Civ Pte
Alt/FL:	1520ft↓	1500ft
	QNH (1026mb)	amsl
Weather	VMC CLBC	VMC
Visibility:	>10km	Unlimited
Reported Separation:		
	50ft V/nil H	NR
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EC135 PILOT reports he was the pilot-in-command and flying under IFR, established on the localiser and glide path for RW27 at Filton heading 273°(M) at 100kt. Flying in VMC, with the Sun on the port beam he was in receipt of a RIS from Filton RADAR on 122·725MHz. At 4nm FINALS, descending on the glidepath through an altitude of 1520ft QNH (1026mb), another ac emerged from directly below his helicopter tracking SE some 50ft below them. The registration letters of the ac – a white/blue DH Hornet Moth - were clearly visible painted on top of the wing of this ac, as he looked back astern from his position in the LH seat. No avoiding action was taken as the ac was first seen as it appeared below and to port with a *"very high"* risk of a collision. The other ac was neither observed by Filton nor in contact with Filton RADAR on RT.

THE de HAVILLAND DH87B HORNET MOTH PILOT reports he had taken off from private airstrip at Grange Farm, situated about ¾nm due E of the M4/M5 motorway interchange. He took off towards the W and made a RH circuit to the N, which is their normal practice. He then set course [SE] overhead Frampton Cotterell for Bath to the SE, his turning point kept him clear of Colerne and the Lyneham CTR. He flew up the Vale of Pewsey to White Waltham airfield, at an en-route cruising altitude of 1500ft and he was flying in VMC with unlimited visibility. Although a single VHF box is fitted it was not used on this flight. He did not see the EC135 helicopter at anytime.

He is always aware of Filton traffic (normally very light) and keeps a good lookout, especially crossing the approach at any distance. Obviously the lookout was not good enough in this case, for which he can only apologise to the reporting EC135 pilot concerned. Unfortunately, the majority of flying from Grange Farm airstrip is in non-radio ac. Nevertheless, he has made all of the other resident pilot's aware of this incident and all intend to give Filton (in fact, all aerodromes) "*a wider berth and greater respect*". Where radio is available they will make contact when possible and 'listen-out' when not.

THE FILTON RADAR CONTROLLER (APR) reports that the EC135 crew was in receipt of a RIS. At 4nm FINALs for the RW 27 ILS the crew initially reported an ac passing 200ft below them, before the instructor pilot later said the other ac was 50ft beneath his helicopter. The pilot reported the registration of the ac that was coloured white with blue lettering. Nothing was observed on radar possibly due to tangential fading which is a common occurrence with the Marconi 264 SRE at Filton with aircraft E of the aerodrome heading S. Furthermore, there was no ac on his frequency in that area. The EC135 crew was advised nothing was displayed on radar, but about 1min later a primary radar contact was observed 1½nm to the S of the final approach to RW27 6nm ESE of Filton, routeing SE.

ATSI reports that the EC135 departed from Filton and the flight was placed under a RIS by the Filton APR. The controller vectored it for a RH circuit to RW27 in order to make an ILS/DME approach. At 1213:00, the controller

instructed the crew to turn R heading 240º and to report established on the localiser. At the time the EC135 was 9.3nm E of the airfield at 2000ft. The crew reported LLZ established and was cleared to descend on the ILS, to report at 4 DME. At 1216:42, the pilot reported at 4nm and was cleared to make a low approach and go around. Immediately after this the pilot advised that a biplane had passed about 200ft underneath as he passed 4 DME. A short time later the vertical distance was amended to 50ft.

The controller advised that there was nothing seen on radar. Analysis of the Clee Hill radar confirms this. The controller complied with the terms of a RIS and could not have been expected to have knowledge of, or to pass information on, traffic that was neither in communication with him nor visible on his radar display.

UKAB Note (1): This Airprox occurred outwith the coverage of recorded radar. The Burrington Radar does not show either of the ac involved and the Clee Hill Radar recording only showed the reporting ac descending steadily on FINALs.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The frank and open report from the DH87B pilot was commendable and it was apparent that some salutary lessons were evident from this close quarters encounter on the final approach track to Filton's main instrument runway.

It was readily evident from the DH87B pilot's report that he had not seen the helicopter at all and Members agreed unanimously that this was indeed part of the cause. A GA pilot Member, who has experience of flying the DH87B, pointed out some of the intrinsic difficulties in flying this vintage machine, especially the nature of the extremely basic electrical system – if fitted at all. Nevertheless, it was clear that if the DH87B pilot had actually communicated with Filton ATC and made them aware of his biplane's presence and route, this might well have resulted in traffic information from the APR, which might have forewarned the EC135 crew. Members concurred that the DH87B pilot should have made use of the VHF radio fitted to this aeroplane - a salutary lesson – that the biplane pilot had clearly accepted would have been wiser. Furthermore, the GA pilot member explained to the Members the poor visibility from a biplane's cockpit at certain angles and the blind spots intrinsic with this type of aeroplane. However, the Board agreed that pilots should be entirely aware of such difficulties with their own ac and take account of them in their general look-out scan and airmanship, moving the aeroplane if necessary to periodically clear dead airspace concealed behind blind spots such as the upper wing and struts. Pilot Members opined that to transit through the extended centre-line of a promulgated instrument runway at a point and height that would conflict directly with traffic descending on the ILS glide path was very unwise and would inevitably lead to a conflict between IFR and VFR traffic – as occurred here. A GA pilot member was concerned that insufficient advice might be given to GA pilots during training to warn them about this aspect, which should be taken into account during their pre-flight planning and it could be that those who do not fly under IFR may not be aware of this issue; the Member elected to look into how this aspect might be taken forward and improved. In situations such as this, pilots should take due regard of instrument approach procedure profiles – the 'feathers' are depicted on CAA VFR Charts - and not choose to fly at a range/height from a runway threshold which is close to the nominal 3° GP. A wiser option would be firstly to ensure that the ATSU is advised on RT that the ac is crossing through the extended centre-line. Secondly, by flying further out from the threshold or descending further under the approach [whilst still maintaining appropriate clearance from the ground etc] to provide greater separation from ac flying an instrument approach. It was clear that the EC135 crew had not received any warning about the DH87B from the APR under the RIS being provided by Filton ATC. The APR opined that nothing was observed on radar possibly due to tangential fading, which is apparently a known problem to the E of Filton. However, if that were the case controller Members were concerned that the RIS had not been 'limited' accordingly and the nature of the limitation made clear. Controller Members familiar with this equipment were well aware of the limitations of the S264 primary SRE in this respect, which coupled with the poor reflective nature of the fabric covered aeroplane of small cross-sectional area, made efficient detection by primary radar all the more difficult. In the absence of an SSR transponder it was understandable therefore that the DH87B did not 'paint' on the APR's display. Pilots of vintage ac should be aware of this aspect and it is important that they communicate on RT accordingly to warn ATC of their presence when they transit past aerodromes.

From the EC135 crew's perspective, the pilots were busily engaged in their IFR approach, the RH seat pilot clearly concentrating on accurate instrument flying. Nevertheless, in the 'see and avoid' environment of Class G airspace

there was still an inherent responsibility to maintain an effective lookout scan outside of the cockpit for other ac. It was evident from the EC135 pilots frank account that the DH87B had not been spotted until after it had underflown his helicopter. Thus the slow biplane, closing obliquely from the starboard side on perhaps a constant relative bearing with little crossing motion to draw attention to it, had defeated the lookout of the instructor pilot from across the cockpit in the LH seat. Blind-spots might also have been a factor here too, but pilots in receipt of a radar service operating in Class G airspace should be in no doubt that other ac – such as this small vintage biplane – will be encountered in the 'Open FIR' and might not be detected by primary radar and again a salutary example of what can occur. Thus unsighted to the biplane beforehand, the Members agreed that the other part of the cause was effectively, a non-sighting by the EC135 crew. In the Board's view, therefore, this Airprox had resulted from an effective non-sighting by the EC135 crew and a non-sighting by the DH87B pilot on the Filton RW27 Final Approach Track.

Turning to the inherent risk, with none of the pilots involved aware of the presence of the other ac before their paths crossed, only fate lay between them and the safety of these two ac was certainly not assured. The anomaly of the EC135 pilot's initial RT report to the APR of 200ft vertical separation that was subsequently amended to 50ft as the biplane passed beneath the descending helicopter gave rise to a wide-ranging debate. Unfortunately, data recordings did not capture this Airprox, mainly due to the location of the nearest recorded radar head – the NATS Clee Hill Source – as at this range it is below coverage. Therefore it was neither feasible to confirm the minimum horizontal separation nor determine the minimum vertical separation at the CPA as the DH87B did not carry Mode C. The only pilot that saw the other ac assessed the risk as *"very high"* and the Board agreed that any separation that did exist was purely fortuitous. The overwhelming majority of the Members agreed therefore, that an actual risk of collision had existed in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

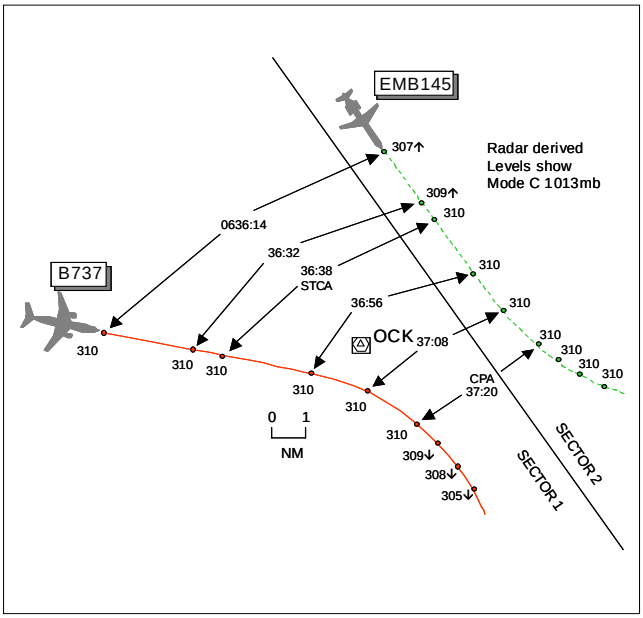
Cause: An effective non-sighting by the EC135 crew and a non-sighting by the DH87B pilot on the Filton RW27 Final Approach Track.

Degree of Risk: A.

AIRPROX REPORT No 141/07

AIRPROX REPORT NO 141/07

Date/Time:	20 Sep 0637	
Position:	5117N 00021W (3·5nm ESE OCK)	
Airspace:	UAR UL9/607	(Class: C)
Reporter:	LACC S1T & S2T	
	1st Ac	*2nd Ac*
Type:	EMB145	B737-800
Operator:	CAT	CAT
Alt/FL:	FL310	FL310
Weather	VMC CLBL	VMC CLOC
Visibility:	>10km	NR
Reported Separation:	S1&2T - Nil V/4nm H	
	Nil V/4nm H	NR
Recorded Separation:	Nil V/4·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LACC S1T reports that during a very busy session, approximately 5min after taking over the sector, he was streaming the B737 for Paris at FL310. The ac was heading E and at about 10nm before the boundary of his sector airspace he instructed the flight to turn R for SFD but there was no response. He tried again but noticed another ac climbing up from LMS going into S2 also at FL310 so he gave the B737 flight avoiding action. Before he could give TI the pilot reported visual and TCAS contact with the conflicting ac. At no point did he infringe S2's airspace or know about the conflicting ac at FL310; separation was nil vertically and 4nm horizontally. He did not notice STCA activating before turning the B737 nor notice that the conflicting ac was an intruder on the display, if it was at all. His fps bay was full to overloading at the time with so many flights either on frequency or about to call that his ability to monitor every ac was severely reduced.

THE LACC S2T reports taking over the position at 0630 and during his fps scan he was assessing his options for the EMB145 which was shortly about to enter his sector from LMS. This traffic had been accepted into S2 climbing to FL310. He noticed that the EMB145 was tracking 2-3nm to the E of the C/L between S1 and S2 and also that S1T was rather busy dealing with traffic in the Farnborough area. It was at this point that he noticed the B737 (background track) tracking E'bound being sequenced into the SFD Sector. With a substantial tailwind the B737 was covering the ground very well and as it was about 15nm from his sector boundary he opted to point out to the S1T that he needed to turn the B737 R as soon as possible. He then communicated with the LMS team that the EMB145 needed to be turned L immediately. The LMS team told him that the EMB145 flight had been transferred but it had not checked in. STCA then activated, highlighting the traffic. He could hear the S1T calling the B737 flight and attempting to turn it R with at least 2 transmissions going unanswered by the crew (1 being answered incorrectly by another flight). The EMB145 flight checked-in and his first transmission was to give it an avoiding action L turn onto heading 060° which was acknowledged. He then gave TI on the B737 which the EMB145 crew acknowledged, reporting visual and that the resolution was satisfactory. The EMB145 crew also reported that no TCAS resolution was received. Without resolution the 2 ac would have been in very close proximity to each other. Separation was nil vertically and 4nm horizontally.

THE EMB145 PILOT reports enroute to Germany IFR and in receipt of a RCS from London squawking 3401 with Mode C. During intermediate level-off at FL310 near OCK on radar heading 155° assigned by London on 132·45Mhz at M0·76, they were transferred to the next frequency 127·43MHz. On initial contact the controller gave avoiding action turn onto 060° against traffic in their 3 o'clock at the same level. The turn was made and the conflicting ac was first seen about 4-5nm away by the FO (the B737) in a R turn away from them. Further discussion with the controller established that minimum separation was 4nm. The B737 was only 'proximate' traffic on TCAS at the time of the turn and no TA or RA warnings were generated.

THE B737 PILOT reports enroute to France IFR and under control from London on 132·84MHz. After reaching their cleared cruising level of FL310 they were instructed to *'turn R heading 180 now, avoiding action'*. They immediately turned, switching the bank angle to 30° (it was on 10° as per SOPs above FL300). The traffic produced a TCAS TA and was spotted on the display and visually (possibly a B757 at 10 o'clock same level). While turning they were instructed to *'descend immediately to FL300'* which was initiated immediately. After the event they were thanked and were cleared to resume their own navigation to SFD.

ATSI comments that the B737 was routeing from Dublin to Beauvais, maintaining FL310 whilst the EMB145 was from Birmingham to Stuttgart and climbing to FL310. The B737 crew established contact with the LACC Sector 1 Tactical controller (S1T) at 0626:50 and reported inbound to NIGIT. The Tactical acknowledged this and advised the crew to route to Seaford after NIGIT. At 0629:35, the crew were instructed to turn L 5°, which the pilot advised would be a heading of 105°. At this time the B737 was about to pass over Lyneham and the EMB145 was in its 10 o'clock at a range of 49nm. At 0634:30, in order to sequence the B737 with others routeing inbound to the Paris TMA, the crew were instructed to maintain M0·78 or less.

The S2T reported that he had received a strip on the S'bound EMB145 climbing to FL310 and was scanning the radar whilst planning what level he could climb the ac to when it called. He saw the B737 heading approximately E, at FL310 and towards his sector boundary. He leaned across to the S1T and asked if he had seen the 2 ac. The S1T had noticed the 2 tracks at about the same time.

The S1T was about to instruct the B737 crew to turn R direct to Seaford when the crew of a B767 called. This was coincident with the EMB145 changing to a foreground intruder on the S1 radar display. He ignored the B767 crew's call and transmitted *"B737 c/s route direct to Seaford"*. At this time (0636:14) the B737 was still maintaining FL310 (G/S 504kt) with the EMB145, which was passing FL307 for FL310, in its 10 o'clock at 9·7nm (G/S 356kt). A turn to Seaford would have required the B737 to turn R some 40° and the S1T believed that this could be achieved with a 'normal rate turn' thus both ensuring separation against the EMB145 and keeping the B737 within his sector airspace. Unfortunately, there was no reply from the B737 flight and the crew of the B767 asked whether it was them that had been cleared direct to Seaford. The S1T replied "*Negative, (B737 c/s) route direct to Seaford now*" but again there was no response. He transmitted the instruction for the third time (0636:30) and the B737 crew acknowledged it but, by now, the 2 ac were only 7·9nm and 100ft apart. The S1T then instructed the crew to turn R immediately heading S as avoiding action, to which the crew responded *"turn right er heading immediately south B737 c/s"*.

[UKAB Note (1): The RT transcript reveals that following this exchange at 0636:53 the S1T transmits *"B737 c/s confirm avoiding action turn right heading south"* to which the crew responds *"affirmative sir we're in the turn now heading south"* followed immediately by *"we have the traffic in sight and on TCAS"*. Just after 0637:10 the S1T transmits *"B737 c/s descend immediately flight level three hundred"* which was acknowledged.]

The B737 was displayed as a foreground intruder on the S2 display and 1sec later, at 0636:38, STCA activated when the ac were 7·3nm and 0ft apart. The S2T had shouted to the LMS Tactical, the position being operated by a mentor and trainee, to turn the EMB145 L but they advised that they had already transferred the aircraft to the S2 frequency. When the EMB145 flight called on frequency (0637:04) stating *"...turning for Dover Flight Level three one zero requesting Flight Level three seven zero"* the initial transmission from the S2T (0637:10) was *"EMB145 c/s er avoiding action I say again avoiding action turn left heading zero six zero"*.

[UKAB Note (2): The RT transcript reveals that following the EMB145 crew's acknowledgement the S2T transmits *"EMB145 c/s traffic information traffic er in your three o'clock range er four miles same level"*. The crew responds *"EMB145 c/s visual with that traffic"* following which the S2T transmits *"Okay and for your information he is turning right but er at the moment we got less than normal"*.]

Separation reduced to a minimum, at 0637:20, of 4·1nm and 0ft.

[UKAB Note (3): The LACC Unit Report states that the S1T reported his workload and traffic complexity were both very high, with a large number of fpss. Although he stated that he was not actually overloaded, traffic levels were such that he was close to his capacity. The S2T described his workload and complexity as low.]

AIRPROX REPORT No 141/07

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 NATS Advisor informed Members that both subject ac were in unusual positions, the B737 had been left on a heading for longer than normal and the EMB145 should have been much further to the E. The Unit Investigation report recommended that a Buffer Zone be established between S1 and S2 within which ac should not be positioned without prior coordination. NATS Safety Dept concluded that this occurrence was a 'one off', owing to the subject ac's unusual positions, and that a buffer zone would restrict the tactical use of the existing airspace. Following this Airprox, a reminder was issued to controllers about their responsibilities when working traffic close to Sector airspace boundaries.Members opined that an amalgamation of several small elements had led to this conflict near the boundary of the 2 Sectors. Firstly, the LMS controller had placed the EMB145 on a radar heading which had resulted in the ac tracking parallel and close to the S2 W boundary. Secondly, the S1T had placed the B737 on a radar heading for traffic streaming which led to the ac tracking well to the E of its intended track from NIGIT to SFD. Good Team Resource Management (TRM) highlighted the potential conflict and the S1T had instructed the B737 crew to turn R to SFD. However, this instruction was given immediately after a B767 flight made its initial call on frequency and the B737 crew did not respond. The B767 crew replied asking if the turn was for their flight, the S1T stated it wasn't and again issued the turn instruction to the B737 crew; this again went unanswered. Finally, after a third attempt, the B737 crew acknowledged the turn which the S1T immediately followed with an avoiding action turn onto S and then a descent to FL300. The crew reported visual and TCAS contact with the EMB145 and the radar recording showed prompt reaction by the B737 crew to these last 2 instructions. After much discussion, Members agreed that had the B737 crew assimilated the controller's initial turn instruction, the situation would have been adequately resolved without any loss of separation and the missed calls from the S1T to the B737 crew had contributed to the incident. The S2T saw the deteriorating situation but his attempts to resolve the situation through the LMS were thwarted as the EMB145 crew was already in the process of transferring to his frequency. After the EMB145 flight's initial call, the S2T gave it an avoiding action L turn away to the E which was immediately acknowledged and actioned, the crew reported visual and TCAS contact with the B737. At the end of the day the Board agreed that, although singularly untidy, all of these elements when combined had been effective in removing any risk of collision.

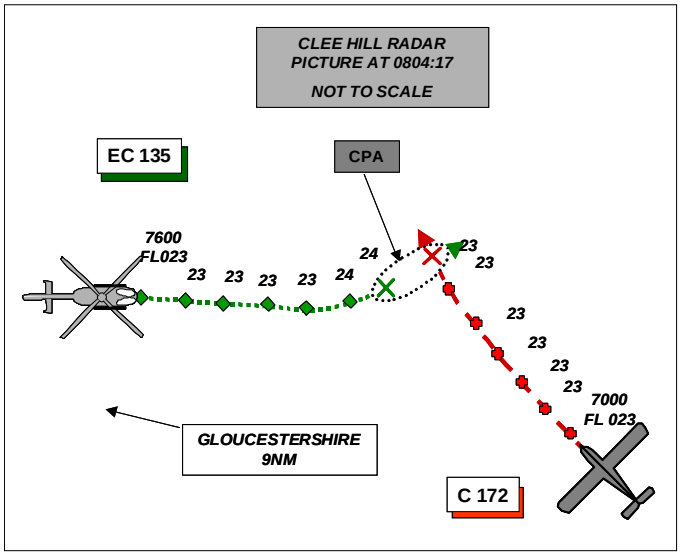
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict near the boundary of two Sectors, compounded by the B737 crew missing S1T's RT calls.

Degree of Risk: C.

AIRPROX REPORT NO 142/07

Date/Time:	21 Sep 0804	
Position:	5153N 00155W (9nm E Gloucestershire Airport)	
Airspace:	Lon FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	EC135	C172
Operator:	Civ Trg	Civ Pte
Alt/FL:	2300ft (QNH 1014mb)	2300ft (QNH NR)
Weather	IMC KLWD	IMC KLWD
Visibility:	0-1000m	IMC
Reported Separation:	0 V/500m H	Not Seen
Recorded Separation:	100ft/ 0.3nm	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EC135 PILOT reports flying a training flight with a trainee pilot in the RHS on a local flight from Gloucestershire, in receipt of an APP service from them and squawking 7000 with Mode C. His trainee was the HP and they were flying level at altitude 2300ft and had been heading 080° at 100kt but had just commenced the base turn pilot for NDB/DME approach to RW27. Part way through the turn he saw what he thought to be a Cessna 172 about 500m ahead of his ac level on a NW track. The Cessna was flying in and out of cloud, as were they, the cloud structure being about 6/8 with a base of 2000ft with the tops at about 4000ft. He took control from the trainee and stopped the left turn in order to pass safely behind the Cessna. He assessed the risk as being very high.

THE C172 PILOT reports flying a private VFR flight routeing, White Waltham, CPT direct to Berrow (nearLedbury)at 115kt. The weather enroute was forecast to be VFR in the Thames Valley and Severn Valley with cloud on the Cotswold Ridge to the E of Cheltenham. After continuing for 6nm on a heading of 270° beyond CPT he requested a VFR transit through Brize Zone at 2000ft but due to the heavy traffic level he was given a routeing, off his planned route which went through the Gloucestershire overhead, flying instead but one mile to the E of Brize Norton followed by 'own navigation'. This took him overhead Little Rissington and Bourton on the Water and 3nm beyond Bourton he set the GPS direct track to Berrow however, mindful of the instrument approach to Gloucestershire he intended to route to Winchcombe before turning on track to Berrow. There was a small band (5nm wide) of cloud over the Cotswold ridge which he was flying through at 2300ft heading 284° when he heard the other ac inform Gloster APP of an Airprox. Within a few seconds of this he returned to VMC again and he noticed that he was just to the S of Winchcombe and he did not see any other ac. After leaving the Brize Zone frequency he had been listening out on Gloster APP and did not hear any other aircraft on the frequency. On hearing that an Airprox had been filed he called Gloster APP and gave his approximate position and details and later on landing at Berrow he telephoned them.

He offered the following comment; henceforth he will:

Attempt to use a radar service when available even for brief periods IMC.

Establish 2-way communication with ATC when in the vicinity of an instrument approach

As operating from Berrow 9nm NW of Gloucestershire discuss with them their preferred routings for his regular flights in their vicinity.

He also thought that the CAA 1:500000 maps should show the Gloucestershire instrument approach, as extending the full 10nm and not 6nm as shown on the map, which he thought was misleading. He further suggested that with the increase in commercial aviation over the last 5 years has made Gloucestershire a popular destination for instrument training and consequently their instrument approach has gone from occasional to frequent use. Ac leaving the Brize Zone heading to the W are only 10nm from the Gloucestershire instrument approach and since frequently there is cloud on the Cotswold Ridge, an early handover to Gloster [Radar] would be extremely helpful when such conditions prevail.

UKAB Note (1): The recording of the Clee Hill Radar shows the incident clearly. The C172 approaches the incident area tracking 320°, indicating FL023, with the EC135 in its 11 o'clock tracking generally Eastwards and also indicating FL023 but it climbs to FL024 (2430ft amsl) two sweeps before the CPA.

UKAB Note (2): The Gloucestershire METAR for 0750 was:

EGBJ 210750Z 21012KT 9999 FEW013 SCT020 BKN035 16/12 Q1014=

ATSI reports that Gloster ATC was operating a combined TWR/APP service, without the use of radar. The EC135 was carrying out an IFR approach while the C172 pilot was only listening out on the frequency; consequently, ATC was not aware of the confliction between the subject ac until the EC135 pilot reported it to them. (The C172 contacted the frequency after hearing the report). No ATC causal factors were revealed.

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 controllers involved and reports from the appropriate ATC authorities.

Members noted that this incident had occurred in Class G airspace where the pilots shared a responsibility to see and avoid other ac and in this case both pilots were poorly placed to do this since they chose to operate IMC, in cloud, without a radar service. Fortunately, a large enough gap in the clouds appeared just in time for the EC135 instructor to see the C172, 500m (10 sec) ahead and take effective avoiding action. The Board unanimously agreed that flying in IMC through Class G Airspace without a radar service is unwise and has an inherent risk attached since the 'see and avoid' principle is dispensed with without any back-up method whatsoever of detecting other ac. The Board noted that the C172 pilot acknowledged this in his report. They also noted that, since the EC135 was known traffic to Gloster APP and was in receipt of a procedural service, they might have been able to give the C172 pilot a warning of its presence and approximate area of operation had he called them; in the event, since he was only listening out, he received no such warning.

It is acknowledged that Gloster APP do not always provide a radar service to either locally based ac or to transit traffic and they have no obligation to do so. That being the case, Members suggested that pilots operating in that area should fly at an altitude that allowed the local LARS service providers namely Brize Norton, Bristol or Filton to provide such a service if they are forced to fly in IMC.

Since both pilots deliberately placed themselves in a situation where they were not able to detect the presence of any other ac, the Board agreed that safety had not been assured; the EC135 pilot's avoidance manoeuvre however had ensured that there was no risk of collision.

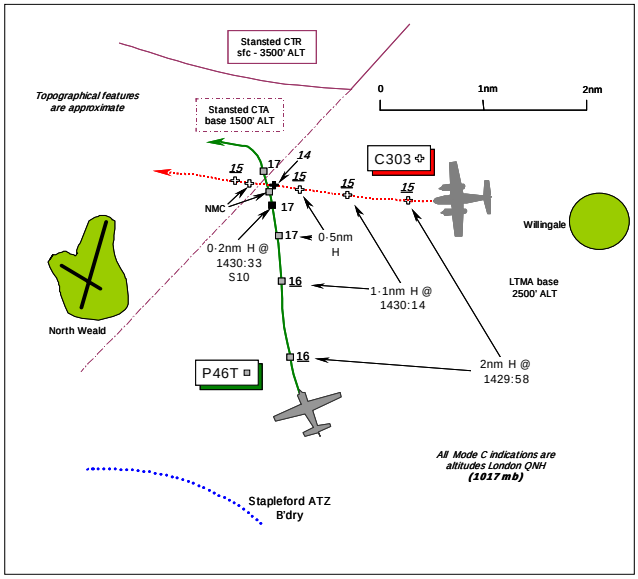
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class G Airspace resolved by the EC135 instructor.

Degree of Risk: B.

AIRPROX REPORT NO 143/07

Date/Time:	23 Sep 1430 (Sunday)	
Position:	5144N 00012E (2nm ENE of North Weald A/D - elev 321ft)	
Airspace:	CTA/London FIR	(Class: D/G
	Reporting Ac	*Reported Ac*
Type:	PA46T	C303
Operator:	Civ Pte	Civ Pte
Alt/FL:	1400ft	1400ft
	QNH (1020mb)	QNH
Weather	VMC CLOC	VMC NR
Visibility:	10+km	10+km
Reported Separation:		
	100ft V/0·2nm H	NR
Recorded Separation:		
	300ft V @ 0·2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PIPER PA46T MALIBU PILOT provided a very comprehensive account and reports he was returning to North Weald from France following an IFR transit with 3 passengers, one of whom was a qualified pilot. Thames RADAR had cleared him to descend out of Class A CAS near Rochester and provided a RAS, he thought, until about 12nm SE of Stapleford, before he switched to Stapleford RADIO flying at around 2400ft QNH under VFR. A squawk of A7000 was selected; Mode S and TCAS I is fitted. He steered N and E of the Stapleford ATZ and briefly talked to Stapleford RADIO to ask for traffic information. During a gentle descent he then changed frequency to North Weald RADIO on 123·525MHz about 10nm out to obtain cct joining information. He was flying in "perfect VMC" on one of the best days for flying conditions he could remember during the year. The RW in use at North Weald was RW20 RHC, but in view of his direction of arrival he requested and was granted a LH join DOWNWIND for RW20 whereupon the A/G Operator informed him of "no known circuit traffic". As he joined the LH DOWNWIND leg at around 1400ft QNH (1020mb) - he remembers this altitude as he was aware of the need to be below the 1500ft amsl base of the Stansted CTA – about mid-way DOWNWIND at 130kt, heading 020°(M) some 2nm abeam of the Tower he became aware that his TCAS was displaying an ac ahead and to the R. The yellow filled diamond colour on the Garmin 530 TCAS indicated a very close ac and a TA of "TRAFFIC TRAFFIC" was enunciated. The TCAS showed the other ac was 100ft below his altitude so he made sure he did not descend further on the DOWNWIND leg. His options were limited in his view as he was aware that a climb could take him into the Stansted CTA. He asked his front right-hand seat passenger to look out for the other ac, who spotted the C303 200yd away slightly below and to his R heading broadly WSW to pass directly underneath the PA46T. This course took the C303 directly overhead North Weald aerodrome at about 1000ft agl. As the C303 passed 100ft directly beneath he saw the ac appear on his portside heading away in a WSW direction at about 140kt. He immediately reported the "miss" on RT to North Weald RADIO. He saw clearly that the other ac was a white coloured light twin, but he did not get the registration as it all happened very quickly with a *"very high"* risk of a collision. The North Weald A/G Operator advised that the C303 pilot was not in contact with North Weald RADIO on RT.

After he had landed he telephoned Essex RADAR, who advised that the C303 pilot had not been 'working' them either. Whilst he recognised there was no ATZ at North Weald and that the other pilot "did not need to work" North Weald on RT, it was nonetheless a busy mixed circuit, including jets, and in his view it was irresponsible of the C303 pilot to transit without calling on RT.

The direction of the C303's approach meant the other ac was below his PA46T's starboard wing and hard to see. With his PA46T above and ahead of the C303 he believed it would have been easier for the C303 pilot to see from his direction and he hoped sincerely that his ac had been seen by the C303 pilot and that he had been watching his ac. Wing and tail HISLS were on. The Airmiss (sic) was also seen by a pilot on the ground.

AIRPROX REPORT No 143/07

THE C303 PILOT provided a very full account of his flight reporting that, with another pilot as a passenger sitting in the P2 position, he flew his C303 on three legs, landing both at Clacton and Rochester before returning to Denham. Recently, he has had a panel mounted GPS installed so to demonstrate waypoint usage, as his P2 passenger often uses Willingale airfield as a waypoint - about 5nm E of North Weald aerodrome - he flew over Willingale on the leg to Clacton and stored it as a waypoint. Therefore, upon his return he routed Rochester, Willingale, Brookmans Park to Denham. The reported Airprox occurred on the Willingale to Brookmans Park leg whilst he was listening-out with Stansted/Essex RADAR on 120·625MHz, but he was not in receipt of an ATS. Whilst his ac is not equipped with TCAS, it is fitted with Mode S, but he has recently experienced multiple intermittent problems with the Mode S transponder. This resulted in the unit being removed for servicing on 5 October – less than two weeks after the Airprox occurred. One problem involved the unit responding FL130 when he was at 2000 or 3000ft, which caused serious problems. Depending on whether or not the transponder was faulty on the day in question and what that fault was, it could have been either: switched off; on with Mode A selected only; or on with Mode S. If it were fully serviceable he would have selected A0013 in accordance with AIC 4/2007 (Yellow 228), but he is unable to confirm his transponder setting or Mode selected at the time.

After leaving Willingale on track of approximately 274°(M) towards Brookmans Park, aiming to pass between Stansted's CTR to the N and North Weald to the S, he descended from 2400ft to 1400ft QNH to remain below Stansted's CTA. As he approached a position about 1¼nm NE of North Weald's RW20 threshold at 157kt at 1400ft London QNH, he spotted an ac in his 9 o'clock about 1nm away – the PA46T. The other ac was high - possibly a little higher than his C303 - on what he presumed to be the DEADSIDE to RW20 at North Weald, but appeared to be DOWNWIND LH for RW20 and descending. He thought, the PA46T continued to descend and passed below and behind him but he was unable to quantify the separation. He believed that their trajectories were predictable; consequently he took no avoiding action and maintained his heading and altitude. According to the Rules of the Air, if the other traffic were not in the circuit, which to his mind is in some doubt, he would have had 'right of way'.

Stressing that he was concentrating on looking out for normal cct traffic to the W of North Weald aerodrome at 800ft QFE, he was very surprised to see the PA46T where it was, however, he does not believe there was a risk of collision.

He is very familiar with North Weald and its procedures. To avoid North Weald Basset and other noise sensitive areas, all ccts are to the W of RW02/20 at 800ft QFE, as published in all flight guides and, he thought, universally practised by airfield users. The surface wind over SE England that day was approximately 200° at 10-15kt, so he believed RW20 would have been in use with a RH cct. Overhead joins are not approved at North Weald, and the A/G Operator always requests traffic to join downwind or crosswind at 800ft QFE i.e. 1121ft QNH. The airfield is unlicensed, there is no ATZ and it is situated in Class G airspace. As gliding ceased sometime ago (he believed they used 20LH), other than model flying, there are no longer any additional activities affecting either published or normal procedures.

This is a well-known E-W choke point made even worse by London City's new CTA. If he had chosen the alternative routeing via LAM VOR there is only 315ft between the top of Stapleford's ATZ and the base of the LTMA and only 2nm between Stapleford's ATZ and London City's CTA, plus the 'honey-pot effect' of the VOR. With hindsight he believes it would have been better airmanship if he had spoken with North Weald and not monitored Stansted. It is a lesson he will not forget in a hurry and one that he has most certainly learnt from. At all times he had strobes, anti-collision and nav lights on.

He does hope the other pilot was not too troubled by the event and offers the PA46T pilot his sincere apologies. Maybe both he and the PA46T pilot had learned a worthwhile lesson and he opined that we do not fly to endanger or frighten either each other, ourselves or most certainly, never our passengers.

[UKAB Note (1): Although the CAA Topographical VFR 1:250000 Chart – Sheet 8 England South (Air Information date 15 Feb 2007) - annotates North Weald as a winch launch glider site where launches may attain an altitude of 2400ft amsl, wef 14/06/2007 this chart was amended to remove all reference to gliding activity at North Weald. Whilst Pooleys Flight Guide (2007) notes that gliders operate in the opposite cct direction, direct liaison with North Weald confirmed that gliding no longer takes place.]

ATSI reports that the PA46T pilot established communication with North Weald RADIO at 1428. The pilot was advised the RW in use was 20, with a right hand circuit and was issued with the QFE. The pilot responded that, as he was inbound from the SE, could he join LH DOWNWIND for RW20. The A/G Operator replied *"..roger just*

avoid the village if possible". Shortly afterwards, the pilot requested whether there was any traffic in the 'ATZ'. [North Weald aerodrome does not have an ATZ.] The operator had no contact with other traffic near to the airfield. The pilot commented on RT that there was a Twin going right through your 'ATZ' at about 1300ft. He added that he considered that it was *"very dangerous"*. A pilot of an ac on the ground reported that he had seen the incident and in his opinion it was *"pretty close"*.

UKAB Note (2): Analysis of recorded radar data shows the PA46T squawking A7000 approaching the Airprox location from the S, after skirting to the E of Stapleford, levelling at 1600ft London QNH (1017mb). At 1429:58, the C303 is shown squawking A7000 in the PA46T pilot's R 1:30 position at a range of 2nm, indicating 1500ft London QNH (1017mb) - some 100ft below the PA46T. The two ac converge to a range of 1·1nm at these indicated altitudes as the PA46T passes 1·7nm E abeam N Weald broadly on a downwind heading, but thereafter the latter climbs slightly to 1700ft London QNH as the C303 starts to draw L approaching the 'merge'. The Stansted 10cm recording shows that at 1430:33, the C303 had descended 100ft to 1400ft London QNH when in the PA46T's 12:30 position at a range of 0·2nm, just before crossing ahead indicating some 300ft below the PA46T at 1700ft. The Mode C indication on the PA46T is then lost and neither is a return evident from the C303 on the next sweep as the tracks cross and the PA46T opens into the C303's 4 o'clock, the former indicating 1700ft Mode C once more but the C303 with no Mode C. The C303 maintains course to pass 1nm to the N of the aerodrome at 1500ft Mode C as the PA46T turns onto a L base for RW20 at N Weald.

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 ATC authority.

The Board appreciated the full accounts provided by both pilots here, which laid out plainly the essential details of this encounter in the confined airspace beneath the Stansted CTA. It was evident that the P46T pilot was mistaken in his comments on RT to the North Weald A/G Operator regarding the C303 transiting through an ATZ, as he plainly realised later that this aerodrome was not afforded such airspace and commented on this within his own report. Consequently, in this case Rule 45 to the Rules of the Air Regulations 2007 [previously Rule 39] could not mandate communication with the aerodrome A/G Station. Although the C303 pilot was aware that he was passing close to the aerodrome, he had understandably elected to listen out with Stansted whilst passing underneath their CTA, instead of North Weald RADIO. Nevertheless, the Board agreed that when passing this close to an active aerodrome, especially crossing just above the FAT and the cct area, good airmanship should dictate that pilots comply with the 'spirit' of Rule 45 and advise the A/G Station of their presence in good time. This enables transit pilots to gain situational awareness of the cct traffic and pilots within the cct area, or joining, to determine what traffic is flying in their vicinity, thereby assisting them to keep a good look-out for each other. It was clear from the C303 pilot's report that he had wisely taken this lesson 'onboard'.

The reporting pilot's concerns over the presence of the C303 passing close to the cct area without any RT contact and the airspace constraints were all clear. However, whilst positioning to join the LH cct to RW20 DOWNWIND, the radar recording showed that the P46T pilot had flown a relatively wide pattern. Members believed that without the relative 'protection' of an ATZ, it might have been preferable to have joined overhead for the promulgated RH cct and perhaps remained somewhat more predictable to other pilots flying in the 'Open FIR'. It was stressed that it is outwith an A/G Operator's remit to grant any request at variance to promulgated procedures, nor do they have the ability to provide a 'clearance' to any pilot's request so responsibility lies solely with the pilot concerned to act on the aerodrome information provided. If the C303 pilot was unsure that the P46T was in the North Weald cct this was, in a CAT pilot Member's view, not unreasonable. Since a LH cct is not promulgated for use and with the P46T in the order of 1300ft aal and high when spotted by the C303 pilot, this perception would be understandable. The P46T pilot reports he had maintained 1400ft QNH (1020mb), however, the radar revealed that he had climbed to an altitude of 1700ft London QNH (1017mb) just before the CPA. Collision avoidance is clearly paramount and the tolerances applicable to Mode C of +/- 200ft made entry into the CTA uncertain and at variance with the pilot's account, but the radar recording suggested that the P46T had wisely held no less than 200ft above the indicated altitude of the C303 before the CPA. The P46T pilot was still unsighted at this stage, although he was plainly aware of the other ac from his TCAS 1 display before he spotted the C303 himself after the CPA. Clearly descent by the P46T pilot whilst unsighted would have been unwise, but whilst he knew he was circuiting to land and might have believed that he had 'right of way' others did not. Although the P46T had been sighted from 1nm away by the C303 pilot, Members reiterated that from another pilot's view, it might not have been immediately apparent that the PA46T was circuiting to North Weald. Therefore, a pilot spotting another ac to port on a converging course

might at that stage have believed that the other pilot would remain clear in accordance with 'the Rules'. However, the 'Rules of the Air' can only work effectively if pilots sight each other's ac in time to take appropriate action. The lesson here is that pilots must not assume that their ac has been seen by the other pilot, so they should always be prepared to take avoiding action themselves to forestall a close quarters situation. This sage advice applied equally to the C303 pilot, who had spotted the other ac at a range of 1nm and Members were surprised that he had not taken any action at that stage. If the C303 pilot thought that the P46T had passed beneath his twin he was mistaken; with the close proximity of the base of the CTA in mind, it was clear from the radar recording that the C303 pilot had maintained his altitude initially, but had then descended 100ft at the last moment to pass underneath not only the CTA but also the P46T, which the Mode C reflected had flown above him. The P46T pilot had not specified at what range he had detected the C303 on his TCAS 1, but there seemed to be no reason that the C330 could not have been spotted earlier as it was plainly there to be seen to starboard in the prevailing good weather. It was evident to the Board that the reporting pilot had not actually seen the C303 himself until he saw it going away some 200ft beneath his ac as it cleared to port. Members considered whether the PA46T pilot had relied too much on his RH seat passenger to keep him apprised of the proximity of the C303, whilst perhaps concentrating too much on the aerodrome off his port wing. If the PA46T pilot had searched more diligently for the other ac and spotted it earlier, the potential for a close quarters encounter might have been more apparent. Pilots should also be wary of over reliance on TCAS 1 for azimuth guidance, as such displays do not give an accurate indication of the horizontal geometry of conflictions. Thus it was apparent that the C303 had not been sighted in time by the P46T pilot to ensure it would pass clear. In the Board's view, this Airprox had stemmed from effectively, a non-sighting of the C303 by the P46T pilot.

Turning to risk, the radar recording had demonstrated that just as the respective ac tracks crossed, the P46T was some 300ft above the C303. Therefore, with the reporting pilot aware of the C303 from his TCAS 1display and conscious that he should not descend, coupled with the C303 pilot's report that he had sighted the other ac from 1nm away and always able to manoeuvre if required, the Board concluded that no risk of a collision had existed in the circumstances conscientiously reported here.

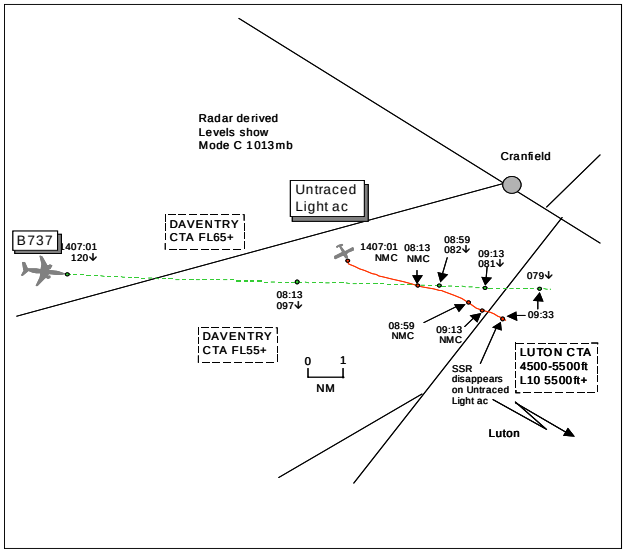
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively a non-sighting of the C303 by the P46T pilot.

Degree of Risk: C.

AIRPROX REPORT NO 144/07

Date/Time:	22 Sep 1409 (Saturday)	
Position:	5201N 00039W (13nm NW Luton)	
Airspace:	Daventry CTA	(Class: A)
	Reporting Ac	*Reported Ac*
Type:	B737-700	Untraced
		Light ac
Operator:	CAT	N/K
Alt/FL:	↓FL80	NK
Weather	IMC IICL	NK
Visibility:		
Reported Separation:		
	Nil V/1nm H	NK
Recorded Separation:		
	0·6nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports on descent to FL80 into Luton IFR and talking to London on 119·775MHz squawking with Mode S. Between CLIPY and BOMBO they received a TCAS TA alert on traffic showing 1nm to their R with no altitude indication. As they were just clearing cloud they started looking out and saw a single engine piston ac at the same altitude at about 1nm. No avoiding action was taken as they were fully visual at the time but they reported this encounter to ATC and agreed to file an Airprox. He assessed the risk as medium.

RAC MIL carried out extensive tracing action and identified an ac that may have been involved in the Airprox. However the pilot concerned reported that he was flying a trial lesson from Cranfield in a PA28 and was flying not above 3500ft routeing N and NE and he concurred with the departure and arrival times supplied by Cranfield ATC. No ac is seen departing to the NE of Cranfield commensurate with the PA28's departure time nor is any radar return seen routeing towards Cranfield from the NE to correlate with the PA28's landing time. However, the radar recording shows a primary return with co-located SSR appearing just over 1min after the PA28's ATD 1nm SW of Cranfield tracking SSW and then W'ly. This radar return then routes SE'ly, crosses ahead of the B737 and passing close on the RHS of the B737, the Airprox, before manoeuvring adjacent to Woburn Abbey. This ac then tracks N and fades 1·4nm SSE of Cranfield about 3min before the PA28's ATA. This difference between the PA28 pilot's stated route and radar data could not be resolved so the identity of the reported ac remains untraced.

THE LTCC NW DEPS RADAR CONTROLLER reports the B737 was being vectored for RW26 at Luton. When the ac was about 10nm NW of Luton the crew reported that there was an ac in their 1 o'clock position at about 1nm. He responded that there was an ac seen there but that it was believed to be below CAS and that there was no height readout displayed. The B737 crew replied that they were visual with it at a similar level, as they were at FL80, and that it was a light single engine ac, perhaps a Grumman type. The B737 came within 0·6nm of the reported ac.

ATSI comments that the B737 flight was inbound to Luton and first contacted the TC NW Deps controller at 1404:05. The pilot reported that they were heading 155°, descending to FL150 with a speed of 330kt. At this time the B737 was 22nm SE of Birmingham Airport. The controller instructed the crew to descend to FL130 and when level, to reduce speed to 250kt.

At 1405:40, when the B737 was 30nm NW of Luton, the controller instructed the crew to turn L heading 095° and descend to FL110 and then a little over a minute later, when the ac was 22·5nm NW of Luton Airport, the controller instructed the crew to descend to FL80. At this time there are a number of returns displaying 7000, in the vicinity of which around half have an associated Mode C readout, the highest of which was 3000ft.

At 1409:00, the crew were instructed to descend to altitude 6000ft, QNH 1020mb which the crew read back and added "*…there's a light aircraft here just about a mile to the right of us is that normal*". The controller replied that it was believed to be outside CAS and that no height readout was displayed. The crew responded with "*Yeah he's just er it must be about flight level eight zero and he was about one mile to the left of to the right of us*". The controller then confirmed that the other ac was now in the 4 o'clock position of the B737 and advised that it was unknown traffic, which was operating within CAS, where the base is FL55, without a clearance.

UKAB Note (1): Analysis of the Stansted radar recording at 1407:01 shows the B737 tracking E descending through FL120 and converging with the unknown ac squawking 7000 NMC in its 1130 position tracking approximately 150°, crossing from L to R. Shortly after this, the unknown ac turns L on a track of 110° and at 1408:13 crosses through the 12 o'clock position of the B737 at a range of 3·3nm. Thereafter the unknown ac diverges slowly to the ESE until 1408:59 when it turns R by about 20°. Meanwhile the B737 continues on a steady track and effectively 'overtakes' the traffic. The CPA occurs at 1409:13, the B737 passes due N of the traffic at a range of 0·6nm as the tracks continue to diverge. Twenty seconds after the CPA the unknown ac's SSR responses disappear completely, the ac showing as a primary only return thereafter.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the B737 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 could add little to this report and it was unfortunate that the pilot of the light ac remained untraced, thus only one aspect of the encounter was available. The NW Deps controller was following SOPs whilst vectoring the B737 within CAS, the untraced light ac was squawking 7000 with NMC so the controller deemed this to be unknown traffic outside CAS. It was only after the B737 crew queried the other ac's presence did the situation become apparent to NW Deps. Pilot Members wondered how this sort of incursion could occur as there had been no recent changes of CAS boundaries/levels in the area so the light ac's pilot should have been cognisant of the airspace structure from the promulgated 1:500,000 topographical chart during both the pre-flight planning phase and the actual flight. Members were in no doubt that the cause of this Airprox was that the untraced light ac pilot made an unauthorised penetration of the Class A Daventry CTA and flew into conflict with the descending B737. Without the light ac pilot's viewpoint, the reason for this infringement remained known only to the pilot in command at the time.

The only safety net that worked here was the B737's TCAS but only a TA alerted the crew, as the other ac was not squawking Mode C. As the B737 broke cloud the crew was able to acquire the light ac visually to their R at a range of 1nm on a diverging track and watched it pass clear on their R at the same level. Owing to the rate of closure and unexpected nature of the event, 2 Members believed that safety had been compromised. However, this was a minority view. In this case the light ac had crossed more than 3nm ahead of the B737 on a generally SE'ly track. Thereafter, the risk of collision had diminished as the subject acs' tracks diverged, the B737 overtaking and passing to the N of the unknown ac with the crew reporting fully visual with it and assessing that avoiding action was not necessary. This was enough to persuade the Board that the B737 crew was always able to react and take timely avoiding action, if it subsequently proved necessary, to avoid the light ac thereby removing any risk of a collision during this encounter.

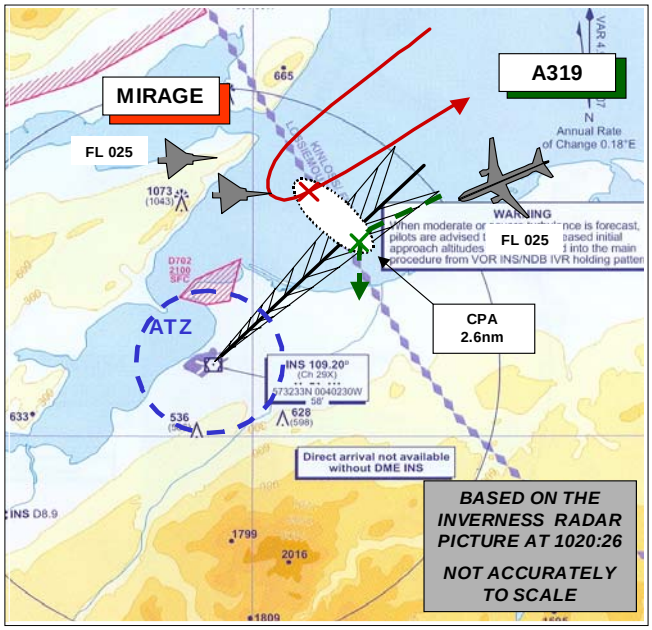
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The untraced light ac pilot made an unauthorised penetration of the Class A Daventry CTA and flew into conflict with the descending B737.

Degree of Risk: C.

AIRPROX REPORT NO 145/07

Date/Time:	20 Sep 1021	
Position:	5739N 00350W (7.8nm RW23 Inverness - elev 31 ft)	
Airspace:	Scottish FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	A319	Mirage 2000 x 2
Operator:	CAT	Foreign Mil
Alt/FL:	2100ft (QNH)	NR (N/K)
Weather	VMC NR	VMC NR
Visibility:	10km	10km
Reported Separation:	3-4nm H(TCAS)	Not Seen
Recorded Separation:	100ft V/2.6nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A319 PILOT reports flying a scheduled passenger flight to Inverness. He was heading 250-260° in receipt of a RAS at 2100ft (QNH) and 185kt, closing with the final ILS approach at 7-8nm when ATC gave him an 'avoiding action' left turn onto 180° which he actioned. They were not able to turn away from the hills for a significant amount of time and when the approach was made available to them his preferred option of a left hand turn to reposition on the Localiser was precluded by other conflicting traffic. The only remaining option was for him to make a tight right hand turn and execute a visual landing on RW23 with a close left base turn. The pilot did not see the other ac but reported receiving a TCAS TA and assessed the risk as being high due to the high ground.

UKAB Note (1): Due to the lack of recorded radar coverage and a large military exercise with many low-level movements, it took 4 months to positively identify the other ac involved. When eventually located, the military operator co-operated fully but unfortunately it was not possible to contact the specific crews to elicit further information.

THE MIRAGE 2000 PILOT reports that they were flying an exercise mission from Lossiemouth and at the precise time of the incident were about 20 nm N of Inverness remaining VFR at about 2000ft, trying to re-establish communications with Lossiemouth following a change of plan due to poor weather. They had been forced to make a U-turn, as they had not been able to continue VFR. They intended to ask Lossiemouth for a handover to Scottish Mil and proceed to their operational area at medium level. They were squawking an exercise squawk with Mode C and did not see any other ac.

UKAB Note (2): The tracing action was initially procedural since no radar or RT replay was available. The A319 pilot reported the incident time as being 1015 and this was the time passed to the Mirage pilots. At that time the Mirages were well to the N of Inverness and unsuccessfully attempting to contact Tain Range (Tain transcript). On checking the Inverness RT and Radar Data much later when a limited replay facility was finally achieved, it was found that the incident had taken place at 1021 when the Mirages were much further to the S and in the incident location and again attempting to gain entry to Tain Range (Tain transcript). Further, by then the ac that were originally believed to have been those involved had contacted Lossie APR for their visual approach to RAF Kinloss.

UKAB Note (3): The Mirages were participating in a very large Military Exercise, which was the subject of an extensive ACN and a NOTAM. The following is an extract from the ACN:

AIRPROX REPORT No 145/07

"SL07 aircraft operating below FL45 within 10nm of Inverness, Stornoway, Benbecula, Kirkwall, Wick, Oban, Barra, Islay, Campbeltown, Tiree or Scatsta airfields should contact the appropriate ATC authority to pass position and intentions and receive relevant traffic information."

INVERNESS APR reported that he was the APR controller at Inverness during a period of medium traffic intensity. Several ac believed to be participating in exercise Sky Lance 07, of which he was aware, were operating in close proximity to Inverness airport and this led to his passing of avoiding action to the A319 just as it was establishing on the ILS [for RW23]. An ACN relating to the exercise stated that ac operating below FL45 within 10nm of Inverness should contact the appropriate ATC authority to pass position and intentions and receive relevant traffic information, but with the ac concerned this did not occur. During a subsequent conversation with the A319 captain he stated that he had received a TCAS traffic advisory prior to the avoiding action.

MIL ATC OPS reports that the ac were not in contact with Lossiemouth at the time of the incident.

ATSI reports that the A319 crew established contact with the Inverness APR at 1009:45 and reported descending to FL130 and 35nm from Inverness. APR advised the crew they were identified and placed them under a RAS; the crew were instructed to change squawk to 6164 and passed their position as 37nm S of Inverness.

APR said that he would vector the crew for either an ILS or visual approach to RW23 and instructed them to continue descent to FL85. Further descent clearance to 5000ft was issued at 1012:30, and the crew instructed to continue on their present heading of 005º. At 1013:05 APR instructed the crew to turn right heading 050º. At that time the returns from the Mirage ac were about 37nm NE of the A319.

Due to military traffic to the W of the A319, APR instructed the crew to stop their descent at FL65 and, once they were clear of it, descent to 5000ft was given, together with an instruction to turn left heading 360º. The Mirages were then 31nm NE of the A319, indicating FL21, and tracking W.

At 1018:00 APR instructed the A319 crew to descend to 2100ft and shortly after this to turn left heading 345º. The Mirages were then 15nm due N of the A319 still tracking W. APR then advised the A319 crew that they were 16nm from touchdown and, as the ac was passing FL53, he requested that they expedite their descent. At 1019, a change of controller occurred. The new incumbent instructed the crew to turn left onto a heading of 320º and passed TI on a return in their 2 o'clock at a range of 2.5nm which was squawking but with no Mode C. APR then instructed the crew to turn left heading 270º to establish on the localiser. At this time the Mirages were NNW of the A319 at a range of 8nm, tracking SW, with their labels garbling but showing a single height readout of FL28. APR advised the crew that there was a lot of military traffic '*…out to their right – no factor at the moment*'.

The radar shows that at 1020:10 the Mirages made a left turn onto a southerly track, while they were NW of the A319 at a range of 4.4nm with both Mirages indicating FL27 and the A319 FL25. The Mirages then turned further left onto a SE track and headed towards the A319 and so at 1020:20, APR instructed the A319 crew to make an avoiding action left turn onto 180º and passed TI just as the Mirages were seen to turn left and track away from the A319 to the NE. The closest the Mirages came to the A319 was at 1020:39, when the separation was 2.6nm and 100ft. The Mirages tracked away to the NE and the A319 was repositioned and made a visual approach and landing.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The ATSI Advisor briefed the Board on the problems with the replay of the Inverness Radar and RT recording and informed Members that a solution was still being sought.

The Board noted that this incident had taken place in the Class G Airspace of the open FIR where the pilots had an equal and shared responsibility to see and avoid other ac. The A319 pilot was in receipt of a RAS to assist him with this responsibility but it seemed to some pilot Members that the Inverness Radar Controller did not fully provide avoidance to the pilot (particularly in respect to previous traffic). A controller Member pointed out however that it can be very difficult to do so in an 'approach' situation.

Members were concerned that the Mirages had flown within 10nm of Inverness without talking to their ATC as required by the NOTAM. Members were briefed that at the time the Mirage Leader was talking to Tain Range, attempting to get permission to enter the range. The Board considered that he should have remained slightly further away from Inverness if too busy to make the call to Inverness ATC.

Members noted the A319 pilot's main concern which appeared to be that he was given a heading towards high ground rather than his proximity to the Mirages. The Secretariat informed the Board that this heading had been in accordance with the minimum vectoring altitudes but a pilot Member familiar with the area noted that nonetheless the terrain further to the S is significantly higher. However, the task of the Board is to determine the risk of collision between aircraft and Members agreed unanimously that in this case there had been no such risk. The Board also agreed that the Controller had been fully justified in passing the avoidance to the A319 as the situation was dynamic and he was not aware of the Mirages' intentions.

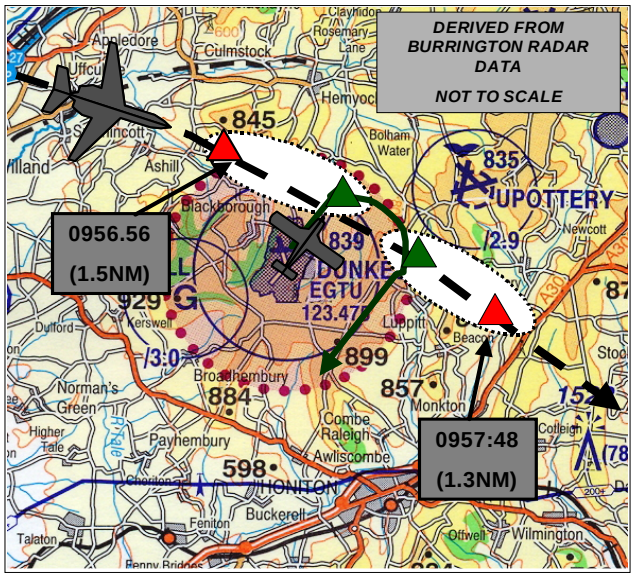
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class G airspace between IFR and VFR traffic in the vicinity of the Inverness RW23 FAT.

Degree of Risk: C.

AIRPROX REPORT NO 146/07

Date/Time:	27 Sep 0957	
Position:	5052N 00312W (¾nm NE Dunkeswell - elev 839ft)	
Airspace:	Dunkeswell ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	PA28	Dominie
Operator:	Civ Trg	HQ AIR (Trg)
Alt/FL:	800ft (QFE 993mb)	300ft (N/K)
Weather Visibility:	VMC CLBC >20km	VMC NR 20km
Reported Separation:	500ft V/½nm H	300ft V/1nm H
Recorded Separation:	400ft V/0·5nm H (as ac abeam one another)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA28 PILOT reports flying a training flight with a student at the controls in the Dunkeswell visual circuit for RW 05 [RH], in communication with them on A/G radio and squawking 7000 with Mode C. The ac was red and white and the Anti-coll beacon was on. As his student rolled out downwind heading 230° at 90kt a Dominie ac was seen in their 11 o'clock low going away tracking about 150°. He estimated that the Dominie had flown ½-¾nm off the upwind end of the RW at a height of about 300ft agl and had passed through an active ATZ and notified parachute drop zone without any RT contact.

Since the other ac was going away when he saw it he did not take any avoiding action but assessed the risk as being Med/High.

THE DOMINIE PILOT reports flying a low-level navigation training flight in a black ac with HISLs switched on, squawking 7001 with Mode C but not in contact with any unit. They were heading 090° [see diagram] at 210kt when the reporting ac was visually acquired at around 4nm prior to them passing clear well behind it. At no stage

did he consider that there was any danger of a collision or a near miss and he was comfortable that they had ensured an appropriate degree of separation. In his view this was not a reportable Airprox event.

However, they did pass closer to Dunkeswell Aerodrome than was planned due to an error in the navigation equipment. A videotape taken at the time of the ac's navigation equipment displays the radar picture of the route flown and contains a limited amount of the crew-intercom conversations.

THE DOMINIE UNIT COMMENTS Dominie crews may only fly at low level once their routes have been well planned. Unfortunately, on this occasion, an error in the ac's on-board navigation equipment meant that the normal separation margins from the civilian aerodrome at Dunkeswell were not met and the crew have acknowledged their mistake in this regard. Even so however, the crew were visual with the Dunkeswell circuit traffic and ensured that they passed safely clear of it.

Having discussed this incident with his flight commanders and FSO, the Squadron Commander is content that this was a one-off occurrence. Nevertheless, the lessons identified have been reinforced to all flying personnel during ground training.

UKAB note (1): Dunkeswell is promulgated in the UK Mil AIP (The UK Low Flying System) LFA2, 'Protected Locations to be Avoided', as a Civil Airfield to be avoided by 2nm (mandatory) from 0800-1800Z or SS in the Summer. It is also promulgated under 'Warnings' as a Free-Fall Parachute Site, 2nm radius, daylight up to FL150.

UKAB Note (2): An analysis of the Burrington radar shows the incident clearly. In the lead up to the CPA, the Dominie is seen squawking and tracking 110° at FL007, but climbing slightly, with the PA28 passing from the Dominie pilot's 1230 to the 11 o'clock, as the PA28 tracked 050° after take off just before turning right and climbing into the downwind leg at FL011. When the Dominie is at a distance of 2nm from the PA28 which is initially at FL008, the Dominie at FL010 turns about 10° to the right and passes 0.7nm behind the PA28 which is by then FL015 while the Dominie had climbed to FL010. The CPA is as the Dominie passes 0.5nm to the S of the PA28 (still in the turn) and 400ft below it, before departing to the SE. The Dominie tracks about 0.9nm N of the ARP for Dunkeswell.

UKAB Note (3): At the time of the incident the Dominie was trying to regain its planned route and (recalculated) timing following a 'Practise Diversion' to Chivenor.

HQ AIR (TRG) comments that being a slave to navigational equipment can, and has in this instance did, get the Dominie crew into difficulty. Crosschecking is not only there for the process, it is there for a reason and at low-level is definitely not optional. The crew have acknowledged their error and will have taken away the learning points and fellow aviators reading this report should do likewise. Although the Dominie crew could see the PA28 and were content with the situation the PA28 pilot was not aware of the proximity of the Dominie until it had overtaken them and was flying away.

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 Dominie operating authorities.

A pilot Member highlighted that the CPA occurred within the ATZ with the PA28 upwind in the circuit. The radar recording showed clearly that the Dominie had penetrated the ATZ and the pilot reported that he had not made any calls on the Dunkeswell frequency.

The Board was briefed that this incident took place while the Dominie was flying on an unplanned leg while returning to the pre-planned part of the route. Although accepting that students make errors on instructional sorties, especially when under the pressure of regaining the planned track and time after an unplanned 'diversion', specialist Members were concerned that the Pilot's Assistant (in the right hand seat), the Nav instructor and the Captain did not notice the student's/nav equipment error and take corrective action. Having been briefed that the Dominie navigation equipment is not very accurate and noting the Dominie Unit comments, specialist Members suggested that this made it even more important than usual to monitor closely the ac's position and track visually. Dunkeswell is often busy and is a well known 'avoid' in the midst of relatively uncongested airspace and can easily be avoided (preferably to the N) by a good margin.

However, an infringement is not necessarily an Airprox, and Members noted that the Dominie pilot had seen the PA28 in good time and avoided it by what he considered to be a reasonable margin. Since the Dominie had approached totally unexpectedly from behind the PA28 and at relatively high speed, Members agreed that the PA28 pilot had most likely been startled despite that it had been a few hundred feet below him and ½nm away. Members were unanimous that there had been no risk in this incident.

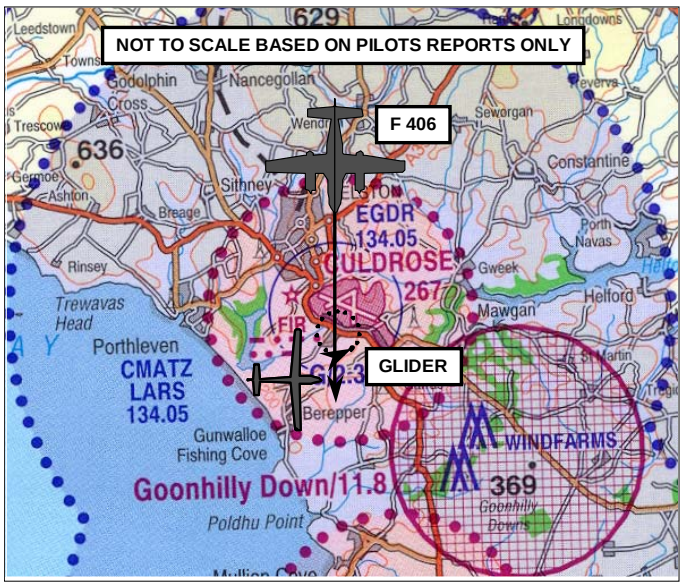
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Following a navigational error, the Dominie penetrated the Dunkeswell ATZ/LFA avoidance and flew sufficiently close to cause the circuiting PA28 pilot concern.

Degree of Risk: C.

AIRPROX REPORT NO 147/07

Date/Time:	29 Sep 1225 (Saturday)	
Position:	5005N 00515W (Culdrose Airfield - elev 267ft)	
Airspace:	ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Capstan Glider	F406
Operator:	Civ Club	Civ Comm
Alt/FL:	1000ft	1750-2050ft
	(QFE NR)	(RPS NR)
Weather	VMC CLBC	VMC NR
Visibility:	5nm	>20km
Reported Separation:		
	100ft V/300ft H	Not Seen
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CAPSTAN GLIDER PILOT reports that at the time of the incident they were launching gliders at frequent intervals using a cable and auto-tow method, the launches reaching between 1000 and 1300ft but they could potentially have been a little higher depending on the wind strength and direction. He was P1 in a short training flight and was circling in thermal at 40kt and at about 1000ft, over the airfield, about 300ft S of the main RW (12) from which they were launching when he saw a twin-engine ac when it was abeam him to the N about 100ft above and displaced by 300ft horizontally. The ac was on a constant heading and by then was no longer posing a significant threat; he was not able to read the registration. Neither ac took any avoiding action and he assessed the risk as being Medium.

He does not recall hearing any radio contact on 130.1 prior to the incident but he heard Glider Control trying, initially unsuccessfully, to contact the twin pilot but the eventual response was unintelligible to him.

THE GLIDING CLUB DUTY INSTRUCTOR reports that on the day of the incident the activity level was very high. The launch point being used was from the 1000ft marker on RW12, and ac were being launched by motor tow.

At about 1235 when 3 gliders were airborne and a 4th was preparing to launch, a twin-engine ac flew over the centre of the airfield from N to S at height he estimated as 1000ft. He called the ac on the gliding frequency of 130.1 but got no response. After a few minutes the ac returned to the area and started to orbit over the airfield in a clockwise direction, apparently close to the airfield boundary but a few hundred feet higher than on its first pass.

He called the ac again and this time got a response and, although it was unclear, he understood that the ac was a C406 engaged in survey work. He asked whether they were aware that they had just flown through the Culdrose ATZ, active with gliders that were cable launching to their height. The initial response was 'standby' but after 30sec he received a further call, which was again unclear, but he understood that the ac was clearing the area; this was confirmed by the ac departing.

The glider pilot involved reported to him that the C406 had initially flown over the airfield and had been within a few hundred feet vertically and horizontally of his ac, so he advised him to submit an Airprox.

By flying across an active gliding site well below potential cable launch height and unannounced, the twin pilot seriously compromised it's own and other's safety for at least two reasons. Firstly, there was a potential risk of collision with gliders that had just launched or were in circuit. Secondly, when glider launching was taking place the cable with glider attached, would have been towed diagonally across the ac's track at a height where there would have been a significant risk of collision, had the incursion coincided with a launch.

THE F406 PILOT reports flying a survey flight with strobe lights switched on, initially in receipt of a RIS from St Mawgan and squawking 1745 with mode C and S. Before leaving their base the Survey Operator called Culdrose ATC for latest weather and advised them of survey location but was told that they would be closing at 1200.

After contacting St Mawgan on Box 1 he asked if Culdrose was open but he was advised that they had closed on Friday at 5pm. He then informed St Mawgan that they would be operating in the vicinity of Culdrose at 1800ft QNH conducting an aerial survey. They tried calling Culdrose ATC on Box 2 as they approached the MATZ but received no reply so he informed St Mawgan that they would remain on their frequency and continue the RIS. St Mawgan informed them of the frequency for Predannack Gliding Site and he called them on Box 2 for TI whilst operating in their vicinity.

They were operating between 1795-2004ft QNH depending on the terrain elevation. While flying a survey line to the NW of Culdrose and when they were passing about ¾nm SE of the main RW he noticed a glider sitting on the RW so he asked St Mawgan if gliding was taking place at Culdrose but they were unsure. St Mawgan then they gave him an unpublished frequency (130.10 [Gliding Common]) to call Culdrose. He then called them on Box 2 and that was when they advised him of the Airprox. Neither he nor any other crew member on board saw any gliders close to them other than the one on the RW.

They then left the survey site due to gliding taking place and returned to their base.

If he had known glider activity was taking place they would not have attempted survey until the weather had improved and they could have flown higher.

CULDROSE SATCO comments that he was not contacted for comment until after the RT tapes had been reused and he was not able to determine who had taken the telephone call from the F406 Survey Operator. Standard practise at the unit however, when responding to such telephone calls, is to inform pilots that there is both gliding and SAR activity at weekends even though the airfield may technically be closed and to reinforce that the ATZ is H24. The SAR helicopter is flown every day of the year during the daily SAR test that lasts 90mins in addition to any real SAR activity that can be called at anytime of the day or night. Since the Culdrose ATZ is H24, if a pilot does not get a response after 3 calls then he should remain clear of the ATZ iaw national procedures.

The Culdrose Gliding Club always operates on the UK Gliding Common frequency of 130.1 but this is not currently published. He has forwarded an amendment to the Culdrose entry to the UK AIP to reflect this.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both ac and from the Culdrose SATCO.

A Royal Navy ATC Member advised the Board that it was likely that an ATC or Ops Assistant had taken the telephone call from the F406 crewman as it was outside normal operating hours. Although the information given may have been technically correct it was not as informative as it might have been and might have led the F406 pilot erroneously to believe that he was verbally cleared into the ATZ or that it was not active. Although the prime

purpose of the ATZ is to protect military ac operating from/to Culdrose rather than gliders, it is nonetheless active H24 and normal entry procedures apply (Rules of the Air, Rule 45).

Although some Members were sympathetic with the F406 pilot in that he had genuinely attempted to correctly gain access to the ATZ so that he could complete his survey task, he had nonetheless not complied with the procedures in the ANO (Rules of the Air) despite that he may have thought that he had done his best in the circumstances when ATC was not open. Notwithstanding that the pilot had been trying to be helpful by conducting the task at the weekend when the airfield was closed, SATCO (in a telephone call to the Secretariat) opined that it may have been better from his perspective to accomplish the task during normal operating hours in receipt of an ATC service.

Since the F406 pilot had not seen the glider and the glider pilot had not seen the F406 until it was too late for him to take any action to increase the limited separation, the Board determined that safety had not been assured in this incident.

It was noted that although the Gliding Common frequency of 130.1MHz is one of several, it is the frequency most commonly used by gliding club airfield base stations, but this is not widely published or known; Members welcomed the initiative of SATCO Culdrose to publish this frequency and encouraged other units where it may apply to follow suit.

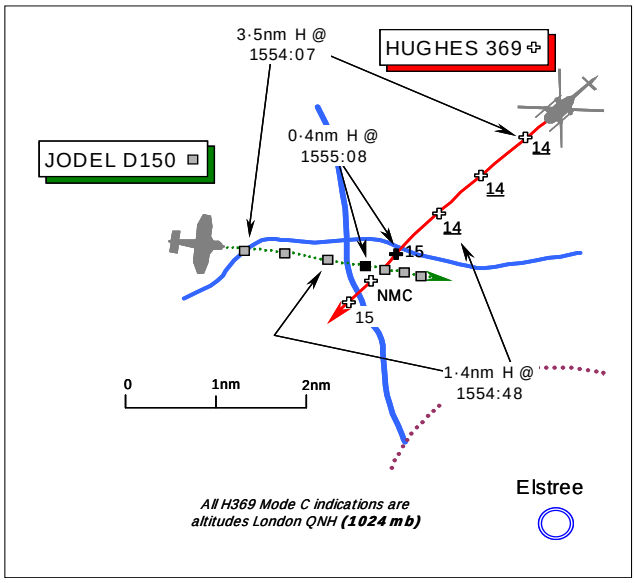
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The F406 pilot entered the Culdrose ATZ without permission and flew into conflict with a glider which he did not see.

Degree of Risk: B.

AIRPROX REPORT NO 148/07

Date/Time:	5 Oct 1555	
Position:	5142N 00022W (3½nm NW by N from Elstree)	
Airspace:	London FIR	(Class: G
	Reporting Ac	*Reported Ac*
Type:	Jodel D150	Hughes 369
Operator:	Civ Club	Civ Pte
Alt/FL:	1400ft	1500ft
	QNH (1026mb)	QNH
Weather	VMC CLOC	VMC CAVOK
Visibility:	10km+	10nm
Reported Separation:		
	30-50ft V/nil H	15-20ft V/nil H
Recorded Separation:		
	Contacts merged	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JODEL D150 MASCARET PILOT provided a comprehensive and candid account, reporting that he was enroute under VFR from Sleap to Headcorn routeing direct to LIC, thence to DTY, BNN & LAM. A squawk of A7000 was selected but Mode C is not fitted (NMC). At the time of the Airprox, weather conditions were very good and he was flying in VMC, with a visibility of 10km+ and a good horizon, but with some relatively low stratus - base of about 2000ft – visible to the NE.

AIRPROX REPORT No 148/07

As it was a very fine day, there was a lot of traffic around and especially flying past the Bovingdon VOR, he saw a lot of GA ac in the locality. For this very reason, he was conscious of other traffic and was keeping a very sharp look out. His track took him past Elstree aerodrome, but not through their ATZ, so he was maintaining a "listening watch" on their frequency of 122·2MHz rather than contacting them, as they appeared to be quite busy.

Flying between Bovingdon and Stapleford in a level cruise at 1400ft, QNH (1026mb), approaching a position some 3½nm NW of Elstree heading 100° at 100kt, he looked down at his chart and then, upon looking up and L, saw a dark coloured black or dark green Hughes 500 helicopter at about the same level closing on a constant relative bearing in his 10 o'clock about 100m away and heading towards him. To avoid the helicopter he immediately pushed forward on the stick into a descent as he wanted to keep the Hughes helicopter in his view as it passed some 30-50ft directly overhead with a *"high"* risk of a collision. No deviation in the helicopter's course was evident and he assumed the helicopter pilot had not spotted his aeroplane.

Whilst annoyed with himself that he only saw the helicopter at a very late stage, especially as he was supposedly keeping a good lookout, he put this down to the fact that the Hughes helicopter was on a steady relative bearing and it was also partly hidden behind his ac's doorframe until he spotted it.

He stressed that he is used to flying in very close proximity to other ac, as a formation and air display pilot, but this was much closer than he would have liked to have been without a formation briefing! If he had not seen the helicopter or altered his height, he believes that they would have collided.

THE HUGHES 369 (H369/500) PILOT reports his helicopter is finished in a disruptive pattern green camouflage scheme, but the 2 HISLs were on whilst flying under VFR between a private landing site near Wattisham to White Waltham at 115kt.

Cruising level at an altitude of 1500ft QNH, in CAVOK weather conditions, he was however flying a heading of 250°(M) directly into the sun with very limited forward visibility. After passing Stansted, he contacted Heathrow initially and was then passed onto Northolt "who had the space". Just after establishing RT contact with Northolt ATC and whilst setting their new transponder code he noticed a "white flash" very close below his helicopter – he quoted about 15-20ft - as another ac passed directly below with a *"very high"* risk of a collision. No avoiding action was taken, as the other ac was not seen until it was already passing immediately below his helicopter. He stressed that with 2 frequency selections and transponder squawk changes in a short period his workload was high, furthermore, the transponder is sited low down on the central radio "stack" in the cockpit.

MIL ACC had nothing to report.

UKAB Note (1): The Heathrow Radar recording illustrates this Airprox, although the H369 is not shown just at the point that the tracks cross. The Jodel – squawking A7000 NMC fitted - is shown flying steadily eastbound on a track of about 100°, crossing over the M25 motorway. The H369 approaches SW bound, squawking A7000, on a steady relative bearing in the Jodel's 11 o'clock at a range of 3·5nm at 1554:07, indicating 1400ft London QNH (1024mb) unverified Mode C. The Jodel maintains it's course S of the M25 motorway, subsequently crossing the M1 and at 1555:08, the H369 has closed to a range of 0·4nm – still in the 11 o'clock - but has now climbed very slightly to 1500ft London QNH. Secondary contact on the H369 is then lost and one primary return of dubious reliability shows in the Jodel's 10 o'clock at <0·15nm - 300yd. The Airprox occurs at 1555:16, as the tracks cross, with no contact on the H369 that is then shown as a primary contact opening in the Jodel's 5 o'clock and rapidly drawing aft, before a Northolt code of A0260 subsequently appears indicating 1500ft London QNH.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The candid accounts provided by both pilots had made it clear that neither was in receipt of an ATS at the moment this Airprox occurred and the Board readily agreed that this was intrinsically a sighting issue. Both pilots were operating quite legitimately in the narrow confines of Class G airspace beneath the LTMA, where see and avoid prevails. Whereas the Jodel 150 pilot had stressed that he was cognisant of the busy traffic scenario and was maintaining a careful scan for other ac, a member postulated that his attention might naturally have been drawn to any traffic in the circuit at Elstree off to starboard. Unfortunately, the other ac was approaching unseen from the port side. This Airprox illustrated clearly the difficulties of sighting a small helicopter in a mock camouflage colour-

scheme of very small cross sectional area, closing on a steady relative bearing with no crossing motion to draw attention to its presence, despite a disciplined lookout and the two HISLs fitted to the Hughes H369. Providentially, the Jodel pilot did manage to spot it, just in time at minimal range in his 10 o'clock - about 100m away he reported – which enabled him to push forward and take avoiding action. This was clearly less than ideal and the Members agreed that a very late sighting by the Jodel D150 pilot was part of the cause.

Commercial helicopter pilot Members were concerned that the H369 pilot had elected to press-on into a low setting sun and whilst his route to his destination took him that way, it might have been wiser to have purposefully introduced a dogleg into his route so as to enable him to see where he was going more clearly. A GA Member wondered if this was a practical thing to do, however, good airmanship would naturally dictate this should be considered when weighing up the risk of encountering another ac. This Airprox was a salutary lesson of the unseen dangers existing in good weather when flying 'into sun'. Moreover, in this instance the H369 pilot was responsible for sighting the other ac and 'giving way' under the 'Rules of the Air'. But 'the Rules' can only work if the other ac is seen in time to take positive action when necessary. Here, the H369 pilot reports he only saw the Jodel as it was already passing immediately below his helicopter. Furthermore, it was evident that this Airprox occurred as the H369 pilot was changing his SSR code – another distraction that can be time consuming. A pilot Member noted that it could take about 7sec to change a code setting, which is a long time to have eyes in the cockpit. A technique he uses is to change two numbers – before taking a scan outside the cockpit – and then changing the last two numbers. However, here the helicopter pilot was unable to take any action whatsoever to forestall this close quarters situation and the Board agreed that this was effectively, a non-sighting by the Hughes H369 pilot and the other part of the cause.

In this instance the Jodel D150 pilot attempted to avoid the Hughes helicopter by diving below it. His reasoning - to keep the other ac in sight - was sound, but the resultant separation was apparently minimal. As Mode C was not fitted to the Jodel, the absence of comparable altitude data made accurate independent assessment of the vertical separation that pertained here impossible. The Jodel pilot had reported transiting in a level cruise at 1400ft QNH (1026mb); whereas the H369 was indicating 1500ft London QNH (1024mb) moments before the tracks crossed. This suggested 160ft of theoretical separation existed, but given the applicable tolerances of Mode C [+/-200ft on *verified* data] this was clearly minimal. There was no reason to doubt the veracity of the reports provided – 15-20ft reported by the helicopter pilot and 30-50ft from the Jodel pilot's account - who was probably better placed to judge the distance anyway. Whether the Jodel pilot had sufficient time to physically move his aeroplane out of the way to avert a collision was debateable, but the radar data had shown the tracks had crossed exactly which corroborated the pilots' reports. Therefore, with at most 50ft reported between them and one of the pilots unable to react because the Jodel was not seen until it was already passing immediately below his helicopter, Members agreed unanimously that an actual risk of a collision had existed in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

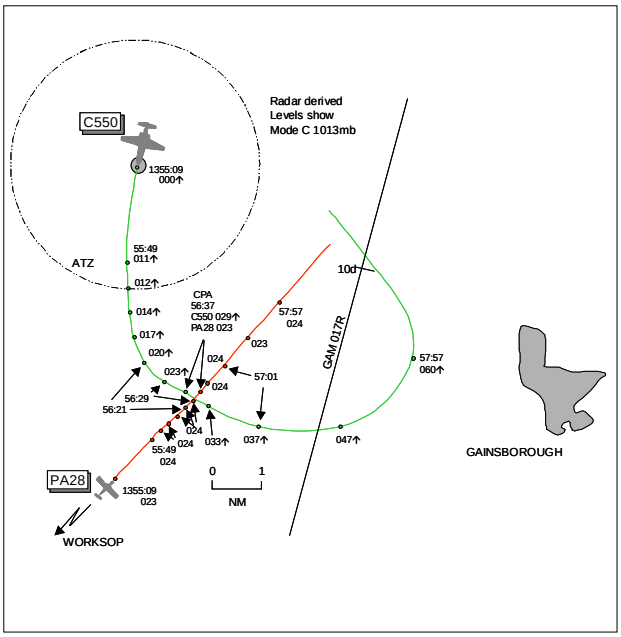
Cause: An effective non-sighting by the Hughes H369 pilot and a very late sighting by the Jodel D150 pilot.

Degree of Risk: A.

AIRPROX REPORT No 149/07

AIRPROX REPORT NO 149/07

Date/Time:	4 Oct 1357	
Position:	5324N 00058W (4·5nm S Doncaster/ Sheffield - elev 55ft)	
Airspace:	FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	C550	PA28
Operator:	Civ Comm	Civ Trg
Alt/FL:	2500ft↑ (QNH 1022mb)	2000-2500ft (QNH)
Weather	VMC CLBC	VMC CLBC
Visibility:	10km	>10km
Reported Separation:	NK V/0·5nm H	NR
Recorded Separation:	600ft V/0·3nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C550 PILOT reports outbound from Doncaster/Sheffield (DSA) IFR and being given a GOLES 20 E departure by DSA Tower squawking 7767 with Mode S. The visibility was 10km flying 500ft below cloud in VMC and the ac was coloured white with beacon, strobe and landing lights all switched on. Shortly after departure, in accordance with the clearance, heading 190° at 210kt approximately 2nm DME I-FNL ATC issued an instruction 'avoiding action, early left turn GOLES' which they complied with. During the avoiding action the ac's ACAS system issued an RA 'adjust v/s', he thought, from the current 2000fpm climb to 3500fpm. They followed the ACAS command and during the turn approaching 2500ft QNH they saw the other ac, a white coloured low wing type, in their 1130 position about 1nm ahead and slightly above. Due to the extreme TCAS vertical command they reduced the avoiding action bank angle and this also allowed them to maintain visual contact with the other ac to ensure they passed behind, believing the minimum horizontal separation to be in order of 0·5nm, vertical separation was unknown. However, it was uncertain whether the avoiding action given by ATC was against this light ac seen or another ac that they were perhaps unaware of, as it was perceived the avoiding action instructions given appeared to take them towards the path of the ac against which they ultimately received the RA. He assessed the risk as medium.

UKAB Note(1): The C550 pilot was contacted by the UKAB Secretariat 4 months post incident to discuss the TCAS aspects of the incident. He agreed that the reported 'adjust v/s' would not have been the annunciated audio call when an increase ROC was demanded on the TCAS display. In the heat of the moment – ATC avoiding action - he had followed the visual indications as reported in his CA1094.

THE PA28 PILOT reports flying a dual training sortie at 2000-2500ft and 100kt from Sherburn-In-Elmet VFR and in communication with Doncaster Radar on 126·225MHz squawking an assigned code with Mode C. The visibility was >10km flying 1000ft below cloud in VMC and the ac was coloured white/blue/yellow with strobe lights on. This was a PPL navigation training flight with turning points at Ferrybridge power station, Worksop Town, Keedby (near Scunthorpe) and Eggborough power station. A FIS was obtained from Doncaster just S of Ferrybridge having cleared the Church Fenton MATZ. The student reported turning at Worksop starting the second leg of the detail tracking 040°. The instructor always maintains a good lookout in that area as it passes through potential approach and departure paths for Doncaster airport. The track maintained a position outside the ATZ and an ac was noted just departing RW20 and it was judged that their direction and speed would take them well past any normal departure path. Further along track when SE of Doncaster aerodrome, Radar advised them of an ac climbing in a LH turn in their 8 o'clock. This ac was sighted climbing through their level, no avoiding action was necessary as

it would pass behind and they reported visual with it to Radar, deeming that it was well clear. They assessed the risk as low.

THE DONCASTER RADAR CONTROLLER reports mentoring a trainee who gave the C550 flight a departure clearance from RW20 based on a projected turn onto N after departure. The plan was sound at the time Tower requested the release however, nearly 4·5min elapsed between the request and the ac taking-off. The C550 flight was given an avoiding action L turn to GOLES and TI on the PA28 at 2500ft which was now 5nm SSE of DSA. The C550 had a surprisingly poor climb rate and a very slow radius of turn which effectively reduced the separation. A turn reversal was considered but ruled out as it would have made the situation worse and, with the PA28 under a FIS at 2500ft, a climb-out restriction was not possible. The C550 crew made no comment on the RT about a TCAS RA or Airprox and the PA28 pilot reported visual with it after receiving TI. The C550's radius of turn eventually placed the flight close to Gainsborough (9nm E of DSA), compared to the normal departure route some 4-5nm E.

UKAB Note (1): Met Office archive data shows the DSA METAR as EGCN 041350 28016KT 9999 FEW030 17/06 Q1021=

ATSI comments that the Airprox occurred approximately 4·5nm S of Doncaster Airport, consequently outside the ATZ i.e. a circle radius 2·5nm centred on the midpoint of the longest notified RW (02/20), vertical limits SFC to 2000ft aal.

The Doncaster Approach Radar position, situated at Liverpool Airport, was being operated by a mentor and trainee. The trainee was making the ATC transmissions. The PA28 pilot established communication with Doncaster Approach at 1340. After a short delay, the pilot was requested to pass his message. He reported on a local flight from Sherburn, at present over Doncaster (town) at 2500ft and routeing via Worksop, Keadby and Eggborough. He requested a FIS, which was approved and instructed to squawk 6162 (a Doncaster assigned squawk). The PA28 pilot was informed it was identified 8nm NW Doncaster (airport), at 1343. Some 2min later, the SSR, which is supplied from the RAF Scampton head, went unserviceable (until 1359). The pilot of the PA28 was informed accordingly and was requested to squawk the Doncaster conspicuity code 6160. At 1350, the PA28 pilot was informed he was believed to be approaching the Netherthorpe ATZ. (This airfield is approximately 12nm SW of Doncaster Airport.)

The Doncaster ADC requested a departure release for the C550 at 1351. The APR released the flight on a GOLES 20 East Standard Route, climbing to FL80. The Route, from RW20, is: *'Climb straight ahead to 500ft or FNL D0.5 whichever is later then turn left on track 190°. At FNL D2.5 turn left to intercept GAM R017° outbound at D10 or FL60 (whichever is sooner). Turn left to GOLES'.* At about the same time, the pilot of the PA28 reported turning at Worksop for Keadby (a Power Station approximately 14nm NE of Doncaster Airport). The radar, timed at 1352:50, shows a 6160 squawk (the PA28) approximately 10nm SSW of Doncaster Airport, tracking SE at FL022.

At 1353, Doncaster Approach received an RT call from another flight having departed Netherthorpe. The pilot of this ac was given information about the departing C550 from RW20, which would be turning E. The pilot was requested, and agreed, to route to the W of the airport initially. The APR was advised that the C550 was airborne at 1355, i.e. some 4min after it had been released. At the time, the PA28 was 6·2nm S of the airport. Immediately after the C550 contacted the Approach frequency, the APR, at 1355:50, replied *"C550 c/s Doncaster Radar identified on departure Radar Advisory Service avoiding action turn left direct er GOLES traffic was southeast three miles tracking northeast no height information"*. This was the first time the C550 pilot had been advised of the presence of the PA28. The pilot reported in a L turn. The MATS Part 1 states that, under a RAS, *'Controllers shall pass avoiding action instructions to resolve a confliction with nonparticipating traffic and, wherever possible, shall seek to achieve separation which is not less than 5 nm or 3000ft'.* Information was then passed to the PA28 flight *"PA28 c/s traffic believed to be you has traffic northwest at three miles er in the left hand turn climbing"*. The radar timed at 1355:49 shows the C550 tracking S climbing through FL011, with the PA28 still tracking NE, as it continues to do so throughout the encounter, 3·6nm S and 1300ft above it. The radar recordings show the C550 carrying out its LH turn as it climbs and turns towards the PA28. When the subject ac were 1·2nm apart (1356:21), the vertical separation was 400ft and at 0·7nm (1356:29) it was 100ft, on both occasions the C550 was below the PA28. As the C550 passed 0·3nm behind the PA28 (1356:37, the CPA) it was 600ft higher. At the time of the Airprox, the Doncaster APR's SSR was unserviceable. Consequently, he was only able to know the altitude of the subject aircraft by pilots' reports. The pilot of the C550 reported at 2700ft, at 1356:28, which placed it above the last reported altitude of the PA28 (2500ft) although the radar recordings show the PA28 at FL024 (2640ft adjusted

to QNH 1021mb) just prior to the Airprox. After the C550 flight reported passing 2700ft, the pilot of the PA28 stated he was visual with the traffic.

When the ADC requested the C550's release, the APR did not consider there would be a confliction with the PA28, as it was 10nm away from the airport. However, as the C550 did not depart for another 4min, the PA28 had approached to about 6nm. The C550 had been given an avoiding action turn as soon as it contacted the Approach frequency. Both the mentor and trainee later commented, in their reports, the C550 pilot had turned and climbed slower than they expected and this led to the close proximity of the subject ac.

UKAB Note (2): The Claxby radar recording clearly shows the C550's track straighten as it crosses behind the PA28 before the L turn is resumed, the ac reaching a position just under 7nm SE of DSA (over 2nm W of Gainsborough) climbing through FL060 before the turn continues back towards DSA enroute for GOLES.

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 noted similarities within this Airprox to Airprox 112/07, which was assessed earlier in the same meeting. The DSA APR had released the C550 but then about 4min had elapsed before this flight was actually airborne. The PA28 pilot had already established a FIS with the APR over 15min before the Airprox and had passed his flight's cross-country turning points, the pilot reporting turning at Worksop when the C550 release was given. Although the subject PA28 was not identified at the time - SSR had been lost 8min earlier - the ac was known traffic to the APR, turning onto a known track, which would pass close to the C550's departure route. Also the PA28 would have been showing as a primary radar contact on his display. However the 4min delay was significant here and resulted in the PA28 being much closer to DSA as the C550 became airborne. Although there was no requirement to separate the subject ac (IFR v VFR traffic with both in receipt of an Approach Control service in Class G airspace), the minimum requirement was for DSA ATC to pass timely TI to both flights. The ideal time to pass this to the C550 crew would have been as the PA28 pilot reported turning at Worksop, via the ADC, before the flight became airborne. Members believed that being forewarned with this TI, the C550 crew would have been better placed to decide a course of action – perhaps select a better ROC, a tighter turn or even reject the departure clearance until the conflicting ac was clear. The APR was cognisant of the potential for a confliction, as he had asked another flight departing Netherthorpe to route to the W of DSA owing to the C550's impending departure. That said, the APR only gave TI and avoiding action immediately after the C550 flight's initial call on his frequency which was too late. Members agreed therefore, that the cause of this Airprox was the Doncaster/Sheffield APR Mentor did not ensure that the C550 pilot was given TI on the conflicting PA28 prior to departure.

In assessing the inherent risk, ATCO Member's opined that the avoiding action given was ineffective owing to the C550's flight profile. At the time the release was issued, it was felt that the C550's departure clearance would have worked safely but 4min later, with the ac already established in the L turn, it was too late for a radar resolution. Fortunately the C550's TCAS warned the crew of the PA28's presence and they had followed the TCAS RA climb guidance. Members commended the C550 crew's actions for reducing their ac's bank angle at the critical moment when faced with a demanding climb rate, and this also allowed the crew to visually acquire the PA28 slightly L of their nose and slightly above their ac. Both of these elements ensured that the confliction was resolved as quickly as possible, the radar recording showing the dynamic resolution with the C550 passing 0·3nm behind and 600ft above the PA28. Although TI was given to the PA28 pilot when separation was 3nm, the pilot only reported visual with the C550 when it was climbing through their level and manoeuvring to avoid their ac. In the end, the visual sighting of the PA28 and robust avoiding action taken by the C550 crew were enough to persuade the Board that no risk of a collision had existed during the encounter.

Following the Board's assessment of this Airprox and 112/07, the ATSI Advisor was tasked by the Chairman to contact DSA in order to follow up progress of proposed changes to the departure release procedure. Members were minded to issue a Safety Recommendation requesting that a review was needed owing to the length of time between Tower ATCO requesting a departure release and the ac presenting itself to radar.

[Post Meeting Note: SI 09/08 was issued by Doncaster/Sheffield ATC effective 22 March 2008 entitled Departure Instructions covering coordination between the ADC and the APR for outbound ac. It states that the ADC must not request a departure release from radar more than 2min before expected time of departure. If for any reason

the ac is not going to be airborne within the 2min period, ADC must inform radar who will then issue a revised departure clearance if required.

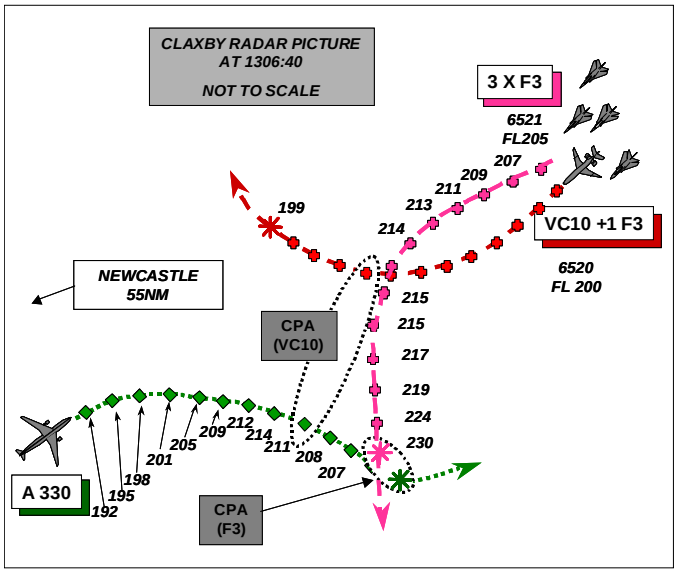
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Doncaster/Sheffield APR Mentor did not ensure that the C550 crew was given TI on the conflicting PA28 prior to departure.

Degree of Risk: C.

AIRPROX REPORT NO 150/07

Date/Time:	8 Oct 1307	
Position:	5522N 00013W (55nm ENE Newcastle)	
Airspace:	TRA 007	(Class: C)
	Reporting Ac	*Reported Ac*
Type:	A330	VC10
Operator:	CAT	HQ AIR (Ops)
Alt/FL:	FL210	FL200
Weather	VMC NR	VMC NR
Visibility:	Unlimited	Unlimited
Reported Separation:	300ft V/3nm H	NK
Recorded Separation:	1100ft/5.1nm H (2300ft V on the F3s at min H (1.3nm))	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A330 PILOT reports flying a scheduled passenger flight from Newcastle to Dubai. On handover from Newcastle, Scottish control cleared them only to FL170 because of military traffic at FL180. Later they were asked to re-contact Scottish on a different frequency and the new controller cleared them to FL250 and to expedite through FL230, which was done. When passing FL200, a TCAS TA was received and at the same time they were asked by Scottish to turn 30° to the right. Even on that heading both ac, as shown on TCAS, continued to close. The controller then asked them to "Turn right to avoid traffic" and just as this was done, a TCAS RA "*Descend, Descend*" was received. They were still in a climb at that time but the manoeuvre was carried out at approximately FL220 and "*Clear of Conflict*" advisory was received at around FL200. Both ac kept in close proximity for a short time. Their queries to ATC regarding the intruders initially went unanswered but later, the controller was unsure and did not sound like he was in control of the situation. The intruders came within about 300ft and 3nm of them. He assessed the risk as being high.

THE VC10 PILOT reports flying an AAR sortie with four F3 receivers. At the reported time of the incident they were in the area that it was reported to have taken place and were level at FL200 in receipt of a RIS from CRC Scampton. None of the crew recall seeing or getting a warning of any other ac.

UKAB Note (1): The incident took place about 20nm S of AARA5 in TRA007 (F195-F245), which was active at the time. The following extract from the UKAIP (ENR) refers:

TRA Access Requirements

1.1.5.6.1 IFR

(a) A flight plan must be filed. Abbreviated flight plans are permissible in accordance with AIP ENR 1.10 and CAP 493, MATS Pt 1, Section 1, Chapter 2, Paragraph 9. Abbreviated Flight Plans will only be acceptable for military ac operating under the control of a military ATS or ASACS unit.

(b) An ATC clearance must be obtained to fly within the airspace.

(c) Radio contact must be maintained on the appropriate frequency.

(d) The flight must be conducted in accordance with ATC instructions.

(e) Ac in IFR transit through a TRA from/to adjacent CAS will be in receipt of an ATC service and will not require to obtain an additional ATC clearance to transit the TRA.

UKAB Note (3): The recording of the Claxby radar shows the incident clearly. At 1300 the Tanker combination approaches the incident position tracking 230°, initially at FL200 as a single formation, with the A330 in its 12:30 position tracking 060° climbing through FL95 with a Mode S selected level of FL170. At 1302 the A330 is seen to squawk ident and 2min later the selected level changes to 190 and a further 17sec later at 1304:17 to 250 as the ac climbs through FL171 with the Tanker combination in its 12 o'clock at a distance of 28nm still as a single unit at FL200. At 1304:50 the A330 is in the Tanker's 12 o'clock at 18nm, the F3 receivers (3ac) are seen to squawk an individual squawk, diverge to the right by 20° of the tanker and commence a climb to FL215. At 1305:29 when the A330 is in the tanker's 12 o'clock at 10nm and 1000ft above at FL210 the A330 is seen to turn right to track 120° and commence a descent and the tanker also turns right onto 290° before commencing a descent the F3s remain at FL215. At this time the F3s commence a slow left turn to cross over the tanker from right to left before also crossing 2000ft above and slightly behind it the A330 having resumed their climb.

UKAB Note (4): The VC10 was TCAS equipped and the pilot reported that he did not see the A330 visually (he was in a turn away at the time) nor did he receive a TCAS TA or RA. It is likely therefore that the A330's TCAS RA was in respect of the F3s as they climbed while splitting from the tanker.

MIL ACC reports that a VC10 was conducting military air-to-air refuelling in AARA5 in the block FL180–210, squawking 6520 with Mode C. In formation with the VC10 was a formation of 3 Tornado F3's, and a further single Tornado F3. All the mil ac were being controlled by a single Fighter Controller (FC) from the CRC Scampton and were receiving a RIS. After leaving the tanker the F3s were planning to transit S for a pre-briefed task in DA323A, approx 30nm away. Scampton reports that all external ATC agencies had been informed that AARA5 was active. Simultaneously an A330 was conducting a CAT flight from Newcastle to Dubai and was receiving a RIS from ScACC (initially Tay Sector), squawking 5221 with Modes C & S. Shortly before the reported Airprox, the A330 was transferred to Tyne Sector who cleared it to climb to FL250.

There are 237 lines of R/T and landline recordings relating to this event but for brevity, only the most relevant are included in this report.

[ACC note: R/T, landline and radar recordings are not all taken from the same time source, so small discrepancies may exist with timings.]

The FC first makes contact with VC10 at 1145:25 and the F3 formation No2 at 1233:45. Formation numbers 1 and 3 make contact with FC at 1239:50 with the single F3 following 1min later. All ac were correctly identified and placed on a RIS. At 1300:46, the Tay Sector controller called the FC for co-ordination stating '*It's Tay co-ordination please your 6520 squawk east northeast Newcastle by 50 maintaining level 200'* and the FC replied '*Er, yes but he's blocking 180 to 210 Tanker combine'*. Tay continued saying *'180 to 210 that's understood ok, my traffic just changed to my squawk Northeast of Newcastle now by 30 miles squawking 5221',* the FC called '*contact'* before Tay said *'not above FL170 until I'm clear of your area of refuelling in plan and once I've got 10 miles I will be climbing through you'*. The FC agreed the co-ordination and the conversation ended. The FC informed all of the tanking ac, which were then in close formation under the VC10 C/S [as is SOP] of the co-ordinated traffic and confirmed to the combine that *'you're not below 180'*. VC10 pilot acknowledged this at 1302:50, when the formation and A330 were about 44nm apart.

Later at 1304:50, the F3 formation leader called the FC stating *'departing climbing er 210 heading 250'*.

[ACC note: The formation of 3xF3s had positioned themselves slightly astern and to the right to prepare to leave the tanker.]

After a radio check, the F3 leader re-stated his intentions, which the FC confirmed with *'210'*. At about the same time, the voice recorder at the CRC Scampton picked up a conversation between 2 FC's in which they are discussing the A330's possible intentions and shortly afterwards, the FC transmitted to all ac on frequency *'VC10 Combine C/S turn right heading north….co-ordinated traffic that was southwest of you 15 miles climbing through 195'*. At 1305:10 the FC called Tay Sector and the Planner picked up the line. After a short conversation about the A330, the Planner said at 1305:28, *'Hang on a wee second (conversation in the background) 'That squawk he's on yeah… I think your actually wanting to talk to Tyne… if it was an [A330 C/S] its Tyne sector, you want to ring Tyne sector*'.

[ACC Note: At 1305:22, the A330 and the VC10 Combine are at the same Level (FL199), but the A330 had started a right turn. At 1305:31 the STCA activated with the A330 in the right turn, indicating FL202 while the F3s had climbed to FL212, with VC10 Combine (now only the VC10 and the remaining F3) maintaining at FL199.]

At that time the single remaining F3 was busy trying to make contact for re-fuelling and the FC asked again at 1305:40 *'VC10 C/S, FC C/S, confirm in a right hand turn onto north?'* and the VC10 pilot replied *'Affirm, VC10 C/S in a right turn onto north'*. At 1305:47 the FC updated the TI by saying *'previous traffics BRA 230 at 5 miles climbs through 215 levelled out at correction headed 090'*. At that point the A330 and the F3 formation were 7.1nm apart with the A330 indicating FL210 and the F3s FL214. At 1305:59, STCA again activated, but this time between the A330 and the F3 formation. At 1306:05 the F3 Leader told the FC *'Formation C/S are visual with that traffic staying above climbing through level 230'*. Twelve sec later the FC instructed the F3s *'roll out 090'* but Leader replied *'Formation C/S are steady on er 180'.* This was the closest the VC10 came to the A330 vertically, with SSR data showing 800ft between them. For the next 9sec, the tanker cleared the remaining F3 to refuel. At 1306:30 the FC informed the F3 formation that *'*{DA} *323A is booked if you turn left onto 090'* and the leader acknowledged. The closest point in azimuth is at 1306:37, with the formation passing just over 1nm behind the A330 however, by this point the SSR showed that there was 2300ft between them. After a short gap in the RT, F3 Leader asked the FC if *'we can have a handover to Boulmer please that 323 is booked for our use'* and after being asked to standby, the FC told him *'you are clear through* {323} *Alpha'*.

Thereafter, the F3 formation remained in the A330's 4 o'clock at about 2nm, slowly diverging and the vertical separation reduced from 2300ft to 1500ft as the A330 re-commenced its climb. The F3s then entered DA323A at 1307:40 as the A330 turned away from the DA boundary.

Throughout this incident, the FC applied the rules of RIS in accordance with JSP552 to all ac under his control. Co-ordination was initiated and agreed in good time between the tanker combination and the A330 albeit, it was not made clear whether this co-ordination included the chicks. When the formation left the tanker, they were under RIS (by default) in TRA 007 (FL195 - FL245). Because the FC was busy trying to establish whether the F3s could enter DA323A, he was content for the formation to continue against the A330 since they had already called visual with it. A Unit Investigation was conducted which concluded that no remedial action was required; the incident however, was discussed at length during unit training.

HQ Air considers that there were no Mil ATC causal or contributory factors because the FC detected that the A330 was breaking co-ordination and gave the tanker combine a turn away and also complied with the rules of RIS by giving the tanker and chicks good TI on the A330.

ATSI reports that at the time of the Airprox, the A330 was in communication with the Tyne Tactical Controller who was operating as both the Tactical and Planner for the sector, which was configured in a bandboxed mode comprising of the Tyne and Humber sectors. He described the workload as moderate and traffic loading as low. The relevant ATC equipment was all reported to have been serviceable and no other factors that may have affected the service provided were identified.

At the time of the Airprox, the Tyne Tactical was working with a Support Controller. The reason for this, together with the role of the Support Controller, is discussed later in the report. The layout of the operations room at the time was that immediately to the right of the Tay Sector position was the Montrose Sector and next to that the Tyne Sector.

AIRPROX REPORT No 150/07

The Airprox took place at FL200 which is Class C airspace however, given that TRA007 was active at the time, between FL195 and FL245, the level of ATS provided within this airspace must be a FIS, RIS or RAS changing only to a RCS when the ac either passes FL245 climbing, or leaves the lateral boundaries of the TRA.

The A330 was operating the inaugural flight of a new service on the day of the Airprox. The crew established communications with the Tay Sector at 1301:30, reporting passing FL116 for FL170, its initial cleared level. The controller identified the ac and placed it under a RIS, adding that there was military activity ahead blocking FL180 and above. The pilot replied: "*Maintain level one seven zero A330 C/S*", however, the level of service was not read back and the controller did not challenge this.

The crew were instructed to contact the Tyne Sector at 1303:15, which they did 20sec later and reported passing FL162 for FL170, the Controller instructed them crew to climb to FL190 and asked, if could they expedite through FL230 if they were given a continuous climb and the crew confirmed that they could; at 1304:05 they were cleared to climb to FL250 and to expedite through FL230. At this time the VC10 was opposite direction to them in their 12 o'clock position at a range of 28nm and maintaining FL200, The controller asked the A330 crew to report their heading which, after reading back the climb clearance, they advised was 073º. At 1304:50, when the A330 was passing FL186 climbing to FL250, with the VC10 in its 12 o'clock at a range of 18.5nm and maintaining FL200, the controller transmitted "A330 C/S *turn right thirty degrees, three zero degrees to the right*". Twenty five seconds later the controller passed TI on the VC10 and another contact, one of the ac that had been refuelled, to which the crew responded that they had them on TCAS. The controller instructed the crew to turn right a further 30º "*….to avoid*".

By now there were two contacts, the VC10, maintaining FL200, NE of the A330 at a range of 10nm and the other contact [the 3 departing F3s] which was 1.4nm NW of the VC10 indicating FL212, while the A330 was passing FL202. The A330 crew were asked whether they still had the traffic on TCAS to which the reply was "A330 C/S *TCAS descend*". The Mode C readout from the A330 indicated FL214 before the descent was commenced and at that time the VC10 was in the 9 o'clock position of the A330 range 5.4nm and the other traffic was slightly ahead of the VC10 and indicating FL215. Minimum separation against the VC10 occurred at 1306:07, when it was in the 9 o'clock position of the A330 at a range of 5.1nm and 1100ft below. At 1306:25, the A330 crew advised that they were clear of the conflict and requested confirmation that they could climb back to FL250. Initially this was not answered but when they called again and repeated the message the controller cleared them to route direct to CUTEL.

The A330 had departed Newcastle routeing via DIGBI on track to CUTEL and had requested FL370 to cruise. There are no specific procedures for departures from Newcastle following such a track but custom and practice is that if there is any potential confliction, Tay Sector will contact Newcastle and effect co-ordination. On this occasion, an unconnected military ac was at FL185 Northbound crossing from the London into the Scottish FIR. This ac was routeing close to the E Coast and so it would not have been known to the Tyne Sector. The Tay Sector contacted Newcastle shortly after 1257 and requested that the A330 be stopped at FL170, which they agreed. Shortly after 1300 the Tay Controller contacted the Tyne Controller to advise him that the A330 was airborne, would be requesting FL370 but it was only climbing to FL170 at present. The Tyne Controller advised him that it could climb to FL290 and route direct to SURAT. At 1300:25, the Tay Tactical Controller contacted Scampton to coordinate the A330 against a 6520 squawk (the subject VC10), which was 50nm NE of Newcastle maintaining FL200 and they advised that the traffic was operating in the block between FL180 to FL210. The Tay Tactical indicated the position of the A330 and said: "*….not above FL170 until clear of your area of refuelling in plan and once I have ten miles I'll be climbing through you*". Although at the outset of this conversation the Tay Controller has started with the words "*Request co-ordination*", at the end of the agreement Scampton simply replied "*Thank you'* but this was taken by both to mean 'co-ordination agreed'.

At 1301:30, the A330 crew contacted the Tay Sector and reported passing FL116 climbing to FL170 while they were 25nm NE of Newcastle. The Tay Tactical Controller placed them under a RIS and advised of military activity ahead blocking FL180 and above. Meanwhile, the Tay Planner telephoned the Tyne Controller and informed him of a change in co-ordination. This would be that the A330 would be transferred climbing to FL170 clear of all other Tay traffic and this was due to the presence of the tanker combination, which was accepted. At 1303:20, the Tay Tactical Controller instructed the A330 crew to contact the Tyne Sector and at around the same time the Tyne Controller telephoned the Scottish Mil Allocator to enquire about the 6520 squawk who advised that he didn't have the details but would try and find out. Very soon afterwards the Allocator called back and advised that the squawk was a tanker with four receiving ac and that they were working Scampton. The Tyne Controller enquired as to

whether the Allocator knew whether the formation was continuing on its SW bound track but he did not have the information and suggested that he contact Scampton. The Tyne controller then wrote out a pink blocking strip stating that there was military activity between FL180 – FL210 and placed it in his display.

The A330 pilot made contact with the Tyne Controller at 1303:35 when they were passing FL160, 40nm NE of Newcastle and when the tanker was in its 12 o'clock at a range of 33nm maintaining FL200 so he instructed them to climb to FL190. He had heard verbally from the Tay Planner that the airspace block being used by the tanker formation was FL180 to FL210 and so was of the opinion that he would be able to climb the A330 to FL220 or above before the agreed 10nm lateral separation with the formation was eroded. The controller explained that he was used to handling flights operated by this airline from Glasgow however, on that service the ac used was a B777, whereas in this instance the ac involved was an A330. This information was clearly marked on the strip but he had not noted it and so was expecting a good climb performance.

Having formulated his plan he asked the A330 crew whether they could expedite a climb through FL230 to FL250, when they responded that they could, he continued with the plan and instructed them to continue their climb to FL250 and to expedite through FL230; at that point the tanker was opposite direction to them at a range of 28nm. The controller was confident that his plan would work, although it might be a little tight but he had previously seen the tanker fly a racetrack pattern and, if it followed something similar, would soon turn right onto a Northerly heading and away from the A330 however, shortly before 1304:50, he noticed one of the formation break away from the tanker and the ac appeared to be climbing.

The A330 was then only 18nm from the tanker and so the controller instructed the pilot to turn right 30º. Meanwhile, Scampton had telephoned the Tay Sector to ask about the intentions of the A330 and was advised that it was now under the control of the Tyne Sector. The Tyne Controller passed the A330 pilot TI on the formation when they were both at FL199 at a range of 12nm, whilst the other traffic, alongside the tanker, was indicating FL209. The A330 crew reported having the traffic on TCAS and then the Tyne Controller instructed them to turn right a further 30º to avoid. At this time they were 10.4nm apart with the A330 passing FL202. The other ac remained about 1.5nm off the tanker's starboard side and was passing FL213. As the A330 commenced the right turn the tanker continued on its SW bound track and, at 1305:50, the controller asked the A330 crew if they still had the traffic on TCAS and they replied: "A330 C/S *TCAS descend*". At this time the tanker was NE of the A330 at a range of 6.2nm maintaining FL200, whilst the A330 was indicating FL213 and the other ac was then now close to the tanker, on its starboard side and indicating FL215. The tanker then began a right turn onto a NW heading whilst the other ac turned left and took up a Southerly track, towards the A330 and climbed slowly.

At 1307:10, the Scampton Allocator called the Tyne Controller to enquire about a 5221 squawk; the controller advised that this was the A330, which was climbing through FL210 for FL250. At the time this call took place the tanker was 13nm NW of the A330 and heading away from it but the other ac, which split from the tanker, was in the 4 o'clock position of the A330 at a range of 2.3nm and indicating FL237. This traffic was then in a left turn from S onto SE, which would parallel the track of the A330 so the Tyne Controller asked if Scampton could keep their traffic S of the A330; they replied that the traffic was going into D 323A however, the Tyne Controller thought that Scampton was referring to the A330 and implying that it was going into the Danger Area. The Tyne Controller repeated his request for Scampton to keep their traffic S of the A330 but the reply was a reiteration that the Scampton traffic was going to D 323A. The left turn made by the A330 in response to the instruction to route direct to CUTEL, kept the ac north of the Danger Area boundary and the Scampton ac made a right turn and entered the Danger Area on a Southerly track.

The Tyne Controller was his first duty back after a period of leave was properly self-briefed and was aware that TRA007 was active. Shortly after taking the position he became aware of some unusual routeings so he requested, and was given, a Support Controller. MATS Part 1, Section 8, Chapter 2, para 7.3 & 7.4 state: '*Providers may use the support controller mechanism for re-familiarisation purposes, to ensure currency in cases where controllers have been absent for a significant period because of leave, sickness etc. It would also be appropriate where there are doubts about a controller's confidence, except as a result of his or her direct involvement in an incident. Where a unit, for whatever reason, uses the support controller mechanism, that support controller shall be an OJTI. The support controller should hold the appropriate rating and unit licence endorsement for the service being provided and should have no other controlling responsibilities beyond the support role*'. However, the unit's MATS Part 2 has a different role for the Support Controller which is described on page GEN1.5, para 1.5.7.2 – Support Controller Tasks: '*The SC is responsible for assisting the P controller in their responsibilities for the safe orderly and expeditious flow of air traffic. The P controller remains responsible*

for the planning, notifying and agreeing the entry and exit of aircraft to and from the area of responsibility'. The Tyne Controller was using the Support Controller in accordance with the MATS Part 1 role rather than that as described in the MATS Part 2.

The Tyne Controller, being of the understanding that the A330 was a B777, stayed with his plan to 'jump' the tanker combination although he knew that this plan might be challenging and he advised that he felt a degree of comfort when the A330 crew reported having the traffic on TCAS. He was checking to see the A330's Mode C pass FL200 and was then happy that vertical separation would be established; however, he was not expecting any of the receiving ac to break away and operate outside of the airspace block between FL180–FL210. The Support Controller also saw what was happening but left the Tyne Controller to continue handling the situation which was in accordance with MATS Part 1; however, there appears to be little doubt that the Support controller would have answered any queries that the Tyne Controller had raised.

The Tyne Controller was asked why he didn't contact Scampton direct when he was seeking information about the tanker but he said that the direct line is not best placed on the sector and so he decided to call the Scottish Mill Allocator.

The question of verbal face-to-face co-ordination was again in this incident; the Tay Controllers had made it clear to Scampton that his intention was to keep his ac at FL170, beneath the block being occupied by the tanker combination, and climb when 10nm clear.

[UKAB Post Meeting Note: The Secretariat informed the Board that the recording of the ScACC desk side communications showed that the co-ordination agreed between Tay **Sector Controller** and the FC at CRC Scampton had not been passed fully by the Tay Planner to the Tyne Sector Controller in the back-up telephone call. However, he (the Tay **Planner)** had initially passed the agreement in full to the Tyne Controller verbally (and therefore not recorded) who confirmed that he was fully cognisant of the co-ordination agreement].

Although the A330 was in receipt of a RIS, the unit's MATS Part 2 permits the passing of avoiding action if controllers determine that it is appropriate, for example in the interest of flight safety. The Tyne Controller advised that with hindsight he accepted that he should have prefixed the turn instruction with the words 'avoiding action' but he did not believe that this would have significantly affected the resultant separation.

The most significant factor in this incident was that the Tyne Controller instructed the crew of the A330 to climb through the level of the tanker without ensuring that lateral separation would exist during the level change. .

The Tyne Controller was under the false impression that all the military activity would be confined to the level band FL180-FL210. Although the tanker and remaining F3 stayed in this block, the departing the departing F3s did not and came closer to the A330 shortly after the first CPA with the VC10 and most likely caused the RA.

Although the A330 was in receipt of a RIS where there is no requirement to provide standard separation the controller attempted to maintain a degree of separation between his ac and the military traffic, however, it was his actions that led to the ac being in this situation.

HQ AIR (OPS) comments that the Tyne Controller was aware of the co-ordination which had taken place between Tay controller and CRC Scampton indicating that the A330 would be kept at FL170 until clear of the refuelling activity. Thus, the Scampton Controller had no reason not to allow, or any perceived need to coordinate the F3s climb from the tanker once their refuelling was completed. Once the Scampton Controller was aware that the A330 was continuing to climb, his TI allowed the F3 pilots to see and avoid the A330 by climbing above it.

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

The Board noted that, although this might seem a very complex incident, much of the information presented in Part A, although clarifying many side issues, did not relate directly to the cause which seemed fairly clear. Members quickly noted that the A330 crew, the Tanker and F3 crews and the FC had, they considered, fulfilled

their respective tasks, with a very minor exception, as they would have expected. Further, neither the role of the Support Controller nor the unquestionable complexity of the Airspace in which the incident took place were considered by Members to be significant factors.

Although the A330 was only in receipt of a RIS the flight had initially been co-ordinated in such a way that it could proceed safely along its route below the area of AAR operations. There was some doubt among Members as to whether the A330 pilot had been aware that he was operating in a see and avoid environment, but that too would not have been of any relevance had the co-ordination effected with CRC Scampton been adhered to by the Tyne Sector controller.

Experienced controller Members noted that the significant breach in co-ordination that had allowed the A330 to continue climbing into conflict with the Tanker formation had been that the Tyne Sector Controller elected to climb the A330 through the level of ('jump') the formation, in an attempt to maintain a continuous climb, rather that to stop the climb at FL170 temporarily until it was 10nm clear of it horizontally, the 'agreement' that the Tay Sector Controller had negotiated with Scampton. One Controller Member opined that in such circumstances when not adhering to a previously agreed co-ordination, even when for good reason, good practise is to call the other unit and inform them of the change of plan.

Despite the co-ordination agreement with CRC Scampton, the Tyne Sector Controller had formulated a different plan which was to 'jump' the VC10 formation; however, when he saw that this plan was not going to work, although not using the phrase 'avoiding action', he took appropriate corrective action to avoid the ac that he believed would be remaining in formation. This action however was based on the incorrect assumption that all the ac all would remain in the FL180-FL210 block and took no account of the F3s departing to the S into the Danger Area. Further, he was not aware that they had seen the A330 and were visually avoiding it. Since the F3 Leader saw and avoided the A330 and the A330 was correctly reacting to a TCAS RA, the Board considered that there had been no risk of the ac colliding.

Although it was accepted that the Scampton FC had been busy with other tasks (the F3 Danger Area entry clearances) and had no obligation to do so (since co-ordination had been effected and he had no reason to suspect it would be breached until the A330 climbed through FL170 at 1304:15), one controller Member considered that he could have informed the Tyne Sector Controller that the Tanker formation was splitting and even perhaps have passed the F3's intentions.

Although it had not affected the incident directly, an experienced CAT pilot Member noted that, had the A330 airline routed the flight along the existing Air Route structure and not through very busy, effectively Class G TRA/AARA airspace, neither this incident nor 2 others that took place on a similar route would have occurred. He also observed as an aside that the B777 climb performance is very similar to that of the A330 at all levels involved in this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

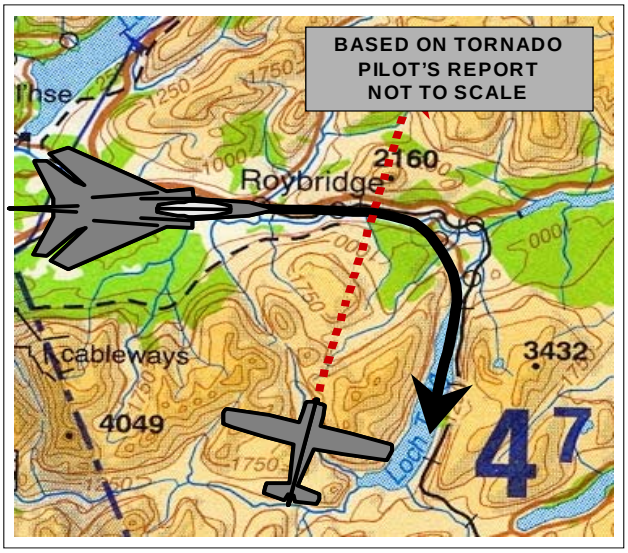
Cause: Contrary to the co-ordination agreed between the Tay Sector Controller and CRC Scampton, the Tyne Sector Controller elected to climb the A330 into conflict with the Tanker formation.

Degree of Risk: C.

AIRPROX REPORT No 152/07

AIRPROX REPORT NO 152/07

Date/Time:	27 Sep 1100	
Position:	5653 N 00442 W (Roybridge)	
Airspace:	LFA 14	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Tornado F3	Cessna
Operator:	HQ AIR (Ops)	NK
Alt/FL:	400ft (RPS 1020mb)	NR
Weather	VMC NR	NR
Visibility:	>10nm	NR
Reported Separation:	200ft V/200m H	NR
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO F3 PILOT reports flying a grey ac with HISLs switched on and squawking 7001 but not in communication with any unit on a singleton low-level tactical navigation sortie. He had approached a turning point near Roybridge from the W in a valley at about 400ft agl and 410kts and his next planned track was due S from Roybridge over Loch Trieg. In the 10sec period prior to arriving at the Roybridge turning point both himself and the WSO were looking out to their right to identify the new track and, having identified the terrain on the new track he resumed his forward lookout. As he did so and his head moved forward, he saw a small Cessna type ac about 1000yds ahead and 100-200ft above their flight-path. It was crossing their track at right angles from right to left and prior to moving his head forward it had been obscured by the canopy arch. He bunted the ac down to about 300ft agl and saw the Cessna pass above them and slightly to their left. He completed the planned 90° turn to the right onto the new track and on rollout he was able to see the Cessna, now in their 5 o'clock position, continue to the N apparently without any deviation from its track.

UKAB Note (1): Neither ac was seen on the recorded radars. Despite extensive procedural tracing action, which included contacting all known airfields N of Glasgow, the Cessna could not be traced.

THE TORNADO STATION comments that this is an honest and open report by the F3 pilot who raised this Airprox. Unfortunately, this was one of those occasions when the Cessna was not seen by the F3 pilot until the last moment. The sight-line rate would have been Low and the F3 canopy arch is notorious for "blanking" arcs of view out of the F3 cockpit. This Airprox should be publicised for the benefit of the aviation community.

HQ AIR (OPS) comments that the avoiding action by the F3 pilot, though late, appears to have been effective. Without any information from the light ac pilot it is difficult to comment further.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of a report from the Tornado pilot and its operating authorities.

Since the light ac could not be traced and the incident occurred below recorded radar cover, the Board had only limited information on which to base their discussion. They had however no reason to doubt any of the information provided by the Tornado pilot which they accepted as a true account and accepted that his ac had been separated by about 200m with the light ac which was about 200ft above the Tornado following the latter's slight descent. The Tornado had been flying at low level in a valley at right angles to the light ac's track and would most likely have been obscured to its pilot by the terrain; it was therefore accepted that he had not seen the Tornado. The light ac on the other hand would have been skylined to the Tornado crew, albeit only when the ac were relatively close,

and by remaining below it (descending a little) and flying their planned track they would have prevented any risk of collision.

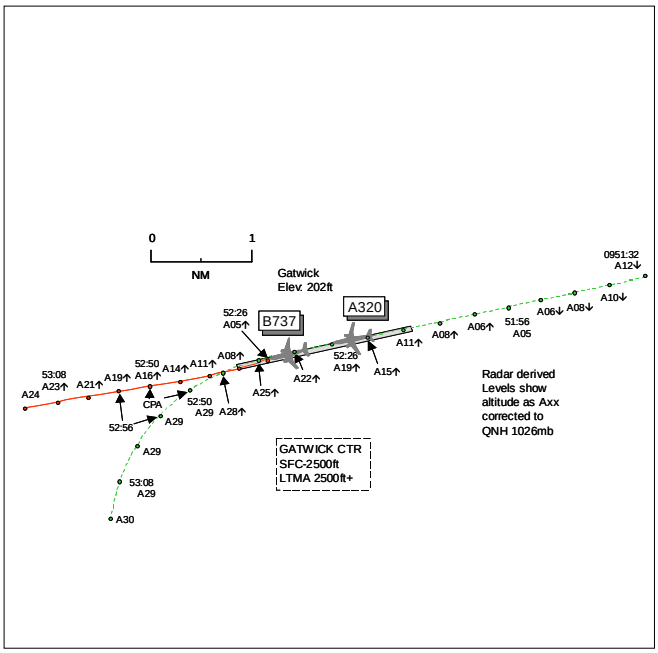
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Assumed non-sighting by light ac pilot and late sighting by Tornado crew.

Degree of Risk: C.

AIRPROX REPORT NO 153/07

Date/Time:	12 Oct 0953	
Position:	5108N 00014W (1·5nm WSW Gatwick - elev 202ft)	
Airspace:	ATZ/CTR/LTMA	(Class: D/A)
Reporter:	Gatwick AIR	
	1st Ac	*2nd Ac*
Type:	A320	B737-400
Operator:	CAT	CAT
Alt/FL:	↑ (QNH)	2300ft↑ (QNH)
Weather Visibility:	NR	IMC NR
Reported Separation:	NR	NR
Recorded Separation:	1300ft V/0·4nm H OR 600ft V/0·9nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GATWICK AIR CONTROLLER reports that during a medium intensity session he instructed the B737 flight to line-up and wait at M1. He advised the flight that there would be a short delay against a previous departure on a similar routeing. On assessing the inbound A320, he noted the ac was fast as it established on the ILS but the ac was still about 8nm out and he expected it slow down in accordance with standard procedure. When the A320 was inside 4nm he cleared the B737 flight for take-off but was now concerned that the arriving A320 appeared not to have slowed down at all. On first contact he advised the A320 flight to reduce to minimum speed and to anticipate a potential go-around and then he watched the final approach to get visual contact. On seeing the A320 he was confident that landing clearance could be achieved at an appropriate time but the ac had initiated a go-around. He elected to confirm the standard missed approach procedure of straight ahead to 3000ft altitude as the ac was in the process of already doing this before issuing a further turn instruction. He notified LTCC INT DIR of the go-around and then issued an immediate L turn to the A320 flight of 180° to take it away from the, now just airborne, departure [the B737].

THE GATWICK INT/FIN RADAR CONTROLLER reports that whilst monitoring a trainee with INT and FIN positions bandboxed, the A320 flight from TIMBA was given a heading and descent on first contact, a little high and fast at the beginning but monitoring. The ac was still high and fast on short final but was put to Tower; the ac went around.

UKAB Note (1): Met Office archive data shows the Gatwick METAR as EGKK 120950Z VRB03KT 4900 HZ SCT004 SCT006 BKN009 14/13 Q1026=

THE A320 OPERATOR was contacted immediately post incident requesting a pilot report however this request was redirected to the company's UK Agent. After several reminders, the UK agent advised that the UKAB request had been forwarded to the company's overseas HQ base for processing. However, despite further requests, as yet, 6 months post incident, no response has been received.

THE B737 PILOT reports outbound from Gatwick IFR and in communication with Gatwick Tower squawking with Mode C. During take-off from RW26L whilst climbing on RW heading at 180kt they received a TCAS TA on traffic at 3000ft. Gatwick Tower then advised 'stop climb' so they levelled-off at 2300ft QNH. When clear of traffic they continued climb to 4000ft in accordance with the SID. He assessed the risk as medium.

ATSI comments that the A320 flight established contact with the Gatwick Director at 0945:40, passing FL83 for FL80 and approaching TIMBA. The Director instructed the crew to turn R heading 325° and descend to 6000ft QNH1026. They were also advised that they were 26nm from touchdown. Shortly afterwards, when the A320 was 21nm SE of Gatwick, the Director asked the crew their speed, to which they replied "*…two five zero knots…*". They were instructed to maintain this speed.

As the A320 passed FL62, when 16nm SE of Gatwick, the Director instructed the crew to descend to 3000ft, advising that they were now 18nm from touchdown. At 0948:30, the Director instructed the A320 crew to turn R, heading 330°, and start reducing speed from 250kt to 220kt. At this time the A320 was 12nm SE of Gatwick passing 5200ft. At 0950:00, as the A320 was passing 3800ft, IAS 217kt, the Director instructed the crew to descend to 2000ft. This they acknowledged and were told to turn L heading 300° and to report established on the LLZ for RW26L. At this time the ac was just approaching a 6·5nm final for the RW.

Meanwhile (0950:10), the B737 flight had been instructed to *"...line up and wait runway two six left be shortly on the runway the same or similar route to the one ahead"* in readiness for a DVR departure.

[UKAB Note (2): The previous departure was another B737 following a LAM4M SID which was cleared for take-off at 0950:00 and transferred to LTCC at 0951:10. Both DVR and LAM SIDs from RW26L involve climbing straight ahead to I-WW D2·3 then a R turn to intercept DET VOR R261.]

The A320 crew reported established at 0950:40, and the radar recording shows the ac slightly R of the C/L at just less than 6nm final. The Mode S data shows the IAS as 219kt and the passing altitude 2200ft. (*ATSI note; the radar shows the A320 turned L to regain the C/L and levelled at 2000ft. It did not descend again until 0951:10, when it was 4nm from touchdown*). The Director instructed the crew to *"...descend ILS speed one six zero knots maintain until four DME"*. At 0951:30, 2 things happened; firstly the Gatwick AIR controller cleared the B737 for take-off and, secondly, the Director instructed the A320 crew to contact Gatwick Tower. Although the A320 had regained the ILS C/L, the ac was at 3nm, indicating 1200ft and the speed was 216kt.

The A320 crew called the AIR and were instructed to continue approach and reduce to minimum safe approach speed, as there was a departure. The A320 crew replied "*(A320 c/s) unable to reduce due to bringing*". The AIR controller instructed them to continue approach but there may be a go-around. At this point the A320 was at 2nm from touchdown, passing 700ft and with an IAS of 204kt. The A320 descended to 500ft before commencing a go-around when at approximately 1nm from touchdown. The AIR controller instructed the crew to climb straight ahead and maintain 3000ft, which he repeated and then the crew acknowledged. The AIR controller rang Director and advised of the go-around and that the A320 would be climbing straight ahead to 3000ft before turning L onto 180° due to the DVR departure (i.e. the B737).

The B737 first appeared on the radar at 0952:26, when it was passing 500ft QNH climbing straight ahead. The A320 was passing 1900ft and 0·7nm behind the B737. The AIR transmitted "*(A320 c/s) make a left turn now heading One Eight Zero acknowledge*", which they did. At 0952:50, the controller asked the A320 crew their altitude to which they advised that they were maintaining 3000ft. The controller asked if they were heading 180° and the pilot replied that they were passing through 210°. At this point 0952:56 the radar shows that the A320 was in the 7 o'clock position of the B737 at a range of 0·5nm and 1000ft above it. The controller instructed the B737 crew to stop their climb and maintain altitude 2000ft. This was acknowledged and the controller asked the B737 crew to report in the R turn to which the reply was "*Now turning right (B737 c/s)*".

[UKAB Note (3): The CPA occurs at 0952:50, the A320 turning L indicating 2900ft QNH 1026mb with the B737 in its 1 o'clock range 0·4nm at 1600ft QNH.]

Minimum vertical separation occurred at 0953:08, when the A320 was at 2900ft and in the B737's 8 o'clock position range 0·9nm when the B737 was at 2300ft. The track divergence took the 2 ac away from each other and at 0953:15, the AIR instructed the A320 crew to contact the Gatwick Director again.

Although the A320 crew were passed several ranges from touchdown, at no stage did they request any extended routeing. However, the Director positioned the A320 onto the ILS at 6nm from touchdown at a speed of 220kt before instructing the crew to maintain 160kt to 4DME; giving the crew only 2nm to reduce speed by 60kt when they were also above the nominal GP.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

An experienced ATCO Member familiar with LTCC Gatwick operations opined that the A320 flight was poorly vectored onto the final approach, with the result that that ac was too high and too fast. The A320 crew had apparently continued their approach whilst trying to comply with ATC imposed speed control and descent instructions. To ensure an ac is stabilised on the approach, it is normal for ATC to descend ac to establish on the LLZ before intercepting the G/P and to issue flights with gradual reductions of speed to ensure the ac was at about 160kt by 7nm finals, with this speed to be maintained normally until 4DME prior to slowing further for landing. Here, the AIR controller had lined up the B737 in the expectation that the inbound A320 would be presented to him at a standard speed which would enable him to execute his plan. It was understandable why the AIR controller had filed this as an Airprox as both ac were not visible to him either visually, owing to the prevailing poor Wx conditions, or on the ATM as the A320 had disappeared into the radar overhead.

Pilot Members opined that although the A320 crew was told to maintain high speed, they should have been monitoring their flight profile and requested either an extended track distance or to reduce their speed. The crew were given several range checks after leaving the TIMBA area and it should have been apparent to the A320 crew at an early stage [using a range/height calculation] that the approach was not achievable without altering the ac's configuration. Although ATCO Members strongly believed that the INT/FIN's instructions had led to the A320 flying an unstable high-energy approach, Pilot Members disagreed stating that it was ultimately down to the aircrew themselves to ensure that the ac's approach was achievable and they should have told ATC that they could not comply with the instructions given, in order to realise that end. All Members agreed with this rationale and it was following this unstable high-energy approach that the A320 crew went around, resulting in a conflict with the B737, which had caused the Airprox.

The AIR controller had noticed the A320's higher than normal speed but believed the ac would slow down. However, following the crew's response that they were unable to reduce speed, he had anticipated that a go-around was possible. The A320 became visual to the AIR briefly before the crew executed their go-around, climbing straight ahead to 3000ft. Following coordination with INT/DIR, the A320 flight was given a L turn onto 180° to resolve the confliction with the B737. As a result of the A320's momentum, the ac climbed very quickly, reaching 3000ft just beyond the upwind end of the RW. With the B737 now airborne, AIR was mindful that separation margins could be reduced as, after hearing that the A320 was still turning L, he told the B737 flight to stop their climb, maintain 2000ft and asked them to report turning R away from the A320. However, the B737 had already passed through that altitude, the crew stopping their climb at 2300ft. These actions had very quickly placated the situation, the subject ac now on diverging tracks with the B737, the lower ac, vertically capped below the A320 in level flight. This convinced the Board that any risk of a collision had been quickly and effectively removed.

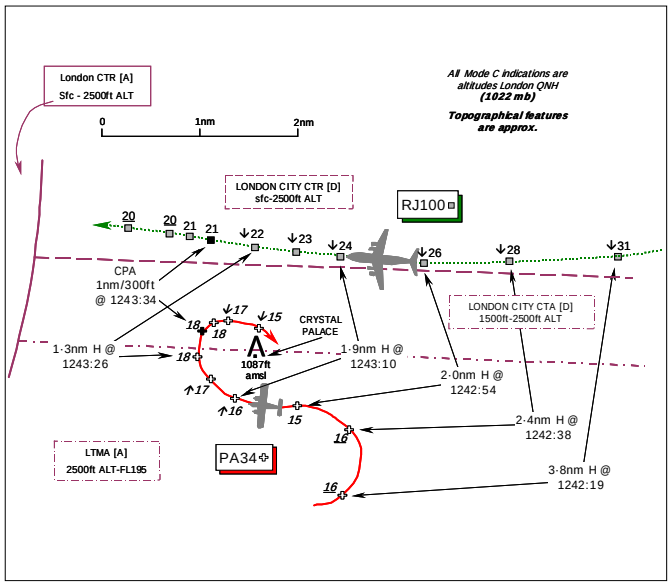
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Following an unstable high-energy approach the A320 crew went around into conflict with the B737.

Degree of Risk: C.

AIRPROX REPORT NO 154/07

Date/Time:	7 Oct 1243 (Sunday)	
Position:	5126N 00005W (7nm SW London City airport - elev 19ft)	
Airspace:	London City CTA/CTR (Class: D)	
	Reporting Ac	*Reported Ac*
Type:	RJ100	PA34
Operator:	CAT	Civ Comm
Alt/FL:	↓2000ft	1800ft
	QNH	QNH
Weather	VMC NR	VMC in haze
Visibility:	40km	8km
Reported Separation:		
	200ft V/1½nm H	500ft V/1·2nm H
Recorded Separation:		
	300ft V/1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AVRO RJ100 PILOT reports that he was downwind RH for RW10 at London City airport, heading 275° at 190kt, whilst in receipt of a RCS from Thames RADAR. Flying in VMC, he thought level at 2000ft QNH, in a position 225° LCY 5nm, another ac was spotted on TCAS at 10 o'clock some 5nm away, 500ft below his ac, about which the controller advised them. However, the TCAS display showed the other pilot was not maintaining his assigned altitude of 1500ft, but climbing through 1700ft – some 300ft below them. The other ac also turned towards them rather than away before the TCAS image disappeared for approx 10-15sec. At this point the controller issued an instruction to the other ac's pilot – a light twin-engine aeroplane – to turn away, before he thought issuing him a 15° R turn to increase separation. The light twin was then displayed again on the TCAS approximately 1½ miles away and 300ft below his ac. Only a TA was enunciated by TCAS but he assessed the risk as *"high"*.

After landing he contacted the controller by telephone who advised that the other pilot had called to apologise. He estimated that at the closest point the other ac was 1–1½nm away some 200ft vertically below them.

THE PA34 PILOT reports he was conducting a local flight from Stapleford, under VFR at 110kt, some 500ft clear below cloud and haze. He was in receipt of a FIS from Thames RADAR; the assigned code was selected on the transponder with Mode C.

A clearance to enter CAS, route to the southern tip of the Isle-of-Dogs and report there had been received. On reaching the Isle-of-Dogs he reported this and was told to orbit in that position, which he did. After some time he was told of in-bound traffic to City Airport and told to leave CAS and route to Crystal Palace and Hold. This was an unfamiliar instruction from ATC and as he had been holding there for just 2min he never had time to properly study his charts and "take stock of his position". Whilst holding to the S of the Crystal Palace Mast just below 1500ft QNH, he was given traffic information about the RJ100 passing behind and above him. On hearing of this traffic he wanted to get visual contact with the airliner so he decided to carry out a RH orbit: it was at this point, while he was looking over his R shoulder, he must have inadvertently pulled back on the yoke making the ac climb 300ft vertically and thus into CAS without clearance. On being told by ATC he immediately and quickly exited CAS by increasing the bank angle and descending. He assessed the risk as "low" but cited an unfamiliar routeing instruction from ATC and a high workload in hazy conditions as significant factors. Estimating that he entered CAS horizontally by about 700m (looking at the radar data later) he believes the minimum separation was 500ft vertically and 1·2nm horizontally.

Once the flight was over he immediately contacted the Watch Manager at LTCC and informed him of the situation and he apologised fully and unreservedly - especially to the crew of the RJ100. Some valuable safety lessons had

been learnt form this incident. As he instructs as well as conducting London Pleasure Flights, he will pass these safety lessons on to his students.

LTCC LONDON CITY DIRECTOR/THAMES RADAR CONTROLLER reports that before the Airprox occurred the VFR PA34 was cleared into the London City CTR as part of its non-standard flight - a pleasure flight that routes from the Dartford Bridge and continues over Central London at 1500ft. Due to a previous TCAS RA on this day against London/City inbound traffic, some 5 minutes beforehand, he elected to move the PA34 out of the CTR to wait for a gap in traffic.

The IFR RJ100 was SE of London City Airport and the crew given traffic information on the PA34 as a "light twin holding at 1500ft outside the Zone". The RJ100 crew was also given traffic information when the ac were about 8nm apart.

As the RJ100 was flying "late downwind" for RW10, the PA34 was observed to be orbiting at 1800ft London QNH inside the London City CTA, at a range of 1½nm from the RJ100 that was descending to 2000ft. Avoiding action was not given to the RJ100 crew as the latter was turning away from the PA34. The PA34 pilot was instructed to move S immediately, given traffic information and reported visual with the RJ100. Later, the PA34 pilot was cleared into the Zone, to operate W of London Bridge and E of Vauxhall Bridge.

The Captain of the RJ100 telephoned London City ATC and reported that he had a TCAS TA.

The controller observed that whilst not connected with this report, there have been a number of frustrating incidents when this and other pleasure flights failed to read back clearances and did not to do as cleared. He does not believe that pleasure flights should be allowed to fly up and down the River Thames on H4 within 6 miles of touchdown when London City is using RW10. The additional workload of having up to 8 ac at the same time doing 7 or 8 pleasure flights EACH is becoming unacceptable. Also, if London Heathrow is on Westerly operations, a risk of a TCAS RA climb by London City traffic towards the descending London Heathrow traffic remains high.

ATSI reports that the pilot of the PA34 contacted the Thames RADAR controller at 1229:30, and was initially instructed to remain outside CAS. The ac was already displaying the allocated squawk of A7051, as passed to Stapleford by LTCC. One minute later details were requested and the pilot advised that he was undertaking a pre-notified sightseeing flight from Stapleford, via the QE2 Bridge, S of London City to Vauxhall Bridge and then returning to Stapleford. The controller placed the flight under a FIS and instructed the pilot to report at the QE2 Bridge.

At 1233, as the PA34 approached the QE2 Bridge, a clearance was issued by the Thames RADAR controller for it to enter the London City CTR, routeing to the Isle-of-Dogs, VFR not above 1500ft London QNH. This was acknowledged but, as the PA34 entered CAS, no change of ATS was specified, as is required. Just as the PA34 was approaching the Isle of Dogs, the pilot was instructed to hold there and contact City RADAR, which he did at 1238:25, and request onward clearance to Vauxhall Bridge. The City RADAR controller instructed the pilot to carry out a left hand orbit, advising that he would clear the ac westbound again when he could. The pilot acknowledged this and the controller responded by saying: "*In fact change of plan sir can you just come south towards Crystal Palace and just hold outside the zone. I'm afraid there's a bit of inbound traffic now to affect you*". The pilot responded with "*Roger that heading towards Crystal Palace* [PA34 C/S]".

The pilot reported holding at Crystal Palace at 1240:20, which the controller acknowledged advising that the delay should only be 2min. He added that there had been a number of TCAS generated climbs by jet traffic against VFR flights and so "*…we're just being a bit cautious by giving traffic*". The Heathrow 23cm radar recording shows the PA34 carrying out a left hand orbit remaining S of the Class D London City CTA, at an altitude of between 1600-1700ft. At 1242:20, the controller passed traffic information on the subject RJ100 as being "*..just north of you by 2 miles in the descent to 2 thousand feet*". Some 20 sec later at 1242:40, the RJ100 crew called the RADAR controller and reported heading 275º, downwind, descending to altitude 2000ft. The controller acknowledged this and passed traffic information on the PA34 at 1242:50, *"..look out for traffic in your left 10 o'clock range of 2 miles orbiting outside controlled airspace at 15 hundred feet".* The RJ100 crew responded that they were looking but had the ac on TCAS and subsequently reported visual with the PA34 just after 1243:10.

The recorded radar data shows that at 1242:58, the PA34 is turning L through NW at 1500ft and in the RJ100's 10 o'clock – 2nm as the RJ100 passes 2600ft. The PA34 then rolls out westerly and commences a gradual climb

before turning R towards the southern boundary of CAS. STCA activated at high severity at 1243:20, as the Mode C of the PA34 indicated 1800ft. (ATSI note; the PA34 was holding just to the S of the London City CTA where the base is 1500ft). The controller transmitted "[PA34 C/S] *you're just coming into the London City CTA you need to turn south immediately, traffic north of you by 1 mile at 2 thousand feet*". The pilot replied by advising he was visual with the traffic and in the turn. The controller then confirmed that the PA34 had not been cleared into the Zone and so the pilot must turn S immediately.

As the RJ100 continued on its downwind heading and the PA34 manoeuvred to the S, separation reduced to 1nm and 300ft before the two ac quickly moved away from 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, a report from the air traffic controller involved and the appropriate ATC authority.

The NATS Advisor briefed the Board that here the controller was cognisant of another TCAS induced incident that had occurred a little earlier during the watch (6min before this Airprox) involving GAT under the control of RADAR and another VFR track. Controllers are naturally cautious of such traffic and the potential for VFR tracks to induce a TCAS RA in IFR CAT ac operating within 1000ft close to the base of CAS is significant – hence the instruction from RADAR to the PA34 pilot here to hold to the S, clear of the radar pattern, in Class G airspace. This was a reasonable request but the controller's plan to forestall any difficulty that might ensue as a result of the proximity of VFR to IFR traffic was thwarted by the PA34 pilot's inaccurate height keeping.

Pilot Members were concerned that the PA34 pilot – an instructor – was unable to keep his ac level at the assigned altitude of 1500ft whilst in the turn, thereby holding clear below CAS. Whilst accepting fully the inadvertent nature of the climb into CAS, pilot Members were nevertheless concerned that the commercial PA34 pilot should have been unable to maintain his altitude at this critical juncture. Pilot Members recognised that it was entirely understandable that he would wish to sight the RJ100 subsequent to the controller's traffic information - and the reason that he reversed into a R turn towards it – but it was this inadvertent climb to a maximum indicated altitude of 1800ft according to the radar recording – penetrating the base of the Class D CTA by some 300ft – that was the crux of this Airprox. The PA34 pilot's comment that he was given an unfamiliar routeing instruction from ATC in a high workload situation seemed slightly at odds with the local nature of the flight, not far away from Stapleford, which it seemed was a regular event. Members suggested that the location of Crystal Palace should have been known to the PA34 pilot and readily apparent. However, the Members agreed that it was possible that the hazy conditions had played a part here. If the PA34 had remained outside of the CTA to the S of Crystal Palace, then the likelihood of such an event was almost entirely removed, but it was unfortunate that the PA34 pilot had elected to enter a RH turn when he did and it was this closing vector coupled with the climb which was the concern. Clearly, however, this enabled him to sight the RJ100 more quickly which mitigated any potential risk.

As the PA34 was turning towards the RJ100, there was significant potential for the ac's TCAS to consider the presence of the light twin as a 'threat' and generate an RA. As it was, the RJ100 crew received only a TA and at the altitudes encountered here TCAS would be aiming to afford vertical separation in the order of 300ft against any 'intruder' that might infringe the protected volume of airspace it was sensing. Fortunately, this safety barrier was not apparently breached and with the minimum recorded vertical separation of 300ft as the PA34 drew aft of the RJ100 no closer than 1nm away it was fortunately outside the parameters that might have triggered a TCAS RA CLIMB scenario. GA pilots should be in no doubt that turning and climbing towards a commercial ac in relatively close vertical proximity could well induce an RA – not a new lesson but one worth repeating here.

For their part the RJ100 crew had the PA34 displayed to them on TCAS from 5nm away and RADAR passed traffic information on the light-twin at the earliest opportunity. This enabled the RJ100 crew to sight the other ac before RADAR instructed the PA34 pilot to turn away to the S. Controller Members considered the absence of any robust avoiding action instruction from RADAR to the RJ100 crew but it seemed that the instruction to the PA34 pilot to turn S immediately was sufficient in the knowledge that each ac had been sighted by the other's pilot and that the controller's radar showed that the RJ100 was on a diverging track. Whilst plainly not ideal – and one highly experienced controller Member was very wary of effectively issuing a vector to VFR traffic - this clearly ensured that the situation did not deteriorate further and Members believed the controller exercised sound judgement in a difficult close quarters situation. Controller Members were keenly aware that more robust avoiding action in the lower reaches of CAS could have a detrimental impact on other traffic in the pattern and be the cause of potentially

more serious problems. The Board concluded unanimously that this Airprox had resulted because, whilst holding outside CAS, the PA34 pilot inadvertently climbed his ac above the assigned altitude, entering the London City CTA without clearance and into conflict with the RJ100. Nevertheless, with the pilots of both ac visual with each other's ac, the prompt reaction by the controller and the divergent geometry of the ac at the closest point all ensured that no risk of collision had existed in these circumstances.

The issue of VFR traffic operating close to the base of CAS was well known to the Board. The NATS Advisor stressed that the Thames/City RADAR controller had expressed a concern widely held amongst controllers at LTC, that ac holding outside CAS - 500ft below the level to which ac are descended in the London City radar pattern – might induce a climb RA if their altitude fluctuates even to a relatively small degree. In the past, such pleasure flights had little impact on GAT as London City Airport was closed at weekends. Increasing use of this Airport has resulted in longer opening hours and greater potential for interaction between such flights as these. As a result of this Airprox – and the comments highlighted by the controller with regard to the intensity of these flights - a review was undertaken which has resulted in the promulgation of an LTC Supplementary Instruction giving control staff more guidance about such flights as the PA34 here. Henceforth, when such flights are notified to LTC, the Senior Watch Assistant will now obtain approval from the Senior Group Supervisor for the flight, taking into account the prevailing traffic situation.

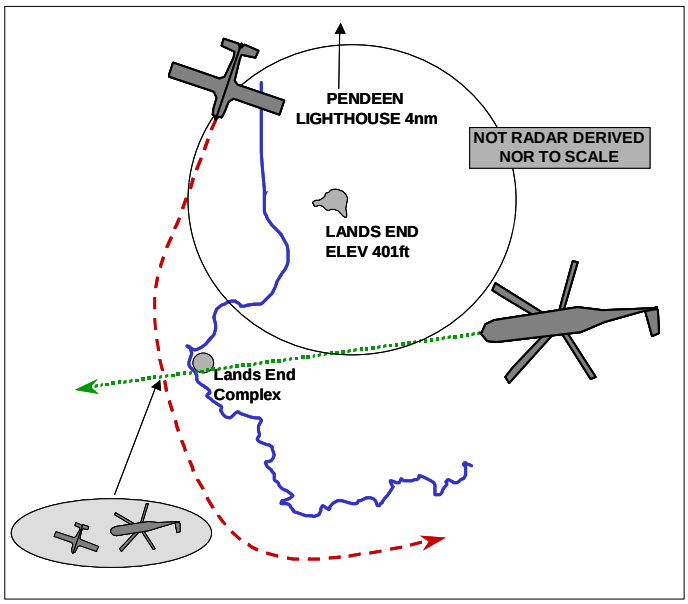
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Whilst holding outside CAS, the PA34 pilot inadvertently climbed his ac above the assigned altitude, entering the London City CTA without clearance and into conflict with the RJ100.

Degree of Risk: C.

AIRPROX REPORT NO 155/07

Date/Time:	5 Oct 0952 (Friday)	
Position:	5003N 00543W (Lands End Point)	
Airspace:	Lands End Corridor (Class: G)	
	Reporting Ac	*Reported Ac*
Type:	S61N	AA-5B Tiger
Operator:	CAT	Civ Pte
Alt/FL:	1500ft	
	(QNH 1024mb)	(QNH NR)
Weather	IMC KLWD	NK NR
Visibility:	0	NR
Reported Separation:		
	NR (TCAS 100ft V)	NR
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE S61N PILOT reports flying a scheduled passenger flight on a standard IFR flight plan [see ATSI report] from Penzance to the Scilly Isles in an ac with TCAS1 fitted. The weather was generally good but there was localised cloud on the route near LND that was not avoidable. He was flying at 1500ft QNH and IMC in cloud 6nm beyond LND, heading 255° at 110kt, in receipt of a FIS from Lands End Tower and squawking 7047 with Mode C, when he received a TCAS TA indicating on an ac at 1nm or less and 100ft below. He had no time to react and in any

case had insufficient information to select a suitable course of action. He reported the incident to Lands End and assessed the risk as being High.

THE AA-5B TIGER PILOT reports that he was only made aware of the Airprox 2 months after the event, therefore his account is only from his recollection of events and was not corroborated by any data.

He took off from Perranporth airfield at about 0930 on a private flight with a passenger intending to transit the coast in an anti-clockwise direction via Lands End and the Lizard Peninsula, he was squawking 7000 with Mode C. Having climbed to about 2000ft QNH it would be his normal practice to obtain a FIS from Culdrose APR on 134.05 for the transit across Carbis Bay to St Ives and in that area it is common for Culdrose to request ac to free call to Lands End on 120.25. He would have called them and stated his intentions, but he does not recall being advised of any other traffic. As he continued S the reducing cloud base meant that he transited the W edge of the Lands End ATZ at about 1300ft QNH to remain VFR. Having passed the Lands End peninsula he heard other traffic on the RT and during his routine lookout he saw a Helicopter approx 500m away slightly behind in his 4 o'clock position at the same height but he thought that it was climbing out behind them.

His flight continued with a call to Penzance Heliport on 118.1 and having transited their ATZ he returned to the Culdrose frequency.

Shortly after calling Culdrose the deteriorating weather conditions caused him to divert from his intended route and return to the N coast eventually landing back at Perranporth at 1030. He did not assess the risk.

UKAB Note (1): The procedures for ac in the Lands End Transit Corridor are in the UK AIP AD 2-EGHC-1-4 2.22 b – Flight Procedures and are outlined in the ATSI report below.

UKAB Note (2): The operating hours of Culdrose LARS are not published in the UK AIP (1-6-3-3); however in the ERS the Airfield hours of Culdrose for Fridays when daylight saving is in force are 0730-1300 or SS.

ATSI reports that the Lands End ATZ is a circle radius 2nm centred on the longest notified runway (16/34), from the surface to 2000ft aal. The Airprox occurred between an AA5 flying VFR, anti-clockwise, around the coast in the vicinity of Lands End and an S61 helicopter on a flight between Penzance and the Scilly Isles. The pilot of the latter reported flying under IFR at the time. The UK AIP states, under the Lands End/St Just entry: 'Passenger carrying flights operating between Penzance Heliport, Lands End Aerodrome and Scilly Isles/St Mary's Aerodrome operate within in a corridor **'Lands End Transit Corridor'** centred on a direct track from Penzance to Scilly Isles from the SFC to 2000ft ALT. Pilots intending to transit the Airspace are strongly recommended to contact Culdrose ATC on 134.050 MHz, or if outside published hours of Culdrose LARS [see UKAB Note 2] then either St Mary's ATC on 123.825 MHz or Lands End ATC on 120.025 MHZ, 10nm before the corridor boundary'. Further information is stated in the AIP, Scilly Isles/St Mary's entry. The S61N pilot reported squawking 7047, the Culdrose conspicuity SSR code, at the time of the Airprox. The LOA between the helicopter operating company, Culdrose and St Mary's, states that each helicopter 'is to contact Culdrose ATC on 134.05 MHz on the first flight of the day, confirming its squawk. This squawk is to be retained by this ac until it has ceased flying for that day, whereupon the squawk may be transferred to another (company) ac on initial contact with Culdrose ATC. Culdrose ATC will assume all (company) helicopters to be in receipt of a FIS from Culdrose, regardless of whether R/T contact has been established, and will broadcast information concerning the proximity of other traffic where possible.'

The AA5 established communication with Lands End Tower at 0944. The pilot reported at 2400ft, heading 240°, anti-clockwise around the coast and requested *"information any traffic to affect"*. He confirmed his position as St Ives (10nm NE of the aerodrome). The pilot was warned about a Merlin, which was operating in the area but not in contact with Lands End. He was instructed to report at Pendeen Lighthouse, a VRP 4nm N of the airport and was issued with the QNH. The pilot read back the pressure correctly.

The S61 contacted Lands End at 0947, reporting at Newlyn Quarry, approximately 5nm E of Lands End airport, at 1500ft, estimating St Mary's at 1005. The usual flight path is to route Westbound from the quarry, coasting out at the Lands End Complex, then S of the Longships Lighthouse. The pilot was instructed to report coasting out and was informed about an opposite direction S61. He did not report his flight conditions. The LOA between the two companies operating to St Mary's and the two ATSUs, states that 'it is agreed that scheduled flights operating within the Lands End Corridor will be conducted under VFR except when a requirement for flight under IFR is specified prior to departure or in good time prior to arrival'. Additionally 'It may not be practicable for ATC to

facilitate immediately an airborne request to change from VFR to IFR and pilots should be prepared to deviate from track, in order to stay in VMC, until an IFR clearance or Radar Service is made available'. On this occasion, the S61 pilot did not make any comment on the Lands End frequency about operating IFR.

Shortly after the S61 contacted Lands End APP, the AA5 pilot reported at Pendeen Light at 2400ft. He was instructed to *"report any change in level and report west abeam Lands End"* and responded *"Er Roger Wilco"*. Approximately one minute later the S61 reported coasting out and was instructed to report at 'Charlie' i.e. LND DME 10nm arc, the boundary line of ATC jurisdiction between Lands End and St Mary's ATSUs. The pilot then enquired if there was any traffic nearby. The ADC commented about the Merlin and the AA5 *"who's just passed Pendeen at two thousand Four Hundred feet"*. The pilot added that he had received a TCAS alert about traffic S of him, separated by 1nm and 100ft. The controller confirmed with the AA5 pilot that he was now S of the aerodrome. He reported that he had sighted the 'Merlin' on his left (in fact the S61).

The RTF transcript confirms that the AA5 pilot did not report W abeam Lands End aerodrome, as the controller expected. The controller was relying on this call to enable him to pass current TI to both flights. However, there may have been some ambiguity about the position report requested i.e. W abeam the Lands End aerodrome or the Lands End geographical feature. The AA5 pilot commented, in his written report, that he had descended to approximately 1300ft to remain VFR, as he transited the W edge of the ATZ. He did not report any change of level on the frequency, as instructed, from 2400ft. Consequently, there was no reason for the controller to believe that the subject ac were not vertically separated by 900ft. Although ac routeing along the coast would be visible from the VCR, as they passed W of the aerodrome, the Aerodrome Controller is the sole occupant and may well have been busy with other tasks at the time.

The Airprox was reported as occurring at 0952. The Lands End weather observation, timed at 0948: surface wind 090°/09kt; visibility 10km or more; scattered cloud at 800ft.

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 authorities.

The Board noted that this was the second similar incident in the last 18 months.

As with the previous incident (047/07) both ac were operating legitimately in Class G airspace, albeit in the Lands End Transit Corridor, where additional warnings apply; nonetheless both pilots again had an equal and shared responsibility to see and avoid (all) other ac. In this incident neither pilot was in a position to see the other ac since the S61N had been flying in cloud when the ac tracks crossed. Members had some difficulty in reconciling the apparently differing pilot's reports but agreed that the insert to the diagram above was probably accurate and the AA5B pilot had seen the S61N in his 4 o'clock only after their tracks had crossed. Members noted that TCAS azimuth information is well known as being sometimes inaccurate, thus possibly denying the S61N pilot the full situational picture. Nevertheless, since the AA5B had been squawking the S61N pilot had been aware of its presence and that it was slightly below him, solely from the TCAS information; had the AA5B not been squawking the S61N pilot would have had no warning of its presence whatsoever.

A Member very familiar with operations on the Penzance/St Mary's helicopter route briefed the Board in some detail on its problems and peculiarities. In particular he briefed that it was often busy, that weather and fuel/weight are frequently significant considerations/limitations. However, he pointed out that there is a low ceiling route available, predominantly over the water slightly to the S, but this was not being flown in this case. In addition, the ATSI Advisor briefed the Board on the LoA(s) that apply to operations on the route(s). Notwithstanding the restrictions placed on IFR operations in the LoA, (noted in the ATSI report above) Members unanimously expressed concern that a CAT flight was being operated in Class G airspace, albeit for a short period, in IMC conditions without a radar or IFR procedural ATC service; furthermore, this was not in accordance with the LoA. Such a procedure not only negates the possibility of the crew being able to exercise their responsibility to see and avoid other ac, but also precludes other pilots from seeing their ac; separation therefore is by luck rather than design.

The AA5B pilot was locally based and therefore presumably familiar with the area and the Scilly Isles operation, therefore Members thought that he would probably not have been confused by the Lands End Controller's

requested position report, even though it had been imprecise. The pilot had however, descended from his reported altitude without informing the controller as he had clearly requested. Although the controller was the only person, at least initially, with the whole picture, his understanding was based wholly on the information/position reports passed by the pilots. The controller believed that there would be adequate vertical separation even if the AA5B pilot had called 'abeam' (the airfield) before the S61N coasted out (at Lands End Complex). By descending without informing the controller the AA5B pilot significantly eroded the separation the controller believed to exist and therefore he was not able to provide either pilot with any warning. Members however agreed that other than a perhaps ambiguous instruction to the AA5B pilot, the Lands End Controller played no part in the incident.

One Member suggested that there might have been a degree of complacency, sometimes encountered in specialised regional operations, shown by all concerned in this incident and counselled that it is sometimes appropriate to re-examine procedures; he also opined however that a formal recommendation was not warranted in this case.

Since the AA5B was operating in good VMC below the cloud and the S61N pilot was aware that 100ft vertical separation existed between the ac, Members considered that there had not been any risk of a collision. The safety of the ac had however, been compromised by the inability of the respective pilots to see and avoid each other's ac since the S61N had been in cloud and therefore its pilot had been unable to see or avoid the AA5B whose pilot had, in turn, not been able to see the Helicopter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the Lands End Transit Corridor.

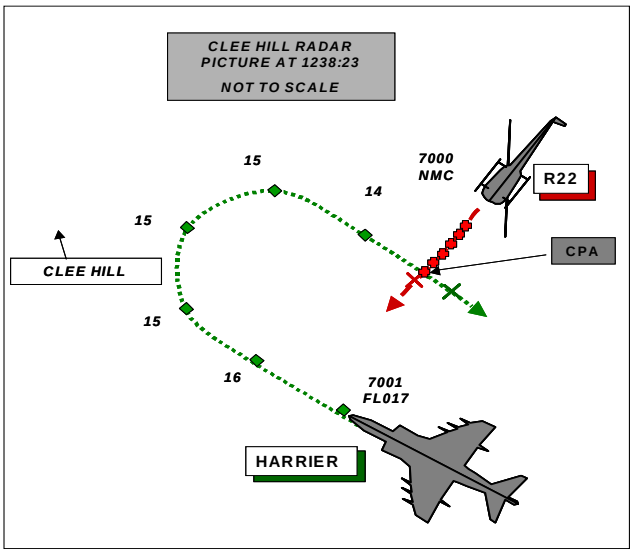
Degree of Risk: B.

Contributory Factors: 1. The S61N crew did not comply with the LoA.

2. The AA5B pilot did not advise Lands End Tower of his change of altitude.

AIRPROX REPORT NO 156/07

Date/Time:	1 Nov 1238	
Position:	5223N 00230W (6nm W Kidderminster)	
Airspace:	UKDLFS/FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Harrier T10	R22
Operator:	HQ AIR (Ops)	Civ Trg
Alt/FL:	1000ft	2300ft
	(RPS 1021mb)	(NR)
Weather	VMC NR	VMC NR
Visibility:	unlt	20km
Reported Separation:		
	50ft V/100m H	Not Seen
Recorded Separation:		
	NR V/ 100m H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HARRIER T10 PILOT reports flying as No2 in a high workload, 4-ship low level tactical instructional sortie, in grey 2 seat ac with HISLs on; the handling pilot was in the front seat and the instructor in the rear. They were squawking 7001 with Mode C. After completing a climbing evasion manoeuvre at 450kt, ending up at 1000ft agl,

the formation was called to turnabout to the R from heading 300° onto a heading of 120°. They maintained their level and after the turn descended back to 250ft agl. Although the handling pilot was concentrating on collision avoidance with the other members of the formation element the instructor began to clear the flightpath ahead of their ac and shortly after the descent was initiated he noticed an object 'blooming' directly ahead and below them (estimated as 300m away). By the time he began to take control to initiate avoiding action the object identified as a R22 was behind them in their 5 o'clock position and no longer a threat. He assessed the risk as being high.

THE R22 PILOT reports flying as an instructor on a training flight from Wolverhampton in a red and white ac in receipt of a FIS from London Info and with SSR and Mode C selected on [he thought]. He had flown several student training flights on that day and could not recall the precise details of the flight but thought that at the reported time of the incident they were in the cruise and would have been at an alt of about 2300ft flying at 70kt and in the area that the incident was reported. He had checked the NOTAMS prior to departing. Neither he nor his student saw the reporting Harrier although they did see 2 other fast jet ac in the Clee Hill area but he could not recall positively if this had been on that flight or an earlier one. [Very close to the reported position].

UKAB Note (1): The Recording of the Clee Hill radar shows both ac throughout the event; the R22 however is not displaying Mode C information. The Harrier approaches the area initially tracking 300° displaced about 2nm to the S then commences a R turn onto a reciprocal track. The R22 is steady on a track of 220° throughout the incident. Less than 10sec after the Harrier rolls out on 120° it passes about 100m behind the R22 which crosses the Harrier's track at right angles from L to R.

UKAB Note (2): The nearest available METAR was Birmingham where the 1250 was:

EGBB 011250Z 27013KT 9999 SCT024 17/11 Q1031

The terrain in the area of the incident is rolling with a mean height of about 210m (690ft). If the R22 were at 2300ft amsl as reported, it would have been at about 1600ft agl.

HQ AIR OPS comments that, since the Harrier pilot reported that the R22 was below them and probably lower than he reported, it would have been very difficult to see in the winter light, especially as it was effectively on a 90° collision course (after the Harrier rolled out of the right turn).

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 Harrier operating authority.

The Board noted that both ac had been operating legitimately in Class G airspace, the Harrier in the UKLFS and the R44 in the open FIR; that being the case the pilots had an equal and shared responsibility to see and avoid their respective ac. Members were briefed that the Harriers had been operating slightly higher than is usual for tactical low level sorties since they were on a high workload, initial conversion, 4-ship, tactical evasion mission. The student pilot in the front seat would have been concentrating on maintaining visual with and formating on his leader following the turnabout through 180 degrees. Following the turn however, the Harrier instructor in the rear seat saw the R22 appear slightly below them (below the horizon) in their 12 o'clock but not in time to take any avoiding action; the R22 pilot did not see the Harrier(s) at any time. Specialist Members thought that the helicopter had probably been slightly lower than its pilot reported and it would have been very difficult to see in the winter light, especially as it was effectively on a 90-degree collision course with the Harrier.

Since the R22 was not squawking Mode C and its pilots had not seen the Harrier, there was insufficient information to verify the Harrier crew's estimation of the vertical separation; that being the case the Board accepted the crew's estimation of 50ft and that the radar showed that the horizontal miss-distance had been minimal.

Due to the effective lack of sighting of the other ac by all 4 pilots involved and that the Helicopter had not been called by any of the Harrier formation members, the Board concluded that it had only been by good fortune that the ac had not collided and consequently that there had been an actual collision risk in this incident.

AIRPROX REPORT No 157/07

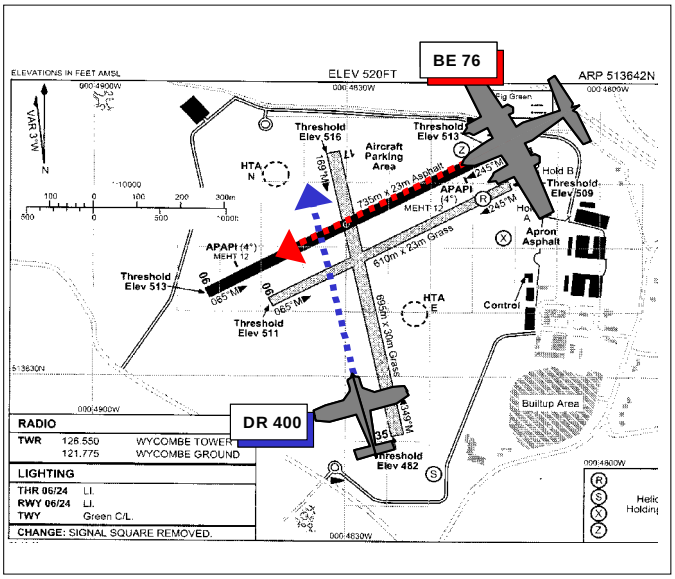
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the R22 pilots and an effective non-sighting by the Harrier pilots.

Degree of Risk: A.

AIRPROX REPORT NO 157/07

Date/Time:	3 Nov 1038 (Saturday)	
Position:	5137N 00049W (Wycombe Air Park - elev 520ft)	
Airspace:	ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	BE76	Robin DR400
Operator:	Civ Pte	Civ Pte
Alt/FL:	0ft	↑50ft
	(QNH 1032mb)	(QFE 1013mb)
Weather	VMC CAVOK	VMC CAVOK
Visibility:	>10km	>10km
Reported Separation:		
	30ft V/0m H	50ft V/Nil H
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BE76 PILOT reports flying a blue and white ac with all lights switched on on a private IFR flight to Deauville. He was squawking 5532 with Mode C and S and was in contact with Wycombe Tower who had cleared him for take off on RW24. The wind was Northerly and the active RW for the separation of ac and gliders was RW35. He had been given notice of a glider high in the 1 o'clock of his take off track and had it in sight. The take-off roll was normal and the rotate speed of 71kt IAS was reached after about 250m [150m before the RW intersection]. After a final check of the glider and his instruments he was about to initiate rotate when a blue and white glider tug [without a glider] entered his peripheral vision 100 to 200m away and slightly to port [on RW35]. It was rotating so he deferred his rotation and as their tracks intersected the Robin crossed above him by about 30ft. He rotated at 85kts and continued to take off normally.

Other than the above he was not able to take any avoidance and he assessed the risk as being very high.

THE ROBIN DR400 PILOT reports flying a blue and white ac with a white strobe selected on on a private VFR flight to Bembridge with a passenger. SSR was fitted but at the time was switched off, and he was in communication with Wycombe TWR. They had been cleared by ATC on the TWR frequency to cross the active RW (35) to the glider side, which operates non-radio. He continued to listen out on the TWR frequency and so he did not hear the ADC asking the glider launch point on 129.975 [the gliding common ground frequency] if it was okay for an ac to take off on RW24 nor did he hear the other ac's clearance to use RW24 [on the TWR frequency]. From where he did his power checks it is not possible to see ac at the threshold of RW24 due to the rise in the ground. Having first visually determined that there were no ac on the approach to the glider side he started his takeoff run. The ac taking off on RW24 was sighted to his right at about 65kt, too late to stop before reaching the intersection with RW24 and he determined that it was safer to continue with the take off crossing about 50ft above the BE76.

He assessed the risk as being high.

ATSI reports at the time of the Airprox, RW35 was the promulgated RW in use. The Wycombe MATS Part 2, Section 3, Chapter 2, states the allocation of ATZ airspace:

'The ATZ is divided into two basic sections to separate glider operations from powered (fixed wing and rotary) operations. A Safety Buffer Zone has been established to provide separation between the Gliding Section and the Power Section airspace. The boundaries extend to the boundaries of the ATZ and are defined on the manoeuvring area when RW17/35 is in use:- The Power Section boundary is defined as the western edge of RW17/35. The Gliding Section Boundary is defined as a line positioned parallel to and 30m west of the Power Section Boundary. In order to preserve the value of the Buffer Zone System for safety purposes both the Power and Gliding Sections must promulgate the same RW direction for use, although opposite direction circuits will be flown. Unless specifically authorised by ATC and Gliding Co-ordinator, no power section traffic is to enter the Gliding Section airspace at or below 1400' QFE (1900'QNH)'. Additionally, under the title 'Gliding Co-ordinator': 'The Gliding Co-ordinator will be available (on radio) during periods of gliding operations to communicate with ATC on the common Gliding Frequency [ground] 129.975 MHz. At periods of low gliding activity, contact may be made through a tug pilot if the Gliding Co-ordinator is absent'.

However, there are Special Procedures, that were applicable on 3 November 2007, for Different or Dual RW Operation stated in the Wycombe MATS Part 2. A request for the use of the non-promulgated RW must be made with ATC, giving two hours notice on a Saturday. The MATS Part 2 states:

'Use of RW06/24 when RW35/17 is in use is solely subject to the approval of the ATCO on duty. Ability to grant the request will depend upon the traffic situation and the co-operation of the Glider Co-ordinator. During periods of intense gliding, fixed wing or helicopter activity, or at other times at the discretion of the ATCO, permission may be denied'.

A take off clearance is not to be issued for departure from RW24, until agreement has been reached with the Gliding Co-ordinator.

On this occasion, the Wycombe TWR and GND positions were combined. The DR400 contacted the frequency at 1027, requesting to taxi to the launch point. The pilot used the callsign 'Tug' and the last two letters of the ac registration. He was cleared to taxi to hold short of RW35 before, subsequently, being cleared to cross. Just after the DR400 had reported clear of RW35 at 1030, the BE76 made its initial call on the frequency. ATC were aware of its request for RW24 and it was cleared to taxi for that RW, although it was informed that the RW in use was 35. There was a slight delay to its departure whilst waiting for its CAS joining instructions from LTCC. The clearance was received and passed to the pilot at 1036, who was requested to report ready for departure. In accordance with the procedures for using RW24 when 35 is promulgated, the controller contacted the Glider Launch Point at 1036:48, using the Glider frequency. *"I've got a Duchess very shortly wanting to depart from RW Two Four I'll give you a call when he's lining up"*. The Launch Point replied *"Thank you we've only got one glider airborne and er you'll see him if you look out towards the end of Two Four"*. Shortly afterwards, the controller transmitted *"The Duchess is lining up can I I see your glider can we let him go"*. The response was *"Affirmative".*

Having previously been cleared to line up RW24, the BE76 pilot was instructed at 1038, *"there's one glider just er as you probably lift off it'll be high and to your right so just caution if he turns downwind for Three Five with that in sight you're clear take off surface wind Three Five Zero at Five"*.

Unbeknownst to the controller, as no further comments were received from the Glider Point, the DR400 took off, without any contact on the Launch Point frequency, from the Glider area (35 Grass). Although it would have been possible to see the DR400 rolling from the VCR, the controller had no reason to believe that any traffic would depart from the gliding section. Having received approval clearance for the RW24 departure from the Glider Launch Point, he had, consequently turned his attention to other traffic. No comments were made on the frequency about the close proximity of the subject ac until after the incident had occurred.

The controller contacted the Glider Point on their frequency *"We weren't aware of that glider tug that got airborne that was quite close to the Duchess"*. The response was *"he's not a glider tug erm and er I'm sorry"*. From following communications it would appear that there was nobody at the Launch Point, the pilot of a tug ac was making the transmissions, on the ground at the glider site. He commented that the subject DR400 was used as a standby tug, but was not on any tug related flight when it took off. He added that *"I assumed he'd been in touch with you he probably didn't realise you were having anything on there 'cos he wasn't perhaps on the frequency"*.

As a result of this Airprox, it is Wycombe's intention to reduce the use of the non-promulgated RW. Additionally, the following procedures, stated in MATS Part 2, have been introduced under the title 'Use of Gliding Side by Powered Aircraft (other than Glider Tugs)':

'RW06/24 in use – use of the gliding side by powered ac (other than glider tugs) is solely at the discretion of the duty ATCO in conjunction with the Gliding Co-ordinator. Approval will only be given if the ac has a legitimate reason, eg, wind, etc.

RW17/35 in use - 'All powered ac (other than glider tugs) **MUST** operate from the main RW and **NOT** from the gliding side'.

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 report from the air traffic controllers involved and reports from the appropriate ATC authorities.

Members were unanimous in agreeing that this was a most serious incident which had the potential to have been an accident. Fortunately, both pilots had seen the opposing ac in their peripheral vision and, somewhat surprisingly to some, they had both opted to continue their take-offs. Although the broad outline of events was evident from the pilots' reports, the precise relative positions as the ac approached the RW intersection was not clear. There was therefore no agreement as to whether the decisions of the pilots to continue having seen the other ac was justified but the Board accepted that the pilots themselves had been in the best position to judge.

Members firstly considered the role of the BE76 pilot and the ATCO. Although some controller Members considered that the ATCO should not have cleared the BE76 for take-off until he had positively checked his visual arc, which includes the RW35 (the duty RW) threshold, for conflictions this was not considered by the majority of controllers to be significant. The ATSI Advisor could not answer detailed questions about the view of the RW35 threshold and the glider launch point from the tower except that the RW35 (grass) threshold was visible from the VCR. Members therefore agreed that the ATCO had not contributed to this incident. Although there was no reason in his report for the BE76 pilot's decision to depart from RW24 (tarmac) (rather than 06) with a slight tailwind component, Members agreed that it had probably been a matter of convenience with both a shorter taxi track and it allowed a more expeditious departure routeing to the S. In any case, it had been agreed and approved by the ATCO as required and the procedures in place should have coped with this eventuality. As discussed above, the Board was unable to decide whether abandoning the take-off would have prevented the incident since it had insufficient information on which to base a decision. That being the case, Members agreed that the BE76 pilot had also not contributed to the cause of the incident.

Members agreed unanimously that the DR400 pilot had incorrectly adopted gliding procedures when, in fact, he was not flying on any gliding associated duties. From the moment he adopted the callsign 'Tug XX' confusion had been caused not only to the ATCO as to his intentions but also to anyone else listening on the frequency. Further, since apparently the pilot did not call Gliding Control (located in another tug ac on the ground at the time) on 129.975, assuming they did not see the DR400, they too would have been unaware of its presence or intentions. The information that Control passed to the ATCO when requested if he could clear the BE76 for take-off, was therefore to the best of their knowledge correct. The Board was not able to determine why the DR400 pilot had not heard the BE76 making the Taxi, Clearance, Line Up or Takeoff calls (a total of 27 transmissions from the BE76 pilot or Tower, 5 of which referred to RW24 and one the hard RW). Even after the DR400 had crossed RW35 grass to the gliding side the Gliding Member was surprised that the pilot had not informed Gliding Control of his presence and intentions as this too could have broken the chain of events by allowing them in turn to tell the ATCO that an ac was about to get airborne from the gliding area and he would have held the BE76 for a short time.

Since both ac had continued their take-off rolls towards one another, it was only by good fortune that the DR400 had rotated slightly before the BE76 and had therefore overflown it by about 40ft. Members unanimously agreed therefore that since apparently neither pilot was in a position to take any meaningful avoiding action, there had been a real risk of the ac colliding.

Members welcomed the swift follow-up action taken by Wycombe, but they urged them to double-check the new reworded regulations in the light of this report, to satisfy themselves that a similar incident cannot happen again.

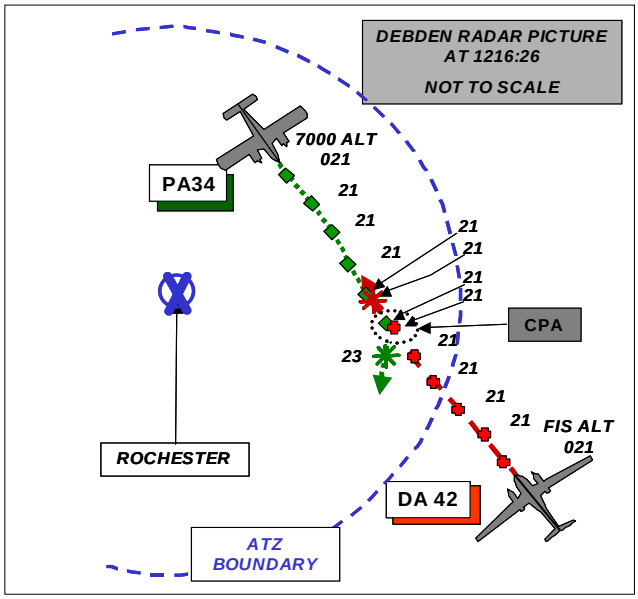
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The DR400 pilot took off from the wrong part of the aerodrome, without ATC clearance, and flew into conflict with the BE76.

Degree of Risk: A.

AIRPROX REPORT NO 158/07

Date/Time:	4 Nov 1216 (Sunday)	
Position:	5121N 00034E (Rochester - elev 426ft)	
Airspace:	Rochester ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	PA34	DA42
Operator:	Civ Pte	Civ Pte
Alt/FL:	2000ft	2300ft
	(QNH 1029mb)	(QNH NR)
Weather	VMC CAVOK	VMC CAVOK
Visibility:	>10km	10km
Reported Separation:		
	Nil V/<50m H	100ft V/150m H
Recorded Separation:		
	0 V/<100m H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA34 PILOT reports flying a red and white ac with strobes and landing lights selected on squawking 7000 with Mode C but with no TCAS fitted, on a private VFR flight from Elstree to Lydd, routeing via Rochester.

He established radio contact with Rochester prior to entering their ATZ, heading 150° at 145kt, and was given a FIS. They specifically requested information on other traffic and were told about another ac in the ATZ, [seen on the radar recording but not shown on the diagram above] which was not the one involved in the Airprox. They called passing about 1nm E abeam when, moments later they saw what appeared to be a white Diamond DA42 very close (estimated to be 100m away) at their level and coming straight towards them from their 11 o'clock position, out of a blind spot behind the engine nacelle. He immediately commenced a right descending turn. The DA42 pilot did not appear to have seen them and he assessed the risk as being very high. Rochester Information advised him that the DA42 was not in contact with them.

THE DA42 PILOT reports flying a white and red ac on a local private flight from Stapleford, squawking as directed by London Info who were providing him with a FIS. He was in the Chatham area just before the Thames in good visibility, straight and level, heading 310-320° at 135kt and in that position he would normally have been flying at around 2300ft on the London QNH. He looked down to make a note on his log sheet and when he looked back up he saw a PA34 300m away in his 11 o'clock which had already started turning to the right of his track; he then also initiated a similar right turn and assessed the risk as being Medium.

UKAB Note (1): Rochester has an ATZ of 2nm radius up to 2000ft aal (2426ft amsl) active from 0700-1700 (Winter).

UKAB Note (2): An analysis of the recording of the Debden radar shows both ac throughout the event. The PA34 is squawking 7000 with Mode C and the DA42 is squawking a London FIS squawk also with Mode C. The PA34

approaches the incident position on a track of 140° indicating 2100ft on the London QNH of 1030mb while the DA42 also indicates 2100ft and approaches the incident position on a track of 320°, almost directly in the PA34's 12 o'clock. The ac pass head to head within 100m of one another crossing 1.5nm ESE of Rochester at 2100ft at 1216:19. On the sweep after the CPA the PA34 can be seen to have turned sharply to the R and climbed to 2300ft but the DA42 did not appear to alter course or alt.

THE ROCHESTER FISO reports that the PA34 pilot had just reported passing overhead the airfield at 2000ft QNH and routeing towards the SE. Twenty sec later he noticed that the ac was carrying out a steep dive so he asked the pilot if he had a problem to which he responded that he was taking avoiding action against a DA42 which was on a reciprocal heading, at the same alt (1574ft QFE) and inside the ATZ. He informed the pilot that the unknown DA42 was not on frequency. At the time the ATZ was very busy with inbound and departing traffic. The PA34 pilot passed his details which were recorded.

The Rochester weather at the time was recorded as:

041150z 01013kt 9999 sct030 Q1029

ATSI reports that there were no ATC aspects to this incident.

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 FISO involved and a report from the ATC authority.

A GA Member noted that this incident had taken place in a busy area of GA operations where the base of CAS is 2500ft thus 'letterboxing' traffic.

Members noted that the PA34 pilot had correctly called Rochester when transiting their ATZ and was given the information necessary to fly safely through the area. The DA42 pilot, on the other hand, was not aware of his position (as witnessed by the radar recording) or that he had entered the ATZ. Notwithstanding this Members unanimously agreed that even when planning to fly close to an ATZ it is wise to call them and advise one's intentions so that information can be passed to other pilots in the area. This is particularly important near aerodromes that are manned by a FISO, since his information source is limited to pilots' radio reports. In this case the FISO was not aware of the presence of the DA42 so he was unable to inform the PA34 pilot about it so that he could see it earlier and thus avoid it.

The radar recording verified that the incident took place within the Rochester ATZ which is Class G airspace where 'see and avoid' pertains. One Member noted that sometimes pilots assume that when within an ATZ they are in a known and notified traffic situation and allow their lookout to be less vigilant however, as this incident amply demonstrates one should always be cognisant of unexpected traffic. Although both pilots saw the opposing traffic, both had done so very late indeed (about 100m). At a closing speed of about 300kt (150m/sec) this gave both pilots under a second to effect meaningful avoidance. Members were unable to resolve the apparent anomaly of the PA34 pilot and the FISO noting that the ac descended while the radar recording apparently showed a climb. This was however not considered to be important as it was agreed that, since both pilots saw the opposing ac in their 11 o'clock and turned right, they were not going to collide even if the avoidance was only partially effective or even ineffective. The lateness of the sightings however meant that safety had not been assured.

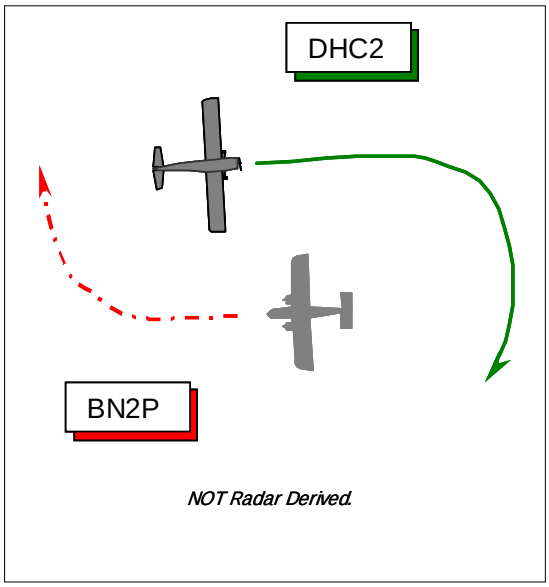
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: ate sightings by both pilots.

Degree of Risk: B.

AIRPROX REPORT NO 159/07

Date/Time:	9 Nov 1124	
Position:	5109N 00132W (Middle Wallop A/D - RW27RH cct - elev 288ft)	
Airspace:	Middle Wallop ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	dHC Beaver AL1	Islander BN2P
Operator:	SAAvn	Civ Comm
Alt/FL:	1000ft	1200ft
	QFE (1017mb)	RPS (1024mb)
Weather	VMC Sky clear	VMC CAVOK
Visibility:	20km+	10+ km
Reported Separation:		
	Nil V/400m H	200ft V/3-400m H
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE de HAVILLAND BEAVER AL1 (DHC2) PILOT reports that he was recovering to Middle Wallop from a local area training sortie, joining the visual circuit for RW27RHC in communication with Wallop TOWER on 118·275MHz. Heading 090° DOWNWIND at 90kt, flying level at the cct height of 1000ft Wallop QFE (1017mb), just as the DOWNWIND checks were completed and immediately before the R turn towards FINALS he looked up just as the accompanying, but not operating, co-pilot issued a warning call of an "Islander 2 o'clock". Sighting the Islander himself about 400m away, a period of a few brief seconds to assess speed, direction and likely intentions of the other pilot was cut by a hasty RT call from TOWER with a very late warning about the other ac. He elected to extend DOWNWIND behind the Islander ac which passed 400m away down the starboard side, level at the same height. He responded to ATC that a report would be filed and requested that TOWER immediately investigate the identity of the other ac.

A full de-brief took place with ATC within 20 minutes of the occurrence which confirmed his assessment of the separation distance and position to be accurate. Given the range and speed of the event, avoiding action was relatively benign but the perils of ac straying through a military training aerodrome at circuit height might have been considerably worse. He assessed the risk as *"low"*, based on the low closing speeds and prevailing good visibility. His ac has a black/green camouflage scheme.

THE BRITTEN-NORMAN ISLANDER PILOT (BN2P) reports he was returning to Netheravon from a parachute display team demonstration at Winchester, under VFR in CAVOK weather in a level cruise. There had been a quick handover from Solent RADAR to Boscombe ZONE on 126·7MHz from whom he had requested a direct transit through Middle Wallop MATZ to his base at Netheravon. There was a delay as the controller was speaking with several other ac on the RT but after a couple of minutes, transit through the MATZ under a FIS was granted by ZONE together with a request to descend to 1200ft. He was not sure why he was being asked to descend but assumed it was for traffic de-confliction and so descended from about 1900ft to an altitude of 1200ft. Assuming at this stage that his request for 'direct' routing to Netheravon had been accepted, he could see that he was entering Middle Wallop ATZ but as it was on his 'direct' track to Netheravon and he had just received an instruction to 'descend to 1200ft' he assumed he was clear to go through the ATZ. Heading 300° (T) at 80kt he was surprised to see the high wing military Beaver but not unduly concerned as they were well separated. He had been watching the Beaver for about a minute (estimated) and assumed it was one of the other ac ZONE was working in transit through the MATZ. The Beaver was less than 200ft below him (if that) as it passed some 3-400m down the starboard side of his aeroplane with a *"low"* risk of a collision. No avoiding action was taken – it was not necessary as their paths did not converge - but later he discovered the DH2C was actually doing circuits at Middle Wallop.

AIRPROX REPORT No 159/07

THE MIDDLE WALLOP TOWER CONTROLLER (TOWER) reports that the DHC2 was the only ac in the visual cct to RW27RHC in receipt of an Aerodrome Control Service when she glanced at the Distance From Touchdown Indicator (DFTI) [an aerodrome traffic monitor (ATM)] and noticed a A2650 squawk about 3nm E of Middle Wallop tracking W indicating 1000ft Wallop QFE (1017mb). Wallop APR had not informed her of this ac so she telephoned the APR to establish this ac's intentions: the initial response from the APR was that he did not know. A Lynx pilot then called her for recovery but she did not hear the callsign clearly on the first transmission. As she asked the Lynx pilot to repeat the callsign, she spotted the unknown ac – the BN2P - inside the ATZ still tracking westbound at a similar height to the DHC2 which was then at the mid-point of the DOWNWIND leg and close to the infringing BN2P. She told the Lynx crew to standby and then passed traffic information to the DH2C pilot about the unknown ac. The DH2C pilot advised her that the infringing ac was too close to him and that he would be filing an Airprox, asking also if she could get the details of the other ac.

THE MIDDLE WALLOP APPROACH/RADAR CONTROLLER (APR) reports that no ac were on frequency whilst he was taking a phone call relating to an inbound Tornado whereupon the Boscombe Down line rang. He asked another controller (RADAR), seated at the console next to him, to take the call. A couple of minutes later TOWER called as she had noticed on the DFTI an ac squawking A2650 about 3nm E of the aerodrome westbound. He assessed that it was heading into the ATZ and indicating 1000ft QFE on Mode C with visual cct traffic opposite direction and about ¼nm N of the unknown conflicting ac's track – the BN2P. A call was made immediately to Boscombe ZONE who was providing an ATS to the unknown ac to ask the pilot's intentions and to instruct the pilot to leave the ATZ. By that stage the MATZ crosser – the BN2P - had already passed S of their visual cct traffic at the same level before it then routed N to leave the ATZ.

THE MIDDLE WALLOP CONTROLLER (**'ANOTHER RADAR CONTROLLER')** reports that at approx 1120 he took a call on behalf of the APR from Boscombe ZONE, who was requesting two MATZ crossers. The first ac – the subject BN2P - was approaching Chilbolton from the SE routeing to Netheravon; on its observed track the BN2P would route to the NE of the Wallop ATZ. Having observed the radar display and APR's flight progress strips, also knowing there was nothing on the APR's frequency, the Boscombe ZONE Controller was told "nothing to effect". The second MATZ crosser was approximately 7nm SSE of Wallop, routeing to the NE, so the Boscombe Controller was again told "nothing to effect". He then took a call from Salisbury OPS about a Tornado inbound to Middle Wallop.

THE BOSCOMBE DOWN ZONE CONTROLLER (ZONE) reports that the BN2P pilot called up asking for a ZONE transit at 1400ft, he thought. The ac was to the E of Middle Wallop and a call was placed to Middle Wallop. Middle Wallop approved the MATZ Crossing at 1200ft Portland RPS (1024mb), direct track to Netheravon. The clearance was relayed to the BN2P pilot who reconfirmed, he thought, the ac's altitude of 1200ft. No clearance was given for the BN2P to enter the ATZ. At the point of passing the clearance to the BN2P pilot, he thought the ac was in a position such that a direct track for Netheravon would keep it clear of the Middle Wallop ATZ so he was expecting it to transit to the N of Middle Wallop ATZ, not to enter it. Thereafter attention shifted to the other ac on frequency and he did not see the BN2P enter the Middle Wallop ATZ until Middle Wallop ATC called up requesting traffic information. The BN2P appeared to be on a westerly heading and not on a direct track for Netheravon so he reconfirmed with the pilot that he was maintaining a direct track for Netheravon and then informed him he was inside the Middle Wallop ATZ. Middle Wallop ATC advised that the BN2P was in close proximity to an ac downwind in their visual cct at which point he informed the BN2P pilot of the traffic which was shown ½nm to the N and that it was believed to be Middle Wallop circuit traffic. The BN2P pilot reported he was visual with the traffic passing down his right hand side and he would be vacating the ATZ to the N. He did not proffer avoiding action to vacate the ATZ because the BN2P was below the minimum RVC height.

ATSI reports that at 1120:15, the DHC2 pilot called Wallop TOWER requesting to join the cct which was approved for RW27RHC, the QFE passed and that the circuit was clear. Shortly afterwards a Squirrel helicopter called TOWER and requested to climb to 2000ft in the engine-off area. This was approved and traffic information was passed to both the Squirrel and DHC2 crews about each other.

In the Approach Control Room (ACR) the APR was engaged on an operational telephone call when the Boscombe Down line rang. The call was answered by 'another Radar controller' who was in the room but not performing an operational task at the time. At 1122:38, the Boscombe ZONE controller started the conversation with "*Request two MATZ crossers*". Details were passed on the first – the BN2P - as "*Chilbolton southwest 2 miles tracking northwest, a non-squawker at the moment*", to which the Wallop 'another Radar controller' replied "*contact*". Boscombe ZONE added "*1 thousand 2 hundred feet on the Portland 1024 routeing direct to Netheravon if*

possible". The Wallop 'another Radar controller', having checked the radar and the APR's fps board, replied "*roger, nothing to affect*". Details on the second ac were passed and a similar response obtained.

A direct track from a position 2nm SW of Chilbolton to Netheravon would take the BN2P through the Middle Wallop ATZ entering 2nm E of the airfield and passing approximately 1nm N of it.

At 1124:15, the DHC2 pilot reported DOWNWIND which TOWER acknowledged and passed the surface wind. The TOWER controller then contacted the APR and asked what the traffic was that she could see on her ATM 2 miles to the E of the airfield. The APR telephoned Boscombe and requested traffic information on this ac which was about to enter the Middle Wallop ATZ. The Boscombe ZONE controller transmitted to the BN2P pilot asking if he was routeing on a direct track to Netheravon. Meanwhile, at 1125:00, the controller transmitted "……[DHC2 C/S] *there does appear to be unknown traffic 2 miles east of us tracking westbound, are you visual*", to which the DHC2 pilot replied that he was.

The ADC later reported that the BN2P had been seen 2nm E of Middle Wallop heading W and, following the call to Boscombe by the Wallop APR, turned N.

The unit investigation found that the second controller in the approach room – 'another Radar controller'- having answered the call from Boscombe ZONE and approved the two aircraft to transit, did not pass this information onto either the APR or the ADC. The unit's MATS Part 2 clearly states that Boscombe Down is the controlling authority for the Combined MATZ (CMATZ) but that they have no authority to allow ac to enter the Middle Wallop ATZ. However, as the Boscombe controller made it clear that the BN2P wished to route on a direct track from SW of Chilbolton direct to Netheravon, which necessitated crossing the ATZ, by the Wallop controller saying '*nothing to affect*' this could, not unreasonably, be taken as implicit clearance to cross the ATZ. The fact that the BN2P approached Middle Wallop from the E rather than transit on a direct track simply made the problem worse rather than causing it.

MIL ACC reports that the historic DH2C ac was RH downwind in the circuit for RW27RHC squawking A7000 with Mode C. The civilian owned and operated BN Islander BN2P was transiting the Middle Wallop CMATZ, returning to Netheravon squawking A2650 with Mode C and flying at 1200ft Portland RPS (1024mb).

The BN2P Islander pilot was in two-way RT contact with Boscombe ZONE on 126·7MHz and was receiving a FIS. The radar replay shows both ac as they approach the Middle Wallop overhead but does not show the actual incident.

From the pilots' reports and other evidence, it is possible to estimate the position of the DH2C at the time of the incident.

The Islander pilot first called ZONE at 1121:11 and was immediately asked to *"standby"*. For the next 30sec, ZONE talked to other traffic before at 1121:42, ZONE asked the Islander pilot to pass his message. The Islander pilot responded *"..piston Islander just completed the parachuting at Winchester, on the Eastern end of the Middle Wallop MATZ, request MATZ transit to Netheravon and we're at 1800 feet on 1028"*. After asking what type of ATS was required, ZONE placed the Islander pilot under a FIS, issued the Portland RPS of 1024mb and a squawk of A2650, all of which the Islander pilot read back correctly. At 1122:37, ZONE called Middle Wallop Approach saying *"Boscombe ZONE requesting two MATZ crossers."* Passing the details on the Islander, saying *"First one's Chilbolton, southwest 2 miles, tracking west, non squawker at the moment", to which the* Wallop 'another Radar controller' replied *"contact"*. ZONE continued *"1200 feet on the Portland 1024 routeing direct track Netheravon"*. The Middle Wallop 'another Radar controller' replied with "*Roger, nothing to affect"* whereupon ZONE continued to describe the second MATZ-crosser, which is unrelated to this incident. The following RT exchange then took place between ZONE and the islander pilot

AIRPROX REPORT No 159/07

TIME	FROM	TO	TRANSMISSION
1123:22	Zone	Islander	[Islander C/S] *your MATZ crossing of Middle Wallop is approved at 1200 feet 1024*
1123:26	Islander	Zone	*MATZ crossing approved, er, was that 1200 feet on 1024?*
1123:31	Zone	Islander	[Islander C/S] *affirm, confirm that was your altitude?*
1123:35	Islander	Zone	*Err, it's fractionally lower but that works, MATZ crossing approved 1200 on 1024,* [Islander C/S]
1123:43	Zone	Islander	[Islander C/S] *roger.*

There does not appear to be a reason for ZONE to ask the Islander pilot to descend. The Boscombe fps for the Islander shows that the controller initially wrote down 1200ft in the 'altitude/FL' box. It is possible that ZONE mis-heard the Islander pilot's reported altitude during the initial call. None of the available data indicates that any other ac under ZONE's control was flying at 1200ft. ZONE was controlling 5 ac at the time, with a workload described as 'medium'. At 1123:43, ZONE gave another unrelated ac MATZ crossing approval, which was correctly read back. At 1124:52, the Middle Wallop APR contacted ZONE by landline saying "*Hi Boscombe, just requesting traffic information on the one just entering our ATZ"*. After asking Middle Wallop to *'standby'*, ZONE asked the Islander pilot to "*confirm you're routeing direct track for Netheravon?"*' The Islander pilot responded with *"Affirm direct Netheravon and just passing what looks like a ..* (garbled) *…..* {ACC Note: The Tape transcriber added to the notes that the last part of this transmission may have been *'DH2C'*.} which is the moment the reported AIRPROX occurred. At 1125:02, the Middle Wallop APR said to ZONE *'Yeah, he's actually flying through our circuit at the moment at 1000 feet, just to the …. (unreadable) ….'* ZONE then informed the Islander pilot that *"..you have entered the Middle Wallop ATZ and that traffic is visual circuit traffic with…. Middle Wallop'*. The Islander pilot immediately responded with *"Roger, I'll swing to the North*", whereupon ZONE informed Middle Wallop at 1125:18 that *"he's just turning north now"*. After establishing that the Islander was inbound to Netheravon, the Middle Wallop APR rang off.

This Command considers that there were 2 minor Mil ATC contributory factors in relation to this Airprox. Firstly, ZONE instructed the Islander pilot to descend from 1800ft to 1200ft Portland RPS (1024mb), unwittingly increasing the chances of that ac flying closer, vertically, to visual circuit traffic. Secondly, because there appeared to be no need to do so, the Middle Wallop 'another Radar controller' did not instruct ZONE to keep the MATZ crossers outside of the Middle Wallop ATZ. In turn, ZONE did not remind the Islander pilot to remain outside of the Middle Wallop ATZ.

Subsequent to this Airprox, SATCO Boscombe Down conducted an internal investigation. As a result, all Boscombe Down controllers were reminded, via a standards bulletin, to be specific when issuing MATZ crossing clearances. Also, they were directed to inform the pilots of all ac that might transit close to an ATZ to remain clear of it.

UKAB Note (1): This Airprox is not shown on recorded radar. The DHC2 is shown squawking A7000 recovering to Middle Wallop from the W, but faded from coverage as the ac joined DOWNWIND R. The BN2P is shown approaching from the E descending through 1200ft (1013mb), before Mode C is lost. It is shown again momentarily at 1124:57, indicating 900ft (1013mb), then 1000ft just before turning R onto a northerly track to clear the ATZ in response to ZONE's warning. A level of 900ft (1013mb) would equate to a height of 1020ft Wallop QFE (1017mb) or an altitude of 1230ft RPS (1024mb).

UKAB Note (2): The UK AIP at ENR 2-2-2-3 notifies the Middle Wallop ATZ as a radius of 2nm centred on 51°08' 22''N 001°34'07''W – a non-standard reference point aligned with a common radar touchdown point - extending from the surface to 2000ft above the aerodrome elevation of 297ft amsl. Boscombe Down is notified as providing the ATS on 126·7MHz.

UKAB Note (3): The UK AIP at ENR 2-2-3-3 notifies the Middle Wallop MATZ as part of the combined Boscombe Down/Middle Wallop CMATZ with Boscombe Down as the "Controlling Aerodrome". The Middle Wallop MATZ comprises a radius of 5nm extending from the surface to 3000ft above the aerodrome elevation of Boscombe Down at 407ft amsl, with a non-standard stub 4nm wide [2nm either side of the centre-line] and 3nm long aligned on a true track of 256°(T).

UKAB Note (4): The UK AIP entry at ENR 2-2-3-2 MILITARY AERODROME TRAFFIC ZONES (12 Apr 07), extant at the time of the Airprox stated at 2.3

Pilots are reminded that an ATZ usually lies within the MATZ and, where applicable, a MATZ penetration approval will implicitly include any necessary approvals/clearances to transit the associated ATZ.

This entry was amended on 20 Dec 07 - after the date of this Airprox - to include the following additional guidance fo

When crossing a Combined MATZ (CMATZ), it is the responsibility of the pilot to ensure that clearance is obtained to transit each individual ATZ embedded within that CMATZ.

HQ AAC had nothing further to add.

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 readily apparent to the Members, from the comprehensive reports provided by both Mil ACC and ATSI, that this Airprox had resulted from a far-reaching breakdown in communications between 'another Radar controller' who had dealt with the MATZ crossing request from Boscombe ZONE. Crucially, the subsequent 'approval' had not been passed on to colleagues within Middle Wallop Tower. Consequently, the APR and TOWER were clearly oblivious to any 'approval' issued by 'another Radar controller' for the Islander to transit the MATZ. No explanation had been given as to why 'another Radar controller' had neither co-ordinated nor passed this information on to his colleagues, but for whatever reason it was clear that when he had replied to ZONE "*Roger, nothing to affect",* he had made an incorrect assumption. Clearly, ac that had already been sent to TOWER might not appear on the APR's 'active' fps display and neither would visual cct traffic operating in the aerodrome cct under the control of the ADC be readily apparent to him. It was therefore incumbent on 'another Radar controller' to co-ordinate the Islander's transit with both the APR and TOWER before approving any request from Boscombe ZONE on their behalf. A salutary lesson here indeed, as there was both the circuiting DHC2 and a Lynx joining from the S, together with a Squirrel helicopter operating up to 2000ft in the engine-off area, all of which was unknown to 'another Radar controller' when he responded to ZONE's request. Co-ordination would have revealed this and patently this was not attempted: hence, both TOWER and the APR were taken somewhat by surprise when confronted with the Islander's presence within the ATZ at about cct height. Members concurred with the ATSI view that having been told "*Roger, nothing to affect",* ZONE might reasonably have believed this applied to the ATZ, especially as here a direct track had taken the Islander through the Middle Wallop ATZ. In a Member's view, the "*..nothing to affect"* phraseology lacked clarity and was not as specific as it should have been. [Post meeting UKAB Note: SATCO Middle Wallop makes it clear in his Unit report that, under the LoA between Boscombe Down and Middle Wallop ATC, the phrase "*nothing known to affect"* is used because, by local agreement, Middle Wallop traffic may operate on a private frequency – and hence 'unknown' to Middle Wallop ATC in a portion of their MATZ – 'the free area' (clear of the ATZ up to 3000ft Boscombe QFE) without reference to Boscombe as the CMATZ controlling authority.] Thus the root cause of this Airprox was that 'another radar controller' at Middle Wallop did not coordinate with the ADC the BN2P's transit of the MATZ/ATZ, leading to a conflict in the cct.

The Mil ACC report had made it clear that ZONE had no reason to descend the Islander to 1200ft RPS for the MATZ crossing – which should perhaps have been flown with reference to the QFE – as it seemed that ZONE had misheard the Islander pilot's reported altitude (1800ft) in his initial call, advising "..*your MATZ crossing of Middle Wallop is approved at 1200 feet 1024*". However, this was not an inherent causal factor, it just exacerbated the situation, although a controller Member considered that the Islander pilot might reasonably have questioned this instruction more strongly thus highlighting ZONE's mistake. However, pilot Members felt that the Islander pilot was merely complying with an ATC instruction. Members agreed, it would not have seemed an unreasonable request to the Islander pilot who, in order to obtain approval for him to cross the CMATZ, would readily accede to this apparently reasonable instruction. Moreover, he could reasonably have considered that this also included transit through the ATZ, which was implicit within any approval given for a crossing of the CMATZ according to the extant procedures in the AIP, but unaware that Boscombe ZONE had no authority to allow the Islander to enter the Middle Wallop ATZ. Unfortunately this placed the Islander almost exactly at cct height in opposition to the DHC2.

However, both pilots had spotted each other's ac: the Islander pilot at a range equating to about 1min flying time [just under 3nm] during which he had watched the Islander close and considered the DHC2 was in transit and thus not a threat. The reporting pilot spotted the BN2P a little later within the cct area where he might reasonably have been expected to have been forewarned of its presence by ATC, if TOWER had been aware of the transit earlier. Both pilots opined that horizontal separation was no closer than 300m, this, coupled with the DHC2 crew's sighting and the pilot's decision to avoid the Islander by maintaining his course DOWNWIND and turn onto BASE-LEG astern of the islander, convinced the Board that no risk of a collision had existed.

Whilst not intrinsic to events here, there was however an anomaly within the current procedures for a MATZ/ CMATZ crossing within the UK AIP that caused the Members some angst. These procedures had been the subject of an earlier review following the Board's assessment of Airprox 033/07, revisions intended to remove any ambiguity subsequently being made to the UK AIP. In the case of MATZ procedures promulgated for use by civilian pilots, it was clear that at the time of this Airprox "..*a MATZ penetration approval will implicitly include any necessary approvals/clearances to transit the associated ATZ",* there being no specific caveat whether or not the airspace was a CMATZ. This responsibility was however reversed specifically for a CMATZ in the latest amendments to these procedures, which made it "..*the responsibility of the pilot to ensure that clearance is obtained to transit each individual ATZ embedded within that CMATZ.* Members considered that this amendment had not made the situation simpler but had complicated an otherwise straightforward procedure and viewed this change as potentially confusing for GA pilots. This was not the Board's intent, following on from the Members' assessment of Airprox 033/07, where the controller had not sought the ATZ controlling authority's approval. The Board had been informed that it was intended to amend the UK AIP to make this issue clearer but military and civilian Members, pilots and controllers alike, viewed the current arrangement with dismay. In the Board's opinion it was at face value an unnecessary complication, with significant potential for confusion that potentially sowed the seeds for further incidents. Therefore, in the light of the revised arrangements following their assessment of this Airprox, the Board charged the Director with writing to the Director Airspace Policy and HQ Air Command to highlight the Board's concerns on this topic and to request that they review the recently applied caveat to CMATZ crossing procedures, as currently promulgated in the UK AIP, to ensure commonality between MATZ and CMATZ alike.

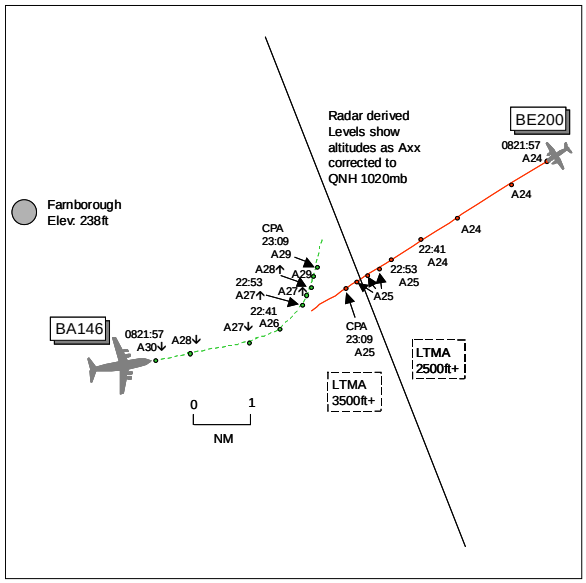
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Middle Wallop radar controller did not coordinate with the ADC the BN2P's transit of the MATZ/ATZ, leading to a conflict in the cct.

Degree of Risk: C.

AIRPROX REPORT NO 160/07

Date/Time:	8 Nov 0823	
Position:	5116N 00038W (5·5nm ESE Farnborough - elev 238ft)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	BA146	BE200
Operator:	Civ Comm	Civ Comm
Alt/FL:	↓1900ft (QNH 1020mb)	2300ft (QNH 1020mb)
Weather	VMC CLBC	VMC NR
Visibility:	>10km	NR
Reported Separation:	300ft V/100m H	1000ft V/2-3nm H
Recorded Separation:	400ft V/0·6nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BA146 PILOT reports inbound to Farnborough IFR and in receipt of a RAS from Farnborough on 134·35MHz squawking 5470 with Mode S. The visibility was >10km flying 2500ft below cloud in VMC and the ac was coloured white/blue with strobes, beacon and nav lights all switched on. After initially being under a RAS they were cleared to position from about 5nm NW of Farnborough for a visual approach downwind LH for RW24 not below 3400ft against departing traffic. Abeam the RW06 threshold they were cleared for descent to 1900ft for the visual approach and were reminded of the noise abatement procedure – not to intercept the RW24 FAT at <3nm. They were informed of Fairoaks departing traffic at 2000ft, he thought, which was not seen. Approaching 2400ft in the descent heading 060° at 160kt a TCAS TA was received followed rapidly by an RA 'climb' simultaneously with Farnborough warning them of traffic 12 o'clock 2nm. The TCAS guidance was followed and the other ac was seen, a BE200 in level flight, passing down their RHS by 100m and about 300ft below. They assessed the risk as medium.

THE BE200 PILOT reports en route to Bournemouth VFR and in receipt of a RIS from Farnborough on 125·25MHz squawking with Mode C. The Wx was VMC and the ac was coloured white/purple/gold with all required lighting switched on. Heading 265° at 220kt and 2300ft QNH he heard another flight broadcast that they were climbing in response to a TCAS RA. This alerted them to the other ac, a BA146 which was seen just R of their 12 o'clock about 2-3nm away in a climbing L turn passing about 3000ft. They turned L 10°, the BA146 eventually passing clear to their R about 1000ft above. The BA146 was downwind to Farnborough for an approach. He assessed the risk as low.

THE FARNBOROUGH APPROACH/LARS CONTROLLER reports acting as an OJTI on the bandboxed position. The BA146 flight came on frequency and reported visual at 5000ft about 10nm NW of Farnborough. The trainee instructed the flight to descend to 3400ft against outbound traffic and was told to expect a visual approach but to continue towards ODIMI initially and was given a RAS. Meanwhile transit traffic called, the subject BE200, E of OCK routeing to Bournemouth. The BA146 was put on its own navigation to join LH downwind but was instructed to maintain 3400ft against outbound traffic. Once clear of the outbound, the BA146 flight was given descent for a visual approach and the transit traffic was called before the outbound flight called on frequency. He told his trainee to tell the BA146 flight to turn onto base to help keep it clear of the BE200 but before he could do this, the BA146 crew reported a TCAS RA climb.

ATSI reports that at the time of the Airprox, the Farnborough LARS and the Approach positions were bandboxed, due to light traffic conditions. The combined position was being operated by a mentor and a trainee, who had previously been an operational controller at other airports. The trainee was, primarily, being trained for the Farnborough LARS position and was inexperienced carrying out the local Approach/Approach Radar function.

The mentor, who described the workload as moderate, due to its complexity, was aware of the trainee's experience. He had no objection to monitoring the trainee carrying out both LARS and Approach Control. In the period leading up to and at the time of the Airprox, all the ATC transmissions were made by the trainee.

[UKAB Note (1): The Approach and LARS frequencies (134·35MHz and 125·25MHz) were cross-coupled during this incident.]

The BA146 flight established communication with Farnborough Approach, at 0815, reporting routeing to ODIMI (approximately 7nm WSW of the airport) and passing 7000ft for 5000ft. At the time, it was within CAS, 22nm NW of Farnborough. The pilot was informed that it would be radar vectoring to the ILS RW24. Approximately 1min later, the pilot reported visual with the airport. The trainee cleared the flight to descend to 3400ft, to expect a visual approach downwind LH but to continue towards ODIMI initially. The restriction was to separate the BA146 from traffic departing Farnborough's RW24, which would be climbing to 2400ft.

At 0817, the BE200 flight contacted Farnborough Approach. The pilot reported at Epsom, routeing VFR from Biggin Hill to Bournemouth via Ockham, at 2400ft and requested a RIS. He was provided with a FIS and instructed to select a Farnborough squawk. Shortly afterwards, the pilot was informed he was identified 6nm E of Epsom and after a further request it was agreed that he would be provided with a RIS, albeit limited with *"possible late warning of traffic"*. The pilot requested if a radar handover could be arranged with Solent Radar. The trainee said he would call him back later about it. It was later confirmed that a telephone call was made to Solent but after the Airprox had occurred.

Meanwhile, at 0818, the BA146 flight had been instructed to turn L 15° (heading 135°). The pilot was then informed that he was leaving CAS, under a RAS, and could expect descent shortly, once clear of the departing ac. At 0819:30, the BA146 flight was instructed *"resume own navigation position downwind lefthand runway Two Four maintain three thousand four hundred feet"*. The radar shows the BA146 passing 7·1nm W of Farnborough Airport at 3400ft. The BE200 is 17·8nm E of the airport at 2400ft. The mentor commented that if he had been working on his own he would probably have provided a RIS rather than a RAS, as the pilot would be carrying out a visual approach. However, he did not challenge the trainee's actions at the time, adding that he intended to comment about it at the debrief. The Farnborough MATS Part 2, Page APR-3, states; *'If the pilot of an inbound aircraft requests, and is cleared for, a visual approach then terrain clearance becomes the responsibility of the pilot and controllers can continue to provide a RAS. The radar service may be downgraded with the agreement of the pilot or if the controller is unable to continue to provide a RAS due to workload'*. The trainee reported, although the pilot had not requested a RAS, he decided to provide the 'best' radar service available to an IFR inbound flight.

The trainee asked the BE200 flight if it would be routeing to SAM after Ockham. The pilot replied that he would be routeing just N of SAM. The trainee continued *"roger advise if you change your altitude from two thousand four hundred feet I have traffic positioning downwind lefthand runway Two Four"*. The mentor said that he did not think it necessary to prompt his trainee or discuss a plan, as he had shown he was aware of the presence of the subject ac and appeared confident to carry out any appropriate actions. He believed that the BE200's routeing towards SAM would keep it clear of the BA146's approach path.

When the BA146 flight was clear of the departure track, it was instructed *"descend to altitude two thousand feet correction one thousand nine hundred feet on the QNH of One Zero Two Zero"*. The aim of the revised descent to 1900ft, rather than 2000ft, was to establish 500ft separation between the subject ac. The pilot only read back the QNH, not the cleared altitude. Further instructions were issued to the BA146 flight *"further descent in accordance with noise position no less than three DME runway Two Four there is traffic west of Ockham by four miles keep you updated at two thousand four hundred feet he should pass to the south of you"*. The pilot asked for confirmation whether he should maintain 2400ft. The descent clearance to 1900ft and the noise information were repeated. The radar, timed as the BA146's pilot asked for clarification of his cleared altitude (0821:57), shows the ac passing 3000ft, turning L through a heading of 081°. This was virtually head-on to the BE200, which was 7·9nm away. The mentor explained that he tried to prompt his trainee to turn the BA146 on to base leg, away from the BE200. It became apparent that the trainee did not hear the prompt but before the mentor could take over the RT, using the 'training box', the outbound flight contacted the frequency. Straight after dealing with this flight, the trainee transmitted to the BA146 flight *"that traffic's just er right at twelve o'clock range of three miles opposite direction two thousand four hundred feet"*. The pilot replied *"BA146 c/s is TCAS climb TCAS climb"*. Information was then issued to the BE200 flight *"you've got er was One Four Six traffic twelve o'clock range of two miles climbing"*. The pilot reported visual. Shortly afterwards, the pilot of the BA146 reported clear of conflict,

resuming a visual approach. The radar reveals that when the two ac were 3nm apart, at 0822:41, the BA146 was heading 068° at 2600ft, opposite direction to the BE200 at 2400ft. The BA146 levelled at 2600ft before, at 0822:53, it is shown passing 2700ft, after reacting to its TCAS RA climb. By now it is heading 047°, 1·8nm from the BE200. When the distance reduces to 1nm, as the BA146 has turned on to a heading of 024°, vertical separation has increased to 300ft. The CPA, 400ft/0·6nm, occurred at 0823:09, when the tracks of the subject ac were diverging, with the BA146 having reached its maximum altitude of 2900ft after its TCAS reaction with the BE200 at 2500ft.

The MATS Part 1, Section 1, Chapter 5, Pages 2/3, states *'A Radar Advisory Service (RAS) is an air traffic service in which the controller shall provide advice necessary to maintain prescribed separation between aircraft participating in the advisory service, and in which he shall pass to the pilot the bearing, distance and, if known, level of conflicting non-participating traffic, together with advice on action necessary to resolve the confliction. Controllers shall pass avoiding action instructions to resolve a confliction with non-participating traffic and, wherever possible, shall seek to achieve separation which is not less than 5nm or 3000 feet, except when specified otherwise by the CAA.'* (Farnborough is authorised by the CAA to use a reduced horizontal radar separation of 3nm.) Additionally, MATS Part 1, Section 1, Chapter 5, Page 11, states: *'Minimum vertical separation (1000ft) may be applied between verified Mode C transponding aircraft provided the intentions of both aircraft are known to a controller because a) they are under his control.'* On this occasion, although on a visual approach, the BA146 was being provided with a RAS and was not provided with the recommended separation from the BE200. It would appear that the trainee's plan, to only provide 500ft vertical separation, was agreed by the mentor, as he took no action to change the trainee's descent instruction to 1900ft for the BA146. The trainee commented that as he believed that the mentor had not made any comments, or took over the RT, his plan was appropriate. The mentor explained that, due to CAS to the E of Farnborough, it was necessary for the BA146 to be below 2500ft before the TMA boundary. Consequently, it was difficult to ensure the correct vertical separation between downwind flights and traffic routeing westbound through Ockham. This, he added, was the reason he would have only provided a RIS to the BA146.

With hindsight, the mentor stated that he did not consider it had been appropriate to operate, in bandboxed mode, with a trainee who was very inexperienced in carrying out the Approach function. He would not monitor such an inexperienced trainee, in similar circumstances, in future.

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 authority.

It appeared that the mentor had not given the trainee's lack of experience enough credence prior to commencing the session on radar. The mentor should have discussed the pending traffic scenario with the trainee and they should have formulated a plan which the trainee could then execute. As it was, the mentor had not taken control of the position when the trainee had cleared the BA146 flight for a visual approach and then descended it to 1900ft which placed it head-on to the opposite direction BE200 at 2400ft. Members agreed that the mentor had allowed the trainee to vector the BA146 into conflict with the BE200 causing the Airprox. The BA46 crew was manoeuvring their ac for a visual pattern and had interpreted the controller's descent instruction to fit into their desired flight profile which led to the ac slowing down with a reduction in the ac's ROD. If the controller had wanted to ensure vertical separation between the subject ac, he should have given a more positive instruction earlier (perhaps adding descend 'now' or 'immediately'). The BA146 crew was given TI on the BE200 but it was given in relation to OCK whereas Members felt that it would have been more helpful if it had been given using clock code or relative bearing as the crew were flying visually endeavouring to comply with the noise abatement procedure. The trainee told the BA146 crew that the BE200 would pass to the S of them but when the mentor realised that the situation was deteriorating he tried to prompt the trainee to take action but this was not heard. Members believed that the mentor should have stepped in earlier and transmitted himself using his 'training box' as the BA146 flight was under a RAS and the controller was seeking to achieve the prescribed separation against the BE200 flight under their control on a RIS, but it all proved to be too late as the subject ac were in conflict and consequently separation was eroded. Members acknowledged this fact and felt that the mentor had not fulfilled the provisions of a RAS and this had contributed to the Airprox.

At the time the trainee passed updated TI to the BA146 flight horizontal separation was 3nm, but the crew was already aware of the BE200 from a TCAS TA and had simultaneously received an RA climb. The guidance was

followed and the BA146 crew visually acquired the BE200 passing, they estimated, 100m away and 300ft below. The BE200 pilot had been told about the BA146 positioning downwind LH for RW24, heard the RA 'climb' broadcast on the RT and, with updated TI, saw the BA146 ahead climbing and turning. The BE200 pilot had turned L slightly and watched it pass an estimated 1000ft above to his R. The radar recording shows the BA146 crew arresting their descent at 2600ft before reacting to their RA command whilst turning L onto base leg, separation of 400ft and 0·6nm pertaining at the CPA. The combined prompt actions taken by both crews and the visual sightings of each other's ac 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

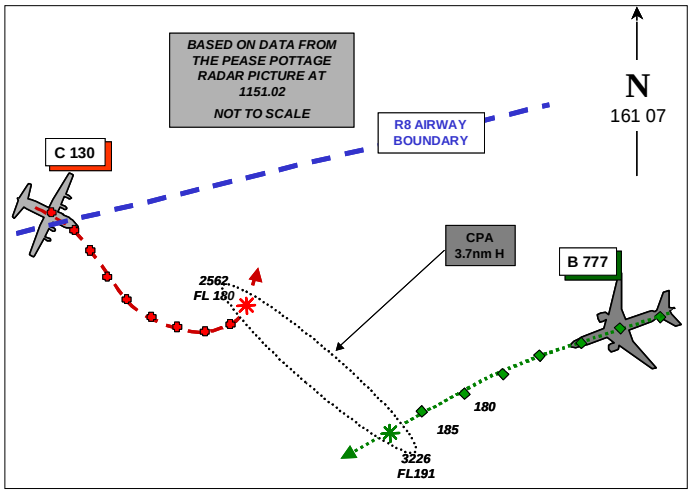
Cause: The Farnborough LARS/APR mentor allowed his trainee to vector the BA146 into conflict with the BE200.

Degree of Risk: C.

Contributory Factors: The mentor did not ensure the provisions of a RAS were fulfilled.

AIRPROX REPORT NO 161/07

Date/Time:	18 Oct 1151	
Position:	5054N 00127W	(5nm SW SAM)
Airspace:	R8	(Class: A)
	Reporting Ac	*Reported Ac*
Type:	B777	C130
Operator:	CAT	HQ AIR (Ops)
Alt/FL:	↑FL180	FL180
Weather	NR	VMC CAVOK
Visibility:	NR	Unrestricted
Reported Separation:		
	0ft V/5.6km H	4nm H
Recorded Separation:		
	1100ft V/3.8nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B777 PILOT reports flying a scheduled passenger flight from Gatwick and was in contact with London and squawking as directed. While climbing through FL180, cleared FL190, and heading 260° in R8, ATC issued 'Avoiding Action expedite through FL190 turn left heading 240'. He questioned his vertical clearance level and ATC re-cleared them to FL210. They complied with the ATC instructions and a TCAS was TA generated. The other ac was identified at 5nm in their 2 o'clock position making a turn away from them. ATC was not in contact with the other ac and commented that it should not have been in that airspace. The other ac was identified as a dark grey military C130 Hercules. He assessed the risk as being Medium.

THE C130 PILOT reports that he was the captain and operating pilot of a C130J on a trials sortie in support of a comms system trial on Salisbury Plain and was tasked to fly a racetrack to the S of Salisbury Plain at FL180. They were on station at approx 0830 and left at 1530 after completing about 45 racetracks. Throughout the trial they maintained simultaneous voice comms with Salisbury Plain Range, the trials sponsors on the ground and variously Boscombe Down or Swanwick Mil for a RIS.

He is uncertain as to which particular racetrack flown was the one that the incident refers to, but he recollects 2 potential occurrences. The first [the one of the incident] occurred when, at the direction of the trial sponsor, they changed the racetrack from a rectangular one to a simple E-W line. At the end of each line they flew a turn

dumbbell to the N to avoid CAS and to maintain line of sight for the comms system. Having made this change to their pattern, on the first instance approaching the Eastern edge of the line he turned the ac left (to N) to maintain clear of CAS and return on the reciprocal leg. During this turn he was directed by Boscombe to turn initially right onto W then left to clear CAS. Referring to the ac's digital map unit he did note that the ac symbol was in close proximity to the edge of the airway, but he did not consider that they had entered it; nevertheless he manually flew the ac with the autopilot disengaged to increase the turn rate. On establishing on the reciprocal track no further RT calls were received on the matter.

[The second occurrence has been edited out as it was not the one on which the incident occurred].

The weather throughout the day was excellent with unrestricted visibility and no cloud cover. In either instance the risk was low.

ATSI reports that the B777 pilot contacted the Sector 20 Tactical controller (TAC) at 1147:40 and reported climbing to FL150 on a heading of 260º. At the time the ac was 21nm ENE of SAM passing FL120; TAC instructed the pilot to climb to FL170, which he acknowledged. A C130 was in the B777's 1 o'clock at 29nm, maintaining FL180 displaying a Boscombe Down squawk and tracking E just to the N of airway Romeo 8, virtually due S of Boscombe Down airfield. [Class G].

At 1149:20, when the B777 was passing FL154, TAC instructed the crew to climb to FL190. The radar recording shows that the C130 had made a right turn and at 1150:02 entered CAS at FL180. At that time the C130 was in the B777's 2 o'clock at a range of 12.8nm and at 1150:15 TAC instructed the B777 pilot to turn left heading 240º but there was no response and so she repeated the instruction. This time the crew replied and she then transmitted: "*(B777 callsign) expedite your climb through flight level one niner zero there's traffic in your twelve o'clock range of five miles I don't know what it's doing it's military traffic*". The pilot responded, advised he had the traffic on TCAS but pointed out that they had only been cleared to FL190; the controller then cleared them to climb to FL210, which was acknowledged and he advised that they were visual with the traffic.

The radar recording shows that after the C130 had turned right and entered CAS, it continued on a Southerly track for a short time, converging with the B777. STCA activated at 1150:26, when the C130 was in the B777's 1 o'clock position at 9.2nm. Shortly after TAC instructed the pilot to expedite the climb, the C130 is seen to make a left turn, onto a Northerly heading and, at 1150:55, was in the B777's 2 o'clock at a range of 4.4nm indicating FL180 with the B777 passing FL185. The next sweep, timed at 1151:03, shows the C130 in the 3 o'clock position of the B777 range 3.8nm with the B777 800ft above it and by the next sweep, vertical separation had been restored.

MIL ACC reports that a B777 was conducting a scheduled passenger flight in Class A airspace and at the time of the incident the pilot was under RC from LACC, squawking 3226, and was in the climb to FL190. Meanwhile a RAF C130J was conducting a trial from RAF Boscombe Down in Class G airspace, squawking 2652, at FL180. The pilot was receiving a RIS, limited due radar clutter, from the Boscombe ZONE/LARS controller (ZONE) on 126.7MHz. The reported Airprox took place at 1150Z, as the B777 was being given an avoiding action climb and turn as the C130 entered CAS.

The C130 had been in two-way contact with ZONE for some time and had already completed several racetracks at FL180. The ZONE controller reports that the workload on the position was initially low however, in the 10min prior to the Airprox it had increased significantly. Analysis of the R/T recording shows that, 7min prior to the incident, ZONE had 6 tracks on frequency, 3 on a RIS (including the C130) and 3 on a FIS. By the time that the Airprox had occurred, ZONE had 10 tracks on frequency (4 RIS, 6 FIS).

Analysis of the Pease Pottage radar shows that, at 1149:40 the C130 was tracking 090°, indicating FL180, and the B777 was tracking 260°, indicating FL159, with the ac 16.8nm apart. The C130 commenced a right-hand turn at 1150:05 and entered CAS. At 1150:12, a hesitant student microlight pilot called ZONE with his initial message, blocking the frequency for 20sec.

Although STCA activated at 1150:25 when there was 10.1nm between the ac, this facility was not available to ZONE. At 1150:38 ZONE instructed the C130 pilot *'avoiding action turn right heading 270 approaching controlled airspace'* and at 1150:45 the C130 pilot acknowledged saying he was already in a left turn. ZONE immediately reacted to this by saying *'C130 C/S er, roger if you can make it a tight left'*, which the pilot also acknowledged. By 1151:09 the C130 was passing through 040° in the left turn with the B777 also turning left 20°, initiated by the civil

sector controller. This is the point of least horizontal separation (3.8nm), thereafter the separation increased. Between 1151:13 and 1151:36, ZONE dealt with other traffic and at 1151:39, instructed the pilot to *'maintain not below FL160 against er general air traffic'; and* the pilot responded saying *'C-130 C/S, and apologise for that, er we're just trying to provide the er…..(garbled)… what they wanted but ….. (garbled) …. Controlled airspace, apologies'*.

In a detailed and frank report the ZONE controller stated *'Whilst I was aware of the high level of traffic in the area, I perceived the majority of it to be low-level and therefore, perhaps sub-consciously, paid less attention to {C130 C/S} than the other RIS traffic. In addition I had not made a conscious mental note of his possible proximity to CAS; rather, I had assumed that his racetracks would automatically keep him clear.'* He also went on to say *'I believe the causal factor of this incident on my part was degradation of performance due to high workload, but also my assumption that {C130 C/S} was safe and required less monitoring than other traffic. I had also assumed that, as a planned sortie, the ac's activity would keep it clear of CAS. This resulted in insufficient scan in relation to {C130 C/S}, therefore no prior warning of his proximity to CAS was issued nor was TI on the GAT passed*'.

HQ Air commends the controller for submitting an open and honest report, in which high workload and a measure of assumption were stated as factors that contributed to a reduced scan regarding the C130. However they note that the controller may have established an element of trust in the crew of the C130 as the ac had been flown close to, but had not penetrated, CAS on several occasions prior to the incident. Having seen the ac avoid CAS several times may have led him to trust the crew and pay less attention to its track. Although it is ultimately the pilot's responsibility to avoid unauthorised flight into CAS, HQ Air acknowledges that the controller also has a responsibility to assist pilots by giving timely warnings. Moreover, the dangers of flying in close proximity to CAS are well known to Boscombe Down ATC staff however, the responsibility to avoid CAS ultimately rests with the pilot.

This has been re-emphasized in recent joint-services Flight Safety publications.

HQ AIR (OPS) comments that it would appear that the C130 crew, whilst attempting to provide the best service to the trials team, unwittingly entered CAS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted the full and frank report by the Boscombe Down Zone Controller and accepted his description of events. They also accepted that, although he was not responsible for ensuring that the C130 did not enter CAS, he could have done a little more to prevent it.

The Board was briefed by a Test Pilot on the procedures for trials such as the one being flown by the C130J crew and that they can be long, often repetitive in nature and tedious for the aircrew. They were also briefed that a Trials Officer, who is not normally an aviator, directs such trials; it is therefore incumbent on the flight crew to advise/ direct him on aviation related aspects. That it was repetitive and presumably therefore tedious had without doubt been the case in this incident and the crew appeared to have conducted a dumbbell to the S at the Eastern end of the changed pattern rather than to the N as they reported had been their intention. This Southerly dumbbell had, as shown on the radar recording, resulted in them penetrating the Airway and quickly and unexpectedly presenting the Sector 20 Controller with a breach of the required separation. He had however reacted equally quickly and appropriately and succeeded in ensuring that the reduction was as small as possible and that a TCAS RA did not ensue.

A CAS infringement however is not necessarily an Airprox and, although Members agreed that in this case the B777 crew had been justified in filing the incident as an Airprox, prompt action by the Sector 20 Controller and the B777 crew had averted any risk.

Some Members were surprised that the C130's navigation equipment was apparently in error by 2-3nm even after a relatively long flight. The STC Member was not familiar with the type of equipment or its operation and could not offer an explanation.

UKAB Post-Meeting Note: The C130J Nav System comprises of twin inertial and GPS feeds to a Digital Nav Computer. An Instructor Pilot assessed that generally it is very accurate and gives pilots notification of any drift detected between the 2 data sources allowing the selection of the more accurate.

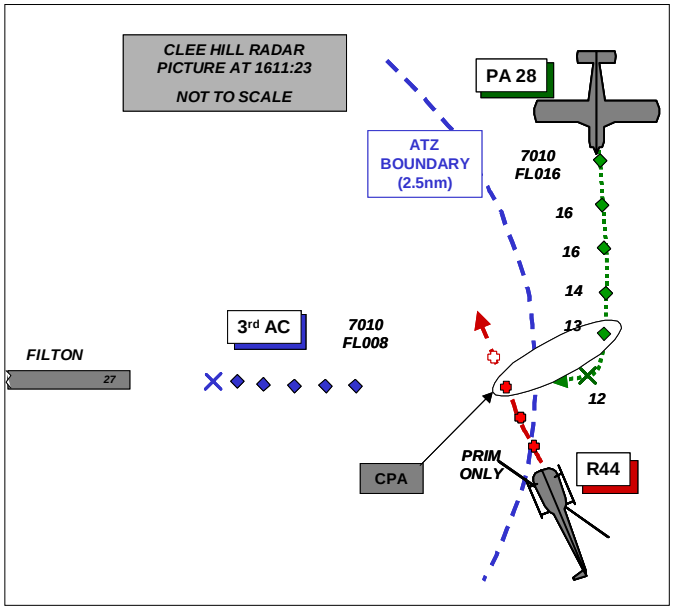
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The C130J crew unintentionally penetrated Class A Airway R8 and flew into conflict with the B777.

Degree of Risk: C.

AIRPROX REPORT NO 162/07

Date/Time:	11 Nov 1611 (Sunday)	
Position:	5131N 00231W (2.4nm E of Filton - elev 226ft ft)	
Airspace:	Filton ATZ	(Class: G)
Reporter:	Filton ATC	
	1st Ac	*2nd Ac*
Type:	PA28	R44
Operator:	Civ Pte	Civ Trg
Alt/FL:	1000ft	1200ft
	(QFE 1013mb)	NR
Weather	VMC CLOC	VMC NR
Visibility:	20nm	NR
Reported Separation:		
	100ft V/350m H	NR
Recorded Separation:		
	NR V/0.5nm (900m) H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE FILTON ADC/APP reports that he was working as the ATCO with combined ADC/APP (as Filton always does at weekends) and he was controlling two PA28's in a RH cct for RW27 when he observed an ac on the ATM which was not displaying any SSR at the time. He looked out to try to see the ac and saw an R44 passing through final approach about 1nm out at about 1000ft. He passed TI to the cct traffic affected and they subsequently reported that they had the R44 in sight. He telephoned Bristol (International) to ascertain if they knew anything about the traffic and it transpired that the ac was based there and they had been on their frequency. The PA28 pilot later reported that if they hadn't been extending downwind to space behind the preceding circuit traffic and the information regarding the R44 had not been brought to his attention, they would have been very close.

THE BRISTOL ADC reports that he was unaware of the incident until Filton advised him they were filing an occurrence report and an Airprox between a PA28 and an R44 Helicopter. The incident happened about 5min after taking over the position at about 1610. At the time the PA28 was operating in the Filton circuit and the R44 was receiving a FIS from Bristol Radar. The R44 took off at 1556z and left the [Bristol] Zone via Chew Valley Lake [5nm SE] cleared not above 2000ft VFR. On leaving CAS the R44 was asked to squawk 4623 and reported he was going to route to the E and then up to Yate [15nm NE]. After this he then took over the controlling position of Bristol Radar. At about 1615 the Bristol APR ATSA received a telephone call from Filton asking if they were working an R44 helicopter just to the E of them. The R44 was the only R44 he was working at the time and he was again instructed to squawk 4623. The R44 was then identified 3nm NE of Filton. Filton then advised him that a PA28 had taken avoiding action on right base to avoid the R44. At the actual time of the incident the R44 was not squawking and there was also a small amount of clutter being displayed on Radar.

Filton later informed him that the PA28 had thought that the R44 was inside the Filton ATZ on the Western side of the M4 motorway at 1000ft. The circuit height at Filton is 1200ft.

The R44 pilot was informed by telephone after landing that Filton were filing an Airprox report.

UKAB note (1): The Filton weather was reported as: 330/5 9999 SCT033 12/06 Q1020.

THE PA28 PILOT reports flying a Cream and Blue ac in the circuit at Filton with another pilot, squawking 7010 with Mode C, and in contact with the Filton ADC. While heading 270° at 85kt on finals to RW27 a blue Robinson Helicopter crossed him from left to right. Having just turned finals, his position was abeam Patchway railway station [2nm] at 1000ft QFE 1013. Having reported that he was visual with the helicopter he slowed to 70kt with two stages of flap and allowed it to pass about 400m in front and slightly below him then called finals and landed without further incident. He assessed the risk as being Medium.

THE R44 PILOT reports flying a local VFR GH training flight, solo in a Black helicopter and in receipt of a FIS from Bristol APR, but he could not recall the squawk. At the time of the incident he was heading 020° at 90kt routeing towards the Yate area but did not see any other ac nor was he given any warnings by ATC. He was not told by APR to contact Filton.

ATSI reports that the R44 departed Bristol International Airport on a local VFR flight. The pilot contacted the Bristol APR at 1558:20 and advised that he was on a standard VFR departure via Chew Valley (a VRP 5nm SE of the airport); APR instructed the pilot to report leaving CAS and informed him that she would be providing a FIS.

Soon after 1600, the pilot reported clear of CAS and was instructed to squawk 4623 and APR enquired as to the maximum operating level of the R44 to which the pilot replied that he would not be above 2000ft. He was then asked his route and advised that he would be routeing N to the Yate area (about 6nm E of Filton) before returning to Bristol. Although the pilot read back the change of squawk, it was not displayed on the radar and APR did not challenge this. MATS Part 1, Section 1, Chapter 5 page 6, para 4.4.1 requires that all controllers assigning any Mode A code must validate the code as soon as possible which was not done in this case.

After this time the R44 is seen on the radar recording as an intermittent primary contact routeing on a N'ly track. Shortly after 1611, the Filton ADC telephoned the Bristol APR to enquire whether they knew of any R44 traffic operating in the Filton area so she called the R44 pilot and asked him to report his position which was given as 'abeam Filton'. APR instructed the pilot to squawk 4623 with Ident and the return was seen about 2nm NE of Filton indicating FL010 (approximately 1200ft) and inside the airspace being used by the two ac carrying out RH ccts to RW27 (the ATZ has a radius of 2.5nm). APR informed the pilot that he was right on the edge of the Filton ATZ and requested that he either move E or contact Filton, the pilot replied that he would move to the E and then took up a N'ly track before turning onto a SE'ly track and then routeing S back towards Chew Valley.

The Bristol unit investigation found that at weekends Filton Radar is not usually manned and the controllers [ADC/APP] have little interest in traffic that will not enter their ATZ. When details are offered by Bristol the Filton controllers routinely decline to take them unless the traffic is transiting the ATZ. As the R44 had indicated that he would be operating at Yate, i.e. well outside of the Filton ATZ, it was probable that the Filton ADC/APP would not have accepted the details even if they had been passed.

Subsequent to this Airprox the two units are working to produce an instruction, in respect of this issue, which formalises when details of traffic should be passed between the two units.

Notwithstanding whether the details were passed to Filton or not, as the R44 pilot was in receipt of only a FIS, it was incumbent upon him not to enter any airspace, including ATZs, unless first obtaining a clearance from the controlling ATSU.

UKAB Note (2): The recording of the Clee Hill Radar shows the incident as described in the ATSI report. As the ac tracks cross the R44 is about 2.4nm from Filton. The R44 however displays some track jitter so the distances cannot be verified.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that although the PA28 had turned finals just outside the 2½ nm ATZ, the actual CPA had occurred just inside the lateral boundary.

The R44 pilot was not only uncertain of his position in an area with ample very significant navigation features, notably the motorways that run along the ATZ boundary, and had not seen either of the light ac in the extended Filton circuit, both of which were within about 1nm of his position.

Specialist Members commented that the Filton ADC/APP controller did well to see and take immediate action to negate any threat posed by the R44. The PA28 pilot however had also seen the helicopter, taken avoiding action and was relatively unconcerned by the event.

Although this was clearly an ATZ infringement the situation was well controlled by both the PA28 pilot and the controller thus preventing any risk.

PART C: ASSESSMENT OF CAUSE AND RISK

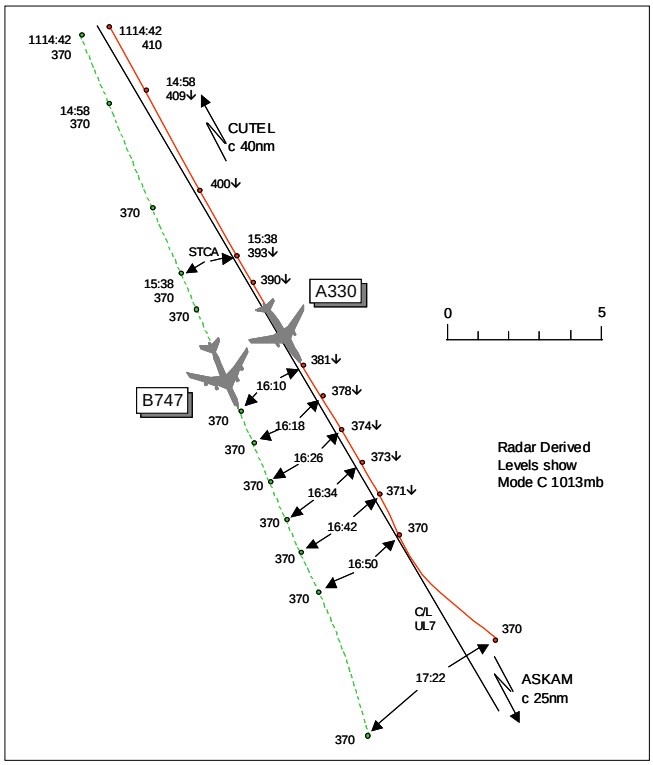
Cause: The R44 pilot entered the Filton ATZ without permission and flew into conflict with the PA28 which he did not see.

Degree of Risk: C.

AIRPROX REPORT No 163/07

AIRPROX REPORT NO 163/07

Date/Time:	14 Nov 1116	
Position:	5518N 00253E (160nm E Newcastle)	
Airspace:	UAR UL7	(Class: C)
Reporter:	ScACC TYNE/HUMBER P+E	
	1st Ac	*2nd Ac*
Type:	A330-200	B747-400
Operator:	CAT	CAT
Alt/FL:	↓FL380	FL370
Weather	VMC NR	NK NR
Visibility:	NR	NR
Reported Separation:		
	Nil V/2·5nm H	NR
Recorded Separation:		
	800ft V/2·7nm H OR	
	Nil V/3·2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SCACC TYNE/HUMBER PLANNER AND EXECUTIVE reports that the 2 subject ac were both inbound to Amsterdam, the B747 at FL370 and the A330 at FL410. Both ac were in exactly the same position so, in an attempt to stream them for Amsterdam she set the ac up on 10° diverging headings. As she also had another ac N'bound at FL390 she decided to descend the A330 early. She cleared the flight to FL380 which was read back. She then observed the A330 descending through FL374, which she initially thought was garbling, but when she realised it wasn't she gave both flights avoiding action turns and subsequently descended the B747 to FL360. The A330 crew believed that they were cleared to FL370 however on checking the RT recordings the flight was cleared to FL380 and this was correctly read back.

THE A330 PILOT reports maintaining FL410 en-route to Amsterdam on radar heading 050°, he thought [actually 151°] at M0·82 with a company B747 maintaining FL370 on a radar heading 060°, he thought [actually 160°]. According to ScACC ATC cleared their flight to descend to FL380 however, the crew understood the cleared level to be FL370. When reaching FL370 ATC told both flights to fly on more diverging headings to increase separation. The weather was VMC and the B747 was in sight about 2·5nm to their R.

THE B747 PILOT was contacted through his Flight Safety Dept but owing to staffing issues this request was approximately 3 months post incident and he was unable to remember any details of the encounter on that flight.

TSI comments that at the time of the Airprox one controller was providing the functions of the Tyne Sector Planner and Executive as well as the Humber Sector Planner and Executive. Traffic levels were reported as light to moderate and it was normal to operate in a bandboxed configuration.

At 1105:22, the crew of the A330 called on frequency at FL410. Some 10sec later the B747 crew called on the same frequency at FL370. Both ac were inbound to Amsterdam and S'bound on UL7. Around 7min later the controller instructed both flights to change frequency to 'the other' of his 2 bandboxed frequencies and both crews complied. The ac were in trail, separated by approximately 1nm, with the B747 being 4000ft below the A330 and catching it up. In order to stream the ac for Amsterdam, the controller instructed the B747 crew (1113:35) to turn R 10° onto 160°. At 1114:40, the controller transmitted "*(A330 c/s) descend flight level Three Eight Zero*" to which

the response was "*Leaving flight level Four One Zero descending flight level Three Eight Zero, (A330 c/s)*". At the time the A330 commenced its descent (1114:58), the B747 was 1·5nm laterally displaced from it. STCA activated (1115:38) as the A330 passed FL393 and as the A330 passed FL381 the distance between the two ac was 2·6nm. At 1116:30, after the A330 had passed FL374, the controller transmitted "*(A330 c/s) confirm maintaining flight level Three Eight Zero*" to which the reply was "*Three Seven Zero (A330 c/s)*".

Avoiding action was passed to both flights [A330 L onto 090°, B747 R onto 180°] and the B747 crew reported the A330 in sight. When the A330 reached FL370 the separation was 3·2nm (according to GDF radar source). As the avoiding action turns started to take effect, the controller instructed the B747 crew to descend to FL360 and separation was restored between the two ac at 1117:22.

The unit investigation found that following the descent clearance issued to the A330 flight, and before the controller realised that separation had been lost, she was involved in a protracted telephone conversation with the TAY sector regarding an unrelated ac and 4 transmissions were made to other flights in the sector. The controller recalled that the 2 ac were garbling and believed that the Mode C data was corrupt, hence the reason for ascertaining the A330's level rather than immediately giving avoiding action, in the knowledge that a safe clearance had been issued to the A330 flight and correctly read back by its crew.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of the A330, 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 opined that there were undoubtedly some Human Factor issues on the A330 flight deck. The controller had cleared the A330 flight to descend to FL380, the crew had read this clearance back correctly but had then, erroneously, descended to FL370. Crew cross-checking procedures should have detected any anomaly between the ATC level clearance issued and correctly acknowledged by the PNF compared to the level set in the ac's A/P by the PF. This error was not detected by the crew so the A330 was descended below the cleared level and into conflict with the B747 which caused the Airprox. A controller Member pointed out that as Mode S Selected Flight Level is not displayed to controllers at ScACC, the A330 crew's Selected Flight Level error would not have been apparent to the Tyne/Humber controller, the 'level bust' only becoming apparent as the ac's Mode C indicated a descent below the cleared level. The controller was undoubtedly surprised when her scan of the radar display revealed the A330's Mode C showing FL374. Initially believing that garbling of the SSR labels was responsible she had confirmed the A330's cleared level before issuing robust avoiding action turns to both flights and subsequent descent to the B747 crew. Both crews reported visual sightings of each other's ac. Fortunately she had previously placed the subject ac on diverging headings which resulted in the ac being laterally separated by 2·7nm as vertical separation was eroded, with 3·2nm pertaining with both ac at the same level. A combination of the diverging headings and visual sightings by the crews allowed the Board to conclude that any risk of collision had been removed.

PART C: ASSESSMENT OF CAUSE AND RISK

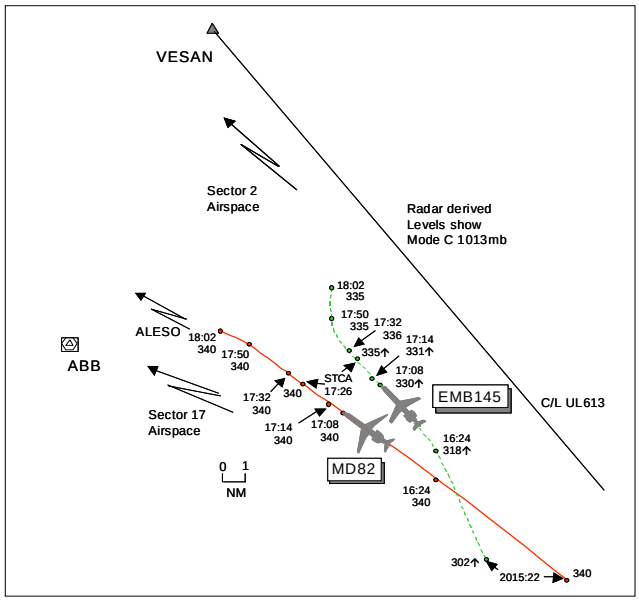
Cause: The A330 crew descended below their cleared level and into conflict with the B747.

Degree of Risk: C.

AIRPROX REPORT No 166/07

AIRPROX REPORT NO 166/07

Date/Time:	23 Nov 2017	NIGHT
Position:	5006N 00210E (13nm E ABB)	
Airspace:	UAR UL613/UT420 (Class: C)	
	Reporting Ac	*Reported Ac*
Type:	EMB145	MD82
Operator:	CAT	CAT
Alt/FL:	FL330↑	FL340
Weather	VMC CLOC	NR
Visibility:	10km	
Reported Separation:	300ft V/2nm H	3nm H
Recorded Separation:	400ft V/2·8nm H OR 900ft V/2·2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EMB145 PILOT reports heading 330° at 230kt enroute to Edinburgh IFR and in receipt of a RCS from London on 127·430MHz squawking 0644 with Mode C. On passing through FL330 in the climb to FL340 ATC called *"turn R heading 360° avoiding action"* followed immediately by an ATC call to stop climb. The ac was turned onto the given heading and ALT selected at FL335 and ATC was informed when they were steady on heading and FL335. They were fully visual with traffic 700ft above prior to the ATC call and during the turn with TCAS 'Proximate' traffic observed on their L 300ft above range approximately 2nm at the CPA. After approximately 2min climb was resumed to FL340 on track, as before, direct to DET.

THE MD82 PILOT reports during the cruise at FL340 they were instructed by London ATC to *"turn L heading 290°"* in order to increase separation from an ac that had been instructed to climb to FL350, he thought [actually FL340], behind them with less than normal horizontal separation. Traffic appeared on TCAS approximately 3nm behind but no TA was activated and, a few minutes later they were instructed to resume normal navigation.

THE LACC S1/2/25/26T reports that about 2015Z the EMB145 flight called on 127·430MHz from Rheims Control. He looked at the Planner's radar to see the ac as it was not visible on his selected display range and climbed the flight to FL340 to keep it within the confines of the offering sector (Rheims XN). However the ac had not yet reached VESAN and it had the MD82 above it also at FL340. On realising this he passed avoiding action to the EMB145 flight – to turn N – and asked it to stop its climb, passing TI as he did so. The EMB145 flight complied with both of his instructions, levelling at FL335. Once clear of the MD82 he put the EMB145 flight on its own navigation to DET and climbed it to FL340, the crew did not report any TCAS warnings.

THE LACC S1/2/25/26P reports that after EMB145 flight checked in on frequency, the Tactical controller asked the crew for their requested level and then climbed it to FL340. A few minutes later the Rheims XN Assistant line rang which he answered on the Planner position, the Rheims controller gave an unintelligible message and rang off. In the meantime the Tactical had spotted the MD82 at FL340 close to the EMB145 on diverging tracks and took appropriate action.

THE LACC S17T reports operating the combined 'DVR/LYD' sector when the MD82 flight checked in on S17 frequency level at FL340 SE of ABB on track for ALESO. The flight was given a BIG3B STAR and given M0·79 converting to 280kt, he thought [actually M0·76 and 300kt], in preparation for streaming into BIG; no descent was given. A short time later he observed the EMB145 climbing through FL334 approximately 3nm SE of the MD82 so he immediately turned the MD82 flight onto a heading of 290° to increase the separation. This would have, without the turn, reduced to 2nm with no collision risk as both ac were on similar but slowly diverging tracks. He

observed the EMB145 flight take an avoiding action turn away to the R so standard separation was rapidly restored. His attention was drawn to the confliction by the EMB145's Mode C, only later did STCA activate.

ATSI reports that at the time of the Airprox, LMS (Sectors 25 & 26) and LUS (Sectors 1 & 2) were being operated in a bandboxed mode, staffed with a Tactical and Planner. The EMB145 flight was in communication with the LUS/LMS Tactical whilst the MD82 flight was in contact with the LACC Sector 17 Tactical controller. The LUS/LMS Tactical reported his workload as 'light' and the traffic loading 'moderate'.

The EMB145 flight established communications with the LUS/LMS Tactical controller at 2015:20. The crew reported climbing to FL320 and advised "*…we're direct ????*". The Tactical acknowledged this call and asked the crew if they were requesting a higher level, to which the response was '*360*'. The Tactical instructed the crew to climb to FL340 and route direct to DET and then HALIF. Meanwhile, the MD82 had called on the Sector 17 frequency at 2015:30, maintaining FL340 and routeing to ALESO. The crew were advised to expect a BIG 3B arrival for Heathrow. The S17 Tactical instructed the crew to maintain Mach 0·76 and on conversion to IAS 300kt, in preparation for streaming into the Biggin stack.

During his routine scanning of the traffic, the LUS/LMS Tactical saw that the EMB145 was climbing in close proximity to the MD82 and so passed an avoiding action instruction to the crew (2017:10) of the EMB145 to turn R heading N. This was followed by a request for the climb to be stopped as, "*…there is traffic above you at flight level Three Four Zero*". STCA activated at 2017:26. At the same time, the S17 Tactical, having seen that the EMB145 was climbing into conflict with his traffic, instructed the crew of the MD82 to turn L heading 290°. Separation reduced to 400ft and 2·8nm(2017:32) before the turn instructions took effect and lateral separation was re-established (2018:02).

[UKAB Note (1): The CPA when vertical separation is lost occurs at 2017:14 as the EMB145 climbs through FL331 with the MD82 2·2nm on its port side, slowly diverging, level at FL340.]

The LUS/LMS Tactical explained that he had been in the position for some 20min prior to the Airprox. He had not adjusted the displayed range of the radar from that selected by the previous controller. He added that it was typical of what he would use normally when the sectors were bandboxed and that his radar picture would display airspace to the S of RATUK, whereas that of the Planner would show to the S of VESAN. The Planner was sat to the Tactical's R and the EMB145 appeared in the lower RH corner of the display. In his experience, it was normal for Reims to transfer such flights when they were within 10nm of VESAN however, he added that, it was not uncommon for flights to be transferred much earlier. At the time the LUS/LMS Tactical instructed the crew of the EMB145 to climb to FL340, the ac was 26nm S of VESAN. The unit's MATS Part 2 (LUS 2.6.10.1) states that control of aircraft on UL613 S of the London/Paris UIR boundary is delegated by the French Authorities to LACC (Swanwick) up to but not including RATUK. Traffic on UL613 is released for turn/climb/descent after VESAN within the delivering sector limits (Reims XN Sector is FL315-FL345).

The LUS/LMS Tactical advised that he saw the EMB145 on the Planner's radar and believed it had passed VESAN. He therefore issued the climb instruction. He did not see the MD82, which would have been displayed as a background track and, with hindsight, he opined that he might have only seen the Track Data Block (TDB) of the EMB145 and not the return from the ac. In order to display VESAN on the radar, the rest of the reporting points would also be shown, which would result in a cluttered picture, especially when operating in a bandboxed configuration.

He was working through his strip display when he realised that he couldn't see the EMB145 displayed and so, at 2017:07, he increased the selected range. He saw the garbled labels from the two ac and moved them so that he could ascertain the data in the TDB. Having seen the problem he immediately issued an avoiding action turn onto N to the crew of the EMB145. It was around this time that STCA activated and also Reims telephoned the Planner to remind her not to permit the EMB145 to climb above FL330 due to the traffic at FL340 alongside. The S17 Tactical had seen the Mode C from the EMB145 increase and realised the potential for conflict, as he did not know its intentions. He therefore instructed his flight, the MD82, to turn L and increase the separation.

The LUS/LMS Tactical advised that he did not really think of avoiding action in the vertical plane and hence did not use the words 'avoiding action' but simply requested the crew to stop their climb. He intended to pass avoiding action, in this case the turn onto N, and obtain an acknowledgement before passing TI, however, he personally

found TI did not 'trip off the tongue'. He had undergone his Training for Unusual Circumstances and Emergencies (TRUCE) 3 days prior to the Airprox occurring.

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 NATS Advisor informed Members that the reporting point VESAN is planned to be added to the normal radar display video map (permanently shown without the need to select additional map layers) in the software update scheduled for August 2008. In this Airprox the LACC LUS/LMS Tactical controller had acted in haste without fully establishing whether the EMB145 had entered his area of responsibility. A more detailed scan of his or the adjacent display would have shown the ac to be S of VESAN, the release point, when he climbed the flight into conflict with the MD82 which had caused the Airprox.

Later the LUS/LMS Tactical had checked his fpss and searched for the EMB145 which revealed the subject acs' TDB 'labels' garbling. He had then manipulated the TDBs which revealed the deteriorating situation, so he issued an avoiding action R turn onto N and then a stop climb instruction to the EMB145 crew. S17 Tactical had noticed the EMB145 climbing through FL334 and gave the MD82 flight a L turn onto a heading of 290° to increase separation. Prior to the intervention by ATC, the EMB145 crew was already visual with the MD82 above and to their L and had turned R and levelled-off at FL335, as instructed, whilst watching the MD82 diverge with TCAS showing it as 'proximate' traffic. The MD82 crew had turned L onto 290°, as instructed, noting the EMB145's presence on TCAS 3nm behind their ac. The radar recording shows the two ac were 2·2nm apart as vertical separation was eroded below the stipulated 1000ft. Minimum vertical separation (400ft) occurred as the EMB145 stopped climb with a momentary Mode C indication of FL336 at 2·8nm range before levelling at FL335. Taking all of these elements into account the Board agreed that any collision risk had been quickly and effectively removed.

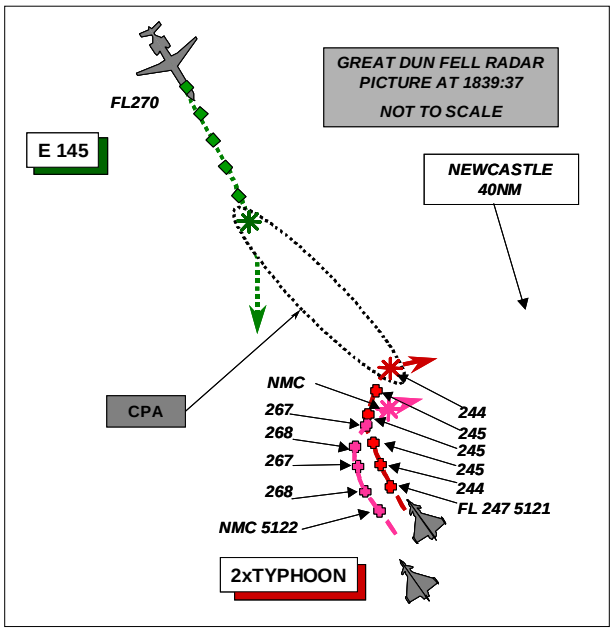
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LACC LUS/LMS Tactical controller climbed the EMB145 before the release point and into conflict

Degree of Risk: C.

AIRPROX REPORT NO 168/07

Date/Time:	29 Nov 1840 (Night)	
Position:	5540N 00215W (40nm NNW Newcastle)	
Airspace:	UN610	(Class: C)
	Reporting Ac	*Reported Ac*
Type:	EMB145	Typhoon
Operator:	CAT	HQ AIR (Ops)
Alt/FL:	FL270	↓26000ft (RPS 993mb) (see Mil ACC report)
Weather	NK NR	VMC CAVOK
Visibility:	NR	NR
Reported Separation:	200ft V/ NR H	>5nm H
Recorded Separation:	Min H 1000ft /7.7nm (Min V 200ft/11nm)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EMB145 PILOT reports flying a scheduled passenger flight from Aberdeen to Norwich, squawking as directed, and in receipt of a RCS from ScACC. While level at FL270 in the cruise, heading 147° direct to NEW and 300kt, they received a TCAS TA showing unidentified traffic 8nm ahead, 200ft below them. Almost immediately (5sec later) ATC gave an "Avoiding Action" instruction to turn 40° to the R; the traffic then went down their left side and disappeared from TCAS. He subsequently saw 3 targets at various altitudes move down their left side. ATC where clearly concerned and briefly explained that there had been a co-ordination failure [they thought]. He did not assess the risk.

THE TYPHOON PILOT reports leading a pair of ac on a tactical combat sortie in OTA E in the block up to 55000ft and were in receipt of a RIS/RCS from Boulmer. While heading 340° at 350kt on commencement on the first tactical portion of the sortie, the formation was asked to descend from 36000ft to below FL260, to co-ordinate against conflicting civilian traffic. Leader descended to 25000ft (about FL255) and Typhoon 2 descended to 26000ft. Due to the large disparity between the regional pressure setting (993) and the SPS, Typhoon 2 was level initially at about FL265 and in confliction with the civilian traffic so Boulmer instructed No 2 to expedite the descent. In addition the formation leader simultaneously instructed a turn away from the conflicting traffic at about 10nm radar range. He reported the risk as being low.

ATSI reports that at the time of the Airprox the controller was performing the functions of Tactical and Planner on the ScACC Montrose sector and he reported that the traffic level was light.

The E145 pilot contacted the controller at 1833:10, and reported climbing to FL270 routeing inbound to NEW; the radar recording shows the ac to be 95nm NNW [of NEW] and passing FL250. At 1835:24, Boulmer contacted the Montrose Sector controller to ascertain the intentions of the E145 and advised him of two squawks operating between the E145 and NEW, both of which were above FL360 at the time, and about 50nm from the E145. The coordination agreed was that these ac would not be above FL260 unless there was 5nm lateral separation.

Some 90sec later, the Montrose Controller instructed the E145 crew to turn right 20º, due to his unease with the situation as the 2 Boulmer ac were now in the E145's 12 o'clock at a range of 23nm, tracking in opposite direction, with one indicating FL267 and the other FL292. Boulmer contacted the sector again at 1838:40, but the Assistant answered the call. About 20sec later the Controller came on the line and Boulmer advised that the ac should be below the E145. At this time (1839:30) the radar shows that one ac was indicating FL245 whilst the other was still showing FL267. The E145 was maintaining FL270 in the opposite direction to the Boulmer traffic and at a range of 10nm. At 1839:30, the controller transmitted "*(E145 callsign) Scottish avoiding action traffic in your twelve*

o'clock range of ten miles opposite direction unknown intentions turn right four zero degrees" and the crew acknowledged this. The Boulmer traffic was then observed to turn right onto an easterly heading.

The unit measured the minimum separation to be 8.2nm and 400ft.

MIL ACC reports that an E145 was conducting scheduled passenger flight from Aberdeen to Norwich, in Class C airspace. The ac was in the cruise at FL270, under RC from ScACC, squawking 7411, tracking 160º at 300kt, while 2 x Typhoons were conducting a practice intercept sortie against 2 x Tornados, initially at FL300 in the S end of OTA E, between 1000ft amsl and FL550. The Typhoons were under RC from a Fighter Controller (FC 1) at CRC Boulmer, initially at FL300 and FL310 respectively, heading 340º at 350kt. The GR4's were at medium level, also working an FC (FC 2) at RAF Boulmer but played no part in the incident.

In order to conduct the attack, Typhoon A & B needed to descend from FL300 to med-low level. The FC working Typhoon A & B identified civil traffic some 50nm N of the formation and decided to initiate co-ordination. Aware of the need to descend Typhoon A & B to low-level, FC1 decided to co-ordinate not above FL260, against the E145 which was in the cruise at FL270. His intention was to descend the Typhoons to below FL260 ahead of the E145 so that an attack on the Tornados could take place. Although the word 'co-ordination' was not mentioned during the conversation between FC1 and ScACC, it is clear from the tape transcripts that both controllers had agreed a course of action at 1836:10. FC1 informed FC2 that the Typhoons were co-ordinated against civil traffic at 1836:13. Between 1836:34 and 1838:07, FC1 instructs the Typhoon formation to descend below FL260 and Typhoon Leader acknowledged. At 1838:22, the Fighter Allocator (FA) called FC1 to check that there was co-ordination between the Typhoons and the E145 and FC1 replied that there was so he was content. At 1838:34, the ScACC controller called FC1 and 8secs later the FA shouted across the room to FC1 saying *'Expedite descent';* 2sec later Typhoon Leader called *'below 26'*, which FC1 acknowledged. FC1 then answered the line at the same time as Typhoon Leader asked FC1 to confirm the regional QNH so FC1 was forced to delay his response to ScACC while replying to Typhoon Leader: *'The regional is errr Tyne 997'*. At 1838:53 (19 sec after the initial call from ScACC), FC1 was able to respond and identified Typhoon A & B by referring to their relative squawks. The ScACC controller said: *'Yeah the 515 errr, 5121 and the 5122, you're sort of aiming straight at my target and descending through him is that right?'* and FC1 responded with *'Errr, no, they are now should be below, just told me below 26 thousand'* and the ScACC Controller replied *'Understood, okay, cheers';* however at 1839:09 the ScACC Controller gave E145 an avoiding action turn onto 180º. FC1 again instructed Typhoon A & B to '*expedite your descent'*, which was acknowledged, by both pilots. At 1839:34 both Typhoons were turning away from the E145 and descending quickly and the closest horizontal distance between the E145 and Typhoon B (the higher of the 2 ac) was 7.7nm at 1839:53 (after the ac had turned away and were no longer closing).

The FA then gave FC1 some advice on his technique which he totally accepted.

The Typhoon Leader stated in his report that he descended to 25000ft [amsl] when instructed and Typhoon B descended to 26000ft [to maintain separation]; however, these descents were probably based on the RPS of 993mb which was 20mb (600ft) lower than the SPS

HQ Air considers that FC1 was totally aware of the traffic situation in the operating area and moreover he co-ordinated in good time and was aware of the need to get the Typhoons below FL260. The FA also showed good awareness and checked that co-ordination was in place before any conflict was allowed to develop and for a second time instructed the Typhoon pilot to expedite his descent. Despite these instructions, Typhoon B remained above FL260 for a short time, and was therefore potentially in conflict with the E145, since the difference in the pressure settings led the pilot to believe that he was actually at or below FL260 rather than at 26000ft which on 993mb equated to FL266.

RAF Boulmer conducted a full investigation into this incident which concluded that the 'on-line' debrief given by the FA to FC1, followed up by an off-console de-brief was the correct course of action; HQ Air endorses that conclusion.

HQ AIR OPS comments that although this does not fulfil the usual criteria for an Airprox, (200ft/11nm) it does highlight a situation that has arisen before. On this occasion, the Typhoon pilot had probably not appreciated the significance of the 20mb difference in pressure settings, or that he was levelling on the RPS.

UKAB Note (1). The SFSO of the Typhoon Station has published this incident widely as an example of the need to be particularly vigilant when not operating on the SPS above the Transition Alt.

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/fighter controllers involved and reports from the appropriate ATC and operating authorities.

Members noted that the required separation of 1000ft or 5nm pertinent in the upper air (below FL290) had not been breached in this incident. They also noted that in this situation, where the closure rate of the opposing ac had been high and therefore reaction time limited, correct co-ordination had been effected. Furthermore, when the No2 Typhoon had initially levelled above the cleared level for a short period, this had been spotted very quickly by both the ScACC and the Boulmer controllers, the level was questioned by Boulmer and, conscious of a potential problem, the Typhoon leader had also taken effective remedial action well before the stipulated separation could be breached. However, this had not been apparent at the time to the ScACC controller and he also initiated correct, timely and effective avoiding action.

The Board was therefore satisfied that all the participants in this occurrence had worked well together to prevent any breach of separation.

It had however highlighted again the potential problem of operating on QNH at medium and high levels and that, if this is considered operationally necessary, crews must be very cognisant of large pressure differences from SPS and their effect on any co-ordination and level clearances.

PART C: ASSESSMENT OF CAUSE AND RISK

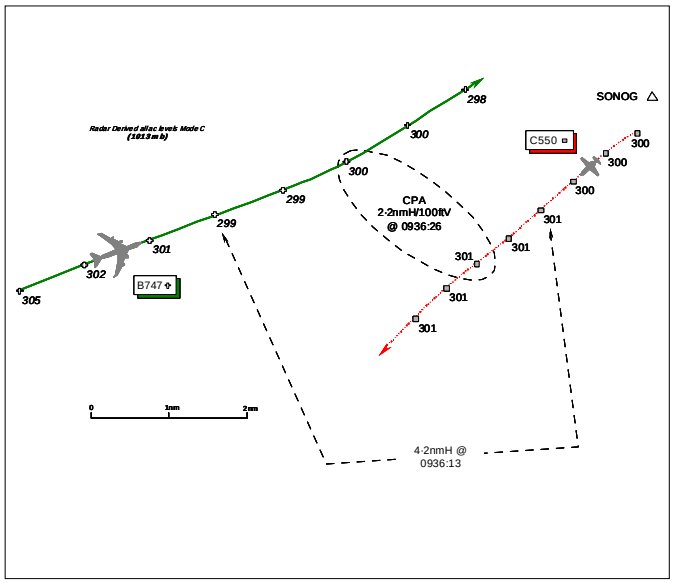
Cause: Controller perceived confliction.

Degree of Risk: C.

AIRPROX REPORT No 169/07

AIRPROX REPORT NO 169/07

Date/Time:	29 Nov 0936	
Position:	5205N 00210E (3½nm WSW of SONOG)	
Airspace:	UAR UP7	(Class: C)
Reporter:	LACC	
	1st Ac	*2nd Ac*
Type:	B747-300	C550
Operator:	CAT	Civ Comm
Alt/FL:	FL320↓	FL300
Weather	VMC CLOC	NR NR
Visibility:	>10km	NR
Reported Separation:		
	NR	NR
Recorded Separation:		
	100ft V/2·2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LACC SECTOR 13/14 TACTICAL CONTROLLER (S13/14) reports that he was operating both S13 & S14 bandboxed and it was fairly busy with a lot of RT transmissions being stepped on. The C550 crew had called on frequency at FL300 routeing UP7 and transiting through S12's airspace in conformity with the standing agreement for Farnborough traffic. At about 0935 he was made aware by his PLANNER that the B747-300 was descending through FL302 and passing about 2nm down the starboard side of the C550. He was working 'another ac' on UP7, also at FL300, and as he deemed 'another ac' and the B747 to have a higher level of "danger" to each other than the C550 and B747 he issued avoiding action to this flight with a L turn onto a heading of 090°. The B747 then started to descend rapidly and was quickly through FL300 so separation between 'another ac' and the B747 was not eroded. The separation between the C550 and B747 was 2·2nm at the closest point.

THE LACC SECTOR 12 TACTICAL CONTROLLER (S12) reports that he was working as a mentor to a trainee. The B747, inbound to Amsterdam, was given descent to FL310, which the crew read back correctly. Approximately 5min later STCA was set off between this ac, now in descent, and the C550 on UP7 at FL300 inbound to Farnborough and working Sector 13T. He then noticed the Mode C of the B747 passing FL304. He rechecked the FPS to make sure of the B747's cleared level – FL310 - then took over the RTF and gave the crew an avoiding action turn onto 340°. The B747 pilot informed him that he had a "TCAS indication" and was descending so he instructed the B747 crew to descend to FL230 with 'a good rate'. The separation between the B747 and the C550 at the closest point was 2·2nm. After passing the C550, the B747 pilot asked if the turn onto 340° was still required, to which he said no, but to continue the expedited descent as there was 'another ac' also working S13T at FL300 about 15nm behind the C550. However, separation between 'another ac' and the B747 was never eroded. As the C550 crew never mentioned any TCAS warning to them (S13) on RT they were unsure whether either crew actually received a TCAS RA or not.

THE B747-300 PILOT, a type rating instructor and examiner, provided a very comprehensive and frank account reporting that the flight was in transit for Amsterdam/Schiphol through the London UIR. A descent clearance was received from the LACC controller, which was heard and understood by all cockpit crewmembers. After confirmation by the Captain PNF, the 1st Officer PF programmed the ac's FMS to make a descent in the VNAV "descent speed mode". This mode maintains a constant airspeed with the consequence however that the vertical speed may vary. A descent was then started from FL370 to FL310 following the normal procedures. As the descent was initiated by ATC before their own calculated 'top of descent', the descent was accomplished initially at a RoD of about 1500ft/min by not fully retarding the power levers.

Just before descending through about FL340 his ac suddenly increased its rate of descent to 3500 to 4000 ft/min. [UKAB Note (1): The radar recording reveals that the B747's RoD after passing FL340 was in the order of 1700ft/

min; this increased to about 2400ft/min from FL323 – FL299] This caught the attention of both the 1st Officer as PF and the Captain who verbally pointed out to the PF to monitor the vertical speed whilst the latter was trying to find out what was going on. Due to the fact that the FMS was controlling the ac via the VNAV Mode, the PF increased thrust to reduce the vertical speed but in his judgement the ac reacted too slowly. The Captain then indicated to the PF to deselect VNAV mode to fall back to the basic "vertical speed mode", in order to regain an acceptable rate of descent while approaching the selected flight level. After judging that the ac's reaction in the basic "vertical speed mode" was insufficient too, the A/P was disconnected to level off the ac in 'manual flight'. Almost simultaneously, flying at 300kt [IAS] a TCAS TA was enunciated, followed seconds later by an RA "MONITOR VERTICAL SPEED", commanding the crew to maintain a RoD between 1500 and 2000ft/min by the green arc on the VSI. In order to comply with the RA the ac had to be descended through their cleared flight level of FL310, which prompted LACC to issue a heading change and further descent instruction at FL303 some 700ft below their assigned level. The clearance issued by ATC included a L turn and a further descent to FL230 followed shortly afterwards by a new heading instruction of a R turn onto a heading 060°. Besides confirming this command to ATC on RT, the PNF indicated additionally that the crew was responding to a TCAS command.

The chain of events from correcting a high RoD until the response to the RA took no more than 30 to 40 seconds. Changing wind strength caused the sudden increase in RoD which triggered the TCAS RA and caused the crew to descend below their cleared level.

Shortly after the TCAS RA, LACC requested that the Captain contact them after arrival in Amsterdam. During this subsequent telephone conversation, the Captain suggested that a misunderstanding about the cleared flight level could have been the cause of the 'level bust' and it was agreed that a report would be made of the occurrence. After careful evaluation by the crew, the conclusion was that the aforementioned TCAS RA caused the 'level bust'.

The Captain added that on a previous occasion, he had experienced similar behaviour of the VNAV Mode during a descent in Brussels airspace that resulted in an RA without, however, causing a 'level bust'. He opined that the VNAV Mode may generate large changes in vertical speed while maintaining a selected IAS, caused by changing meteorological conditions. Especially in RVSM airspace this is an undesirable situation so the crew has suggested to the company to adapt descent and climb procedures.

THE C550 PILOT reports that they were in transit for Farnborough and in receipt of a RCS from LACC and following radar vectors in level flight. The RTF was quite busy and they got the impression that ATC had several ac with "minimum separation" but "in full control". Another ac, a Boeing 747, was flying a parallel but reciprocal track on their starboard side but he could not recall the airliner's level. Visual contact was gained, then the B747 was seen on TCAS [display range 12nm] and they followed its progress. ATC gave the B747 a left turn, thus turning it further away from his ac and while the other ac was in that turn a TCAS CLIMB RA was enunciated but it was of very short duration and before they were able to respond the RA disappeared. The frequency was busy and both he and his 1st Officer felt that there was no real danger to the situation. Discussing between themselves whether or not to report the TCAS RA to ATC at the time, the airspace seemed quite congested, the frequency was very busy and the RA so brief, coupled with visual contact on the B747 the whole time so he elected not to report it on RT.

LACC reports that this Airprox occurred on East CLN Sector. At 0929:50, the C550 crew called S13/14 at FL310 descending to their cleared level of FL300. At 0930:55, the B747 crew, cruising at FL370, was instructed by Sector 12 to continue on present heading and descend to FL310, which was read back correctly.

STCA activated between the B747 and the C550 at 0935:05 and stopped again at 0935:32.

It reactivated at 0936:13. Two seconds later the following R/T conversation took place:

S12 T: "[B747 C/S] *avoiding action, avoiding action. Turn left please heading 340°."*

The B747 crew: *"Heading 340. We have TCAS indication Sir and continue on this heading".*

S12 T: "[B747 C/S] *affirm. Descend FL230 good rate".*

S12 T: "[B747 C/S] *descend, expedite descent FL230"*

The B747 crew: *"Descend FL230* [B747 C/S] *and confirm the heading still 340".*

S12T: *"You can leave the heading now Sir. Turn right again heading 060°. You have more traffic at FL300".*

The B747 crew: "*Roger, heading 060 and descending FL230* [B747 C/S]"

S12 T: "[B747 C/S] *thank you. What did you think your previous cleared level was?"*

The B747 crew: *"230 now?"*

S12 T: *"Yes, descend now with a good rate, FL230".* (Whilst this conversation was taking place, at 0936:37, STCA extended to include another ac which was approximately 15nm behind the C550 also at FL300).

The B747 crew: *"We are in the descent Sir".*

S12 T: "*And* [B747 C/S] *London, what did you think your previous cleared level was? You were cleared FL310 initially".*

The B747 crew: "*No. Initially FL310 and after that FL300 Sir"*.

Avoiding action was also passed to another flight [not the C550] from 0936:40, whence the following R/T conversation took place:

S13/14 T: ".. *avoiding action. Turn left immediately heading 090°*."

Another flight C/S: "*Left heading 090..* "

S13/14 T: "...*there's traffic in your 2 o'clock, range 5nm, just descending through your level now*."

Another flight C/S: "*In sight..*"

S13/14 T "*Roge*r".

The B747-300 from Paramaribo to Amsterdam was cruising eastbound at FL370 under the control of S12. The C550 was on transfer from NORTH SEA to S13 in accordance with the standing agreement between these sectors, to be level FL300 by BARMI [028°(T) SONOG 25nm]. S13 was being operated in a band-boxed configuration with S14. The routeing of the C550 flight, along UP7, took it through 20nm of S12's airspace. S12 controllers were seated on the sector suite behind S13/14. In accordance with standard practice the flight did not call S12 but was transferred directly from S10 to S13. S12 had a flight progress strip on the flight and the track showed as a foreground [normal return] on their radar display.

The S12 controller reported that he had been in situ for only a couple of minutes prior to this event and that he was acting as OJTI to a U/T who was working towards Level 3 [just commenced training with 'live' traffic]. During the handover of the operating position there was nothing of significance mentioned and workload was described as moderate. The first and most pressing task was to start the descent of the B747 that was required to be at FL230 by the FIR boundary. Both mentor and U/T reported that they were aware of the presence of the C550 at FL300 and another flight, which was on the same route also at FL300 some 15nm behind the C550. Both ac were recognised as traffic to the B747, hence the U/T's initial descent instruction to FL310. STCA activated at 0935:05 between the C550 and the B747 as the latter was passing FL328. At this point the ac were 19·8nm and 2800ft apart. Both Mentor and U/T reported that activation of STCA at this point was not unexpected and neither of them deemed it necessary to take any action, given that the B747 crew had been cleared to, and had read back correctly, FL310. Mentor and U/T were engaged in discussions about controlling techniques at the time. The mentor was alerted to the confliction during a routine scan of the radar when he observed the B747 passing FL304. Although STCA reactivated at approximately this time, the controller reported that he had no recollection of seeing STCA at all during the event. His first thought was that he might have missed his U/T clearing the B747 crew below FL310 so he looked to the paper fps to confirm the cleared level. He used the training box to transmit avoiding action directly to the B747 crew and then issued a further instruction to resolve the confliction between the B747 and another flight. The mentor was unsure at the time about whether the B747 crew had received a TCAS RA as

he considered the phraseology used by the pilot was unclear ["…*We have TCAS indication…*"] and so gave further instructions. He was also concerned when the B747 appeared to level off, or reduce his rate of descent as, having passed the C550, there was further conflicting traffic. Analysis of the radar replay does not show a turn of any significance by the B747, although the crew would not have been required to comply with this instruction given that they were following a TCAS RA.

The Captain of the B747 was requested to telephone the LACC Supervisor after landing, which he did. The Supervisor's report stated that the pilot told him that he believed he had been cleared to FL300 and that he intended to request the cockpit voice recordings be impounded. Analysis of the LACC RTF recordings shows no mention on the RT of "FL300" from the time when the B747 crew read back their cleared level of FL310, to the time when the aircraft descended below that level.

Although the ac appears to have been "Enhanced Mode S" equipped, no Mode S data is evident from this aircraft, so it is not possible to confirm from Mode S derived data the level to which the ac was descending and at what time a level below FL310 was selected [if indeed it was].

ATSI had nothing to add to the LACC Unit report.

UKAB Note (2): The absence of recorded Mode S data does not permit the enunciated TCAS RA's to be reviewed independently but NATS Systems Safety Department conducted a TCAS simulation of this event using the InCAS simulator. This indicates that the B747 crew would have received a TCAS TA as it was passing FL310. A TCAS "MAINTAIN VERTICAL SPEED" RA would have been received at 0936:03, some 20sec later. According to the simulation and recorded SSR data, at this time the B747 was passing FL301, which is at variance with the pilot's report that the RA caused them to descend through FL310.

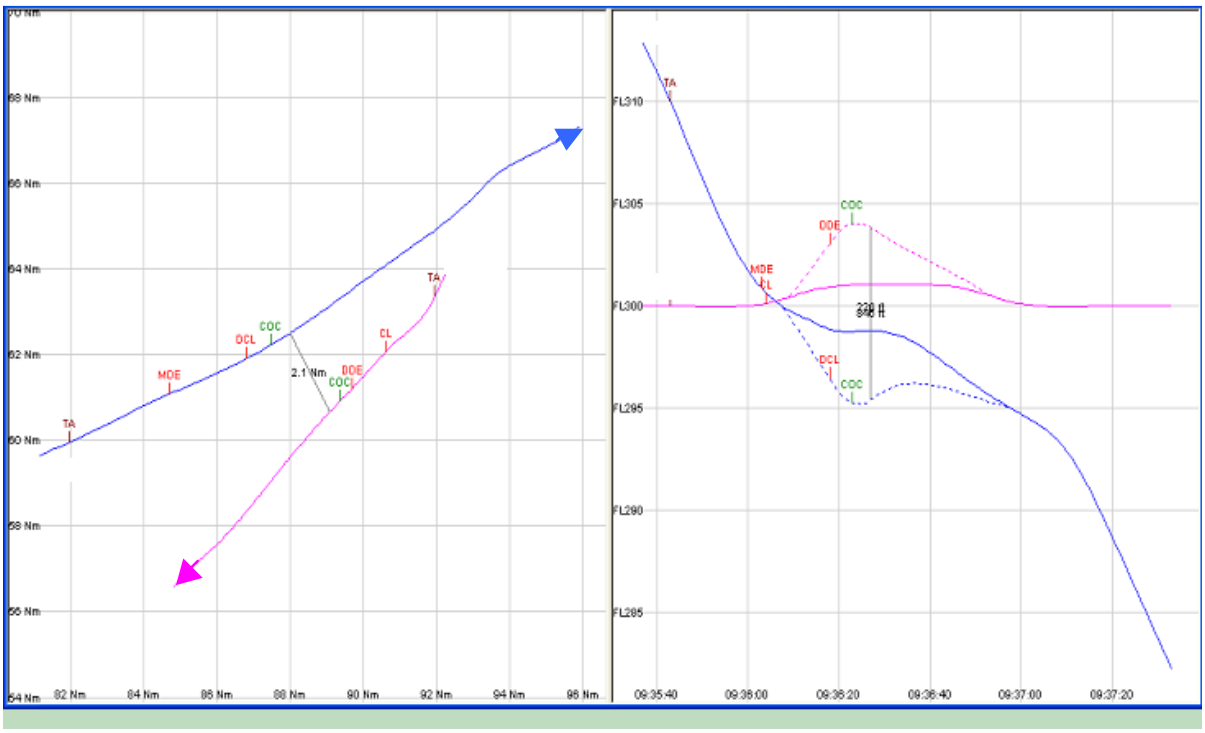
The pilot of the C550 advised that he received a TCAS "CLIMB" RA but he could not recall by how much or at what rate. The TCAS simulation for this event indicates that the RA received by the C550 crew lasted 16sec (from 0936:04 to 0936:20). The nominal "time to respond" allowed for in the TCAS simulation is 5sec.

The report also considers the "ideal pilot response" to the simulated TCAS RA's. This is indicated by the dotted lines on the InCAS graph. This indicates that if both pilots had followed the "ideal response" this would have provided 846ft of vertical separation. Minimum separation recorded by SMF [which is predictive in nature] at 0936:24, was 2·1nm and 100ft.

The InCAS simulation of the event differs from the B747 pilot's account which states that the TCAS RA caused the aircraft to descend below FL310 whilst the simulation suggests that the RA was not received until after the ac had descended below this level. Both ac's crews received TCAS RAs; the B747 pilot did not follow the "ideal" response to their RA, and nor did the C550 crew, possibly because of the short duration of the RA and that they were visual with the B747.

UKAB Note (3): The Debden radar recording shows the B747 descending through FL302 at 0936:02 and steady ENE, the C550 having just crossed through the B747's 12 o'clock at a range of 7nm maintaining FL300. The B747 levels momentarily at FL299 and climbs 100ft (which is not shown on the InCAS) at the CPA of 2·2nm to FL300. The C550 also climbs 100ft at this point to FL301, before the B747 then resumes a steady descent.

TCAS InCAS SIMULATION



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, an analysis of the TCAS data, reports from the air traffic controllers involved and reports from the appropriate ATC authority.

The comprehensive LACC report had shown that the B747 crew had been assigned a level of FL310, which would have afforded standard vertical separation above the C550 at FL300. S12 acted promptly when the B747 was detected below FL310, but whilst avoiding action had been proffered to the B747 crew by S12, the former were evidently busy on the flight deck and little reaction to the L turn onto 340° was evinced. The phraseology used by the B747 crew to indicate to S12 that they were reacting to TCAS was somewhat confusing and Members extolled pilots to stick to ICAO standard voice phraseology. In this context the UK has adopted the recent change to the ICAO phraseology, which is the removal of the vertical direction of the TCAS RA from flight crew initial reports. The ICAO rationale was to simplify the pilot's initial report, whilst also resolving flight crew uncertainty on the RT phraseology to be used in response to, for example, a TCAS RA 'adjust' or 'monitor' vertical speed resolution as here. Henceforth, after a flight starts to deviate from any ATC clearance or instruction in order to comply with a TCAS RA, ATC will expect crews to report this by use of the phrase: "[C/S] *TCAS RA"*.

Thus with TCAS taking charge of the situation in the vertical plane and the B747 crew requesting to stay on the heading, which the controller readily acceded to, the horizontal resolution offered had no affect at all on the conflict with the C550. However, the avoiding action issued to the ac following behind the C550 resolved this second conflict between the B747 and 'another ac', where separation was not eroded and appropriate safety margins were maintained through the prompt action of S13/14. For their part the LACC controllers had acted wisely to forestall a potentially difficult situation and controllers members believed that they could have done little more in the circumstances presented to them.

It was clear from the B747 pilot's frank account that the crew had been experiencing some difficulty with the automatic flight control system during their initial descent to their assigned level of FL310 and which had been

read-back by the crew. A CAT pilot Member commented that it was very clear from the information contained in Part A that the autopilot had not attempted to level the ac off at FL310, and as a consequence the B747 descended below the cleared level and whilst doing so the TCAS TA and subsequently the RA were enunciated. Whilst some form of technical failure could not be ruled out it was more likely that the answer lay in the Captain's report, in that the crew's manual de-selection of the VNAV 'descent speed mode' in favour of the 'vertical speed mode', in order to regain an acceptable RoD while approaching the selected flight level, could have also caused the 'capture' mode to deselect. This would depend on the precise timings of the autopilot's automatic entry into the altitude 'capture' mode, which in the case of the B747's high rate of descent, as reported by the Captain and visible on the TCAS InCAS Simulation, could have been some 2000ft before the cleared level of FL310, and before the crew's manual reversion to the 'vertical speed mode'. This conflict between automatic and manual modes is a common problem and pilots need to be aware of the implications of manual interventions when an ac is established in a descent and approaching the selected level. After the crew judged that the ac's reaction in the basic 'vertical speed mode' was insufficient too, the A/P was disconnected to level off the ac in manual control but simultaneously, at the cleared level FL310 the TCAS TA was enunciated. In his comprehensive report the B747 pilot had postulated that the TCAS RA was a MONITOR VERTICAL SPEED that had commanded the crew to maintain a RoD between 1500-2000ft/min, thus their B747 had to be descended through their cleared flight level of FL310 in order to comply with this RA. However, the TCAS InCAS simulation coupled with recorded Mode S data had suggested that this was not the case. The co-ordinated TCAS RA was enunciated at 0936:03 in both ac: the B747 crew being commanded to maintain a descent whilst the C550 crew were commanded to climb. The simulation and recorded SSR data indicated that this was when the B747 was passing FL301 – some 900ft below their cleared level. It seemed to CAT pilot Members – one of whom is a Captain on the B747 – that there might well have been a 'Human Factors' issue here as the crew's situational awareness might have lapsed, whilst they concentrated on trying to resolve their difficulties with the automatics, a reversion to manual control and the need to assimilate the enunciated TCAS TA and RA. Pilot Members were not surprised that the TCAS RA had demanded "MAINTAIN VERTICAL SPEED" as it was triggered during the level off and whilst the B747's rate of descent was reducing. The dynamic nature of the circumstances that pertained here would thus account for the variance from the optimum RA profile, as shown on the InCAS diagram, but nevertheless commanded the crew to maintain a RoD that would resolve the conflict with the C550. Consequently, in the Board's view, it was the B747 crew's preoccupation with their ac's automatics that had caused them to descend initially below their cleared level resulting in the conflict with the C550, which the Members concluded unanimously was the cause of this Airprox.

Turning to risk, the Board viewed with concern the C550 pilot's lack of compliance with the demanded CLIMB RA, as no significant climb was evident – merely 100ft - and the data had showed that the RA had persisted for 16sec. However, Members understood why the C550 crew was not overtly concerned at the situation, although they did comment that this was not in accordance with published procedures. Fortunately, they had spotted the B747 at range and were watching it as it passed down their starboard side over 2nm away. Therefore, the Members concluded unanimously that no risk of a collision had existed in the circumstances conscientiously reported here.

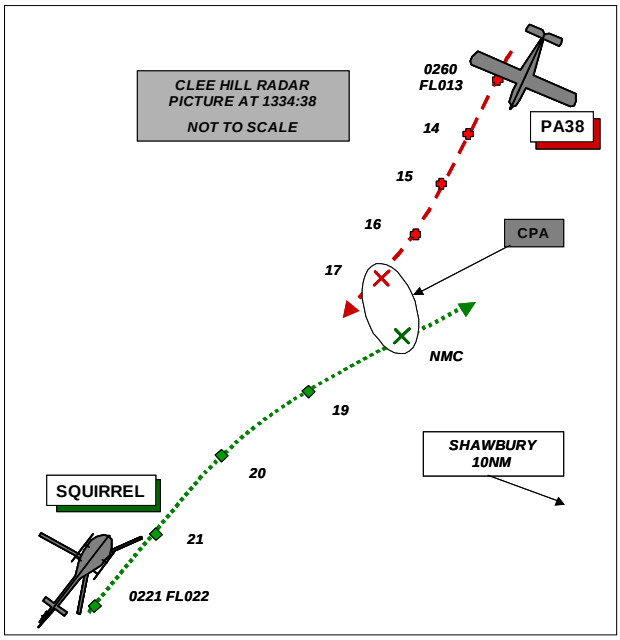
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The B747 crew descended below their cleared level into conflict with the C550.

Degree of Risk: C.

AIRPROX REPORT NO 170/07

Date/Time:	11 Dec 1035	
Position:	5252N 00248W (10nm WNW Shawbury)	
Airspace:	Shawbury AIAA	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Squirrel HT1	PA38
Operator:	HQ AIR (Trg)	Civ Trg
Alt/FL:	2200ft↓	1500-2000ft↑
	(RPS 1026mb)	(N/K)
Weather	VMC CAVOK	VMC Haze
Visibility:	35km	>10km
Reported Separation:		
	0ft V/150m H	0ft V/200m H
Recorded Separation:		
	100ft V/0.1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SQUIRREL HT1 PILOT reports flying a training flight from Shawbury in a black and yellow helicopter with all lights switched on, in receipt of a FIS from them and squawking 0221 with Mode C. They were in the descent passing 2000ft, heading 030° at 90kt, positioning for a PFL exercise, when a light ac emerged late from the blind spot of the door pillar. The other ac appeared to be in a climb passing through the same height and passed down their port side about 150m away, after they had taken avoiding action; the other ac was also seen to take similar avoidance to the right. He thought that a collision would have occurred if avoiding action had not been taken and assessed the risk as being very high.

THE PA38 PILOT reports flying a white ac with strobes selected on, on a training flight from Liverpool with a student at the controls. They were squawking 0260 with Mode C and were in receipt of a FIS from APR. They were tracking Southbound between Oswestry and Rednall aerodrome at 90kt, carrying out a climbing exercise, heading into sun with slight haze, and were between 1500-2000ft when he spotted a small helicopter about 200m ahead, slightly to the left of their track at about the same level. They turned right through about 30° to avoid it with a resultant miss-distance of about 200m and he assessed the risk as being low.

THE PA38 OPERATOR comments that all flying staff within the company have been reminded of the priorities of the ground station to be called when operating within an AIAA airspace.

MIL ACC reports that the RAF Shawbury ATC Supervisor stated that the radar, although fully serviceable, was showing *'a number of returns believed to be 'anaprop'*. Their report goes on to say that, IAW local orders, helicopters operating in LFA 9 were being provided with a FIS but were not identified, all however, were displaying the same squawk of 0221.

The Squirrel pilot was receiving a FIS from RAF Shawbury ZONE and the PA38 a FIS from Liverpool APP. The first indication to ZONE that an AIRPROX had occurred was when the Squirrel pilot called at 1038:54 and passed comprehensive details.

Since the Squirrel was not identified and was receiving a FIS at the time of the incident, it is considered that there were no Mil ATC causal or contributory factors in relation to this Airprox.

UKAB Note (1): Analysis of the Clee Hill radar confirmed that the Squirrel was in the descent at the time of the incident and that the PA38 was climbing however, in the minutes leading up to the incident the Squirrel had been

climbing while the PA38 had been descending; both ac had been heading SW initially. There were also 5 other 0221 squawks showing on the 15nm radar picture, all Shawbury based helicopters. Immediately prior to the CPA the Squirrel had turned right through 180° to track 040°, descending through FL019, with the PA38 just to the left of its 1200 o'clock tracking directly towards it and indicating FL016 climbing. Although the Squirrel's Mode C does not show on the following sweep (the one of the CPA), it indicated FL017 on the sweep after the CPA. It is therefore reasonable to assume that it was descending through FL018 at the CPA while the PA38 was climbing through FL017. The CPA occurred at 1034:38 and the separation was calculated to be just under 0.1nm horizontally and about 100ft vertically although due to the close proximity this is only approximate.

HQ AIR (TRG) comments that both pilots were conducting training exercises during good weather in the Shawbury AIAA (Class G airspace) and in receipt of a FIS, from different agencies. The crews of both ac were obviously engaged in their training exercises and did not see each other's ac until a late stage of the incident; however, both had sufficient time to execute an avoiding manoeuvre.

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

While totally accepting that both ac had an equal right to operate in this area of Class G airspace, some Members commented that the incident had taken place in an exceptionally busy military helicopter training area and a notified AIAA; one considered that there were better and less congested areas in which to conduct Liverpool based civil training. Even if the PA28 pilot had called Shawbury the traffic intensity in this case was (as it generally is) such that they could have provided very generic information (i.e. the number of ac in the area that were in contact with them).

While accepting that both ac had been on instructional flights and that consequently the respective instructors would both have been busy with their instructional tasks, often involving rapid and unpredictable changes of flightpath, experienced pilot Members pointed out that in these circumstances lookout is even more important that normal.

The Board noted that PA38 was flying in haze and into sun and that the PA38 had appeared from the blind spot behind the door pillar. These were both well-known factors that have featured in many previous incidents and both are avoidable; however, in this case both had clearly been significant in contributing to the lateness of the sightings by both pilots.

When the respective pilots did see the opposing ac late and at about the same time, they had both taken correct and effective avoiding action; Members agreed therefore that due to the lateness of the sightings the safety of the ac had not been assured.

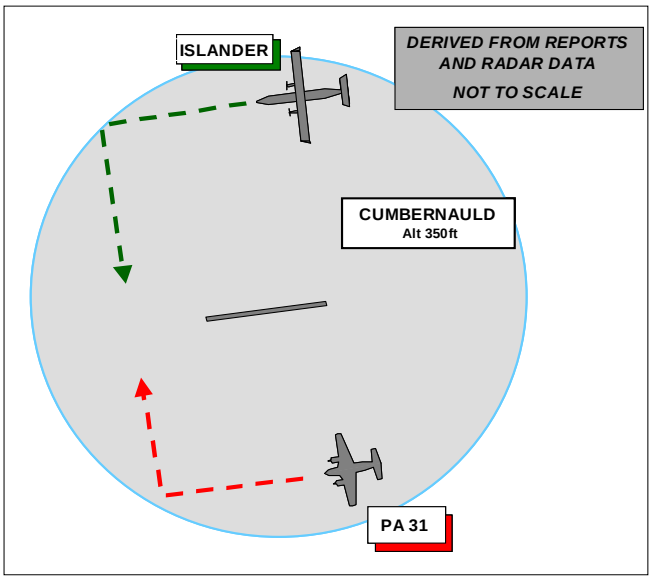
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by both pilots.

Degree of Risk: B.

AIRPROX REPORT NO 172/07

Date/Time:	11 Dec 1509	
Position:	5559N 00400W (Cumbernauld- elev 350 ft)	
Airspace:	ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	BN2B	PA31
Operator:	CAT	NR
Alt/FL:	↓700ft aal (QNH 1029mb)	NR (N/K)
Weather	VMC CLBC	NR NR
Visibility:	10km	NR
Reported Separation:	200ft V/180m H	NR
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BN2B (ISLANDER) PILOT reports flying a commercial flight inbound VFR from Colonsay and re-familiarising another pilot on the approach to Cumbernauld. He was squawking 7000 with Mode C, was in contact with Cumbernauld A/G and the cloudbase was about 1700ft aal. The circuit was active for RW08 LH and he joined at beginning of downwind leg at 80kt and made all the standard calls. He only spotted the conflicting traffic, a low wing, white, twin ac about 250yd away in his 1o'clock and slightly above, as they were heading 170° on base leg and about to turn final. He assumed that the other ac was apparently joining on the right base and it broke off the approach when he saw their landing lights. Since the other opposite direction ac was apparently avoiding them he did not take any further avoiding action and continued his approach but reported the Airprox to the Tower after landing; he assessed the risk as being high.

THE PA31 was hired to a professional pilot but despite being contacted on several occasions, he declined to provide a report.

UKAB Note (1): The UKAIP states that Cumbernauld has an ATZ of 2nm radius centred on the longest notified RW (08/26). The ATS unit is Cumbernauld radio, which is operational during airfield hours. Flight Procedures at Para 2.22 b states:

Circuit direction: Runway 26 RH – Runway 08 LH.

Circuit height 1000ft QFE. Join overhead at 2000ft QFE, descending on the dead-side to join the circuit.

ATSI reports that Cumbernauld provides an Aerodrome Air/Ground Communication Service (AGCS). CAP413, Chapter 4, Paragraph 5, describes the service and the associated phraseology. Of interest it states:

'An AGCS radio station operator is not necessarily able to view any part of the aerodrome or surrounding airspace. Traffic information provided by an AGCS radio station operator is therefore based primarily on reports made by other pilots. Information provided by an AGCS radio station operator may be used to assist a pilot in making decisions however, the safe conduct of the flight remains the pilot's responsibility. Radio operators must ensure that the full callsign, including the suffix 'RADIO', is used in response to the initial call from an aircraft and on any other occasion that there is doubt.'

The table of phraseology includes:

'A/C requests joining information for a landing: (Aircraft callsign) runway (designation) left/right hand circuit surface wind (number) degrees (number) knots, QFE/QNH (pressure) millibars (traffic information). A/C reports joining circuit: (Aircraft callsign) roger, (plus, when applicable, updated traffic information and any changes to aerodrome information)'.

An additional note states:

'Air ground operators must not use the expression 'at your discretion' as this is associated with the service provided by FISOs and is likely to cause confusion to the pilots'.

On this occasion Cumbernauld did not use the suffix 'RADIO'; however, the operator subsequently, informed the pilot of the PA31 that he could not approve a clearance to final number one as he was operating as an Air/Ground operator.

The BN2B pilot contacted Cumbernauld at 1503 and he was informed that the weather was fine with a light Easterly wind, the RW in use was 08, with a left hand circuit, which was active and the pilot replied that he would call joining. The PA31 pilot established communication with Cumbernauld at 1505 reporting inbound from Biggin Hill, VFR. He stated his position as 4.5nm S, setting up for a right base for RW08. He was informed of the RW use but not the circuit direction, the pressures, or that the circuit was active. The pilot asked if he could join right base leg, whereupon the A/G operator commented at your discretion, traffic permitting, to avoid the hotel and the new houses. (Both the UKAIP and Pooley's quote a LH circuit for RW08.)

At 1507, the BN2B pilot reported joining wide downwind left hand RW08 and asked if there was any other traffic. He was informed of two departures, one of which would be joining the circuit, and an ac joining from the S (the subject PA31). At 1508, the PA31 pilot reported wide right base for RW 08 and having been informed about two aircraft downwind, he asked if he could continue to final number one; this was when the A/G operator commented that he could not approve it as he was operating an Air/Ground service. He reported traffic (the Islander) late downwind turning base leg and the PA31 pilot replied that, in that case, he would break off the approach. After a query by the A/G operator, the BN2 pilot reported visual with the PA31 breaking off. The latter then repositioned for a LH circuit to RW08.

UKAB Note (2): The recording of the ScACC radar was not useable.

PART B: SUMMARY OF THEBOARD'S DISCUSSIONS

Information available included reports from the pilot of the BN2B, transcripts of the relevant RT frequency, reports from the A/G Operator involved and reports from the appropriate ATC authorities.

The Board noted that by declining to provide a report the PA31 pilot had limited the information available to the UKAB and therefore the efficacy the investigation into this incident.

Members noted that the joining procedures and circuit direction at Cumbernauld were clearly promulgated, both in the UKAIP and in Pooley's Flight Guide. Although the cloudbase had probably precluded the flying of a standard visual overhead join at 2000ft, the BN2B pilot had determined the traffic situation and integrated safely into the LH circuit for RW08 while the PA31 pilot had not. Members noted that Cumbernauld was manned by an A/G operator and the ATSI clarification of his responsibilities, but considered that the PA31 pilot should have been aware of the situation. Although the initial call by the A/G operator was incomplete (significantly the circuit direction was omitted) and could have been misleading (apparent approval to join 'at your discretion'), there were other (blind) RT transmissions that would have given the PA31 pilot an indication of the circuit status, but these were either not heard or not assimilated by him. He apparently broke off the approach only at a late stage either when he saw the Islander or when the A/G operator said (now correctly) that he could not approve his request to continue to final number one due to the type of service being provided.

Members unanimously agreed that the PA31 pilot had not joined the Cumbernauld circuit in the approved manner and thus had flown into conflict with the Islander, as it was about to turn finals. Since however, the PA31 had correctly broken off the approach with the Islander in sight, albeit at a very late stage and that the Islander pilot had seen the PA31 and continued without having to take any avoidance, Members were persuaded that there had not been any risk.

AIRPROX REPORT No 173/07

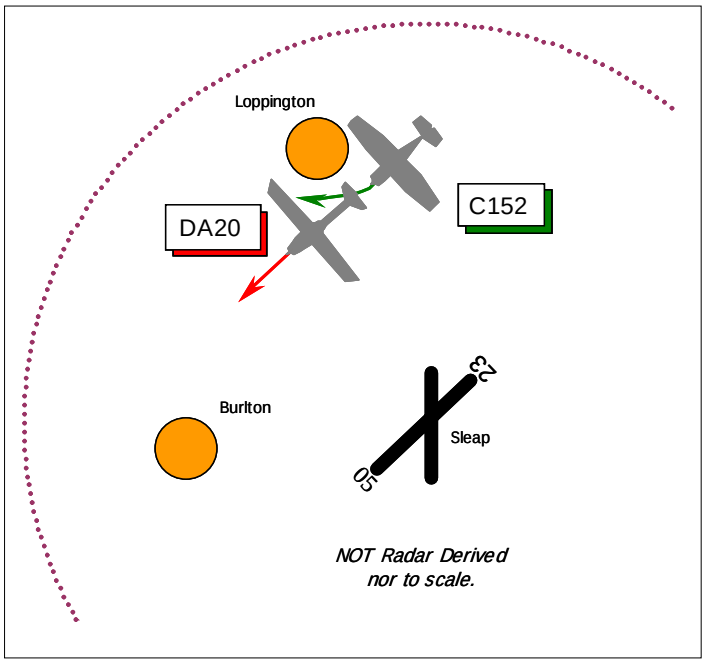
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA31 pilot did not conform to the published and active traffic pattern and flew into conflict with the BN2B.

Degree of Risk: C.

AIRPROX REPORT NO 173/07

Date/Time:	16 Dec 1205 (Sunday)	
Position:	5250N 00246W (DOWNWIND Leg to RW05 at Sleap A/D - elev 275ft)	
Airspace:	ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	C152	DA20
Operator:	Civ Club	Civ Trg
Alt/FL:	1000ft	1100ft↓
	QFE (1028mb)	QFE (1028mb)
Weather	VMC In Haze	VMC In Haze
Visibility:	6-7km	8km
Reported Separation:		
	20ft V/100ft H	NR
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C152 PILOT reports that his ac has a red/white colour scheme and the HISLs were on whilst flying in the LH circuit for RW05 at Sleap. Flying in VMC some 1000ft clear below cloud with an in flight visibility of 6-7km in haze, he was in communication with Sleap RADIO A/G Station on 122·45MHz. Whilst on the LH DOWNWIND leg heading 230° (M) level at the circuit height of 1000ft QFE (1028mb) at 90kt, another pilot was heard on RT reporting DOWNWIND. A DA20 was then seen passing some 20ft above his C152 about 100ft away on the same heading. He altered course to give clearance on the DA20 and radioed its pilot to warn of the proximity of his own aeroplane. The DA20 pilot replied that his C152 had not been seen beforehand. He assessed the risk as *"high"*.

THE DA20 PILOT, a flying instructor with a student, reports flying inbound to Sleap from Enstone and in communication with Sleap RADIO A/G Station on 122·45MHz.

Flying in VMC some 1500ft clear below cloud with an in-flight visibility of 8km in Haze there was no cloud at their height as they descended through 1100ft QFE (1028mb) heading 230° at 105kt on the DOWNWIND leg to RW05. The C152 flown by the reporting pilot was not seen and they were not aware of their aeroplanes proximity to it until afterwards. Neither the minimum separation nor the risk was assessed.

Unfamiliarity with local procedures and a misunderstanding of them was cited as a contributory factor. Another student had previously been sent to Sleap and a briefing had been received at this time on how to carry out a 'centre-line' join. On the day of the Airprox the Instructor called up again and was asked to confirm whether familiar with the local procedures and said that they had been briefed on them. The line entry in the flight guide saying centre-line joins were only used on weekdays had been missed. (Also when the briefing on that centre-line join

was given it was understood [erroneously] as: "join overhead at 2000ft QFE; lose 500ft on CROSSWIND and 500ft on DOWNWIND".)

UKAB Note (1): During a subsequent telephone call with UKAB Secretariat staff the DA20 instructor reaffirmed that no RT calls from the C152 pilot had been heard and neither the instructor nor the student were aware of the presence of the C152, either in the cct or DOWNWIND before it's pilots RT warning transmission.

UKAB Note (2): On this Sunday a standard overhead join from 2000ft QFE should have been flown.

UKAB Note (3): This Airprox is not shown on recorded radar data.

UKAB Note (4): The UK AIP at AD 2-EGCV-1-3 AD 2.17 promulgates the Sleap ATZ as a circle radius 2nm centred on the longest notified runway (05/23) extending from the sfc-2000ft above the aerodrome elevation of 275ft amsl.

UKAB Note (5): Section AD 2.3 Operational Hours states: Winter Fri-Wed 0930-1700; Remarks *"This aerodrome is strictly PPR by telephone (briefing must be obtained)"*.

Section AD 2.18 ATS Communication Facilities states that an A/G Service C/S Sleap RADIO is available as A/D hours above on 122·45MHz. Remarks states: ATZ hours are coincident with the A/G hours.

Section AD 2.22 Flight procedures states a) Circuits variable…Note: A full briefing must be obtained by telephone prior to departure.

UKAB Note (6): The 2007 Pooleys Flight Guide states that the aerodrome is operated in conjunction with RAF Shawbury during weekdays. PPR and briefing essential for centreline joining procedures. Airfield situated within Shawbury MATZ.

Following Procedures apply during ***weekdays*** only:

Pilots must contact Shawbury Approach 120·775MHz for MATZ clearance.

No deadside. Join overhead centre line at 2000ft QFE

Civil Fixed/Rotary Traffic – all circuits to east of aerodrome

Beware of intensive military helicopter activity.

Standard overhead joins at 2000ft QFE at all other times.

Circuit height 1000ft QFE.

Circuits should be contained within the ATZ.

UKAB Note (7): During their assessment of Airprox 136/07, Members expressed concern regarding anomalies in aerodrome procedures at Sleap published in the AIP, Pooleys Flight Guide and Operation Brief as to when standard O/H joins are permitted. The Board therefore charged the Director with writing to the Aerodrome Operator requesting them to review the relevant documentation with the aim of ensuring commonality amongst the various documents. To date no reply has been received on this topic.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac.

The frank account from the Diamond DA20 instructor pilot was commendable and it was evident that although an aerodrome briefing had been obtained on a previous occasion, as is required, the DA42 instructor had not used the correct cct procedures for use on a Sunday when no military helicopters were operating there. Notwithstanding concerns raised during the investigation of a previous Airprox over commonality amongst the various documents,

the published entry in the commercial flight guide that the instructor referred to was correct and seemed plain enough. It was also clear that a standard overhead join from 2000ft QFE should have been flown, but this particular line in the entry had been missed entirely. Members were in little doubt that flying the centre-line join incorrectly, by descending on the DOWNWIND leg, left little opportunity for either the DA20 instructor or the student to spot the circuiting C152 beneath them as they were both completely unaware of it beforehand. This incorrect cct join was fundamental to the cause of this Airprox, insofar as this was contrary to established procedures and did not allow the DA20 pilots to integrate into the traffic pattern correctly. Some Members were surprised that RT calls had not advertised the presence of the other ac, but as Sleap provides only an A/G Service no transcript of what was actually said on the RT was available. Although there was no reason to doubt that appropriate cct calls were made at the time, why this had not alerted the DA20 instructor to the other ac was not clear, nor conversely warned the C152 pilot before he heard the DA20's DOWNWIND call. The unanimous conclusion of Members was that this Airprox had resulted because the DA20 instructor did not integrate into the circuit correctly and descended into conflict with the C152 which was not seen.

Turning to the inherent Risk, it was evident from the C152 pilot's report that whilst he had turned to increase the separation and thus remain clear, he was only aware of the DA20 after it had overtaken his slower ac from astern as it flew into his field of view ahead, after presumably being masked above him by his aeroplane's mainplane. Therefore with none of the pilots involved aware of each other's ac as the DA20 descended from above and overhauled the C152, any separation that did exist was purely fortuitous. In the absence of any recorded radar data, the Board could only rely on the C152 pilot's report which stated that he saw the DA20 a mere 20ft above his aeroplane and about 100ft away. The Members agreed, again unanimously, that at these distances an actual risk of collision had existed in the circumstances conscientiously reported here.

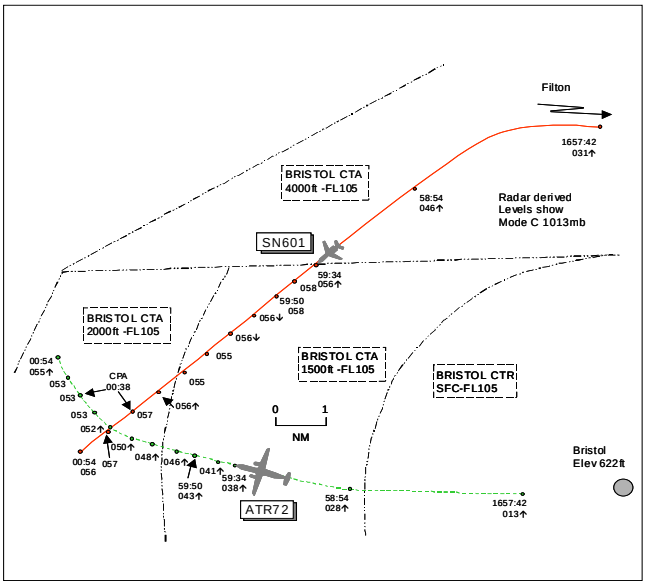
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The DA20 instructor did not integrate into the circuit correctly and descended into conflict with the C152 which was not seen.

Degree of Risk: A.

AIRPROX REPORT NO 174/07

Date/Time:	20 Dec 1701	NIGHT
Position:	5125N 00259W (10nm W Bristol - elev 622ft)	
Airspace:	Bristol CTA	(Class: D)
	Reporting Ac	*Reported Ac*
Type:	ATR72	SN601 Corvette
Operator:	CAT	Civ Pte
Alt/FL:	↑6000ft (QNH 1030mb)	6000ft (QNH 1031mb)
Weather	VMC CLAC	VMC CLOC
Visibility:	>40km	4000m
Reported Separation:	200ft V/NK H	400ft V/1-2nm H
Recorded Separation:	400ft V/1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ATR72 PILOT reports following a BCN1X departure from Bristol IFR at 180kt and in communication with Bristol Approach on 136·075MHz squawking 4453 with Mode C. They were given a radar heading approximately

330° and were about to level-off at 6000ft when a TCAS TA alert was heard against traffic coming from behind them crossing R to L. TCAS quickly changed into an RA requiring a descent at 1000fpm or more, which was promptly followed by an instruction to level-off. During the RA the controller asked that they level-off but the RA was followed. The other ac was seen on TCAS to pass from their R and behind and about 200ft vertically above. They were then asked to change to Cardiff and the RA was reported to them. He assessed the risk as high.

THE SN601 CORVETTE PILOT reports outbound from Filton IFR at 250kt and under a RCS from Cardiff on 125·85MHz squawking 6367 with Mode S. After take-off RW27 the initial climb with Cardiff ATC was to 6000ft towards EXMOR (heading 231°), which they acknowledged. Traffic was seen on TCAS 6nm ahead as they levelled at 6000ft before a TCAS TA 'traffic traffic' was generated. The weather was VMC with in-flight visibility of 4000m with no significant cloud and they saw the lights of the traffic which they kept in sight just ahead moving onto the RHS. A TCAS RA 'climb climb' was received – green arc between 2000 and 3000fpm – and then 'clear of conflict' followed about 10sec later. The RA guidance was not followed, instead maintaining 6000ft and heading 231° their last clearance, as they kept the traffic in sight for all of the time during the encounter; the traffic passed 400ft below and 1-2nm to their R. Further clearance was then given to climb FL100 to EXMOR. He assessed the risk as low.

THE BRISTOL RAD1 reports that Low Visibility Procedures (LVPs) were in use RW09 however the RVR had reduced below minima so flights were electing to make CAT3 approaches to RW27. Tower had the ATR72 flight starting for departure and the crew advised that they were able to accept departure on RW27 with a tailwind. The ATR flight was released on a BCN1X SID and subsequently the SN601 was given clearance for a RW27 departure from Filton to climb straight ahead to maintain 4000ft. The SN601 flight departed first and was told to climb to 6000ft and then Tower was requested to transfer the ATR72 flight to Bristol Radar frequency on departure still on the SID. Coordination was effected with Cardiff and the plan was to climb the SN601 to FL100 and for the ATR72 to climb 1000ft beneath. When both ac were established in the climb and were maintaining more than 1000ft separation in the climb, the SN601 was released on its own navigation to EXMOR and the ATR72 was given heading 280° to give a few more track miles to ensure separation. When the SN601 was observed at A060 with a climbing arrow the flight was transferred to Cardiff Radar so they could continue its climb further; at this time the ATR was climbing through A048. Shortly after this it was noted that the SN601 appeared to have stopped its climb and for a short while appeared to be descending. The RAD1 stopped the ATR72's climb which was on radar indicating A055. The ac passed approximately 1·5nm apart at the same level.

THE CARDIFF RAD1&2 reports that traffic was very light and the RAD1 and RAD2 positions were bandboxed. Cardiff, Bristol and Filton had nominated E'ly operations and the Cardiff/Bristol 'Buffer' was set accordingly. Filton rang advising of a departure, the SN601, which would be using Filton RW27, expecting the traffic to work Bristol initially climbing to 6000ft. Bristol also rang advising that the ATR72 would also be a RW27 departure due to low visibility CAT3 arrivals. Separation between the 2 ac would always be Bristol's responsibility. He observed the SN601 airborne from Filton and shortly afterwards the Bristol controller rang asking for a higher level of FL100 in order that the ATR72 could be climbed beneath the SN601; this was agreed. About 1701Z the SN601 flight called when about 7nm NW of Bristol Airport tracking towards EXMOR. The RT was heavily accented and almost unintelligible so he asked the crew for a passing level. He did not receive a clear response from its crew but he assumed that the SN601 was climbing to FL100 with the ATR72 underneath. At this point the ATR72 was crossing 5nm ahead and 1200ft below the SN601. He passed TI to the SN601 flight, which appeared to be levelling-off at 5800ft, and asked if they had the other ac insight, to which they replied *"affirmative in sight"*. The SN601 was then seen to descend to 5400ft and to pass about 1nm behind the ATR72 at the same level. As the incident occurred the Cardiff STCA triggered to an immediate red (high severity) alert. The ATR72 flight did not contact Cardiff at any stage during the incident. He asked the SN601 crew if they had received a TCAS RA which may have accounted for their sudden descent but the only understandable response was that they had received a TCAS warning. Later the ATR72 crew called - 15nm N of Cardiff at 6000ft – and the crew confirmed that they had received a TCAS RA.

ATSI reports that at the time of the Airprox, the ATR72 flight was in communication with the Bristol Approach Radar controller (APR) and the SN601 flight was in contact with the Cardiff APR having just been transferred to him by the Bristol APR. The Bristol APR described both her workload and traffic loading as 'low'.

The SN601 flight established communications with the Bristol APR at 1656:40, and reported climbing to 4000ft, having been told to continue on the Filton RW heading (273°). The ac was passing FL013 (1800ft QNH 1030mb) and was instructed by the Bristol APR to climb to 6000ft, which the crew acknowledged. At the time, the SN601

was in Class G airspace, and MATS Part 1 (Section 1, Chapter 5, page 9 para 8.2) requires that the pilot be informed that the ac is identified and passed their position which was not done. Additionally, no level of service was requested by the pilot or offered by the controller.

The Bristol APR telephoned Cardiff and requested further climb to FL100 for the SN601 in order to keep the ac above the ATR72, which was just airborne from Bristol. Cardiff agreed to this request and 20sec later, at 1657:45, the Bristol APR instructed the crew of the SN601 to turn L and route direct to EXMOR. At the time, the SN601 was passing FL031 (3600ft QNH) and was 8nm N of the ATR72, which was climbing out from RW27 at Bristol, following a BCN 1X SID (*Climb straight ahead. At D4.5, at or above 3000 feet turn right to intercept BCN VOR R150. Cross BCN D20 above 4500, cross BCN D15 at 6000 feet to BCN VOR*) and passing FL013 (1800ft QNH). At 1658:50, the APR called the crew of the ATR72 and instructed them to continue on their present heading and climb to 6000ft, which the crew acknowledged advising that their heading was 280°. At 1659:34, when the ATR72 was passing FL038 (4300ft QNH) with the SN601 in its 3 o'clock range 4·6nm, SW bound, and indicating FL056 (6100ft), the Bristol APR instructed the crew of the SN601 to contact Cardiff Radar.

The crew acknowledged this and the APR immediately instructed the ATR72 to turn R and route direct to Brecon. At the time this instruction was given (1659:50), the two ac were converging with a distance of 3·8nm between them and the SN601 1500ft above the ATR72. The crew of the SN601 contacted Cardiff (1700:00) *"Cardiff good evening er SN601 c/s ???? six thousand feet er to Exmor"*. The APR transmitted *"SN601 c/s roger and just check your passing level there is traffic crossing left to right three miles ahead of you about a thousand below"*. The crew reported traffic in sight and they were maintaining 6000ft. The Bristol APR transmitted *"ATR72 c/s stop climb now maintain level"*, but there was no reply. The radar recording shows that the SN601 continued on its SW'ly heading and passed 1nm behind the ATR72 and 400ft above it (at 1700:38).

The Bristol APR explained that there was no 'standard' way of dealing with Filton departures routeing towards EXMOR. Such movements took place, on average 2 or 3 times a day and Filton advised both Cardiff and Bristol before they departed. A typical clearance would be climbing to 6000ft via EXMOR and then transferred to Cardiff unless there was Bristol traffic in potential confliction. On this occasion, the clearance for the SN601 to climb straight ahead to 4000ft was a convenient way of getting the ac airborne and then to integrate it into the traffic pertaining at the time. The APR advised that she was aware that the SN601 was a Corvette [executive jet] and its associated performance. The initial clearance passed by the APR to the Bristol ADC was that the ATR72 was released off RW27 and to contact Cardiff after departure. The APR stated that sometimes there is a significant delay between Filton requesting release on a departure and the ac getting airborne and so she wanted to keep a number of options open and assess the traffic situation before making a final plan.

The SN601 was seen on radar to be airborne at around the same time that the ATR72 was cleared for take off. At the time the SN601 flight contacted the APR, the ATR72 was only just getting airborne and so the APR decided that her plan would be to climb the SN601 and keep it above the ATR72. In order to facilitate this plan, the APR telephoned Cardiff and coordinated climb for FL100 for the SN601 however, this clearance was never passed to the flight. The APR advised that she adopted the 'write as you talk' approach during her controlling and it was possible that she wrote '100' in the level box of her fps during this conversation with Cardiff. Standard practice would have been to write it in the domestic box with a letter 'C' through the climbing arrow. The APR had then 'sealed' in her own mind a picture that the SN601 was climbing to FL100 whilst the ATR72 would only be climbing to 6000ft and therefore vertical separation would exist until after the 2 tracks had crossed and lateral separation was established.

Convinced that the plan was sound, the APR instructed the SN601 flight to route direct to EXMOR. This would erode the lateral separation in place but the APR was content that the SN601 would climb and stay above the ATR72, which was 8nm S of the SN601 and 1800ft beneath. The APR called the ATR72 when it was 5nm W of the airport and passing FL028 (3300ft QNH). The APR advised that if departures are transferred to Bristol radar then it is the radar controller's responsibility to verify the Mode C, however, on this occasion this was not done. The APR instructed the crew of the ATR72, to continue on RW heading, rather than follow the SID, and climb to 6000ft. The APR explained that although she mentioned in her report her intention to climb the ATR72 1000ft below the SN601, it was not her plan to employ specific rates of climb, but rather to observe how well the 2 ac were climbing and modify the plan accordingly.

Having observed the Mode C of the SN601 indicate that the ac was approaching 6000ft, the Bristol APR, still convinced it was climbing to FL100, instructed the crew to contact Cardiff radar. (*ATSI note: The Bristol radar*

display shows altitudes below 6000ft and flight levels above, together with a climbing / descending arrow alongside the level). At the time the SN601 was transferred the APR recalled seeing a climbing arrow alongside its level, which simply confirmed her belief that the ac was climbing. As soon as the crew had acknowledged the frequency change, the APR instructed the crew of the ATR72 to turn R to Brecon. At that time (1659:50), the Mode C of the SN601 was indicating FL058 but the APR noticed that the climb arrow alongside the ac's level changed to a descending arrow. Very shortly afterwards the Bristol APR transmitted *"ATR72 c/s stop climb now maintain level*" but there was no reply. The Mode C from the SN601 now indicated FL056 (6100ft QNH) whilst that of the ATR72 showed FL048 (5300ft QNH).

The APR advised that she was confused as to what was happening as the Mode C for the SN601 further reduced to FL055 (6000ft QNH) and that of the ATR72 continued to climb through FL050 (5500ft QNH). To seek clarification, the Bristol APR rang Cardiff to ask what was happening. In her mind the SN601 should still be climbing and so the Cardiff controller was asked if the ac was climbing to FL100. The Cardiff controller replied that the pilot had only just called and he said that he [the SN601 pilot] had the ATR72 in sight. The APR replied; *"Oh right, well I thought I'd given him climb to a hundred but he seems to have levelled off"*. The Cardiff controller asked the pilot of the SN601 [just after 1700:45] if he was in the climb to FL100 to which the pilot replied *"So, climbing now one hundred..."*.

The pilot spoke with a strong accent and it was difficult to ascertain what he was saying, however, despite being asked several times if he had received a TCAS descent the pilot said several time that he had *'a TCAS alarm'* and that *'...traffic was in sight all the time'*. When the SN601 had passed behind the ATR72, the crew of the ATR72 advised the APR that they had received a TCAS Resolution and they were now maintaining 6000ft on course to Brecon.

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.

Concentrating on the controlling aspects first, it was clear that the Bristol APR did not execute her plan as intended. Having forgotten to instruct the SN601 crew to climb to FL100 after coordinating this with Cardiff ATC, she released the flight onto its own navigation to EXMOR climbing to the same altitude as that which the ATR72 had been cleared to. Also, she did not comply with the MATS Part 1 requirement when using Mode C for assessing the vertical position of an ac. She had seen the SN601's Mode C showing it passing 6000ft altitude and then transferred the flight to Cardiff instead of waiting until the indication had changed by 400ft or more in the required direction, which is when the ac is deemed to have passed through such a level. These factors led Members to agree that the cause of the Airprox was that the Bristol APR had vectored the SN601 into conflict with the ATR72 without ensuring vertical separation. That said, Members believed that both the Bristol and Cardiff ATCOs could have taken more positive steps to resolve the deteriorating situation when they realised what was happening. Normally, a flight's initial call on frequency should include a passing level with the cleared level. The Cardiff APR had naturally expected the SN601 to be climbing to FL100, in conformity with the co-ordination agreed with the Bristol APR, but the crew's first call only mentioned 6000ft. The Cardiff APR then asked the crew for a passing level and gave TI on the ATR72 to which the SN601 crew replied that they were established at 6000ft and visual with the traffic. One Member wondered why the Cardiff APR did not restate the clearance for the SN601 to climb FL100 as part of his initial response to the flight as the crew only mentioned 6000ft. However, another ATCO thought this was a harsh comment considering the APR's expectation of the flight's profile, the difficulty in understanding the crew's RT and the very rapid evolution of events. Whereas the Cardiff controller ensured that the SN601 crew was fully visual with the crossing ATR and the Bristol APR told the ATR flight to stop climb, which was not acknowledged, controller Members were disappointed that neither the Bristol nor Cardiff APRs issued 'avoiding action'.

Turning to the piloting side of the incident, the ATR72 crew did not report the RA immediately to the Bristol APR, which occurred about the time the controller told the flight to level-off, only stating this after manoeuvring the ac following the TCAS guidance. Of more concern to Members was the fact that the SN601 crew did not follow their TCAS RA climb. In the UK crews are not permitted to disregard an RA because they believe that they have visually identified the conflicting ac and deem the TCAS guidance to be unnecessary. Indeed, this should be an international requirement but the Members were not in a position to confirm whether this was in fact the case with the National procedures of the Operator of the SN601. Therefore it was not known whether the SN601 crew were

allowed to do so by their OPS Manual or whether the crew deviated from SOPs, as they were apparently comfortable with the situation at the time.

It was noticeable that the SN601 did climb to FL058 (6300ft QNH), some 300ft above their assigned altitude before descending back to 6000ft, their cleared altitude, which was probably the trigger for the TCAS event. During the encounter, as the ac approached the CPA, the SN601 climbed slowly 200ft before descending again after the CPA, whilst the crew were reportedly monitoring the separation visually between their ac and the ATR72. These minor level excursions led pilot Members to wonder if the ac was perhaps being flown manually during this flight phase at night, without the benefit of A/P altitude acquisition and hold.

Fortunately, both aircrews were aware of the situation. The ATR crew had followed its TCAS guidance and monitored the SN601's flight profile, the radar recording suggesting the ATR had stopped its climb for 3 sweeps (24sec) before climbing again. The SN601 crew had seen the crossing ATR on TCAS before a TA was generated allowing them to visually acquire the ATR72's lights ahead and below. The Cardiff APR had passed TI and confirmed that they were visual. The SN601 crew had watched the ATR72 cross and move to their R whilst not following the RA 'climb' command but maintaining sight of the ATR, climbing 200ft in the process. Although there had been many singularly untidy elements in this incident, the Board were able to conclude that the visual sighting of the ATR by the SN601 crew and subsequent actions taken by both crews were enough to ensure that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Bristol APR vectored the SN601 into conflict with the ATR72 without ensuring vertical separation.

Degree of Risk: C.