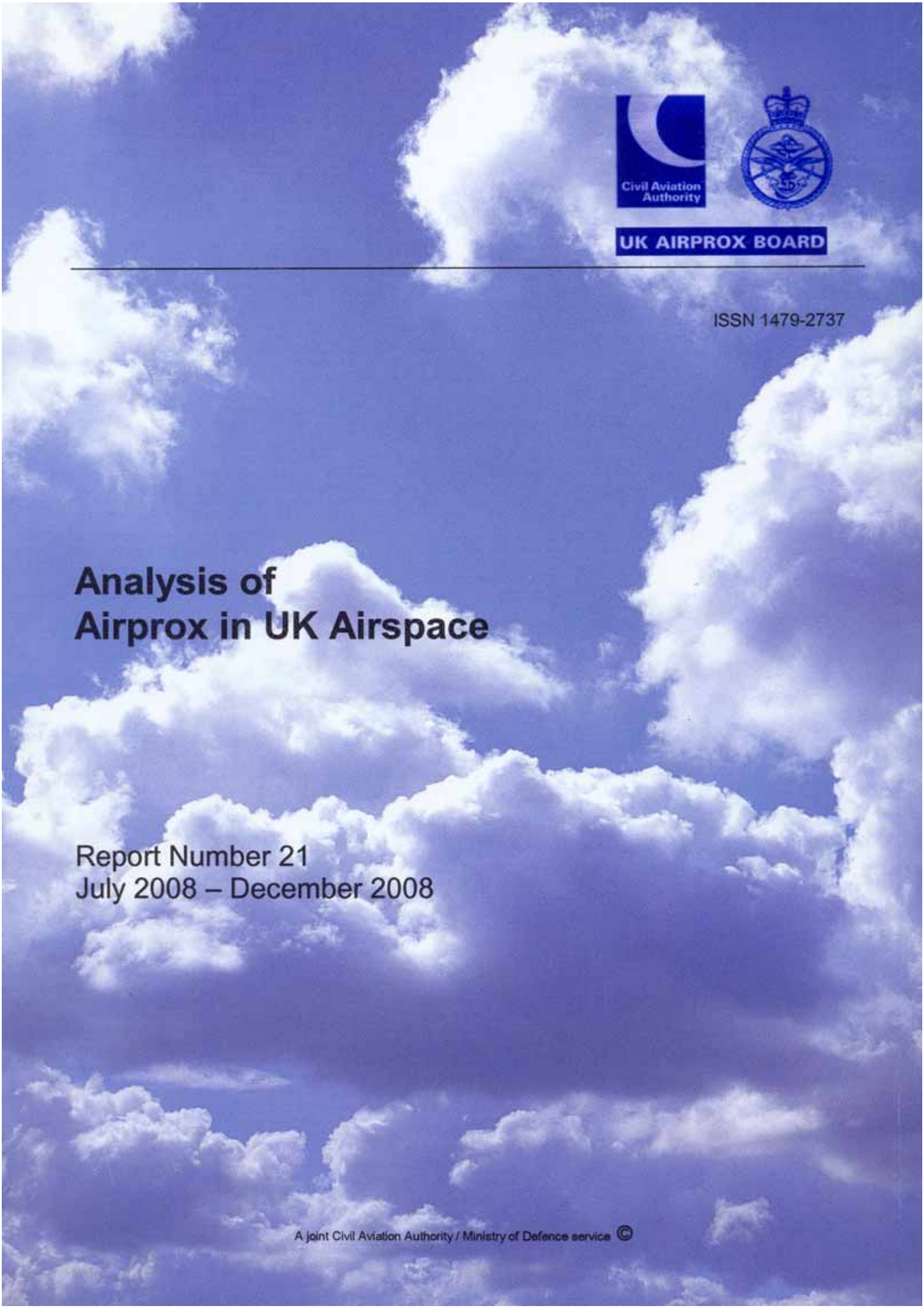

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Analysis of Airprox in UK Airspace

Report Number 21
July 2008 – December 2008

Twenty-First Report by the UK Airprox Board:

‘Analysis of Airprox in UK Airspace’

(July 2008 to December 2008)

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 twenty-first Report from the UK Airprox Board, is to promote air safety awareness and understanding of Airprox. “Book 21” covers the second half of 2008 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 and assessed by the UK Airprox Board.

At the time of publication of “Book 20”, preliminary data for 2008 as a whole indicated that figures for the year would be in line with those for 2006 and 2007: that is, of the order of 155~160 Airprox fully investigated and assessed. That indication proved correct in that the figure for year 2008 was 155 against a ‘prior five year’ average of 178. The total of 87 Airprox for the first six months of 2008 was virtually equal to the average of comparable figures in each of the first half of the preceding five years whilst the total for the second six months of the year was some 22 below the historical average. As will be reported in due course, these lower figures at year-end 2008 are being maintained in the first few months of 2009.

In addition to the individual Airprox reports, almost 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 2008. In this respect, the statistical sections herein follow the customary format.

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 (CAT). In this regard, the total number of risk bearing Airprox in year 2008 and which involved at least one CAT aircraft is the lowest in the period 1999-2008: there were no Risk Category A occurrences and just two 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.

By the time that you read these words, the handover to my successor is expected to be well underway, my ‘five year term’ being at an end. I would again thank the air traffic controllers and pilots who have been involved in Airprox and have subsequently participated in the investigations; the Members and Advisors of the UK Airprox Board; the Airprox Inspectors and UKAB’s administration team together with the many military and civilian specialists whose work contributes so much to the UK Airprox investigation system. If our 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. I close with my thanks and my customary plea that this Report be made freely available, in particular to pilots and air traffic controllers, so that maximum flight safety value is gained from the work of the UK Airprox Board.

Peter Hunt

Director
UK Airprox Board

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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, identifying 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 2008 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 2008

Numbers of Airprox - 2008

Figure 1 shows the cumulative distribution of Airprox by month during 2008 compared with a 'prior-five-year average' of the progressive totals. At the end of June 2008 the progressive total was in line with the preceding-five-year average but numbers of reports reduced, the year as a whole ending with a total of 155 Airprox reports fully investigated and assessed compared with the prior-five-year average of 178 Airprox.

Fifteen reports - a below-average number - were initially made during 2008 but then subsequently withdrawn (by the reporters) after reflection and in the light of fuller information.

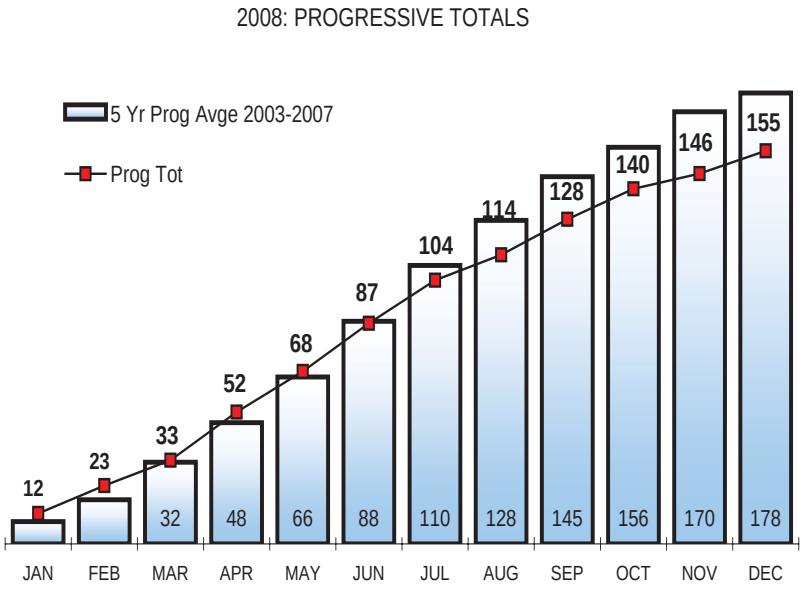


Figure 1: Numbers of Airprox during 2008

Trends by User Groups

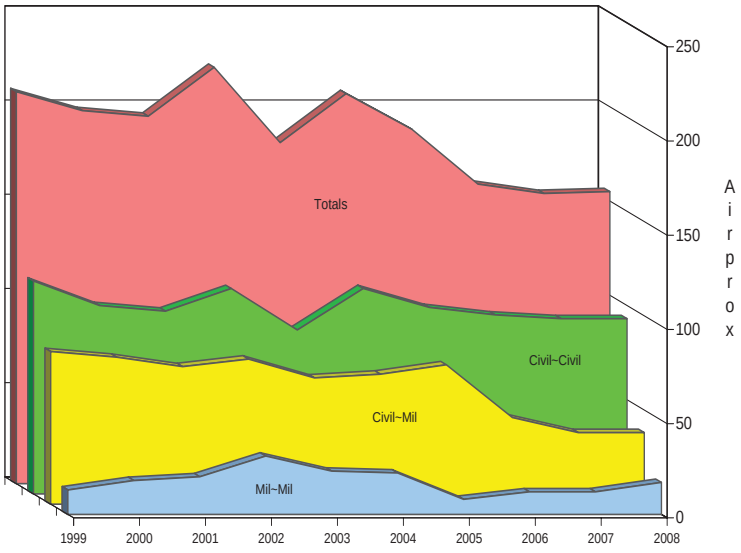


Figure 2: Airprox totals by main user groups

Airprox totals over the last ten years, by the two 'user groups' *Civil* and *Mil(itary)* are shown in Figure 2, the underlying data being in Table 1 below. Following its underlying downward trend over the early years of this decade, the total number of Airprox has been substantially level over the period 2006~08 inclusive.

As shown in Table 1, within the full year figures for 2008, the number of Mil~Mil encounters rose from 12 to 17, this latter figure being in line with the average of all such figures for the period 1999~2007.

Further information is given in the sections below.

Table 1: Airprox totals by main user groups

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Civil~Civil	113	100	97	109	87	109	99	95	93	93
Civil~Mil	81	78	73	77	67	69	74	46	38	38
Mil~Mil	13	18	20	31	23	22	8	12	12	17
Other	1	2	5	4	4	7	7	6	11	7
Totals:	208	198	195	221	181	207	188	159	154	155

Airspace in which conflicts took place

Figure 3 shows the airspace types in which the various encounters took place. During 2008 and as in previous years, most Airprox occurred in Class G airspace, around 70% of the total to be precise. Given this statistic, the Board continues fully to support the Airspace & Safety Initiative (ASI), the 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 (ATSOCAS) were introduced in March 2009, details being available through many sources including the internet at http://www.airspacesafety.com.

One of the lessons identified through the investigation of Airprox that have occurred outside controlled airspace is the vital importance of pilots understanding both the conditions associated with the class of airspace in which they are flying and the services that can be requested from ATC. Time spent pre-flight in getting fully to grips with both is time well spent, the hazards associated with infringement of controlled airspace and other restricted airspace such as Danger Areas being self-evident.

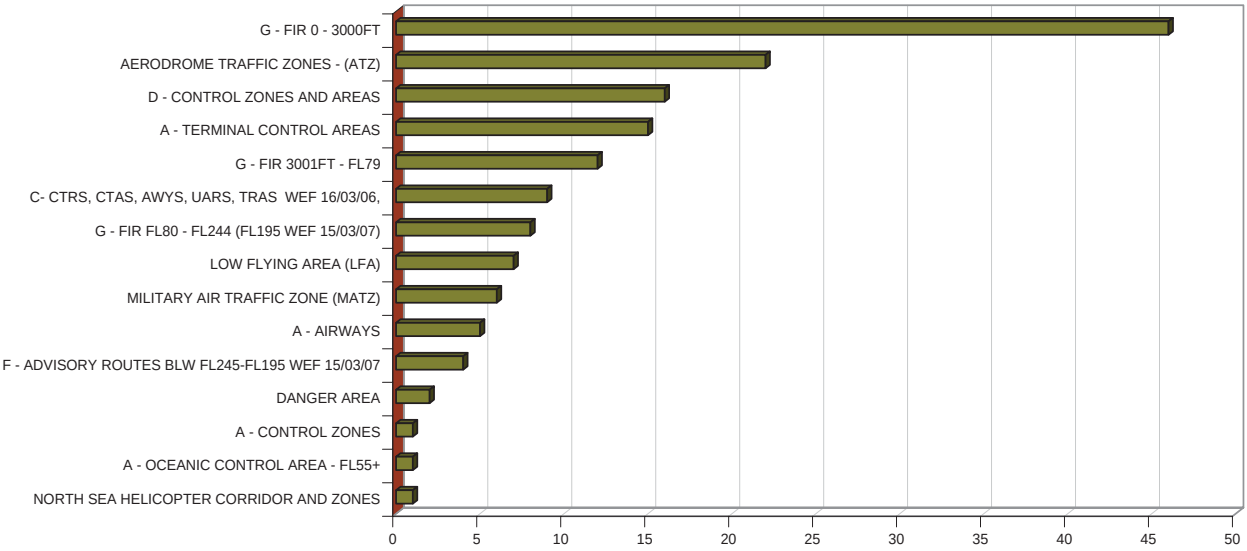


Figure 3: Types of airspace in which Airprox occurred - year 2008

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 ten year period 1999-2008 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	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
CAT Risk A	4	6	0	1	0	1	1	0	0	0
CAT Risk B	12	8	14	7	12	7	7	6	5	2
CAT Risk C	83	85	65	70	54	67	78	68	60	58
CAT Risk D	0	1	4	4	0	4	1	0	0	1
CAT Total Airprox	99	100	83	82	66	79	87	74	65	61
Hours x 10K	133.2	138.90	139.50	136.60	139.80	148.50	154.60	160.20	162.0	161.5
All Airprox	208	198	195	221	181	207	188	159	154	155

Table 2: CAT Risk data 1999 - 2008

CAT Risk Results (cont.)

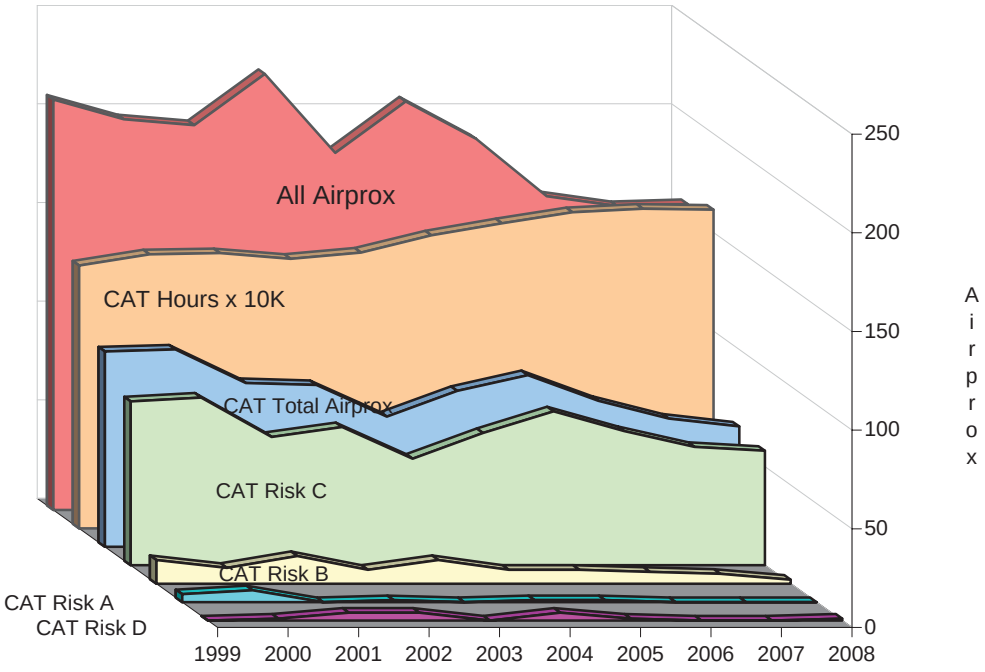


Figure 4: CAT Risk distribution 1999 - 2008

The most noteworthy conclusion from Table 2/Figure 4 is that in 2008 the number of Risk Bearing Airprox involving at least one CAT aircraft was the lowest in the dataset. In 2008, there were no Risk A and just two Risk B events, making a total for 'risk bearing events' of two. This is most gratifying and reflects well on all concerned. It is also noteworthy that the upward trend in flying hours over the period 2002~2007 has reversed into a decline, albeit of too small a magnitude materially to affect any rate calculations.

Examination of the figures in Table 2 also shows that the proportion of 'CAT Risk C', 'no risk of a collision' events, has increased from its level of 92% of 'CAT Total Airprox' in 2006 and 2007 to 95% in 2008. The increase in the total number of Airprox reports involving at least one CAT aircraft in years 2003~2005 has been followed by three years of reducing numbers: 74 (2006), 65 (2007) and now 61 in 2008.

The two events where the UK Airprox Board assessed the degree of Risk as 'B' have little in common. Geographically well separated; one event in Class G and the other in Class D airspace - the only similarities are that in each case the reported aircraft was 'GA' and that TCAS played a significant part in resolution of the conflictions, yet again proving its value in flight safety. 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 in respect of rate for 'all CAT Airprox' continues downwards, from 4.01 per 100,000 flying hours in 2007 to 3.78 in 2008. The downward trend in the CAT 'risk bearing' rate continues, the year-on-year improvement being from 0.31 to 0.12, the CAT 'Risk Bearing' Airprox Rate per 100,000 hrs flown in 2008.

CAT Airprox Rates

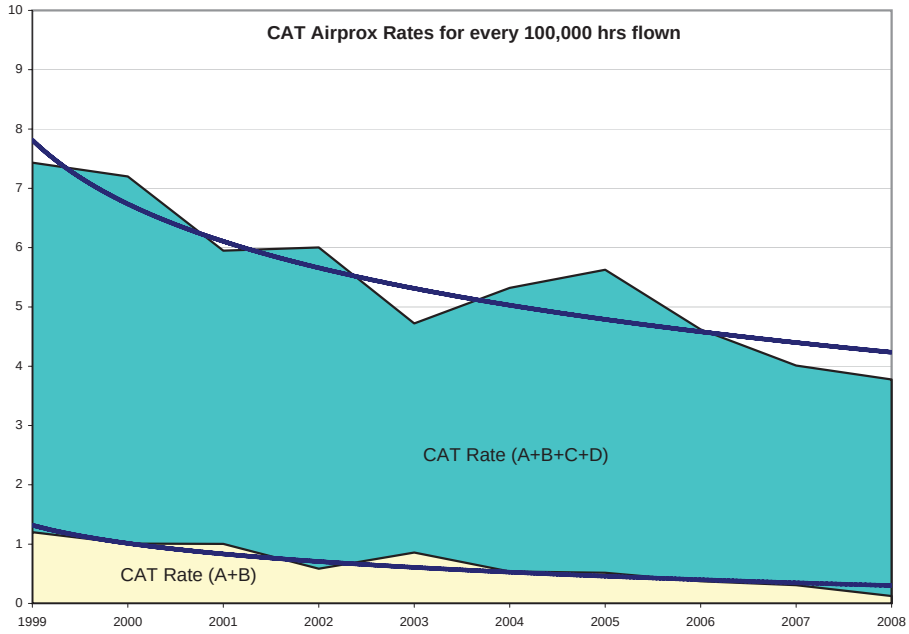


Figure 5: CAT Risk rates 1999 - 2008

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

CAT Rates	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
CAT Rate (A+B)	1.20	1.01	1.00	0.59	0.86	0.54	0.52	0.37	0.31	0.12
CAT Rate (A+B+C+D)	7.43	7.20	5.95	6.00	4.72	5.32	5.63	4.62	4.01	3.78
Hours x K	1,332	1,389	1,395	1,366	1,398	1,485	1,546	1,602	1,620	1,615

CAT Causal Factors

Table 4 below lists the predominant Causes behind the 61 Airprox involving at least one CAT aircraft. One Airprox can have more than one causal factor, 106 such factors being allocated in toto to the 61 Airprox. The 'top ten' Causal Factors are listed in Table 4 below, the list being similar to that in previous years. In the context of Ser. 2 in Table 4, attributed to Pilots, the UKAB continues to share industry concern regarding 'level busts' (and, as an aside, infringements), fully supporting the safety improvement actions aimed at reducing this hazard.

Table 4: Most common Causal Factors in Airprox during 2008 having a CAT aircraft involvement

Ser.	Cause	Totals	Attributed to
1	DID NOT SEPARATE/POOR JUDGEMENT	22	CONTROLLER
2	CLIMBED/DESCENDED THROUGH ASSIGNED LEVEL	6	PILOT
3	CONTROLLED AIRSPACE CONFLICT IN VMC	6	OTHER
4	NOT OBEYING ORDERS/ FOLLOWING ADVICE/ FROM ATC	5	PILOT
5	LACK/BREACH OF CO-ORDINATION BETWEEN CONTROLLERS	4	CONTROLLER
6	DID NOT ADHERE TO PRESCRIBED PROCEDURES	4	PILOT
7	DID NOT ADHERE TO PRESC'D PROCED'S/OPERAT INSTR'S	4	CONTROLLER
8	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	4	PILOT
9	MISINTERPRETATION OF ATC MESSAGE	3	PILOT
10	PENETRATION OF CAS/ATZ WITHOUT CLEARANCE	3	PILOT

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 flat as indeed are the figures for Airprox having a GA involvement which now hover around 100 Airprox per annum. In 2008, approximately 40% of the total number of Airprox involving at least one GA aircraft were Risk Bearing, the same as the average figure for the prior nine years.

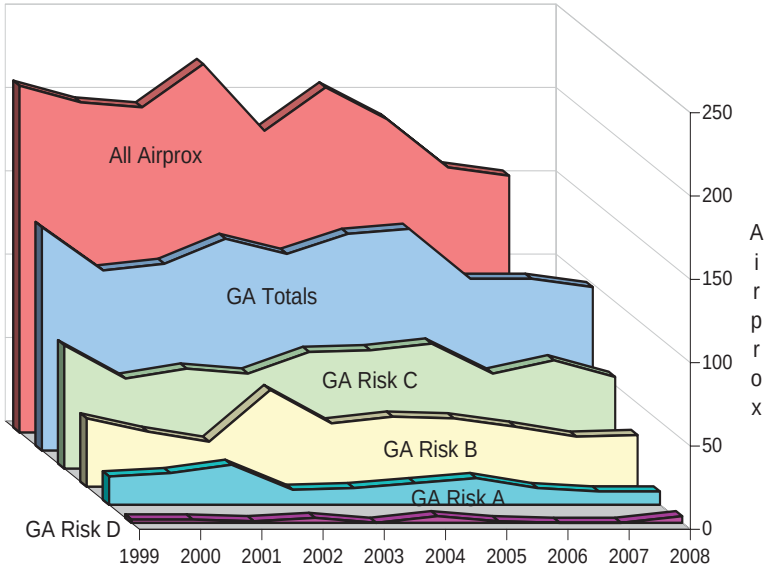


Figure 6: GA Risk distribution 1999 - 2008

As has been noted before in these Reports and elsewhere, being involved in an Airprox is one thing - being involved when safety was compromised quite another. In the course of their work, the Airprox Inspectors frequently speak with GA pilots who have found themselves very shaken by the unexpectedly close proximity of another aircraft. Lessons identified from Airprox investigations into GA events continue to repeat themselves:

plan a flight thoroughly;
keep well clear of notified and active gliding sites unless operating therefrom;
join and fly circuits correctly;
maintain a good lookout; and
both carry and operate a transponder with Mode C switched 'on' during flight.

Table 5: GA Risk data 1999 - 2008

GA Risk	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
GA Risk A	17	19	24	9	10	13	16	10	8	8
GA Risk B	41	33	27	58	38	42	41	36	30	31
GA Risk C	74	54	60	57	70	71	75	57	65	55
GA Risk D	2	2	1	3	0	4	1	0	0	4
GA Totals	134	108	112	127	118	130	133	103	103	98
All Airprox	208	198	195	221	181	207	188	159	154	155

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 2008 is 1,351,000 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 both for risk bearing (i.e. Risk A plus Risk B) and for all GA Airprox. 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.

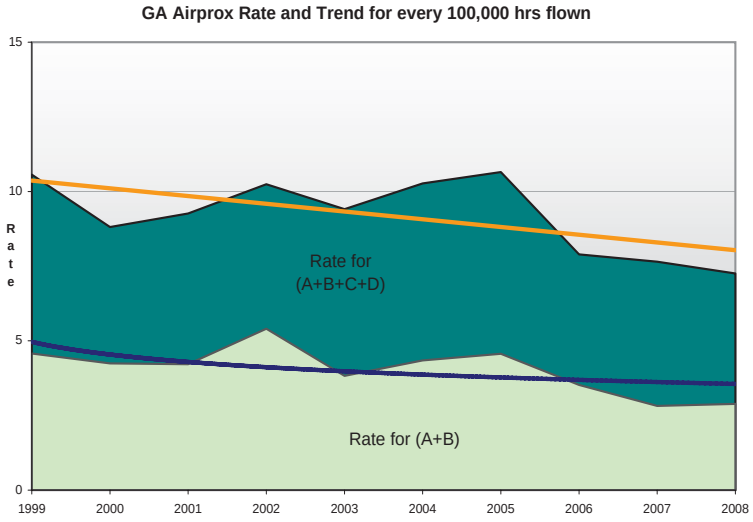


Figure 7: GA Risk rates 1999 - 2008

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

GA Rates	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Rate for (A+B)	4.57	4.24	4.22	5.40	3.83	4.35	4.56	3.53	2.82	2.89
Rate for (A+B+C+D)	10.57	8.81	9.26	10.24	9.41	10.27	10.65	7.89	7.65	7.26
Hours flown in K	1,268	1,226	1,209	1,240	1,254	1,266	1,249	1,305	1,346	1,351

GA Causal Factors

A total of 35 different factors were assigned to the 98 'GA Airprox' in 2008, many of them more than once such that there were 171 'assignments' in total. Table 7 below gives the ten causal factors most frequently assigned to Airprox involving GA pilots. Top of the list, as in previous years, are causal factors involving sighting issues. 'Did not see the conflicting traffic' and 'Late sighting of conflicting traffic' were assigned a total of 55 times in 2008: in terms of ratio, that's one-third of the total, 171. Note too that the Risk Bearing rate for GA is more than 20 times that for CAT. These figures again serve to emphasise the importance of good lookout and also serve to remind all who fly, in particular in Class G airspace, of the importance of full use of an aircraft's transponder further to improve everyone's safety.

Table 7: Most common causal factors in Airprox during 2008 having a GA aircraft involvement

Ser.	Cause	Totals
1	DID NOT SEE CONFLICTING TRAFFIC	29
2	LATE SIGHTING OF CONFLICTING TRAFFIC	26
3	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	9
4	DID NOT ADHERE TO PRESCRIBED PROCEDURES (PILOT)	9
5	DID NOT SEPARATE/POOR JUDGEMENT	8
6	PENETRATION OF CAS/ATZ WITHOUT CLEARANCE	7
7	NOT OBEYING ORDERS/ FOLLOWING ADVICE/ FROM ATC	5
8	CONTROLLED AIRSPACE CONFLICT IN VMC	4
9	DID NOT ADHERE TO PRESC'D PROCED'S/OPERAT INSTR'S (CONTROLLER)	4
10	FLYING CLOSE TO/OVER GLIDER OR PARADROP SITE	4

MILITARY (MIL) SECTION

MIL Risk Results

Figure 8 below (and Table 8, on which the Figure is based) shows the number of Airprox involving at least one Military aircraft by Risk category. The figure of seven for Risk Cat A events in 2008, a jump from the corresponding figure in 2007, is nevertheless below the average (of 11) for the period 1999~2007. In other respects, numbers of events in 2008 are much as in 2007.

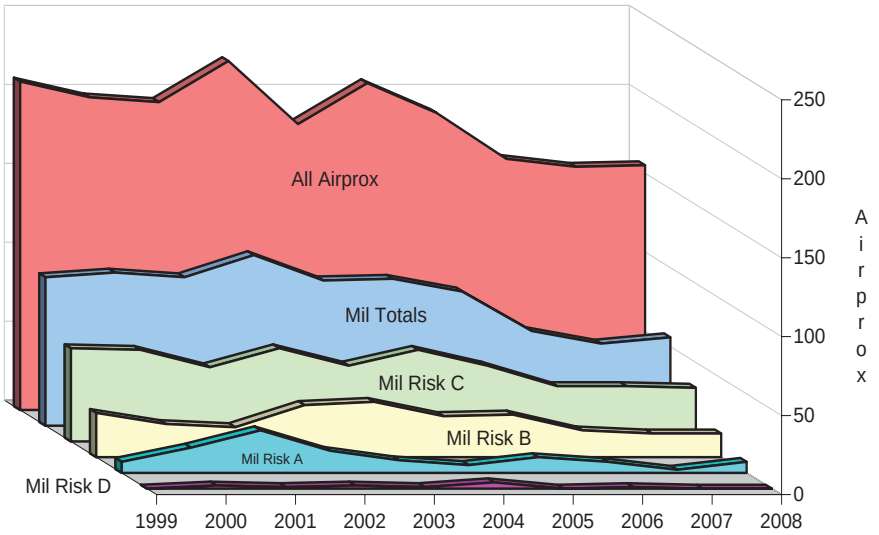


Figure 8: Military Risk distribution 1999 - 2008

Table 8: Military Risk data 1999 - 2008

Mil Risk	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Mil Risk A	7	16	27	14	8	5	10	7	2	7
Mil Risk B	28	21	19	33	35	26	27	17	15	15
Mil Risk C	59	58	47	59	48	58	48	35	35	34
Mil Risk D	0	2	1	2	1	4	0	1	0	0
Mil Totals	94	97	94	108	92	93	85	60	52	56
All Airprox	208	198	195	221	181	207	188	159	154	155

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. Table 9 below and Figure 9 overleaf present the results, based on flying hours for 2008. As can be seen in Figure 9, underlying trends have also been plotted: from visual inspection it is evident that the downward trend since 2002 has been better than the 10-year line would indicate.

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

MIL Rate	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Rate for (A+B)	7.13	8.08	9.16	9.50	8.74	6.80	8.29	5.56	3.92	5.48
Rate for (A+B+C+D)	19.14	21.18	18.73	21.83	18.69	20.41	19.04	13.91	11.98	13.96
Hours flown in K	491	458	502	495	492	456	446	431	434	401

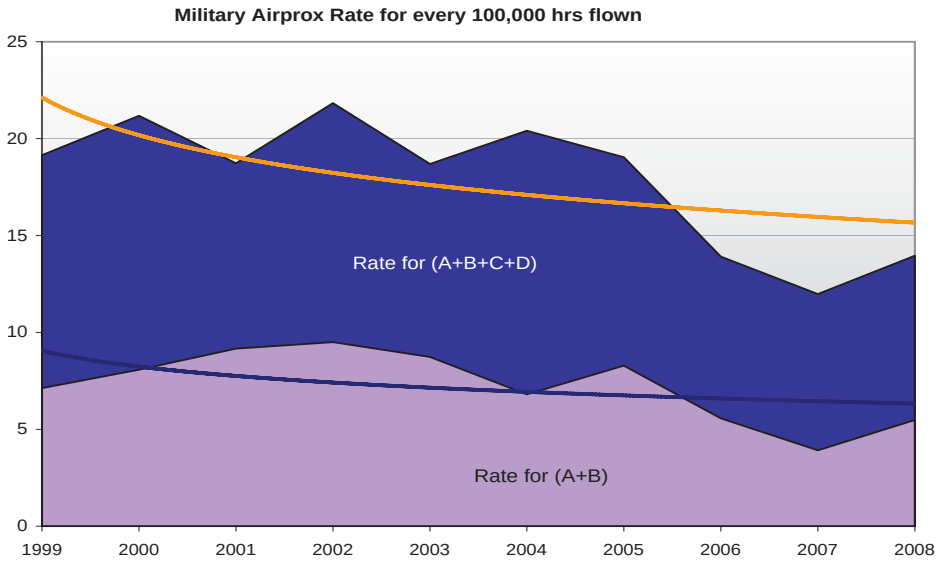


Figure 9: MIL Risk rates 1999 - 2008

MIL Causal Factors

From a total of 37 different factors that were identified following investigation of the 56 Airprox involving at least one military aircraft, those assigned at least four times are listed in Table 10. As the data in Table 10 shows, the main causal factors assigned to the set of Military Airprox in 2008 relate predominantly to sighting issues. This is perhaps unsurprising given that as with GA, so much of the Military activity takes place in Class G 'see and avoid' airspace.

Examination of the 22 'military' Risk Bearing events in 2008 shows that none involved a CAT aircraft. A review looking for common features in the 22 Airprox found that geographically they occurred across the UK and that the (military) aircraft types spanned from Nimrod to an Auster, helicopters also featuring. A review of the assigned Causes shows that sighting issues feature in a number of cases, emphasising again the importance of good lookout and the value of Airborne Collision Avoidance Systems such as TCAS.

Table 10: Most common causal factors in Airprox during 2008 having a MIL aircraft involvement

Ser.	Cause	Totals:
1	LATE SIGHTING OF CONFLICTING TRAFFIC	14
2	DID NOT SEE CONFLICTING TRAFFIC	11
3	DID NOT SEPARATE/POOR JUDGEMENT	6
4	DID NOT ADHERE TO PRESCRIBED PROCEDURES (PILOT)	5
5	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	4
6	LACK/BREACH OF CO-ORDINATION BETWEEN CONTROLLERS	4
7	DID NOT ADHERE TO PRESCRIBED PROCEDURES/OPERAT INSTRS (CONTROLLER)	4
8	PENETRATION OF CAS/ATZ WITHOUT CLEARANCE	4

Airprox Trends

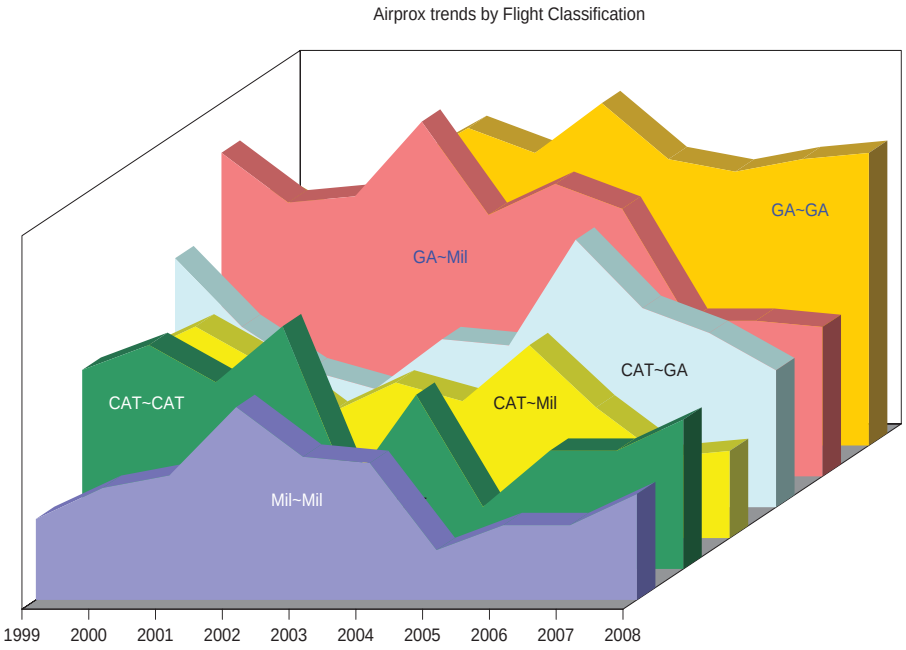


Figure 10: Airprox trends by Flight Classification

Figure 10, derived from data in Table 11 below, is arguably one of the quickest ways to obtain a snapshot of the UK's Airprox 'scene'. From 1999 until 2002, the underlying trend in MIL~MIL encounters was upwards - from the 2002 peak, the trend has been downwards, albeit the last three years has seen a rising trend again. It is known that much action is taking place within the Military to address issues raised from Airprox investigation. CAT~CAT Airprox data is shaped like a sawtooth but the trend is downwards over the ten-year period, albeit again with a rising trend of overall numbers in the most-recent three years but with reducing levels of Risk. CAT~MIL and CAT~GA data reveals an upward trend 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

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
GA~Mil	52	44	45	57	42	47	43	25	25	24
GA~GA	41	35	45	51	47	55	46	44	46	47
CAT~CAT	32	36	30	39	13	28	10	19	19	24
CAT~GA	40	29	22	19	27	26	43	32	28	22
CAT~Mil	29	34	28	20	25	22	31	21	13	14
Mil~Mil	13	18	20	31	23	22	8	12	12	17

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.

044/08 16 Apr 08 involving an ATR72 and an EMB195 Risk C

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

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

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

STATUS – ACCEPTED – OPEN

100/08 22 Jul 2008 involving a B412 Griffin and a Fokker 50 Risk C

RECOMMENDATION: In concert with the MoD, the CAA should, for the benefit of controllers and pilots alike, review references to the term 'clearance limit' in MATS Pt 1; CAP413 and the applicable JSPs to ensure consistency both of meaning and usage of this RT phraseology.

ACTION: The CAA accepts this Safety Recommendation. Supplementary Instruction (SI) 2009/003 was issued on 24 March 2009 advising that "*where a controller requires a VFR aircraft operating in Class D airspace to hold at a specific point pending further clearance this is to be explicitly stated to the pilot*". The phraseology is to include the instruction "hold at (specific point)". This requirement will be reflected in the next amendment to Manual of Air Traffic Services (MATS) Pt 1 which will be published on 18 June 2009, and effective from 2 July 2009. Relevant sections of CAP 413 (Radiotelephony Manual) will be expanded to clarify the phraseology to be used and will appear in Edition 19, due for publication December 2009. The SI has also been copied separately to the MoD representative on the CAA Phraseology Working Group.

STATUS – ACCEPTED – OPEN

148/08 15 Oct 2008 involving an Airbus A321 and a pair of Eurofighters Risk C

RECOMMENDATION: The MoD should conduct a thorough review of the recovery phase of the subject TLP to ensure that all lessons are identified and acted upon so that the risk of such circumstances occurring again is significantly reduced.

ACTION: The MoD accepts this Safety Recommendation. A review of the recovery phase of the subject TLP has been initiated. To ensure a timely and comprehensive response, Air Command (Air Traffic Control) has been asked to co-ordinate action. MoD will advise the outcome of the review in due course.

STATUS – ACCEPTED – OPEN

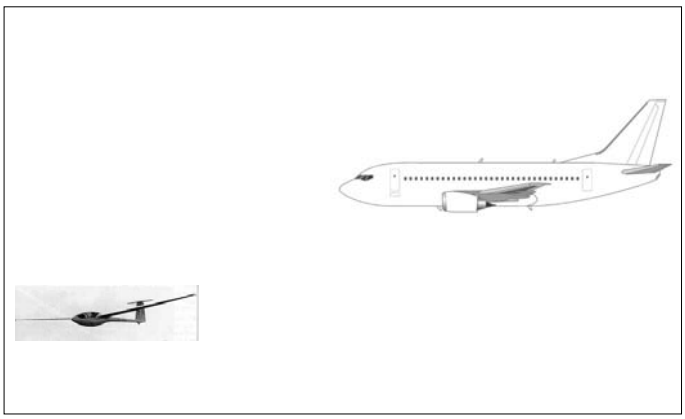
List of Abbreviations

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 094/08

Date/Time:	4 Jul 1232	
Position:	5249N 00103W (10nm Approach to E Midlands)	
Airspace:	E Mid CTA	(Class: D)
	Reporting Ac	*Reported Ac*
Type:	B737	NK
Operator:	CAT	NK
Alt/FL:	3000ft (QNH 1015mb)	NK
Weather	VMC CAVOK	NK
Visibility:	10km	NK
Reported Separation:	400ft V/500m H	NK
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports that they were inbound to East Midlands in contact with APR, squawking as directed with Mode C and on a radar heading of 300° at 180kt to intercept the localiser for RW27 from the S when he saw a low-winged glider in his 12 o'clock, passing N to S between 300ft and 500ft beneath them. He did not take any avoiding action but assessed the risk as being high.

UKAB Note (1): The B737 is seen on the radar recordings but there is only one other primary contact, which shows for one sweep only, around the reported position and time of the incident. The B737 was descending through about 4300ft at the time it passed about ½ nm E of the approximate position of the primary contact. The controller reported that the B737 was passing 3400ft at the incident time which would have put it about 3nm NW of the position of the primary contact. He also reported seeing an intermittent primary contact tracking S and disappearing 15nm SE of East Midlands (near Leicester aerodrome, which was not operating any gliders).

UKAB Note (2): All the local glider sites were contacted, 12 in all, 10 of which were not operating at the time of the incident. There were 8 gliders operating from the remaining two sites. The pilots were contacted but all reported that they were operating well away from the area of the Airprox.

UKAB Note (3): The reported position of the Airprox is about 10nm E of East Midlands Airport in the CTA where the base of the CAS is 1500ft amsl.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the B737 pilot, radar video recordings and a report from the air traffic controller involved.

The Board was briefed that despite the extensive tracing action, the glider could not be identified. The ac was not seen on the radar recording and therefore it could not be determined positively whether it was in the East Midlands CTA or below the base of CAS. From the B737 pilot's report, which was the only information available to the Board, it was assumed that the glider was in the CTA and, since it was not in contact with East Midlands APP, that it was infringing Class D airspace.

The relatively late visual acquisition of the glider by the B737 crew was thought by airline pilot Members to have most likely been due to their high workload as they were coming onto the final approach and preparing the ac for landing. In addition, it is well known in the aviation community, that modern, low profile, gliders are very difficult to acquire visually, particularly in good gliding conditions when there is a significant amount of white cloud present.

Since the APR had not been aware of the glider's presence, ATC had not been in a position to pass any warning to the B737 crew. However, having seen the glider, the B737 crew had considered that avoiding action was not required. Members therefore agreed that there had been no risk that the ac would have collided.

PART C: ASSESSMENT OF CAUSE AND RISK

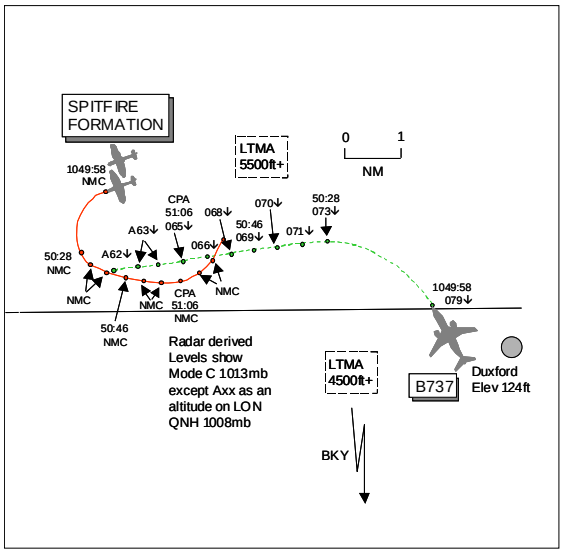
Cause: A conflict with an untraced glider.

Degree of Risk: C.

AIRPROX REPORT No 095/08

AIRPROX REPORT NO 095/08

Date/Time:	8 Jul 1051	
Position:	5207N 00003W (6nm WNW Duxford)	
Airspace:	LTMA/FIR	(Class: A/G)
	Reporting Ac	*Reported Ac*
Type:	B737-700	Spitfire x2
Operator:	CAT	Civ Pte
Alt/FL:	6000ft	5200ft
	(QNH 1007mb)	(RPS 1002mb)
Weather	VMC CLOC	VMC CLOC
Visibility:	30km	Unltd
Reported Separation:		
	Nil V/500m H	700ft V/0·5nm H
Recorded Separation:		
	0·3nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports inbound to Luton IFR and in receipt of a RCS from Essex Radar on 120·62MHz squawking with Modes C and S. Heading 260° at 220kt level at 6000ft, he thought, QNH 1007mb, they saw - on TCAS, showing NMC, and visually - a pair of camouflaged Spitfires 5km away. The pair were flying in echelon formation, passing from R to L ahead, climbing and turning. The Spitfires passed 500m away on their L at the same level before passing behind. Essex Radar was informed. He assessed the risk as low.

THE SPITFIRE FORMATION LEADER reports flying a local sortie from Duxford, VFR and not in communication with any ATSU, squawking 7000 with Mode C, he thought. The visibility was unlimited: they were flying 2nm clear of fair-wx cumulus cloud in VMC and both ac were in WW2 camouflage. Operating as a pair doing formation practice in clear airspace at 210kt and 5200ft RPS, possibly 1002mb, a B737 was seen from about 2-3nm away, maybe more, in his 9 o'clock high in level flight but could have been descending. He eased his gentle LH turn to keep the B737 visual as it appeared to be descending towards his level, to give it as wide a berth as possible whilst remaining in VMC. He was unsure if the B737 was descending as the cumulus cloud structure was such as to make that judgement difficult. Turning through E, the B737 was seen to pass about 700ft above in his 9 o'clock range 0·5nm. He assessed that there was no risk of collision.

THE LTC STANSTED INT/ESSEX RADAR CONTROLLER reports vectoring the B737 inbound to Luton from the E. He was about to position the ac through the 'Luton Gate' as per standing agreement when the pilot reported seeing 2 Spitfires passing abeam by 500m; the pilot advised he would be filing an Airprox. The B737 was at altitude 6000ft inside CAS where the base is 5500ft and the pilot reported the Spitfires were at 6000ft. The Spitfires headed N but were not able to be tracked.

ATSI reports that the incident took place at 1051, 6nm WNW of Duxford aerodrome, in area TMA 9 of the LTMA where the base of Class A CAS is 5500ft amsl.

The B737 was inbound to Luton and being vectored by Essex Radar prior to handover to Luton Radar for an approach to RW26. Inbound to BKY VOR from the SW, the flight was instructed to adopt its current heading as a radar heading. At 1048:17, the flight was passing FL107 Mode C for FL90 and was further cleared to 6000ft on the QNH 1007mb. At this point, the radar recording shows, the ac is about to pass BKY, 9nm NW of Stansted airport. At 1049:13, the Essex controller instructed the B737 to turn L onto heading 265°, to position the ac in accordance with local agreements.

[UKAB Note (1): The radar recording at 1049:58 shows the B737 turning L through a NW'ly heading 1·6nm NW of Duxford descending through FL79 with an unknown ac squawking 7000 with NMC, the Spitfire formation, 6nm to the WNW turning L through a SW'ly heading.]

By 1050:46, the radar recording shows the B737 steady on the assigned heading, passing FL69 Mode C and now within area TMA 9. Once level at 6000ft QNH, the B737 would be 500ft above the base of TMA 9 (5500ft) and in accord with the MATS Part 1 guidance at Section 1, Chapter 6, Page 4, Paragraph 9, which 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."*

Also at this time the radar recording shows the Spitfire formation in the B737's 12 o'clock position, range 2·3nm, in a L turn. In the absence of Mode C and any other information, Essex had no reason to believe that this unknown ac [actually a pair] was anything other than traffic operating below CAS. Subsequent sweeps of the radar show the unknown radar return appearing to stop its turn on an E'ly track and then pass to the S of the B737. At 1051:05, the B737 pilot calls Essex and he responds by issuing the flight a heading change onto 240°. This was read back but the pilot adds *"…we've just been passed very close by two Spitfires in formation same level"* to which the controller replies *"…they're obviously inside controlled airspace confirm that's level at six thousand feet",* the pilot answering *"Affirm Sir er they were probably er five hundred metres away if not less".*

UKAB Note (2): The radar recording at 1051:04 shows the B737 passing FL65 Mode C (6320ft QNH 1007mb) with the Spitfire formation in its 9 o'clock position, range 0·3nm. Thereafter, respective tracks diverge, the Spitfire formation continuing E before turning NE, 1·3nm astern of the B737.

UKAB Note (3): Met Office archive data confirms the Chatham RPS for 1000-1100UTC as 1002mb.

UKAB Note (4): The Spitfire Leader reported flying at 5200ft RPS which equates to 5350ft QNH 1007mb, about 950ft below the B737 at the CPA.

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 Spitfire Formation Leader was operating on the RPS whilst flying below the LTMA. This was contrary to the procedures set out in the UK AIP [ENR 1-7-1] which states that airspace within and under TMAs do not form part of the Altimeter Setting Region. Moreover, when flying below TMAs and CTAs, pilots should use the QNH of an adjacent aerodrome when flying below the Transition Altitude. This is to ensure that pilots of such flights are able to operate safely, cognisant that their indicated altitudes flown are placing their ac below the promulgated CAS base level. It was also noted that although the Spitfire Leader had reported squawking Modes A and C in line with the guidance in the UK AIP [ENR 1-6-2-1], NMC was evident from the radar recording. Members reiterated the importance of squawking Modes A and C, when fitted, to ensure that ATC conflict alert systems and ACAS 'safety nets' are able to function fully.

An experienced Pilot Member commented that there was not a lot of room for the Spitfire Formation to operate, the airspace in that area being 'tight'. It was not unusual for flights to operate just below CAS with the proliferation of GA aerodromes/airfields situated under the LTMA and in this case, the pilots were looking for clear air to practice formation flying. Noting the disparate separation distances quoted by both crews, Members wondered whether there were any possible reasons for these 2 different viewpoints. One hypothesis put forward was that the B737's flightpath at the time was, as evidenced by the radar recordings, not level flight - as reported by the B737 crew - which may have given them a different visual perspective on the incident. The B737 crew had reported that when level at 6000ft, seeing the Spitfire formation on TCAS and visually 5km away and estimated that they passed 500m away on their L at the same level. The B737 crew were undoubtedly surprised to see 2 Spitfires whilst they were within CAS. From the radar recording it was evident that at the time the B737 crew visually acquired the Spitfires, the airliner was still descending, passing through FL65 (6320ft QNH) at the CPA. Members wondered whether the slight nose-down flying attitude of the B737 in descent combined with the surrounding cloud could have also led to a mistaken impression of the Spitfire formation's flightpath and separation from the B737's flightdeck.

For his part, the Spitfire Lead had reported flying level at 5200ft RPS (5350ft QNH) just below CAS but he had difficulty in assessing the B737's flight profile - it was either level or descending - owing to the cloud structure. Having visually acquired the B737, he had eased the formation's L turn and watched the airliner pass about 700ft above and 0·5nm clear to his L. Another possible reason proffered by a Member was a misreading of the altimeter (6200ft instead of 5200ft) in the Spitfire Leader's cockpit leading to the formation flying at a higher level than

reported. This would have put the subject ac closer together in the vertical plane (substantiating the B737 crews viewpoint) but then this did not accord with the Spitfire Leader's reported passage 700ft below the airliner. Without any additional information, these anomalies went unresolved with only the 2 crews knowing exactly how close vertically the ac passed during the encounter. With both crews visually acquiring each other's ac; the Spitfire Leader's actions and in light of the actual geometry that pertained, the Board was minded to conclude that this had been a sighting report, any risk of collision having been effectively removed.

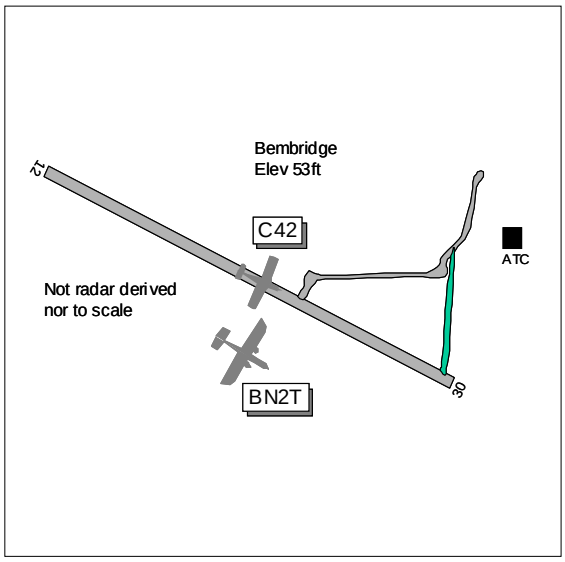
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT NO 096/08

Date/Time:	1 Jul 1415	
Position:	5041N 00106W (O/H RW12 Bembridge -elev 53ft)	
Airspace:	ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	C42 Ikarus	BN2T Defender
Operator:	Civ Trg	Civ Pte
Alt/FL:	100ft↑	↑
	(QFE)	(QFE)
Weather	VMC CLBC	VMC Haze
Visibility:	>20km	>10km
Reported Separation:		
	50ft	500ft V/1000m H
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C42 IKARUS PILOT reports flying a dual training sortie with a student PPL in the visual cct at Bembridge and in communication with Bembridge Radio on 123·25MHz; no transponder was fitted. The visibility was >20km flying 3000ft below cloud in VMC. The ac was coloured white with blue stripes and the strobe lights were switched on. He was positioned downwind for RW12 when another ac's pilot reported joining crosswind and visual with his ac. As he turned onto base he saw the other ac, a BN2T Islander, tight in behind his ac so he reported his position again stating his intentions to fly a tight cct with a touch and go. He believed that this would increase the separation rather than fly a normal size cct. He landed and proceeded with the touch and go half way down the RW. As he commenced his climb passing 100ft at 65kt he heard the BN2T's pilot declare he was going around, at the same time seeing a large shadow of an ac alongside his ac on the RW. Fearful of a collision he called on the 'Tower' frequency asking on which side of his ac was the BN2T passing. Hearing a reply *'on the right'* he then saw the BN2T in a low climb filling his screen on the starboard quarter no more than 50ft away having obviously carried out a very late 'go-around'. He continued his climb holding the RW C/L as he did not know the intentions of the BN2T's pilot after the go-around. The incident was witnessed by a ground observer who described how close the BN2T was on initiating its go-around and, at that point, he realised that it was his duty to report it. He later spoke to the BN2T pilot who was unrepentant of the whole incident. He assessed the risk as high.

THE BN2T DEFENDER PILOT reports that in his mind this was not an Airprox. At the time he was inbound to Bembridge VFR and in communication with Bembridge 'Tower' on 123·25MHz squawking with Mode C. The visibility was >10km in slight haze and the ac was coloured white/blue with anti-collision lights switched on. He joined the RW12 cct crosswind, clear of existing cct traffic, sighted from 3-4nm away, with enough separation for landing after the preceding Ultralight [C42 Microlight] ac which was performing a touch and go. During a prolonged base leg, the C42 pilot changed his intention to perform a glide approach. This was a very late declaration and it quickly became apparent the RW would not be clear for his landing and that the overtaking speed was quite high. On finals at 70kt and at a safe distance he performed a go-around taking separation to the deadside in a climb back to cct height, the C42 was still in the landing phase when overtaken. During this overtake manoeuvre, he was at all times visual with the C42, estimating it passed 500ft vertically below and 1000m clear laterally. After speaking to the C42 pilot a few days later, it is understood that he thought that the Defender's shadow was large and when he had eventually seen the ac during the overtake he thought it was large, the Defender is larger than the usual ac operating at Bembridge.

THE BEMBRIDGE AIR GROUND OPERATOR reports being surprised that the incident had been filed as an Airprox. The C42 made an approach to RW12 for a touch and go followed by a faster BN2T. The BN2T pilot took timely and decisive action to maintain separation having decided that the safe option was to conduct a go-around rather than attempt a landing.

AIRPROX REPORT No 096/08

UKAB Note (1): The incident occurred outside of recorded radar coverage.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac and a report from the air ground operator involved.

On the limited information available, Members were unable to resolve the disparate separation distances quoted by both pilots. What was clear was that the BN2T pilot had carried out a 'go-around', a not uncommon occurrence and an SOP, owing to the RW being occupied by the preceding C42. The C42 pilot was concerned when he heard the BN2T pilot's RT call and then saw the ac's shadow alongside his ac on the RW. After establishing on which side the BN2T was overtaking, the C42 pilot saw it pass on his RHS, estimating 50ft separation, whilst he maintained his flightpath, climbing straight ahead in the cct. Conversely, the BN2T pilot had reported maintaining visual contact with the C42 during his go-around, passing 500ft above and 1000m clear. However, irrespective of the anomaly between reported separations, the BN2T pilot was always in a position to manoeuvre his ac further if necessary, as he passed the C42, which led the Board to conclude that this had been a sighting report with no risk of a collision.

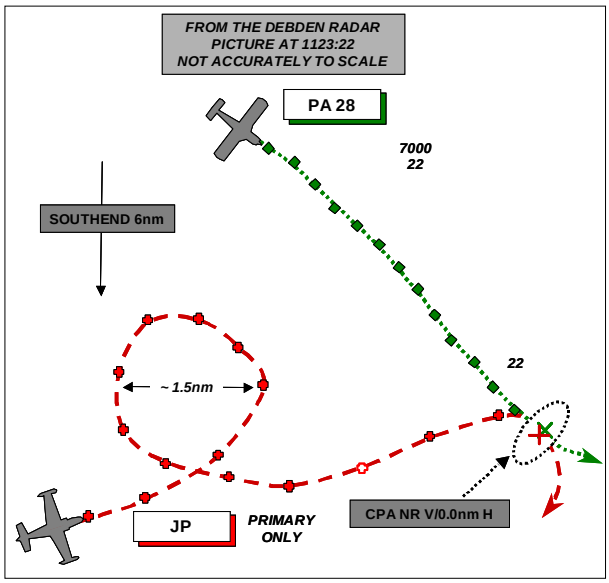
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT NO 097/08

Date/Time:	12 Jul 1123 (Saturday)	
Position:	5140N 00042E (5nm N Southend - elev 203ft)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	PA28	Jet Provost
Operator:	Civ Pte	Civ Trg
Alt/FL:	2000ft (1008 QNH)	NR (N/K)
Weather	VMC NR	VMC NR
Visibility:	30km	NR
Reported Separation:	0ft V/200m H	NR
Recorded Separation:	NR V/0nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA28 PILOT reports that they were flying a white and green ac with the anti-coll beacon switched on, squawking 7000 with Mode C, in good VFR weather from Andrewsfield direct to Southend. His wife was flying the ac from the LHS and he was acting as co-pilot in the RHS. Fifteen miles out of Southend they checked the ATIS and then when close to Chelmsford contacted Southend APP (radar was out of service). On contact they were asked to maintain 2000ft on 1008, position for a right base to RW24 and call at the River Crouch. They maintained 2000ft and took up a heading of approx 140° at 100kt and shortly after they saw a Jet Provost (JP) in their 2 o'clock heading roughly 090° at a similar height. He continued to watch the JP while his wife concentrated on positioning their ac correctly and looked for the IFR traffic that they believed was outbound in the procedural approach to RW24. It then became clear that the JP was holding its course, height and a constant bearing and they needed to turn to give way so they initiated a level left turn away from the JP. After about 20sec he became concerned because his view of the JP was now blanked by their right wing and he had no confidence the JP would continue to fly straight and level so he asked his wife to briefly drop the right wing to establish were it had gone. At this time they had a sudden view of the underside of the JP in a steep left climbing turn, he thought, about 200m away on their RHS and it appeared that while they had turned away to avoid a collision the JP had turned steeply towards them. At this time Southend APP asked for confirmation of their position: his wife reported that they had had to take avoiding action and the controller replied he had no radio contact with a JP and was unaware of it. They had no further sighting of the JP and continued inbound.

He considers that there was a very high risk of a collision because it seemed the JP pilot was unaware of their presence throughout and the slightest change in the timing or rate of turn the JP initiated could have easily brought the aircraft into contact. The difference in flying speeds and manoeuvrability of the two ac had reduced their efforts to maintain a safe separation. Subsequent to his reporting the Airprox to Southend ATC, they contacted the pilot of the JP to ascertain his details.

Although he accepts that this incident occurred in Class G airspace, he considers that flying/manoeuvring fast jets within a few miles of a very busy airfield is unwise particularly when not communicating with the Approach Controller. For him, the lesson learned is that they should have taken more positive avoiding action earlier although, as in this case, it could have been negated by the other, faster and very manoeuvrable, ac.

THE JET PROVOST (JP) PILOT reports that he received informal notification of the Airprox 2 days after the event and contacted Southend ATC with his contact details to save extensive tracing action. Neither he nor the 2nd pilot could recall seeing a PA28 in the position reported. On receiving the details of the incident he discussed it with the other pilot and the assistance they can offer is below.

From the reported details, the event appears to have taken place as they transited from North Weald to the S of the River Blackwater, about midway between Chelmsford and Southend, while they were flying at 200kt in good VMC at 2500ft on the QNH. In that area, they completed two steep turns, each through 360°, firstly to the left, then right, with an entry/exit heading of 080°. Since this had been a training flight, he distinctly recalled emphasising/monitoring the need to lookout prior to, during, and after each steep turn. The flight had been a check/conversion flight for the 2nd pilot who was already familiar with the lookout techniques, as per RAF JP teaching, and he needed no further coaching/debriefing in that area.

From the PA28 pilot's remarks, it appears the closest proximity might have been during the RH steep turn. A lookout check had been done prior to this to the LHS, albeit there are blind spots e.g. under the wing/tip tank area.

They did recall, although they could not remember exactly at what point in relation to the steep turns, seeing a light GA aircraft in their 1-2 o'clock about 1nm away, heading 150° and slightly lower than them. At the time it caused them no concern as to its proximity, or even mentally backtracking its earlier flightpath which they broadly estimate (assuming no heading change) would have been about ½nm ahead of them.

Numerous other light GA aircraft were also sighted at various points during the flight, with avoiding action taken as required.

THE SOUTHEND APP CONTROLLER provided a comprehensive report which is largely the same as that in the ATSI report below.

After the incident North Weald A/G was contacted by telephone and they reported that the JP had departed them to the East at 1115 and subsequently had landed back there at 1158.

ATSI reports that the incident took place at 1123, approximately 6nm N of Southend Airport in Class G airspace of the London FIR. At the time of the incident, the Southend Approach Controller (APP) was providing the PA28 with an Approach Control service but without the use of an ATS surveillance system which was unserviceable.

At 1121, the PA28 established communications with Southend APP, the pilot reporting inbound from Andrewsfield at 2000ft, QNH 1009mb; that he had received ATIS Information and was requesting re-joining instructions. Responding, APP instructed the flight to *"…maintain two thousand feet until instructed report crossing the River Crouch right base join two four QNH one zero zero niner QFE one zero zero eight",* which was readback. APP explained in his report that he gave the PA28 joining instructions at 2000ft due to traffic both in the circuit and flying the ILS procedure at 1500ft. At 1123:10, APP asked the PA28 to report its position. The pilot reported *"…approaching the Crouch just taking avoiding action on a Jet Provost I think turning to the left"* and this was acknowledged. The ILS traffic then reported outbound and was given traffic information on the joining PA28 and in turn the latter on the former. To this the PA28 pilot responded *"Er copy the traffic (*own callsign) *now at the Crouch and there's a Provost circling at the sa-similar position just er west of Burnham* (on Crouch)." In reply the APP stated *"Roger understood er he's not er working me I'm afraid at the moment"* followed by further traffic information to allow the flight to integrate into the circuit.

In conclusion, there are no apparent implications for ATC in this incident.

UKAB Note (1): The recording of the Debden Radar commencing at 1118:50 shows the PA28, squawking 7000 with Mode C, tracking SE towards a position 6nm N of Southend. Meanwhile a primary only contact presumed to be the JP conducts a tight (1.5nm diameter) LH orbit just to the W of the incident position; it then rolls out on a track of ENE towards the PA28, to pass about 0.1nm behind it at 1123:22 just as the JP commences a similar orbit to the right closing with and overtaking the PA28. At the CPA the PA28 was at an alt of 2200ft amsl. The groundspeed of the JP was calculated from the radar to be approximately 250kt. The JP turned through the first 360° in just under 1min which equates to a rate 2 turn or about 60 ° AOB/2G at 240kt.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

A Member with extensive GA experience informed the Board that in certain circumstances it can be very difficult for the pilot of a low performance light ac to avoid a faster and higher performance ac. Although slightly difficult to assess, Members agreed that, after the JP's first tight turn and in the lead up to the second, it had right of way and thus the PA28 should have given way to it. It was also agreed that in the circumstances, the PA28 pilot could and should have taken lateral avoidance earlier; it was however accepted that this would probably have meant a turn to the left which would have obscured the JP by putting it below the starboard wing - a short wing drop during the turn might have helped. The Board agreed, however, that this would have been a better course of action than continuing to close with the JP - for about 30 sec, from the radar recording - until very late avoidance was required.

Nevertheless flight in Class G airspace depends on the 'see and avoid' principle and the JP crew, although apparently having been very conscientious in their lookout, had not seen the PA28 at any time after the first turn. It was agreed that in the initial stages - i.e. while in the first 360 ^{o} turn – the JP crew had probably not been able to see the PA28, there was a period of about 25sec straight and level between the turns when it should have been visible to them in their 11 o'clock, albeit almost on a line of constant bearing and with a reduced aspect size.

Although it is often difficult to determine which is the best unit to call, Members agreed that when conducting high energy manoeuvres a call to the nearest ATS unit can help the (APP) Controller gain a better understanding of the traffic picture, especially when he does not have the benefit of radar. In this situation however, the position of the incident made Southend the logical unit to call although it was about 6nm away.

Although accepting that the PA28's avoiding action had most likely been effective, Members unanimously considered that the lateness of this action had led to a reduced margin of safety in this case.

PART C: ASSESSMENT OF CAUSE AND RISK

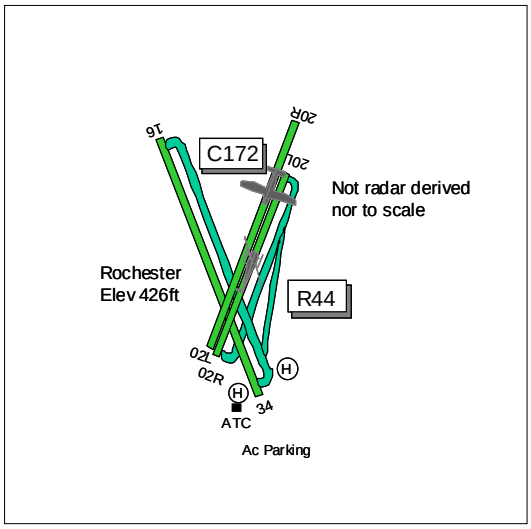
Cause: A non-sighting by the Jet Provost crew compounded by late avoiding action by the PA28 pilot.

Degree of Risk: B.

AIRPROX REPORT No 098/08

AIRPROX REPORT NO 098/08

Date/Time:	2 Jul 1246	
Position:	5121N 00030E (O/H RW20 Rochester - elev 426ft)	
Airspace:	ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	C172	R44
Operator:	Civ Trg	Civ Trg
Alt/FL:	5-20ft↓	5ft↑
	(QFE 998mb)	(aal)
Weather	VMC CLOC	VMC CLBC
Visibility:	10km	8km
Reported Separation:		
	10-20ft V/10m H	15ft V/25m H
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C172 PILOT reports flying a dual training sortie with a student and in receipt of an AFIS from Rochester Information on 122·25MHz; the transponder was switched off. The visibility was 10km in VMC and the ac was coloured white with strobes and anti-collision lights switched on. He was conducting a cct detail on RW20 and was on final approach having already reported 'final'. On short final he heard a request being made by an R44 student pilot to taxi (not using 'student' c/s but he had heard the pilot when inbound 1hr earlier when he had become temporarily unsure of his position and needed guidance) to which the Tower responded with 'hover taxi to 20'. The R44 pilot did not appear to understand this call and asked for it to be repeated which the Tower did, annunciating more slowly to 'hover taxi to 20'. By now there was another ac on finals behind his C172, a PA28 being flown by a solo student pilot who had also called final. At this point the R44 pilot commenced take-off on RW02 relief RW [RW02R] towards them, accelerating and then climbing to about 20ft passing close to their L. He had had the R44 in sight at all times but was concentrating on its manoeuvres rather than his student's landing for a touch and go. At the closest point they were in the flare and float at 3-4ft above the RW heading 200° at 65kt whilst the R44 passed 20ft above them and 10m clear to their L flying at about 50-60kt. During this phase they did experience some turbulence from the R44 but it was minimal. They continued with their touch and go and understood that the R44 at some point turned W across the path of the PA28 student on final. He called the Tower to state that they were on RW20 but made no further comment as he did not want to distract the R44 student. After completion of the sortie, he discussed the matter with the AFISO who said she would be contacting the R44 student's instructor and that she would be reporting the incident. He assessed the risk as medium.

THE R44 PILOT reports on departure solo from Rochester VFR and in communication with Rochester Information on 122·25MHz squawking with Mode C. The visibility was 8km in VMC and the helicopter was coloured blue; no lighting was mentioned. He was hover taxying down the taxiway 02 at 5ft agl and 5kt and saw a single-engine ac on final. He was asked by the controller if he could see the ac and, after stating he could, he side-swept to the R to give the ac more room then took-off after the ac landed to the W via RW02. The other ac passed 15ft below and 25m away and he assessed the risk as medium.

THE ROCHESTER AFISO reports the R44 was being flown by a solo student from Redhill on a land away at Rochester. On departure the pilot called for start, which was approved, and was told to call ready for lift. When the pilot called ready he was told to 'lift and hover taxi for RW20 QNH1013 and report ready for departure'. There was a C172 in the cct on base leg at the time. The R44 pilot hover taxied to the 02 numbers and reported ready for departure and, believing that he was departing RW20 from there, he was told to 'lift and depart RW20 at his discretion' and given the surface wind (S'ly 8kt). The pilot turned his helicopter to look down 02 and departed on 02. As soon as this was obvious, she pointed out that the active RW was 20 and not 02 and the R44 pilot confirmed what she had told him but continued on 02. She cautioned him about the fixed wing traffic which was now on short

final [RW20] at which point he stated 'roger, got him' but continued on 02. Previously when she started work she had been briefed that the R44 pilot had experienced problems on arrival so when he did not realise that he had departed on the wrong RW she believed it was safer to let him continue as he was clear of the C172. She identified where the remaining cct traffic was and ensured that there was no further risk to them, observing the R44 routeing to the W. Later she contacted the R44 student's instructor to inform him of the incident.

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac and a report from the aerodrome flight information service officer.

A pilot Member opined that from the information provided it appeared that perhaps the student pilot was not quite ready at that stage of his training programme to have undertaken his solo land-away. Although student pilots are briefed by their instructors prior to carrying out any training tasks, Members sympathised with the student pilot's predicament but it was clear that the student had not assimilated the information given to him by the AFISO with respect to the RW in use for departure. The AFISO had assumed that after the student had positioned his helicopter towards the RW02 threshold and was told to 'lift and depart RW20', he would depart SSW-bound. However, the student manoeuvred the R44 and took off, downwind, on the wrong RW (RW02R) and into conflict with the C172 landing on RW20 which had caused the Airprox.

The C172 instructor was aware from the RT of the impending departure of the R44 and had seen the helicopter as it commenced its take-off towards him, watching it pass 10m to his L and 20ft above during his landing flare whilst experiencing turbulence from the R44's downwash. The AFISO had passed TI on the landing C172 to the R44 pilot who had seen it and manoeuvred further to the R to give it a wider berth, estimating it passed 25m away to his L and 15ft below. Taking all of these elements into account and mindful that the incident occurred during the critical stages of both flights with the ac passing in close proximity, the Board believed that safety had not been assured during the encounter.

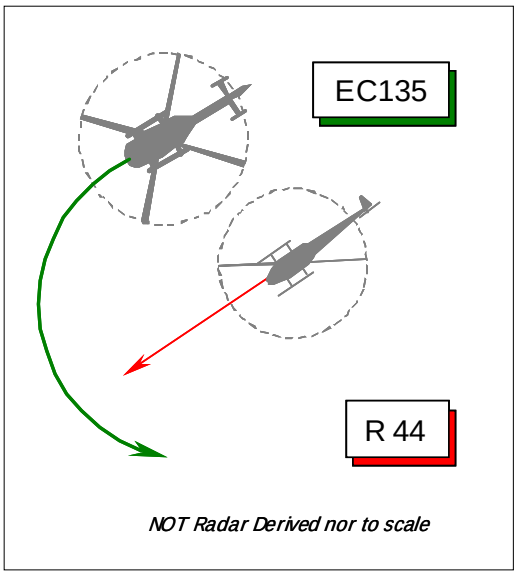
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The R44 student pilot took off on the wrong runway and flew into conflict with the C172.

Degree of Risk: B.

AIRPROX REPORT NO 099/08

Date/Time:	19 July 0953 (Saturday)	
Position:	5019N 00449W (10nm SSE St Mawgan)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	EC135	Robinson R44
Operator:	Civ Comm	Civ Pte
Alt/FL:	500-600ft agl	900ft RPS (1004mb)
Weather	VMC CLBC	VMC NR
Visibility:	10km+	>10km
Reported Separation:	100ft V/nil H	400ft V/1-2km H
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EC135 HELICOPTER PILOT reports that he had departed from St Mawgan on a Helicopter Emergency Medical Support (HEMS) mission and was in receipt of a FIS from St Mawgan APPROACH (SMG APP) on 128·725MHz, squawking A0020 with Mode C. His helicopter had a distinctive red/yellow colour-scheme and the HISLs and two landing lights were all on.

Operating VFR they were orbiting level at 5-600ft agl in a position between Trelowth and Polgooth [about 1½nm SW of St Austell at the OS Grid given of SW 994 505] whilst preparing to land at an unsecured landing site. Turning L through 240° at 60kt, another helicopter – a dark blue Robinson R44 – was first seen as it flew some 100ft directly underneath his helicopter heading southwesterly towards Lands End flying straight and level. No avoiding action was taken as the reported helicopter had already flown underneath before any action could have been taken. When questioned, SMG APP said they had no radar contact with the reported helicopter but had been in RT communication with its pilot. Apparently, the pilot of the reported helicopter had his EC135 in sight but still flew underneath them rather than remaining clear. ATC said they should have reported the traffic to him. After the reported helicopter cleared from their vicinity away to the SW, he was told it appeared on APP's radar display and SMG APP then realised it was in fact very low and close to the height at which they were orbiting. He assessed the risk as *"high"* because he was preparing to land at the time the R44 underflew him.

THE ROBINSON R44 HELICOPTER PILOT provided a frank account, supplemented with additional comment in a landline call with UKAB staff. He had lifted from a private helicopter landing site (HLS) at an Hotel in St Austell and was en-route under VFR to Lands End in VMC. He was under an "advisory" ATS from SMG APP on 128·725MHz and squawking with Mode C on. Whilst executing an en-route climb to an altitude of about 900ft at 90kt, he spotted a helicopter in a high-conspicuity colour-scheme about 1-2km away that appeared to be orbiting a fixed point. To avoid the other helicopter – the EC135 – he descended and reduced his height but maintained his course towards Lands End as the EC135 helicopter orbited above – he reported the minimum vertical separation to be 400ft but added later that it could have been less as it was difficult to estimate. Assessing the risk to be "low", he opined that he did not consider this to be an Airprox. His helicopter has a blue colour-scheme and the single HISL was on.

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

UKAB Note (2): The 0950UTC St Mawgan METAR was 28014G24KT 9999 FEW015 17/12 Q1012 BLU. The SCILLIES RPS for 0900 to 1000 UTC was 1006mb and the WESSEX RPS for this period was 1004mb.

SATCO (RAF) ST MAWGAN reports that the station-resident air ambulance EC135 helicopter, called ADC 'on task' to go towards the St Austell Bay area. The flight was transferred to APPROACH (APP) on 128·725 MHz, squawking A0020 and was provided with a FIS in transit towards St Austell. Although both primary and secondary radars were working, once operating in the St Austell area no radar return was seen from the EC135. At 0951:07, the R44 helicopter pilot called APP on the same VHF frequency, lifting out of the HLS of an Hotel in St Austell outbound to Lands End and requesting a FIS. The flight was placed under a FIS and passed both the Wessex and Scillies RPS. APP then requested clarification on the location of the R44; there was no radar return evident for that helicopter either. At 0952:11, the R44 pilot responded that he was 6nm SSW of St Austell to which APP immediately responded with *"..roger just be advised, St Austell Bay is active the air ambulance has just gone there on a red call".* The R44 pilot stated at 0952:24 that he was visual with the air ambulance. At 0953:33, the pilot of the EC135 reported *"..overhead the scene..we are just going to be landing shortly and we have just had contact with R44 passing underneath us.."* and asked if APP could see it on radar. APP replied that although the R44 was not visible on radar, its pilot had reported visual with the air ambulance on the same frequency.

Both helicopters were under a FIS on the same frequency and not visible on radar because they were both below radar coverage in the area that the Airprox occurred. APP provided traffic information to the R44 pilot about the air ambulance as soon as possible. The R44 pilot then elected to fly underneath the air ambulance despite information that it was 'on task'. When the air ambulance helicopter landed, the pilot called APP on the landline and asked if she knew what the other aircraft was as no information had been passed to him in the EC135. APP acknowledged that she could have passed the information on the R44 as it was likely to be in the same area. However, she did not do so as firstly, both helicopters were on the same frequency and the R44 had already reported visual with the air ambulance and secondly, because she knew that the EC135 was in contact with the police as it descended on site. She judged that the call could have been a hindrance in the circumstances bearing in mind the R44 had reported visual with the EC135.

As a result of this Airprox, the only lesson identified from an ATC perspective could be that APP could have called the R44 to the EC135 pilot. In hindsight, from this experience, the controller will probably do so in future.

MIL ACC had nothing further to add to the unit report.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts of the relevant RT frequency and a report from the appropriate ATSU.

The Board noted that the provision of ATC services at 'Newquay Airport' was now the remit of the recently-established civilian ATC Unit. Thus the military ATSU at St Mawgan referred to here at the time of the Airprox had now been dis-established. Nevertheless, it was clear that the incumbent St Mawgan SATCO had highlighted some important points in his report which had been endorsed by Mil ACC. It was plain that this Airprox had occurred at low-level and below St Mawgan's radar coverage. Thus without any radar contacts displayed to the controller from either helicopter just before the Airprox occurred, APP would not necessarily have been immediately aware of the close proximity of the R44 to the site of the EC135's mission as the R44 pilot departed from the hotel's HLS in St Austell and set course towards Lands End. Albeit that APP was only providing a FIS to both flights, it was clear that the controller had realised the potential for a conflict and had as soon as possible provided an appropriate warning to the R44 pilot about the EC135. It was evident from the pilot's own report and the RT transcript that the R44 pilot had acquired the air ambulance at that point; recognised it as such and had reported visual contact moments before the Airprox occurred. Unfortunately, APP had elected not to pass information similarly to the EC135 pilot about the R44 and it is reported that she thought at the time that this might have been a hindrance to the pilot. It was unfortunate that the EC135 pilot had not been aware of the R44 pilot's RT calls on the same VHF frequency and had not heard the interchange between the R44 pilot and APP. Controller Members understood why APP might not have wished to distract the air ambulance pilot: however, it was also clear that if the controller had passed traffic information to the EC135 pilot it would have given him forewarning of the other helicopter in the vicinity. The Mil ACC Advisor agreed that it would have been wise in these circumstances for APP to issue a warning to the EC135 pilot, which would clearly have aided the pilot's situational awareness – a point which it seemed the controller accepted. Whilst recognising that ATSs outside CAS will be changing significantly in the very near future, the Mil ACC Advisor added that a general reticence amongst controllers to pass traffic information or a warning under a FIS about ac in close proximity was being monitored by HQ Staffs and appropriate advice on this topic was being issued to units.

Helicopter pilot Members recognised the high workload of the EC135 pilot whilst communicating on his other VHF radio with emergency service units on the ground, flying his helicopter and looking out for other ac. The JHC Member believed that the EC135 pilot would have been closely focused on his task, looking to the inside of the turn for a suitable landing site adjacent to the incident location. Moreover he might have turned down the volume on the SMG APP frequency while talking to units on the ground on the second box. Whilst orbiting the incident there would also have been periods when the small R44 helicopter would have been astern in the EC135 pilot's blind arc and recognising that the R44 had lifted from an HLS that was not far from the incident, it might be that the EC135 pilot saw the R44 as soon as he was able. Some Members thought there was possibly an element of surprise here when the EC135 pilot stated he first saw the R44 beneath his helicopter. Another helicopter pilot Member familiar with HEMS missions thought it unusual that the EC135 was orbiting LHD if its pilot was flying the helicopter from the RH seat as per the norm, which might have made his lookout scan more difficult.

This Airprox occurred in the 'see and avoid' environment of Class G airspace where the pilots were equally responsible for sighting each other's ac in good time and affording appropriate separation. Nevertheless, in the helicopter pilot Member's view, good airmanship dictated that other pilots remain clear of air ambulance helicopters when they are spotted and identified as such, especially if they are observed to be orbiting at low-level. A GA pilot Member believed there was an education issue here; he suggested that the community could do more to publicise to GA pilots advice about the operating techniques of HEMS helicopters and thus increase the awareness of GA pilots. Nonetheless in his view the broad message was - if you see an air ambulance stay out of its way and give it a wide berth - it could act unpredictably. Other helicopter pilot Members agreed and good airmanship dictated that pilots give such ac as much leeway as possible to allow them to execute their life saving tasks with all speed and without any hindrance.

It was evident from both pilots' accounts that each had a slightly different perspective on the minimum separation that pertained in this situation. The EC135 pilot reported the R44 was first seen as it flew some 100ft directly underneath his helicopter flying straight and level whereas the R44 pilot has stated that the distinctive EC135 was spotted 1-2km away as it orbited. To avoid the air ambulance he reduced his height and passed the EC135 helicopter no closer than 1-2km away that was some 400ft above his helicopter's height – but later said it might have been less. Given that the EC135 pilot reported that he was orbiting at 500-600ft agl and the R44 pilot stated he was at 900ft WESSEX RPS (1004mb), with ground in the vicinity at an elevation of broadly 350ft, the two reports did not correlate closely. Members were also aware that it was more difficult to estimate the separation of an ac passing beneath another but the absence of recorded radar data did not allow the Board to resolve this anomaly. The Board had, therefore, to give equal weight to each pilot's report. Having spotted the distinctive EC135 helicopter, the R44 pilot could and should have, the Board agreed, given the air ambulance a wider berth even if that required a significant deviation from planned track. Moreover, it was extremely unwise to under-fly SAR, HEMS or Police helicopters at close quarters as they might land with little or no notice – this was an important lesson for the unwary and worth emphasising here.

In the Board's view the R44 pilot could have given the EC135 a wider berth when he first saw it and concluded that the cause of this Airprox was that the R44 pilot's chosen flight path caused the EC135 pilot concern. However with the R44 pilot visual with the EC135 throughout and able to afford wider separation if need be then the Members agreed unanimously that no risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The R44 pilot's chosen flight path caused the EC135 pilot concern.

Degree of Risk: C.

AIRPROX REPORT NO 100/08

Date/Time: 22 July 0917

Position: 5130N 00001W (2nm W of London City Airport - elev 19ft)

Airspace: London City CTR/ATZ (Class: D)

Reporter:	London City ATC	
	First Ac	*Second Ac*
Type:	B412 Griffin	Fokker 50
Operator:	HQ Air (Trg)	CAT
Alt/FL:	2000ft QNH (1026mb)	On climb-out
Weather	VMC SKC	NK NR
Visibility:	30km	NR

Reported Separation:

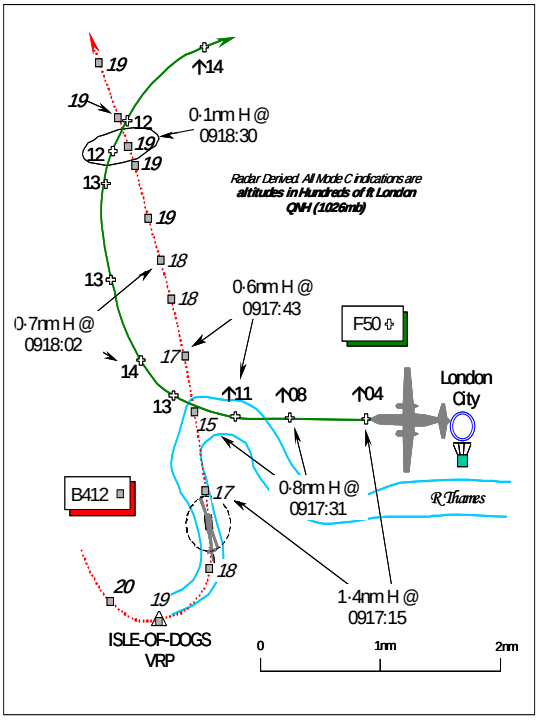
London City TOWER 200ft V/ 0.5nm H

1000ft V/200m H NR

Recorded Separation:

400ft Min V@ 0·7nm H

Nil H - 700ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE COMBINED LONDON CITY AIR & GROUND CONTROLLER (TOWER) reports that the F50 was lined up on RW28 for a Clacton 5T SID, outbound for Amsterdam, whilst the Griffin helicopter was in transit from Northolt to Wittering within the CTR eastbound along Helicopter Route H4 at 2000ft London QNH (1026mb). The Griffin was cleared to fly from London Bridge with a clearance limit of the ISLE OF DOGS VRP.

Traffic Information was passed to both crews about each other's ac whereupon the FK50 crew was given take-off clearance from RW28. Shortly after this he noticed that the helicopter's SSR return on the Tower ATM appeared to indicate that the Griffin crew had flown beyond the limit of their clearance – the ISLE OF DOGS VRP - and was now turning N. He instructed the Griffin crew to remain behind the departing F50 at all times and cleared the helicopter to leave the CTR to the N via the Lea Valley.

The Griffin helicopter continued northbound, crossing the climb-out to RW28 with the F50 in close proximity. Looking out of the Tower window it was not clear if the helicopter had crossed in front of, or behind the F50. The ATM indicated that the helicopter had passed in front of the F50.

After the aircrafts paths had crossed he instructed the Griffin crew to descend to an altitude of 1000ft London QNH (1026mb) to allow the F50 to climb above the helicopter. The pilot of the F50 then reported that he was visual with the helicopter and was remaining at an altitude of 1000ft so he then instructed the Griffin pilot to climb to an altitude of 2000ft to achieve some form of separation. The ac's paths crossed again - after the F50 had turned R to follow the SID - and the F50 pilot reported that he was happy to climb.

THE BELL 412 EP GRIFFIN HELICOPTER PILOT reports that he was in transit from Northolt under Special VFR through the London CTR at 2000ft London QNH (1026mb) in a clear sky with an in-flight visibility of 30km.

Whilst transiting H4 eastbound under SVFR with Heathrow Special VFR controller, they were cleared to route to LONDON BRIDGE and hold. Switching to London City on 118·07MHz, on contact with TOWER they were cleared through LONDON BRIDGE and told to expedite eastbound to ISLE OF DOGS/Lea Valley due to the imminent departure of traffic from RW28. They called at the ISLE OF DOGS, at 2000ft London QNH, but were not given

instructions to hold. TOWER then released the F50 for take-off, which they had been visual with from just N of the ISLE OF DOGS lined-up on the threshold of RW28 some 2½nm away. Whilst his helicopter was heading 350° at 120kt, the F50 crew stopped their climb at an altitude of 1000ft London QNH, as requested by TOWER, and under flew his helicopter by 1000ft before turning R and commencing a further climb to the NE. At no time was there a risk of collision as there was 1000ft vertical separation and they were visual with the F50 and the latter's crew had also reported to this effect.

The controller then apologised for the situation, cleared them both to their en-route frequencies and they left the CTR to the N at 2000ft London QNH. Subsequently, an RT message was broadcast about an Airprox on their monitored frequencies by a different voice as they departed northbound up the Lea Valley. However, they were unsure if the broadcast was made on the London City TOWER frequency or GUARD.

THE F50 PILOT reports that after they were cleared to LINE-UP they received a TAKE-OFF clearance on RW28 which was subsequently cancelled. London City TOWER then issued traffic information about a helicopter that was proceeding southbound at that time. TAKE-OFF clearance was then issued. The Griffin helicopter crew was instructed by TOWER to remain behind his ac at all times. Climbing through 800ft London QNH, TCAS enunciated a TA at which point both he and his co-pilot became visual with the helicopter. The Griffin crew was then told to climb to 2000ft London QNH. As their own climb to 3000ft London QNH on departure would most probably have resulted in an RA, they stopped their climb at 1500ft for about 30sec to clear the helicopter traffic. When they were clear of the Griffin they continued their climb and informed TOWER that they would be filing a report.

ATSI reports with RT transcript that the London City TOWER position was being operated by a mentor and trainee controller. The F50, on an IFR flight from London City to Amsterdam, was issued with a Clacton 5T SID from RW28. The initial routeing is to:

'Climb straight ahead. At I-LSR D1.5 turn right onto LON VOR R081 by LON D19. Crossing LON D23 at 3000'.

The F50 had been cleared to BACKTRACK the runway to vacate and HOLD at 'MIKE'. The B412, eastbound VFR on H4 within the Class D airspace of the London City CTR, established communication with City TOWER at 0912:59 and was instructed to hold W of LONDON BRIDGE. After the F50 was cleared to LINE-UP and WAIT, traffic information, about another departure, an Avro RJ aircraft, was issued to the B412 pilot just after 0913:30, *"..traffic information is an RJ just departed runway 2-8 will be turning north abeam the dome report visual"*. He reported visual and was instructed at 0914:00, "..[C/S] *you're cleared eastbound along H4 clearance limit is ISLE OF DOGS V-R-P"*. The pilot read-back "[C/S] *cleared eastbound H4 to ISLE OF DOGS"* and was then asked to make *"..best speed"* which, after the request was repeated, the B412 pilot acknowledged.

The F50 was cleared for TAKE-OFF by the trainee at 0915:30 but the Mentor immediately took over the frequency and transmitted an instruction for the FK50 crew to HOLD position. This was because of the position of the B412. Traffic information was issued to the FK50 crew about the B412, *"Merlin* (sic) *helicopter 12 o'clock range 3 miles shortly taking a southerly turn"* i.e. towards the ISLE OF DOGS. After traffic information was passed to the B412 crew – *"Fokker 50 departing 2-8 turning North after departure",* the F50 crew was cleared for TAKE-OFF, the trainee having now taken back the frequency.

Subsequently, as the B412 did not hold at the ISLE OF DOGS as expected, the mentor asked the pilot his intentions. The pilot replied after 0917, *"now at the ISLE OF DOGS to route north to Lea Valley…"* and was instructed by TOWER to *"..remain behind the departing Fokker 50 at all times cleared Lea Valley northbound"*. Just before 0917:30, the pilot read back *"Cleared..Lea Valley north..*[C/S]*"* but did not acknowledge the restriction to remain behind the F50. The radar photograph shows the B412 heading N, just crossing the S bank of the Thames at 1600ft London QNH. The mentor apologised to the F50 crew about the B412 routeing S to N and the F50 crew reported visual with the helicopter. Believing that the F50 would climb above the B412, the mentor asked the helicopter's pilot *"..can you..reduce initially to not above a thousand feet"*. However, as the pilot of the F50 reported *"we will be crossing below him* [the B412]*..we'll stay at our level"* the B412 crew was instructed to climb to 2000ft. The pilot of the F50 reported *"..currently 600ft below the..helicopter"* and confirmed to TOWER that he was happy to climb again once it had passed.

If the B412 pilot had been specifically instructed to hold at the ISLE OF DOGS, any ambiguity about the helicopter's clearance would have been overcome. Additionally, the mentor did not ensure that a full readback was obtained from the B412 pilot, when he was instructed to pass behind the F50.

UKAB Note (1): The LATCC (Mil) Radar recording shows the B412 Griffin helicopter transiting along Helicopter Route H4 toward the ISLE OF DOGS. The B421 passes this VRP at 0916:44 and continues to follow the course of the River Thames as the helicopter turns northerly, descending to 1700ft London QNH (1026mb). At this point - 0917:15 - the F50 climbs into radar coverage, on departure from London City airport, through 400ft London QNH (1026mb), 1·4nm away. The helicopter crosses 0·8nm ahead of the F50 from L – R indicating 1500ft London QNH, some 700ft above the F50 as the latter climbs through 800ft and continues astern of the B412. Maintaining a generally NNW'ly course the B412 climbs back to 1800ft London QNH as the F50 levels at broadly 13-1400ft London QNH whilst turning R to the W of the helicopter's track. Minimum vertical separation of 400ft is apparent at 0918:02, as the F50 closes off the B412's port quarter 0·7nm away. Whilst the F50 turns about easterly, the B412 ascends to a maximum indicated altitude of 1900ft and is under-flown by the twin just after 0918:30, at 1200ft London QNH when vertical separation of 700ft is evident on Mode C.

HQ AIR (TRG) comments that there are some differences between the ATC clearances and what the crew of the Griffin thought they had been cleared to do. These misunderstandings meant that the Griffin was flown beyond the ISLE OF DOGS VRP and in front of the departing F50. As both crews had each other in visual contact throughout, the risk of collision was reduced.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The NATS Ltd Advisor contended that from the London City TOWER perspective the controller considered the helicopter to be operating under VFR in the Class D CTR. The Griffin crew was issued with a clearance to the ISLE OF DOGS VRP and that was the extent of their clearance from TOWER – in effect, TOWER said, their 'clearance limit' – where the Controller expected them to hold (but did not actually use that phraseology). The Advisor pointed out that the MATS Pt 1 states that a 'clearance limit' is the point to which the flight is granted a clearance – here the ISLE OF DOGS VRP – and as such the Unit believed that the Griffin crew had been instructed to go no further than this VRP which, in the Unit's view, had been read-back correctly by the helicopter crew. However, it was pointed out that the CAP413 RT Manual Edition 17 - at Chapter 4 Page 2 - only made reference to a 'clearance limit' when used in conjunction with taxy instructions and is not generally accepted phraseology for use in any other context. Controller Members agreed that the pilot of a military helicopter might not reasonably be expected to be intimately aware of the content of MATS Pt 1 or indeed CAP 413, albeit that the terminology used seemed fairly self evident to pilot Members. The AAC helicopter pilot Member agreed and in his view it seemed plain that the Griffin crew should have held at the VRP in the first instance. He also took care to point out the individual training conducted by military pilots in order that they can become familiar with operations on these routes. Nevertheless, it was evident that the Griffin crew had not understood TOWER's instruction as they were not cleared to proceed any further than the ISLE OF DOGS VRP but patently did so. Some Members believed that when the crew was instructed in a following transmission to make *"..best speed"* that this might have seemed to have varied the earlier instruction in some way. Furthermore, the read-back from the Griffin crew was not exactly as transmitted by TOWER which did not include the imperative element and Members believed that this was sufficient reason to challenge the read-back given by the crew – but neither the Mentor nor his Trainee did so. The NATS Advisor questioned this perspective and stated that controllers would not expect to hear the words "clearance limit" included in a read-back. Whilst CAT pilot Members were familiar with the term, experienced controller Members were of the view that use of the term 'clearance limit' was not in common usage to ac in the air and agreed with the ATSI view that there was ambiguity about the helicopter's clearance. Whilst Members recognised that TOWER would have been unaware that there was a Student/Instructor crew in the Griffin, the same combination was operating TOWER and all the more reason not to use incorrect phraseology when instructing trainees and instead use, for example, "..cleared eastbound H4 to ISLE OF DOGS and **HOLD**", which would have been plainer and entirely self-evident. Noting that this was a Military crew operating in CAS as GAT, which would only fly the helicopter routes on an infrequent basis, Members believed this was all the more reason to 'spell it out' and keep instructions as straightforward as possible. The Board was advised by the current Editor of MATS Pt 1 that "clearance limit" is not a recognised term approved for use on RT in this context and "hold" should have been used. This brought an end to a wide-ranging debate about this topic and the Board concluded that there was a significant disparity between common practise at the Unit; the terminology in MATS Pt 1 compared to the civilian RT phraseology publication CAP413 for use by pilots and the perceived absence of the "clearance limit" terminology in the military sphere for use by military pilots and controllers. The Members agreed

unanimously that this topic should be reviewed by such as the CAA's RT Working Group – which included military representation - and that a Safety Recommendation was warranted. Therefore, in light of this Airprox, the Board recommended that in concert with the MoD, the CAA should, for the benefit of controllers and pilots alike, review references to the term 'clearance limit' in MATS Pt 1; CAP413 and the applicable JSPs to ensure consistency both of meaning and usage of this RT phraseology.

Having exited the Class A London CTR, in the case of a VFR flight transiting Class D CAS separation is achieved against the IFR flight by the pilot of the VFR ac being given traffic information by ATC so that he can establish separation visually. Furthermore, traffic information must also be given to the IFR flight about the VFR ac – hence the reason for the Mentor's earlier interjection rescinding the F50's take-off clearance to pass traffic information about the B412 helicopter. When the Mentor realised that the Griffin was not in fact taking up a hold at the ISLE OF DOGS as he anticipated, there was, in the Board's, view still an opportunity to prevent this Airprox by sending the Griffin back to the VRP or instructing the crew to slow down. Subsequently, when TOWER instructed the Griffin crew to *"..remain behind the departing Fokker 50 at all times cleared Lea Valley northbound"*, the pilot merely read back *"Cleared..Lea Valley north..*[C/S]*",* but did not acknowledge the restriction to remain behind the F50. Controller Members believed that the absence of this crucial factor within the Griffin crew's reply to TOWER's instructions should have been challenged. That TOWER did not do so was a lost opportunity to forestall this Airprox and the Board agreed that the absence of a challenge to the limited readback given was a Contributory Factor. Some contended whether the Griffin crew actually received that part of the transmission made by TOWER, but as they replied, on balance the Board concluded if it was received it was clearly not understood – thereby highlighting the value of the principle of a read-back. Thereafter, having tripped at the first hurdle and flown past the VRP, clearly the Griffin crew should have given way to the departing F50 and adjusted their flight path accordingly. However, it was evident that they maintained their northerly course toward the Lea Valley as included in their clearance and there was, in the Board's view, an element of ambiguity here. Although TOWER had proffered a solution to the subsequent conflict by instructing the helicopter crew to descend, the radar recording and RT transcript reflected that it was the IFR ac's crew - the F50 – that had elected to take their own *visual* avoiding action to stay beneath the Griffin. This was not a normal situation by any means and it was fortunate that this *'volte face'* was readily understood by all concerned at the time or further confusion might have ensued and exacerbated the situation. As it was, with both crews visual with each other's ac, the helicopter crossed ahead of the FK50 by 0.6 – 0.8nm, the radar recording reflected, just before the twin under-flew the Griffin with vertical separation in the order of 6-700ft from Mode C data. Subsequently, it was evident that the minimum vertical separation of 400ft occurred as the F50, whilst turning onto the track of the SID, passed to the W of the helicopter and then under-flew it directly with 700ft of vertical separation evident, before re-commencing the climb – and all this with each crew visual with one another's ac and now aware of their intentions. The Board agreed that the cause of this Airprox was that having passed the Isle of Dogs VRP, the B412 Griffin crew did not comply with TOWER's instruction to pass behind the Fokker 50 and flew into conflict with it. Nevertheless, despite this somewhat confused scenario at the distances reported here with each crew visual with one another's ac, no risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Having passed the Isle of Dogs VRP, the B412 Griffin crew did not comply with TOWER's instruction to pass behind the Fokker 50 and flew into conflict with it.

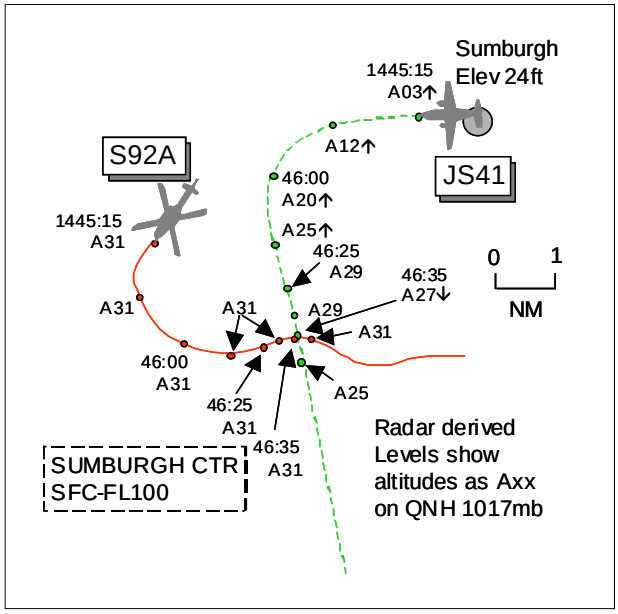
Degree of Risk: C.

Contributory Factor: TOWER did not challenge the absence of a readback by the B412 Griffin crew.

Safety Recommendation: In concert with the MoD, the CAA should, for the benefit of controllers and pilots alike, review references to the term 'clearance limit' in MATS Pt 1; CAP413 and the applicable JSPs to ensure consistency both of meaning and usage of this RT phraseology.

AIRPROX REPORT NO 101/08

Date/Time:	22 Jul 1446	
Position:	5949N 00123W (4·5nm SW Sumburgh - elev 24ft)	
Airspace:	CTR	(Class: D)
Reporter:	Sumburgh Radar Controller	
	First Ac	*Second Ac*
Type:	JS41	S92A
Operator:	CAT	Civ Trg
Alt/FL:	3000ft↑ (QNH 1022mb)	3100ft (QNH)
Weather	VMC CLAC	VMC CLAC
Visibility:	10km	>10km
Reported Separation:	800ft V/0·5nm H	500ft V/0·5nm H
Recorded Separation:	>400ft V/Nil H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SUMBURGH RADAR CONTROLLER reports the S92A was carrying out training and had just completed a radar vectored ILS for RW27. He briefed the crew that there were 2 departures which would climb out below their ac and therefore their go-around clearance included a climb to 3100ft to allow the departures to 2100ft. Whilst the S92A was carrying out its go-around, TWR called for departure clearance on the JS41 followed by a SF340 from RW27. His plan was to put the JS41 L onto heading 180° climbing to 2100ft and the following SF340 on 250° climbing to 2100ft, released subject the JS41 +1min. TWR advised that the SF340 was still at the hold so he told TWR that he would call back with clearance for the SF340 as he could probably improve on that. He then issued clearance on the JS41 with a L turn heading 180° climb FL100, release subject radar. In his mind he was giving the release subject radar as he was still thinking the JS41 would climb to 2100ft, as per his plan, and at the time the S92A was not through 2100ft in the climb. The TWR controller read back the clearance correctly and he, the Radar Controller, did not pick up his own error at this point. Once the S92A had passed through and was clear of 2100ft he telephoned TWR and released the JS41. TWR then telephoned him with the departure time. He first realised something was wrong when he observed the JS41 climbing through 2300ft on Mode C. After looking at his fps and realising that he had given clearance to FL100, he gave the S92A avoiding action. He telephoned TWR to ask for the JS41 and was told it had already been passed across to him. He called the JS41 flight to see if it was on frequency with the intention of passing avoiding action and the crew replied immediately stating that they had the traffic on TCAS and were descending. Once the conflict was resolved he put the S92A on a heading to the E to keep it clear. He informed the crews that he had made a mistake and would be filing a report. As an afterthought he felt he was not as current as he should have been on the sector having spent most of his time recently as the Watch Supervisor. He had arranged to 'plug-in' on the day in order to get some time on sector to achieve his minimum hours in his 45 day period.

THE JS41 PILOT reports outbound from Sumburgh IFR and in receipt of an ATS from Sumburgh Tower then Radar squawking an assigned code with Mode C. The departure clearance was 'after departure turn L heading 180° climb FL100'. During the frequency change about 3nm SW of Sumburgh, traffic was seen on TCAS and the turn was continued onto 180° at 170kt with climb above MSA. Approaching 3000ft a TCAS TA was received followed by an RA 'descend' which was actioned. At the time the visibility was 10km flying 1000ft above cloud in VMC and a helicopter was sighted, possibly a Sea King, 0·5nm away crossing R to L, coloured white and red flying straight and level. At the CPA it was seen to pass 800ft above and 0·5nm away with minimal risk of collision.

THE S92A PILOT reports flying a local sortie from Sumburgh IFR and in receipt of a RAS, he thought, from Sumburgh squawking 2630 with Modes C and S. The visibility was >10km flying 1000ft above cloud in VMC and the helicopter was coloured white/orange with LED anti-collision and nav lights switched on. Following a go-

around from a training ILS approach, the missed approach procedure was completed and ATC requested that they continue the climb to 3100ft. Once level heading 220° at 110kt he monitored his student co-pilot whilst he completed the go-around checks and planned his next approach. At the same time he noticed a TA on TCAS as Radar gave them an avoiding action R turn heading 240°. As he took control and turned R he spotted a departing SF340, he thought, in his 4 o'clock approximately 500ft below and 0·5nm away. Both ac were on diverging tracks and although in close proximity, he assessed there to be no risk of collision. Sumburgh Radar stated that they, ATC, had been at fault and would be filing an Airprox.

ATSI reports that the controller was operating as the Sumburgh Radar Controller, which is located at Aberdeen Airport. He described his workload as light to medium. He commented that he was also the acting Watch Manager for the afternoon shift. He explained he had recently spent time acting as a Watch Manager to cover annual leave. Accordingly, he had only had a limited time for operational duty and was concerned that he might not achieve the required number of hours in the current 45 day period, especially as he had a period of leave booked later in the month. Considering his currency on the Sumburgh Sector, he decided to undertake operational duty for the sector, adding that another controller was available, if necessary, to allow him to return to Watch Manager duties. He thought that this lack of currency might have been a causal factor to the Airprox. Additionally, prior to taking over the Watch that day, he had attended an ATC project meeting and had been trying to resolve some rostering problems.

The Airprox occurred within Class D airspace of the Sumburgh CTR. The 1420 Sumburgh weather observation: Surface wind 230°/14kt; visibility in excess of 10km; Cloud few at 800ft and broken at 1800ft; Tempo, broken at 800ft; QNH 1017MB. Sumburgh ATC is not radar equipped.

The S92A was carrying out an IFR training detail at Sumburgh Airport. At 1435, the helicopter reported established on the LLZ, RW27, and was cleared for the ILS approach. The pilot was instructed to carry out a standard go-around after the approach i.e. *'Continuous climb to 2100. Initially straight-ahead to until abeam VOR SUM then turn left to establish on SUM VOR R250. On reaching 1500 (1479) turn left to VOR SUM climbing to 2100 (2079) or as directed'*.

The JS41 was planned to depart Sumburgh, routeing S'bound on Advisory Route (ADR) W5D. The procedure for departing traffic from Sumburgh to route via ADRs is: *'When a flight intending to route on advisory routes W5D or N560D, requests start up, the Sumburgh ADC controller, or his assistant, will pass the relevant squawk directly to the Sumburgh Radar controller to warn of the impending outbound aircraft. The Sumburgh ADC controller will also advise the Sumburgh Radar controller of the runway for departure to assist planning, and confirm the aircraft type and requested level. The procedure only applies to aircraft operating in accordance with the Scottish Standing Agreement (via W5D clearance to maintain FL100). The Sumburgh ADC controller shall ensure that they obtain a Departure Clearance/Local Restriction, before the aircraft is permitted to depart.'* Accordingly, the Sumburgh ADC telephoned the Radar Controller to pass the relevant details about 2 departing ac from RW27. The first of these was the JS41. Having received the details, the Radar Controller informed the ADC that the S92A was at 7nm for RW27. It was agreed that the helicopter would be able to complete its approach this time, as previously, it had to be turned off, due to other traffic.

In view of the pending outbounds, the Sumburgh Radar Controller changed his plan, with reference to the S92A's go-around instructions and informed the pilot *"correction to my last there's a couple of more departures gonna be underneath you so on the go-around it'll be own navigation and back to Sierra Uniform Mike climbing altitude three thousand one hundred feet"*. The pilot read back *"On go-around it'll be three thousand one hundred feet (callsign) and to hold"*. He was warned it might be necessary to hold at SUM but the current approach would be completed before the 2 ac departed. The reason for the climb to 3100ft was to allow the outbound aircraft to climb to 2100ft initially. (2100ft is the minimum terrain safe altitude at Sumburgh.)

The Radar Controller telephoned the ADC, at 1438:45, to inform him the S92A was at 3nm. The go-around was approved by the latter controller *"clear for low approach go around runway Two Seven not below four hundred feet over the road"*. This clearance was issued to the S92A, its pilot confirming he would be above 400ft over the road.

At 1442:40, the ADC telephoned the Radar Controller to explain the situation with the outbound traffic. The JS41 was backtracking RW27 and the other departure was at the holding point. The Radar Controller issued a clearance for the JS41 *"on a left turnout heading of One Eight Zero degrees climb Flight Level One Hundred"*. The ADC read back the heading instruction but not the cleared level. This was not challenged by the radar controller.

He later explained that as FL100 is the Standing Agreement Level for W5D it is not always included in the clearance message and, therefore, is not read back. He reasoned that this could explain why he had not noticed its omission on this occasion. He annotated the JS41's fps with climb to FL100 in the level box. However, his intention had been to restrict the JS41 to 2100ft i.e. 1000ft below the S92A. Although he had stated the JS41's cleared level as FL100 and had annotated the fps accordingly, he was now under the impression that he had issued clearance only to 2100ft. He informed the ADC that the JS41's release was subject to radar. His plan was to allow the JS41 to depart to 2100ft, having ensured that vertical separation would exist with the S92A climbing to 3100ft. He said he would call back about the other ac's departure clearance.

When the S92A flight reported going around, the Radar Controller asked *"will you be happy to go straight beacon outbound at three thousand one hundred feet and I'll descend you once you're on your outbound leg"*. The pilot requested to enter the hold and this was approved at 3100ft. Shortly afterwards, in accordance with his plan, the Radar Controller informed the ADC that *"JS41 c/s released"*. Subsequently, he received a telephone message from the ADC that the JS41 was airborne at 1445. By now, the pilot of the S92A had reported level at 3100ft, about to turn L to return to the hold.

The Radar Controller observed the JS41 on the radar display, on a crossing track to the S92A i.e. the former was turning onto its cleared heading 180°, inside the track of the latter routeing towards SUM. Because he believed that vertical separation, in accordance with his plan, existed between the 2 flights he turned his attention to another helicopter, which was reporting airborne from the Regalia, which is situated some 70nm SE of Sumburgh. However, scanning the radar display, he noticed that the JS41 had climbed above 2100ft. Cutting short the message being received from the other helicopter, he transmitted at 1446:27 to the S92A *"S92A c/s avoiding action turn right immediately heading of two four zero degrees"*. Although, at the time, there were part simultaneous transmissions, the pilot of the S92A heard the turn instruction replying *"Right turn two four zero S92A c/s"*. Shortly afterwards, the pilot reported *"we got the traffic visual now"*. Having not received an initial call from the JS41 flight, probably because the other helicopter had been transmitting, the Radar Controller queried if it was on the frequency. The pilot replied *"we are visual with the traffic we've had er TCAS descent on that"*. The controller apologised and then instructed the S92A flight to head 090°, to *"take you away from the traffic he's visual and passed behind you"*. The pilot of the S92A confirmed his visual sighting of the traffic.

The radar recording details supplied by Aberdeen ATC reveal that when the avoiding action instruction was issued to the S92A (1446:27), the 2 ac were on converging tracks, 0·6nm apart. At the time, the S92A was maintaining 3100ft and the JS41 2900ft. Thereafter, when they were 0·2nm apart 1446:35 and still converging, the JS41 had commenced descent in reaction to its TCAS RA and was passing 2700ft. (The JS41 remained at 2900ft, its maximum altitude, for two radar sweeps before descending.) It is estimated that when the horizontal distance reduced to zero, the JS41 was between 2700ft and 2500ft.

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 of actions taken by the ANSP since the Airprox. Two Safety Notices have been published, one highlighting procedures to be taken by controllers when they are concerned about lack of operational currency and a second highlighting safety risks caused by inappropriate distractions of controllers at operational positions. A Supplementary Instruction was also produced detailing the production and use of extra fpss when the level box of a fps becomes cluttered, usually occurring when an ac is on a training flight. Sumburgh controllers are now required to read back any level given to them by Radar, even if it is the Standing Agreement level, and appropriate refresher training was undertaken by the radar controller involved.

Members and Advisors endorsed the Chairman's opening remarks in which he warmly commended the Radar Controller for conscientiously reporting this incident. The Radar Controller had formulated a plan to resolve the potential confliction between the JS41 and S92A but had then not executed it accordingly. The altitude restriction of 2100ft proposed for the JS41's departure release was not passed to the Sumburgh ADC nor written on the fps. Instead, the controller gave FL100, the Standing Agreement level and wrote FL100 in the level box on the fps. Furthermore, the Sumburgh ADC did not fully read back the release, omitting the level, which went unchallenged by the Radar Controller thereby denying the Radar Controller a cognitive reinforcement of the clearance passed. At the time, the Radar Controller opined that a readback was not always given, as FL100 was the standard level

for a W5D release so it was not always included in the clearance. However, the Radar Controller had passed a heading and level to the Sumburgh ADC which Members agreed should therefore have been read back. An ATCO Member reminded all those present that controllers are recommended to use the acronym 'WAYSRAYL' as SOP - 'Write As You Speak, Read As You Listen' – as this captures the intent when passing and acknowledging clearances. However, one Member expressed doubt that, given the Radar Controller's actions in passing FL100 and writing it on the fps, whether a readback would have broken his train of thought. These basic, minor slip-ups led ATCO Members on to discuss the currency issues, highlighted by the Radar Controller and broached within the ATSI report, as well as the difficulties faced when controllers are expected to carry out extraneous duties whilst also actively controlling. Members understood the 'time' pressure that the Radar Controller felt he was under whilst attempting to achieve the required minimum number of hours to remain current and commended the NATS follow-up action to help him post incident. Being the focal point for the on-duty Watch, the Watch Manager's task involves various duties including rostering and implementing SRATCOH breaks throughout a shift, as well as 'run of the mill' daily supervisory tasks such as being available to respond to questions. These extraneous duties can easily impact on the WM/controller's workload whilst being plugged-in at the console. Ultimately, taking all of these elements into consideration, Members agreed that at the end of the day, Sumburgh Radar Controller released the JS41 into conflict with the S92A and this had caused the Airprox.

Turning to risk, the Radar Controller noticed the JS41 climbing above 2100ft and had attempted to resolve the confliction by giving an avoiding action R turn to the S92A flight as the JS41 had not yet checked-in on his frequency. At this time the S92A crew saw the JS41 on TCAS and then visually as it passed through their 4 o'clock range 0·5nm and 500ft below. Fortunately during the period that the JS41 crew was changing between Tower and Radar they had seen the S92A on TCAS as they turned to establish on the assigned heading of 170° before receiving a TA then RA 'descend. The RA guidance was followed and the S92A was seen visually 0·5nm away as it crossed from R to L above. This visual sighting and the prompt robust actions taken by the JS41 crew allowed the Board to conclude that any risk of collision had been quickly and effectively removed.

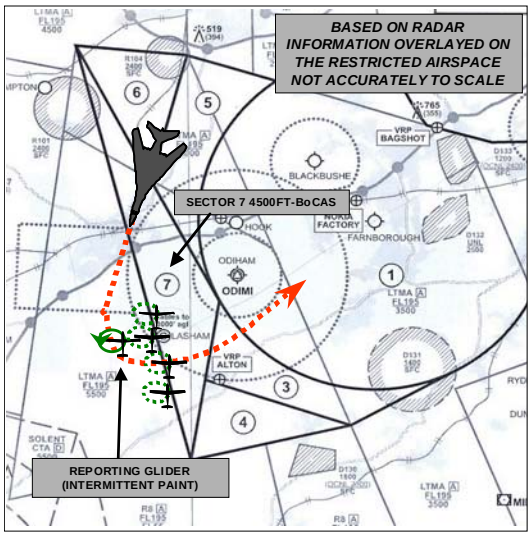
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sumburgh Radar Controller released the JS41 into conflict with the S92A.

Degree of Risk: C.

AIRPROX REPORT NO 102/08

Date/Time:	16 July 1440	
Position:	5112N 00102W(1nm NW of Lasham)	
Airspace:	Odiham MATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Grob Astir Glider	B-1B
Operator:	Civ Pte	Foreign Mil
Alt/FL:	1400ft	3000ft
	(QFE 1002 mb)	(N/K)
Weather	VMC NR	VMC NR
Visibility:	>30nm	NR
Reported Separation:		
	300ft V/<100m H	NR
Recorded Separation:		
	NR (See UKAB Note (2))	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GROB ASTIR PILOT reports flying a soaring flight in a white and red glider with no lights or SSR fitted. When passing through heading 270° while circling 1nm NW of Lasham at 50kt, he saw a B-1B 2-3 nm away holding for the Farnborough Air Show. The ac was to the NE of Lasham and when it was about 050° from his position, it banked left towards Lasham and tightened its turn. He descended from his initial height of about 1700ft QFE to about 1400ft QFE during his turn and flew along the centreline of Lasham RW09. During the turn the B-1B passed through the area where he and one other glider were orbiting in a thermal but the closing speed was too high for him to make a turn away. At the time he was turning left from 290° to approx 270° so he pushed the nose down and selected full airbrake to descend. The B-1B passed within 100m of him, both vertically and horizontally, and with its steep angle of bank his view of it was a side profile.

On its course the B-1B and his ac were initially at the same height but his descent reduced the collision risk. The B-1B's proximity was close enough for him to be concerned about wake turbulence. After the ac had passed he continued to descend to 1000ft QFE and turned into a right hand circuit for Lasham RW27 N side grass.

He provided a diagram of the event.

THE B-1B PILOT reports that while holding for their 'push' to the air show, their ac was in the vicinity of a glider field. They were at their assigned altitude and at their assigned holding point and were following ATC instructions. They visually acquired 10-12 gliders between the hold and their run-in. They were given 'advisories' from ATC of the traffic while they were holding. At the reported time of the incident they had just been given clearance to enter the air show's restricted airspace from their assigned holding point. Their holding point was to the W of their run-in track and they had left the hold point and were arcing onto the run-in track. They were at 250kt and their holding altitude of 3000ft did not change until they commenced the turn onto the run-in for the air show on a heading of 060°. Although he saw the glider slightly late at a similar level, by the time they passed they were above it and therefore he assessed the risk as being low.

THE FARNBOROUGH AIR SHOW CONTROLLER reports that he was notified of the Airprox 2 weeks after the event so his recollection of it is unclear.

He was controlling a B-1B which was holding to the W of Farnborough prior to its display. It was in a N/S race track about 10nm W of Farnborough. He believed that the B-1B was under his own navigation but some vectors were suggested to keep it in a reasonable area. The pilot was warned about the vicinity of Lasham and given TI on a number of contacts believed to be gliders. As the B-1B was Southbound he believed that it was commencing a right turn to the North but since the time for the run in was rapidly approaching, he told the pilot to commence

his turn in. He then noticed that the ac had reversed his turn to the left and flew very close to Lasham. He believed that he passed further TI and then transferred it to the display frequency.

ATSI reports that the incident occurred during the Farnborough International Air Show. It took place 1nm W of Lasham aerodrome, a glider launching site situated in Class G airspace. Lasham is 11nm from Farnborough and on the centreline for RW06. A number of Restricted Areas (Temporary) were established around Farnborough to provide protection to show ac during their flying display. The incident occurred below the base and just outside the lateral limits of one of these RA(T)s.

The B-1B had departed from Fairford and was due to display at the Air Show. The pilot established communications with Farnborough Radar at 1410, reporting at 2500ft. The flight was wearing a previously-allocated Farnborough discrete SSR code with Mode C. The controller advised the flight it was identified and that a RIS was being provided. At this time, the B-1B was about 10nm N of Lasham, tracking S. The controller informed the pilot that the flight's show slot had been delayed by 10min which resulted in the ac adopting a right-hand holding pattern N/S commencing about 5nm N of Lasham. Remaining in this impromptu hold, the B-1B was provided with TI on both known and unknown traffic. At 1420, the flight was transferred to Farnborough Director. On first call, the current QNH (1021mb) was issued. No level of service was established: however, it is apparent from the Director's written report that it was his intention to provide a RIS.

A Radar Information Service (RIS) is described in MATS Part 1, Section 1, Chapter 5, Page 3. It states that a "…*RIS is 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 aircraft whether or not the controller has passed traffic information."*

The B-1B continued holding for a further 14min, again being provided with comprehensive TI as appropriate. On one occasion during this period, when the B-1B was at the southern-most point of its hold, the Director informed the flight *"…five miles south of you you have a gliding site Lasham with multiple contacts."* This was acknowledged by the B-1B pilot. (Note: It is recorded in the Unit report that *"During the investigation, the Unit General Manager confirmed that he had spoken to the ground handling crew for the B-1B on the day prior to the incident advising that Lasham was an area to be avoided due to the intense gliding activity that takes place there.")*

By 1434, with the B-1B's display slot now imminent, the ac commenced a right-hand orbit about 7nm N of Lasham. It momentarily stopped the turn when about 2nm NW of Lasham before making a turn to the left in preparation for the start of the run-in towards Farnborough. At this point, 1436:55, the Director provided further TI *"…keep a good lookout to the south multiple gliders"* which the pilot acknowledged, adding moments later *"…visual with gliders".* The radar recording shows that as the B-1B continued the left turn, at 2800ft Mode C, it passed very close to at least two primary-only targets, about 1nm W of Lasham. The targets appear almost stationary and have insufficient movement to determine their direction. Thereafter, the B-1B passed just to the S of Lasham as it established on track towards Farnborough RW06. A short time later the flight received a clearance from the Director to commence its display. It was subsequently established that the pilot of the subject glider, who was flying in the vicinity of Lasham at the time, had called Lasham on the glider operations frequency and reported his intention to file an Airprox in respect of the B-1B.

It is assessed that the Farnborough Director met his responsibilities under the terms of a RIS which he was providing to the B-1B. During the course of the Unit investigation, alternative holding options for display traffic at future air shows were explored, with the aim of mitigating risk to all airspace users. One viable option emerged, which formed the basis of a Unit Recommendation to Farnborough ATC Management. This was accepted and a target date set for 01 January 2010.

UKAB Note (1): The Farnborough International Air Show was the subject of 2 AICs/RA(T) s/NOTAMS, one of which applied at the time of the incident. The incident took place on the lateral boundary of 'Area 7' (active 1230-1600) but well below the base of the restriction which was 4500ft. The boundary of the main display area (a circle of 8nm diameter, SFC-BoCAS) was 3nm to the NE. The base of the LTMA in the area of the incident is 5500ft amsl.

UKAB Note (2): The recording of the Heathrow 23cm radar shows the B-1B squawking 0423 with Mode C throughout. There are multiple primary-only contacts in the area of Lasham, one of which is believed to be the reporting glider. On the sweep of the CPA the glider does not paint but the B-1B is level at an alt of 2800ft (QNH

1021) and passes within 0.1nm of the projected position of the glider at 1437:19. The B-1B commences a gentle descent on the RW centreline at 1438 1nm E of Lasham. Assuming the height reported by the glider pilot was accurate at 1700ft, equating to an alt of 2318ft (before his avoidance), the vertical separation would have been 482ft increasing to 782ft after he had taken avoiding action.

UKAB Note (3): NATS Farnborough conducted an extensive unit investigation into the incident. As noted in the ATSI report above, ways of reducing the risk of a recurrence are being explored by the unit in conjunction with the Air Show organisers.

HQ 3AF comments that the B-1B pilot, who was not UK based, would not have been as familiar with the nuances of radar services as a UK based crew; consequently, he was doing as he was told and may well have thought that his options to manoeuvre were less than they were. However, that a display aircraft should be in a position where it has to avoid large numbers of gliders only 11nm on the extended centreline of the display runway is surprising. When compared to adjacent sectors, it would appear that the base of Sector 7 was a compromise to allow gliding to continue largely unhindered during an air show which takes place only once every 2 years. A more meaningful airspace restriction might have provided better protection for display aircraft and gliders alike, as well as easing a demanding control task.

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 and operating authorities.

Although Members accepted that in the event the vertical separation at the CPA between the glider and the B-1B had been of the order of 700ft, the Board was very concerned by this incident. As will be explained below, the Board considered that although there had been no degradation of safety nor risk of a collision, Members unanimously agreed that the glider pilot had been right to submit his report.

Members fully understood the desire to continue operations at Lasham as far as possible unhindered, particularly in mid-summer, but the majority (including the specialist gliding Member) considered that some mandatory segregation of gliding and display activity was very desirable. It was noted that the purpose of the RA(T) associated with air displays is to protect both display and other ac. Whilst accepting that the CPA had taken place after the B-1B had left the 'impromptu' hold, Members noted that there were apparently no planned and promulgated holding procedures. Whereas it might not be possible to have a hold in a segregated area, it seemed to those Members who were familiar and current with display procedures - both as participants and organisers - that arrival, holding and hold departure procedures should be promulgated and if possible NOTAM'd. The DAP Advisor explained that airspace arrangements were implemented following detailed consultation with the Airshow Organising Committee to ensure that the RA(T) met with the requirements of the [RA(T)] Sponsor (Farnborough).

It was however agreed by the Board that the airspace restriction at the time of the incident had not been sufficient to achieve the aim of prudently integrating a display participant with other air activity. One Member even opined that the Farnborough International Air Show is a national showcase that takes place only every other year and activity at Lasham would not suffer unduly if its activity were curtailed for short periods during the display (and practises). In essence, Members agreed that the RA(T) had been a compromise that for the B1-B's participation had not served either Lasham or Farnborough well.

Members were informed by the NATS Advisor that the B-1B crew had been thoroughly briefed by Farnborough ATC both on ATC procedures and the significance of Lasham and also by the display organisers regarding the display regulations. Members agreed with HQ 3AF's comment, noting also that the US-based crew would most likely not have been fully conversant with UK civil ATC procedures which are very different to those employed by military aircrew in the USA. Without wishing to make any assumptions whatsoever regarding the ability of the B-1B crew concerned, a military Member pointed out that when organising events or exercises involving even very experienced foreign aircrew not familiar with the UK, it is wise to assume a low knowledge level and brief them accordingly. Members also agreed unanimously that when a foreign ac is invited to participate in any display it is incumbent on the organisers to provide the highest level of assistance possible, ensuring that crews are given the fullest support so that displays can be conducted in a safe and effective manner. This is even more important when, as here, an aircraft operates from a remote airfield and flies to the display location, often running straight

into its sequence: in these circumstances a formal liaison 'officer' with appropriate experience of GA & local airspace can be very useful.

An ex Red Arrows pilot Member observed that the air activity with the highest accident rate in the UK is displays. He went on to point out that high performance ac are very constrained both in direction and altitude on their display arrival routeing. In this case he considered that the B-1B had flown both a track and at altitudes that he would have expected and that this should have been no surprise to ATC nor to the display organisers. Accepting that the ac had been required to hold (for 14min) between Fairford and Farnborough, its route would necessarily have taken it close to Lasham which lies very close to the extended centreline of Farnborough. Furthermore, the ac's altitude (2800ft, from the radar recording) and speed of 250kt were fully commensurate with a safe yet minimum nuisance arrival at the display. It was also pointed out that even had the B-1B not held, its routeing and altitude would most likely have been very similar to that flown and, even taking into account that ATC discharged their formal responsibility under a RIS and warned the pilot about the gliders, he had few avoidance options other than to thread his way through the gliders. Although the gilders concerned were below the B-1B and its pilot considered them well separated, they could have quite legally been operating up to the base of CAS/restricted airspace and presented much more of a hazard (the Board having no information on the altitude of the other gliders painting on the radar).

Despite the nuances of the air display; the associated RA(T) and that Lasham is a promulgated glider launch site, the Board unanimously agreed that the B-1 pilot had little choice in his selected routeing. Both ac had been operating legitimately in Class G airspace; that being the case the 'see and avoid principle' had applied. Since both pilots had seen and avoided the opposing ac, the Board decided that this incident had been a conflict in Class G airspace. Furthermore, the timely and effective avoiding action taken by the glider pilot had resolved that conflict.

Regarding the degree of risk, Members noted that the B-1B is a very large ac and flying at 250kts the wings may well not have been fully swept back; therefore to the glider pilot it may well have looked closer than it actually was. Members considered that both the radar-displayed altitude of the B-1B and the pilot-reported altitude of the glider had been accurate. Thus although the lateral separation had been small, the vertical separation would have been significantly over 500ft. That being the case and since both pilots had seen the opposing ac, there had been no risk of collision.

Members considered whether a safety recommendation was warranted, concluding the discussion by asking the Director to write to the Display Director of the next Farnborough International Air Display, drawing attention to this incident and the Board's concerns.

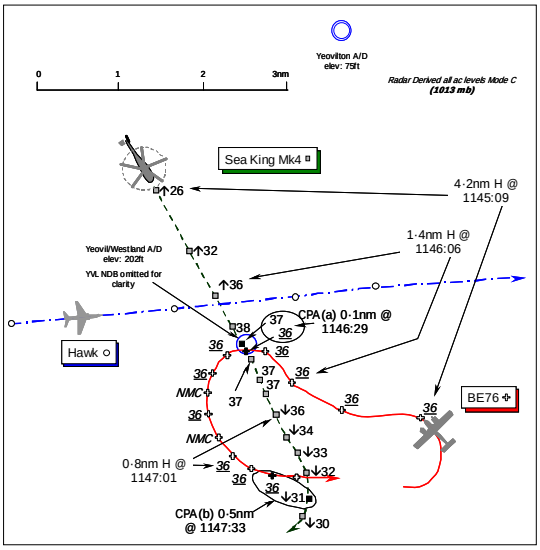
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class G airspace resolved by the Grob Astir gilder pilot.

Degree of Risk: C.

AIRPROX REPORT NO 103/08

Date/Time:	21 July 1146	
Position:	5057N 00240W (Overhead the YVL)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reporting Ac*
Type:	Sea King Mk4	BE76
Operator:	HQ JHC	Civ Trg
Alt/FL:	4000ft	4000ft
	RPS (1023mb)	QNH (1026mb)
Weather	IMC IBCL	IMC IBCL
Visibility:	30 km	0.5 NM
Reported Separation:		
	300ft V/200m H	300ft V/300m H
Recorded Separation:		
	100ft V/0·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

BOTH PILOTS FILED

THE WESTLAND SEAKING HC MK4 PILOT, a QHI, reports that he was outbound for an IFR NAVEX, clockwise around Yeovilton, whilst in receipt of a RIS from the Yeovilton APPROACH controller (VLN APR). His helicopter was crewed with two pilots and he was occupying the LH seat as pilot-in-command with his student in the RH seat. The assigned squawk was selected with Mode C.

Departing under IFR, IMC in between cloud layers, their planned track after take-off required a L turn at 1700ft PORTLAND RPS (1023mb) under their own navigation to o/h the YVL NDB [situated at Yeovil/Westland] climbing to FL40 at 80kt. Thereafter, their route was a R turn onto 248° (T) to the EX NDB and thence continuing clockwise around Yeovilton. Approaching the YVL heading 150° some ½nm horizontally from cloud during the level-off at 4000ft whilst selecting the SAS of 1013mb, another ac was spotted crossing from L – R some 200yd away and 300ft below his helicopter in a turn o/h the YVL NDB. No traffic information was received from VLN APP regarding the other ac – a white, red & blue low-wing twin – but no avoiding action was required. He assessed the Risk as *"high"* and stressed that he was 'head-in' changing the altimeter setting from the RPS to the SAS, adding that the attitude of their climbing helicopter had prevented the RH seat pilot from spotting the twin approaching from their left until they levelled-off.

His ac has a dark green camouflage scheme, but the HISLs were on.

THE BE76 PILOT reports he was conducting an IFR instructional flight and in receipt of a procedural approach service from Yeovil/Westland APPROACH (APP) on 130·8MHz. The assigned squawk of A0266 was selected with Mode C on. HISLs were on.

They had been cleared to enter the YVL NDB hold at 4000ft QNH (1026mb) and were turning L outbound in the hold at 130kt. On completion of this hold, his student reported to APP that they were ready for the racetrack NDB/DME procedure whereupon they were cleared by APP to commence the procedure. During the hold they were in and out of cloud (reported cloud was SCT at 3500ft), but just as they passed the beacon they flew out of cloud. His student started the turn to the L just as a helicopter appeared to their right, flying level but seemingly tracking SE. They entered cloud again and asked APP where the helicopter had come from but the controller replied that he did not know about it at all. En-route back to Bournemouth, Yeovilton LARS informed them that the helicopter had been under their control. He assessed the Risk as *"very high"*.

THE YEOVILTON APPROACH CONTROLLER (VLN APR) reports that he took over the position some 18min before the Airprox occurred with RW27 as the duty RW in CC BLU/BLU conditions. Under his control at the time

of the Airprox were the subject Sea King Mk4 under a RIS conducting a NAVEX via the YVL o/h to Exeter; a Hawk executing a radar PFL and another station based Sea King [hereafter referred to as SK2] the crew of which had called up from low-level asking to operate in Yeovilton's Instrument Flying Training Area 2.

Whilst conducting the radar PFL and passing traffic information to the pilot of SK2, the crew of the subject Sea King Mk4 called on RT informing him that they would be filing an Airprox upon their return as an ac had just underflown them by about 100ft. On looking at the 'current' radar display, the Sea King Mk4 was indicating 3400ft (1013mb) and the other ac – the BE76 - was indicating 3000ft (1013mb) in the Yeovil/Westland instrument pattern. After acknowledging the report, the Sea King Mk4 crew proceeded with their NAVEX and he continued with the radar PFL. No traffic information had been passed to the Sea King Mk4 crew.

THE YEOVILTON RADAR SUPERVISOR (VLN SUP) reports he was liaising via landline with TOWER & the Duty Air Traffic Control Officer (DATCO) when the APR informed him of a Sea King Mk4 crew on his frequency reporting an Airprox. The APR pointed to his own traffic – the subject Sea King Mk4 tracking SW, followed by another ac – the BE76 - approximately 2nm to the NE of the helicopter and by this stage diverging. The BE76 had been wearing a Westland's assigned squawk which was showing normally. The APR was relieved from console within 5min.

THE YEOVIL/WESTLAND APPROACH CONTROLLER (APP) reports that he was operating as the combined APP & TOWER controller. The BE76 was operating under IFR in the NDB Hold under a Procedural Approach Service for an approach to RW28. Yeovilton was aware of the BE76 as Yeovilton LARS had handed the ac over to him. After instructing the BE76 crew to report 'BEACON OUTBOUND' the pilot enquired "do you have this ac heading SW", which he did not know anything about. The Sea King Mk4 was then observed, both by himself and his Assistant, at about the same altitude as the BE76 and about 1nm to the SW of the aerodrome, heading SW after apparently tracking through the overhead. He then contacted the Yeovilton LARS controller.

SATCO YEOVILTON provided a comprehensive report with transcripts of the relevant RT frequencies and landline conversations together with photographs of the Yeovilton SSR recording.

The Yeovilton APPROACH controller (APR) had been controlling for about 20min on freq 243·3MHz. There was initially one ac on frequency, a Yeovilton-based Hawk conducting GH in the vicinity of the airfield, which was nearing its notified 'Charlie' (recovery) time. RW27 was in use, the airfield's weather was good and reported to ATC as:

Vis 30Km; Cloud BKN 4000ft, Colour Code BLU, Forecast Colour Code BLU (The 1150UTC METAR was: 30010kt 9999 BKN040 16/06 Q1025 BLU NOSIG)

(In fact, immediately post the occurrence, the appearance of the sky was noted as being extremely similar to that depicted on the cover of Airprox Report books!)

At about 1137, whilst the helicopter was taxying, the departure details for the subject Sea King Mk4, had been passed to APP by the GROUND (GND) controller. This was an instrument departure from RW27 with a left hand turn out to route 'on top' the YVL (Yeovil/Westland NDB) followed by a heading of 248° towards the EX (Exeter NDB) at FL40. A few minutes later, the Sea King Mk4 was 'released' for departure, squawking A0211 with Mode C.

The Sea King Mk4 pilot checked in with the APR at 1141:52, having just departed, requesting 'own navigation' and a RIS. APR instructed the pilot to climb to FL40, confirmed the provision of a RIS and released the flight on its 'own navigation'; this was acknowledged by the Sea King Mk4 pilot following which the APR confirmed with him that he was intending to fly over the YVL NDB and thence to Exeter.

At 1143:06, the Hawk pilot called "*...2 minutes to recovery and we'll be for a radar PFL"*, whereupon the APR confirmed the Duty Runway at Yeovilton as RW27. At 1144:12, the pilot of a second Sea King (SK2) free-called the APR in a position about 20nm NE Yeovilton to request a radar pickup for a climb into the Yeovilton Instrument Flying Areas (vertical limits 3000-6000ft Portland RPS). There were a number of RT exchanges with the pilot of SK2 over the following 45secs as the APR was not able to identify the ac on radar from the pilot's reported position and initially a FIS was provided whilst SK2 commenced a climb. Immediately after this exchange, at 1145:05, the Hawk pilot requested recovery via a radar PFL. The Hawk pilot was instructed to set the Yeovilton QFE (1023mb) and given a steer for the overhead (040º) and his range (5·5nm). The Hawk pilot reported that he was too high at this range and would need to turn outbound, which was acknowledged by the APR at 1145:29. To provide the

'requisite range and bearing' calls for the radar PFL, the APR placed the radar display's trackerball marker over the Hawk's position on the radar and 'hooked' the SSR return of the ac. This action provides a line on the radar display between the Hawk and the airfield overhead, with a digital range/bearing indication at each end of the line. At 1145:41, the APR informed the SK2 pilot that he was identified, released to manoeuvre and also passed traffic information on unknown traffic, which the SK2 pilot acknowledged. This was followed, at 1145:54, with further traffic information on a second contact that was manoeuvring ahead of the SK2. Immediately after the SK2 pilot's acknowledgement, the APR updated the Hawk pilot with a range and steer. At 1146:49, the APR provided a further update to the Hawk pilot after which he returned his attention to the SK2 and updated the pilot with further traffic information. At 1147:13, the SK2 pilot reported level at 3000ft Portland RPS (there is also another indecipherable transmission made at the same time) and released by the APR to manoeuvre between 3000ft and 6000ft. Immediately after this the APR provided updated radar PFL information to the Hawk pilot, following which the pilot of the subject Sea King Mk4 called the APR. Having been asked by the APR to pass his message, at 1147:31 the Sea King Mk4 pilot responded *"APPROACH* [C/S] *just like to call an Airprox on top of the Yankee Victor Lima, approximately 200 yards at about a hundred feet lower..twin engine aircraft in the overhead of Judwin".* (Judwin is the name by which Yeovil/Westlands airfield was previously known).

The recording of the Yeovilton SSR (primary radar is not recorded) shows the Airprox, although it is stressed that the positional information provided by SSR is not sufficiently accurate to be able to properly assess horizontal separation. The timings on the radar photographs are shown in 'local' (A) time, but in order to equate to the RT recordings, the times quoted here have been converted to UTC by subtracting 1 hour. All SSR Mode C levels are based on 1013mb, hence the precise altitudes are not noted below, but the relative difference in vertical separation can be deduced. From the photographs provided, the subject ac, as well as the Hawk and SK2, can clearly be seen throughout.

At 1142:49, the Sea King Mk4 can be seen 2nm W of Yeovilton, on climb-out from RW27 tracking 265º, indicating 600ft Mode C, whilst the BE76 is 1·5nm SW of Yeovil/Westland airfield, squawking A0266 in a L turn through S in the YVL hold at an indicated 3600ft Mode C some 5nm S of the Sea King Mk4. At 1144:11, the time that the SK2 pilot free-called, Sea King Mk4 is 3·7nm NW of YVL, in a L turn through S and indicating 2100ft whilst the BE76 is 2·5nm SE of YVL, tracking 100º (outbound in the hold) at 3900ft; the Hawk is 6nm W of YVL, in a R turn from a NE'ly track at 13,800ft. Of note, there is also an ac (type unknown) wearing an A7000 squawk (converted to 'V') 3nm E of YVL at 700ft and inbound to Yeovil/Westland. At 1145:18, about the time that the APR commenced providing radar PFL information to the Hawk pilot, all 4 ac are within 2nm of the YVL and tracking towards it.

[UKAB Note (1): The LATCC (Mil) Burrington Radar recording shows the BE76 turning L in the YVL hold maintaining 3600ft (1013mb) throughout, as the Sea King Mk4 approaches the YVL from the NNW on a steady course climbing through 2600ft (1013mb) some 4.2nm distant. The ac converge to a point directly o/h the YVL NDB as the Hawk executing the PFL crosses eastbound passing within ½nm to the N of Yeovil/Westland aerodrome. The Sea King climbs through the level of the BE76 at 3600ft at a range of 1·4nm as the ac converge to CPA (a) at 1146:29. Before this point the Sea King Mk4 has ascended to a maximum indicated level of 3800ft (1013mb) and then descended 100ft to 3700ft as the BE76 crosses from L – R 100ft beneath the helicopter maintaining 3600ft. The helicopter maintains 3700ft for three further sweeps and then descends on a steady track as the BE76 turns about to the W in the hold. The Sea King Mk4 descends through the level of the BE76 at 3600ft once more, at a range of 0·8nm, whilst the twin turns L to pass astern of the helicopter at a minimum range of 0·5nm at 1147:33, with the Sea King passing 3100ft some 500ft below the BE76, before the helicopter turns R on course for the EX NDB.]

It should be noted that, during the Yeovilton radar replay for the photographs, a considerable amount of label management was required to ensure accurate track ident (with the operator aware of the dynamics of the situation and the radar range reduced to 10nm). Constant input was required to rectify label overlaps; the APR would not have been able to employ this amount of label management on his 30nm operating picture. This SSR label clutter would have been exacerbated with the additional range and bearing data displayed for the radar PFL.

As he taxied, the pilot of the Sea King Mk4 provided his intended climb-out and routeing details to the GRD controller, which were then relayed directly to the APR and logged on the Sea King Mk4's fps. The planned route for the Sea King Mk4, outbound from Yeovilton direct to the YVL o/h and thence to EX at FL40, is not a route in regular use by Yeovilton-based ac and hence there is no specific 'procedure' laid down for such departure routeings. Whilst the flight was not particularly complex the route to overhead the YVL climbing to FL40 should have ‘rung alarm bells’ with the APR; the altitudes/levels allocated in the YVL hold by Westland ATC are routinely

3000ft & 4000ft, FL40 & FL45. Hence the intention of the Sea King Mk4 crew to climb towards the same hold should have taken on a greater relevance and triggered the APR to make a more detailed plan. The APR stated that when the Sea King Mk4 pilot called him on climb-out, he checked the Yeovil/Westlands overhead but as there was no confliction evident on radar (the BE76 was turning away from YVL at the time) he thought nothing more of it and so released the Sea King Mk4 pilot onto his own routeing without informing the pilot that another ac was over the YVL at essentially the same level. It is evident that, while traffic levels were quiet, the APR had not registered the significance of the BE76 holding and hence the potential for a conflict with the climbing Sea King Mk4.

Once the pilot of SK2 freecalled for a service and the Hawk pilot commenced the radar PFL, the APR's workload started to increase significantly; the radar PFL is a very labour intensive recovery profile and, with SK2 apparently in confliction with 2 other tracks, the provision of a RIS (although never actually stated by the APR) to the Sea King Mk4 became the lowest of the APR's priorities and hence distracted him from noticing the developing confliction. Finally, with the Hawk transiting E-W, almost overhead the YVL, the extent of the SSR label overlap, coupled with the additional label 'clutter' from the 'hooked' range/bearing information would have masked the confliction with the BE76 still further and thus prevented the APR from providing any traffic information.

Due to the proximity of the Yeovilton and Yeovil/Westland airfields, close liaison is required and this is covered within an LoA between the 2 ATSUs, which has worked well over time, with only minor routine amendment. The relevant paragraph in this instance from the LoA states:

Yeovil/Westland will inform Yeovilton APP/SUP whenever an ac under their jurisdiction commences an Instrument Approach. Such traffic will be allocated an SSR code of 0266 or 0267, is flying under IFR, and needs to be separated from other known IFR traffic. When informed, Yeovilton ATSU shall co-ordinate and liaise as necessary with Yeovil/Westland [about] *conflicting traffic, particularly impending southbound departures.*

Information about an ac operating in the YVL hold was available in the Yeovilton radar room. The BE76 was squawking 0266 and was visible on the radar; the BE76 had actually been previously transferred to Yeovil/ Westland by the Yeovilton LARS controller (this is a routine action for all ac inbound for IFR training) although there is no requirement for LARS to provide any additional notification to the APR. The information about the ac in the hold (SSR code and level) had been passed to Yeovilton ATC by the Yeovil/Westland APP controller; this information is written onto 2 display boards by the Radar Assistant, one by the APR position and one by the LARS position, together with an indication of the runway in use at Yeovil/Westland. As far as can be ascertained, the information for the BE76 was correctly annotated; these boards are of the 'dry wipe' type and are immediately cleaned off once informed that the traffic has cleared, hence no physical records are retained. Routine flying operations from Yeovilton tend not to interact closely with the Yeovil/Westland NDB hold however, and thus occasions where co-ordination is required between the two ATSUs are quite rare (the exception being when Yeovilton is operating to RW22/04, which results in high volumes of co-ordination/liaison). VFR/FIS flights operate under the 'see and avoid' principle (generally helicopters at lower levels) and the radar pattern traffic naturally routes away from the area of the YVL hold, although separation/traffic information is afforded in accordance with the radar service that is being provided. In practice therefore, Yeovilton controllers rely on radar information to identify and resolve potential conflictions with YVL hold traffic, rather than separate procedurally. This works well for the routine Yeovilton arrival and departure traffic flows and does not require any further 'tightening up' of procedures; it should have been clear, however, that an ac departing directly to 'on top' another unit's hold required some form of liaison with Yeovil/Westland ATC irrespective of whether or not the hold was occupied, but this was not done by the APR. It could be contended however, that the reported weather conditions appeared to be good, the Sea King Mk4 pilot had *'only'* requested a RIS and, when the APR released the helicopter to turn towards the area of the YVL, the BE76 was not actually in confliction at the time. In addition, the YVL hold, plus the whole of the instrument approach outside of the Yeovil/Westland ATZ, is situated within Class G airspace and hence 'free airspace' for any ac to transit through without reference to either of the ATSUs. As before however, the points raised here reiterate the impression that the APR had not registered that the BE76 was flying a hold and hence he did not note its potential significance.

Turning to the control of the Hawk's radar PFL, the APR used the widely employed method (taught at Central ATC School) of 'hooking' the radar's range/bearing line onto the SSR contact of the subject ac. This action generates a continuous line on the radar display between the ac and the radar overhead, with a numeric range/bearing readout, similar in size to the SSR readout, at each end of the line. Although this provides very accurate information to relay to the pilot and the information is updated automatically, as shown from this occurrence it also

produces a significant amount of additional label clutter on the display. Had the APR employed a different method, such as selecting 1nm range rings and visually estimating the heading for the Hawk pilot to steer, the slightly lower level of label clutter may have enabled the APR to have detected the conflict in time to have provided some form of traffic information to Sea King Mk4.

In summary, the Yeovilton APR did not pass traffic information to the Sea King Mk4 crew about the BE76 because the controller did not appreciate that the BE76 was flying a hold. The APR was distracted whilst dealing with a free-call from SK2 and the Hawk's radar PFL and so did not detect the developing confliction between the BE76 and the Sea King Mk4. The significant amount of SSR label overlap ac in the vicinity of Yeovil/Westland also prevented the APR from detecting and resolving the confliction.

As a result of this Airprox the following internal unit action was taken:

a. The YVL NDB hold and its significance have been highlighted to Yeovilton controllers, specifically the need to liaise/coordinate traffic known to be navigating via the YVL between the levels of 3000ft and FL50.

b. Whilst the 0266 and 0267 squawks are uniquely allocated to ac in the YVL hold from the Westlands SSR code block allocation, these codes can blend in with the Yeovilton SSR code block (which also begins with 02xx). In order to increase the conspicuity of these specific codes, an adjustment has been made to the Yeovilton radar displays' code/callsign conversion facility to make them more apparent. This takes the form of a '66HOLD' label (for 0266) and 67HOLD (for 0267) that has been considered most successful to date.

The unit also forwarded a recommendation to Mil ACC relating to the use of the 'hooked' range and bearing marker when controlling radar PFLs.

ATSI reports that the Airprox occurred in Class G airspace. The BE76 crew established communication with Westland APP after transfer from Yeovilton, at 1137, reporting maintaining 4000ft. The flight was cleared to the YVL at 4000ft for an NDB approach to RW26. The controller confirmed with the BE76 crew that it was *"a procedural service only but maintain squawk 0-2-6-6 for adjacent unit information"*. The BE76 reported entering the hold at 1142:28 and, subsequently, BEACON OUTBOUND at 1147. About 30sec later, having been cleared for descent on the procedure and instructed to report BASE TURN complete, the pilot of the BE76 commented *"we're in and out of India Mike Charlie there's a helicopter near by I was wondering if he's aware of us".* The APP controller reported that there were no other ac on the frequency. The pilot continued *"roger we just saw one a helicopter flying southwest from here",* adding he was now VMC.

The Yeovil APPROACH Controller complied with the LoA between Yeovil and Yeovilton. Yeovilton were aware of the BE76, operating IFR in the YVL hold, with the intention of carrying out an NDB Approach. Yeovil/Westland ATC was not informed about the presence of the Sea King Mk4.

MIL ACC had nothing further to add.

HQ NAVY COMMAND did not wish to comment further.

HQ JHC did not wish to comment further.

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 all-encompassing report from the unit SATCO, to which the Mil ACC Advisor had nothing to add, had ensured that the important elements of this Airprox from the ATC perspective had been brought out. It was clear to the Board that the APR had become distracted both by the Hawk's PFL and SK2 climbing up into the Yeovilton IF Area, the former partly obscuring the conflict to the controller and the latter distracting his focus to the NE. However, a more diligent all–round scan that might necessitate rotating SSR labels – or even momentarily de-selecting the SSR labels for a few seconds – should have revealed the BE76 in the YVL NDB hold and the potential for a conflict to develop with the helicopter – not a new lesson but worth repeating here. Members opined that perhaps the

Yeovilton SUP could have been more proactive here: if the Hawk conducting the highly labour intensive PFL had been handed over to a Radar DIRECTOR, this would have allowed the APR to focus on departing traffic and perhaps afforded the Hawk crew a better service unhindered by free-calling traffic – perhaps another lesson from this Airprox.

The Sea King Mk4 crew, operating IFR, could reasonably have expected at the very least to be provided with traffic information about the BE76. It should have been readily apparent to the APR that the BE76 was executing an Instrument Approach to Yeovil/Westland who, under the agreed terms of the LoA, had so informed Yeovilton ATC. The APR was aware of the Sea King Mk4's route through the overhead of the YVL NDB and the aforementioned LoA established between the two ATSUs made it plain that the APR was under remit to initiate liaison with Yeovil/ Westland ATC and co-ordinate the passage of the helicopter to ensure separation between these IFR flights. Members questioned the wisdom of operating IFR in IMC under a RIS – conceivably a RAS would have been more appropriate - but the ATSI Advisor observed that as only a RIS was being afforded to the Sea King Mk4 crew, at their request, how was the controller required to provide separation. However, controller Members agreed unanimously that irrespective of the terms of a RIS, the agreement between the two ATSUs in the LoA held sway, an Agreement which had been established to prevent just such as an occurrence as related here. Members pointed out that this could have been accomplished with little difficulty to ensure IFR separation was afforded. Aware of the helicopter's route from the departure release and the BE76 inbound to Yeovil/Westland from prior liaison, the Yeovilton APR should have co-ordinated the Sea King Mk4's departure and routeing through the YVL o/h with Yeovil/Westland ATC. The Board concluded, therefore, that the fundamental cause of this Airprox was the Yeovilton APR did not comply with the LoA.

Turning to the inherent Risk, from the reporting pilot's account it was clear that the Sea King Mk 4 crew were completely unaware of the BE76 operating above them in the YVL hold as they climbed up towards it, IMC, in between cloud layers. Members noted that the twin was not spotted by the Sea King Mk4 pilot until the BE76 crossed ahead from L – R some 200yd away. The reporting pilot's account stated it was some 300ft below his helicopter in a turn o/h the YVL NDB at this point and it was clear this was already after they had climbed through its level. However the verified Mode C indications from the radar recording suggested that the helicopter was no more than 200ft above the BE76 at the zenith of their climb. Similarly, the BE76 crew was flying in and out of cloud and unaware of the helicopter until they passed the beacon and flew out of cloud, just as the helicopter appeared to their R tracking SE. Members recognised that it was indeed fortunate that both acs' crews saw each other's ac when they did, but it was also clear from the respective pilot's accounts that no avoiding action was taken. It seemed from the pilot's reports that none was needed and perhaps this was merely fortuitous. However, it was unclear if either crew could have done anything to increase the separation in the time available at these close quarters, as the Sea King Mk4 was shown to have descended 100ft to 3700ft as the BE76 crossed from L – R 100ft beneath the helicopter, the twin still maintaining 3600ft, before the helicopter descended further as the BE76 turned L to the W. In assessing this Airprox the Board was mindful that Members could only deal with what actually occurred and not what might have happened if circumstances had been different. This was certainly a very close encounter indeed and whilst there might have been just sufficient separation to avert an actual collision, the safety of the ac involved here had certainly been compromised in the circumstances conscientiously reported here.

The Board commended the positive stance taken at the unit, the measures taken should certainly assist in reducing the potential for a recurrence.

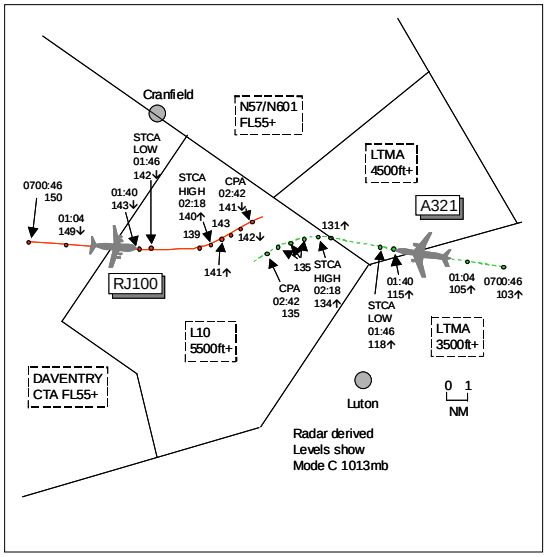
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Yeovilton APR did not comply with the LoA.

Degree of Risk: B.

AIRPROX REPORT NO 104/08

Date/Time:	22 Jul 0703	
Position:	5159N 00029W (8nm NW Luton)	
Airspace:	L10	(Class: A)
	Reporting Ac	*Reported Ac*
Type:	A321	RJ100
Operator:	CAT	CAT
Alt/FL:	FL135↑	↓FL140
Weather	VMC CLNC	VMC
Visibility:	>10km	
Reported Separation:	500ft V/NR H	Nil V/1nm H
Recorded Separation:	600ft V/1·5nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A321 PILOT reports outbound from Stansted IFR and in receipt of a RCS from London on 119·775MHz squawking 2235 with Mode C. Climbing towards BKY, their initial clearance was to turn L heading 280°. They were cleared to FL160 and on passing FL115 at 250kt they were told to expedite through FL120 and again shortly afterwards through FL130. A TCAS TA was received at about FL125 on traffic about 5nm away followed by an RA 'descend' passing FL135. Avoiding action was taken in accordance with TCAS demands until clear of conflict. Shortly before the RA the controller gave an 'avoiding action' L turn onto heading 220° which was executed. He was not sure of the exact geometry of the Airprox as one pilot was taking avoiding action whilst the other was making RT calls but he believed the other ac passed 500ft above at the CPA with a high risk of collision. He was concerned because when he advised ATC of their TCAS descent the controller had said 'negative climb climb' which, had they complied, could have been catastrophic.

THE RJ100 PILOT reports inbound to London/City IFR and working London on 119·775MHz squawking with Mode C. During the descent, on radar vectors speed 250kt, they were cleared to FL130, he thought [actually FL140], on a heading of about SE. During level-off a TCAS TA symbol with associated aural warning appeared at 12 o'clock showing –1300ft climbing. ATC issued a heading of 060° [and descent to FL130] and as this was being carried out a TCAS RA 'climb climb' occurred with a v/s of about 2500fpm demanded. The FO, PF, immediately disconnected the A/P and A/T (auto-throttle) and commenced a pull-up into the green v/s band. The ac commenced climbing and reached FL132 [actually FL142] when a 'clear of conflict' message was received. A B737 [actually the subject A321] was seen in their 3 o'clock about the same level range 1nm in a L turn. The ac was levelled-off and PNF announced 'TCAS climb' to ATC and the ac was then adjusted back to FL130. During this manoeuvring another flight was heard being given an avoid vector and then announcing a 'TCAS descent'. The flight then continued normally to destination.

THE LTC NW DEPS CONTROLLER reports working a non-standard complex situation when he had a loss of separation between the A321 and RJ100. She issued avoiding action climb to the A321 flight and then descent to the RJ100 flight but a little after this the A321 received a TCAS RA descent. She believed it made the resolution occur a lot slower as the A321 was expediting climb to FL160 so the crew had to level-off and then begin their descent.

ATSI reports that the LTC NW Sector was split, NW DEPS and Bovingdon. The NW DEPS Controller reported that the sector was busy, as normal for the time of day.

The RJ100 flight, from Glasgow to London City, established communication with the NW DEPS Sector, at 0656, reporting descending to FL150 on heading 150°. The SC instructed it to continue on the radar heading at 250kt, to expect the *"full arrival procedure for London City"* i.e. via BKY/SPEAR. Approximately 90sec later, the A321

flight, outbound from Stansted, contacted the frequency, its pilot reporting climbing to FL70 towards BKY. The ac was tracking N, 5·4nm W of Stansted Airport and the crew was instructed to turn L heading 285°. It was then cleared to climb to FL120. At 0658:30, the RJ100 flight was instructed to turn L heading 120°. The subject ac were 43nm apart at the time. At 0700:10, the controller instructed the A321 flight, which was passing FL91, to climb to FL160. At the time, the RJ100, at FL150, was crossing through the A321's track, 27·5nm ahead. Shortly afterwards, the RJ100 crew was instructed to turn L heading 090° and then (0700:45) to descend to FL140. This turn placed the 2 ac on reciprocal tracks, 22nm apart.

The controller realised the confliction, just prior to STCA activating and believing that it could be resolved by expediting the climb of the A321, at 0701:42, she instructed the flight to *"...expedite climb through Flight Level One Three Zero please Sir"*. The pilot read back *"...Expedite the climb through Flight Level One Two Zero"*. Without querying the pilot reading back the level incorrectly, she transmitted to the RJ100 *"(Company wrong suffix) sorry it's (company) correct c/s turn left now heading of Zero Six Zero degrees descend Flight Level One Three Zero"*. The instruction was read back correctly. At the time (0702:00), the 2 ac were 8·1nm apart, the RJ100 at FL140 and the A321 passing FL123. The controller instructed the A321 flight to *"...turn left now avoiding action turn left heading of Two Two Zero degrees"*. After the pilot read back the avoiding action instruction the controller continued *"...expedite climb through Flight Level O- One Four Zero"*. The pilot replied *"...Wilco er stand by TCAS RA"*. The controller responded *"Thank you"*. The pilot of the RJ100 then transmitted that he had a *"...TCAS RA also"*. The controller replied *"...avoiding action descend now Flight Level One Three Zero"* which the pilot read back. Thereafter, the following exchanges took place, commencing with the A321 pilot: *"And er (A321 c/s) TCAS RA er we are descending"*; [ATC] *"Er climb it"*; [A321] *"Negative Ma'am"*; [ATC] *"Roger"*. The radar shows the RJ100 tracking NE at FL143 and the A321 in a L turn, 2·8nm away, at FL135. As the 2 ac passed abeam each other at the CPA (0702:42), the horizontal distance was 1·5nm and the vertical separation was 600ft. (The RJ100 at FL141 and the A321 at FL135.) The required separation was 1000ft vertically or 3nm horizontally. The pilot of the A321 reported *"...clear of conflict resuming climb Flight Level One Six Zero"*. The RJ100 also reported *"clear and descending"*.

The MATS Part 1, Section 1, Chapter 9, current at the time of the Airprox, stated the ATC procedures after a pilot reports a TCAS RA: *'On being informed that an aircraft is manoeuvring in accordance with an RA,* ***a controller must not issue control instructions*** *to that aircraft. Once an aircraft departs from an ATC clearance in response to an RA, the controller ceases to be responsible for providing standard separation between that aircraft and other aircraft affected as a direct consequence of that RA manoeuvre. The controller's responsibility for providing standard separation for all aircraft resumes when the following conditions have been met to the satisfaction of the controller: a) The flight crew informs the controller that the TCAS manoeuvre has been completed; and either b) i) The controller acknowledges the report from the flight crew of the aircraft that reported the RA, that the aircraft is returning, or has returned, to its assigned clearance, or ii) The controller issues an alternative clearance to the aircraft that reported the RA and this has been acknowledged by the flight crew.'* An Air Traffic Services Information Notice (ATSIN) 131/08, concerning changes to TCAS procedures and phraseology, was published on 23 May 2008. This confirms that when a pilot reports a TCAS RA, the controller's response is *"(c/s) Roger"*. Additionally, it notified a change to the MATS Part 1 procedures concerning issuance of traffic information i.e. *'Controllers should not routinely pass traffic information to aircraft conducting RA manoeuvres, or other aircraft affected by such manoeuvres. Nevertheless, there may be circumstances where the passing of traffic information is justified; consequently, controllers may, provide traffic information under the following circumstances: i). To aircraft conducting an RA manoeuvre if it is considered essential for flight safety (e.g. information on aircraft which are known to be in close proximity to the aircraft conducting the RA, that are not transponding Mode C information). ii) To other aircraft affected by an RA manoeuvre if judged necessary by the controller (e.g. in airspace where the carriage and operation of TCAS and/or SSR transponders is not mandatory)*.

The ATSIN has now been cancelled, as the information has been included in MATS Part 1. The current MATS Part 1 stipulates that *'When a pilot reports an ACAS RA, controllers shall not attempt to modify the aircraft flight path until the pilot reports "Clear of Conflict" '*.

UKAB Note (1): The NATS Unit Investigation Report reveals that a TCAS simulation was carried out and was supplemented with data download from the A321's TCAS equipment and Mode S downlink TCAS RA messages. The simulation showed that both crews would have received TCAS TAs at 0701:56, 10sec after STCA activated and 13sec after the A321 flight was instructed to expedite climb. The A321 was at this time climbing through FL123 with a ROC just over 3100fpm and increasing. At 0702:14 the RJ100 received a TCAS RA climb and 4sec

later the A321 a TCAS RA descent when the A321 was turning through heading 277° passing FL134 with a 3200fpm ROC.

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 part of their TRUCE training LTC and LAC controllers are now given an exercise module which includes TCAS events which require controller responses. Also, the subject Airprox is being used for TCAS training in this year's TRUCE syllabus. The company have thoroughly investigated the circumstances surrounding the NW DEPS's non-conformance with SOPs post TCAS RA annunciations, concluding that this had been an isolated incident and not a unit-wide issue.

Members could not reconcile the NW DEPS's actions after the initial reports by both crews of TCAS RAs. It seemed that on seeing that separation margins were being eroded, in the heat of the moment, she had stuck with her plan to climb the A321 through the RJ100's level. An ATCO Member familiar with LTC N opined that these sectors are the busiest within the Ops Room with considerable numbers of climbing, descending and crossing tracks. The NW DEPS had elected to give both ac turns, which placed the flights on reciprocal tracks, as well as climb/descent; this option was not 'fail safe'. It was thought a better option would have been either to place the flights on headings to ensure the ac were not pointing at one another or ensure lateral separation existed before dispensing with vertical separation. Where tactical vectoring is required (i.e. streaming or positioning ac) a better option is to give both flights intermediate stop-off levels – the RJ100 FL130 and the A321 FL120 - and to have waited until the ac had crossed before continuing their climbs/descents. However, the actions taken by the LTC NW DEPS had led to her vectoring the A321 and RJ100 into conflict and this had caused the Airprox.

An experienced airline pilot Member remarked that the A321 crew had reacted correctly in the circumstances and had exhibited a good response to the TCAS RA received which, with such a high ROC, would have required robust action to reverse the ac's flightpath. The RJ100 crew had also reacted correctly and followed their TCAS guidance and in addition the controller had issued avoiding action turns to both flights whose crews had actioned promptly. All of these elements, when combined, allowed the Board to conclude that any risk of collision had been quickly and effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

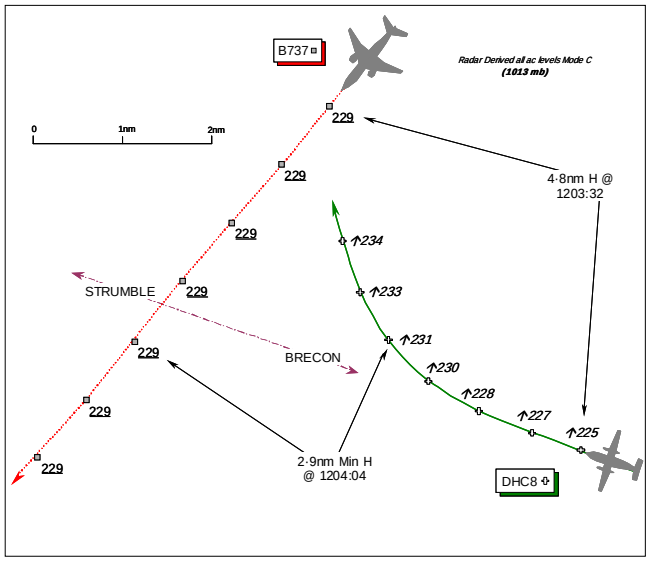
Cause: LTC NW DEPS vectored the A321 and RJ100 into conflict.

Degree of Risk: C.

AIRPROX REPORT No 105/08

AIRPROX REPORT NO 105/08

Date/Time:	25 Jul 1204	
Position:	5145N 00327W (6¾nm W of BCN)	
Airspace:	Airway L9	(Class: A)
Reporter:	LAC Swanwick	
	First Ac	*Second Ac*
Type:	DHC8	B737-300
Operator:	CAT	CAT
Alt/FL:	FL230↑	FL230
Weather	VMC CLOC	VMC CLAC
Visibility:	NR	20nm
Reported Separation:		
LACC:	200ft V/2·8nm H	
	400ft V/4-6nm H	300ft V/ 4nm H
Recorded Separation:		
	200ft V @ 2·9nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LAC COMBINED SECTOR 8 & 35 TACTICAL CONTROLLER (S8/35 TAC) reports that the DHC8 was outbound via BCN (BRECON) and STU (STRUMBLE). His PLANNER had co-ordinated a climb with S23 but no level restriction was mentioned so he annotated the paper fps accordingly. After the DHC8 turned westbound at BCN, STCA activated between it and a background track - the B737. Avoiding action was issued to the DHC8 crew to turn R onto a heading of 360°. The DHC8 crew reported having the other ac displayed to them on TCAS but no report of an RA was received. Once clear of the B737, the DHC8 was turned L onto a heading of 300° and the crew instructed to resume their own navigation toward STU.

THE LAC COMBINED SECTOR 8 & 35 PLANNER CONTROLLER (S8 PLAN) reports that he had co-ordinated a climb for the DHC8, which was outbound to Belfast City, with S6 & S23 to climb to FL220. He advised his S8/35 TAC of the co-ordination but did not mention any level restriction imposed by S23 PLAN. Having planned FL220 as the Sector Exit Level, he thought that this would suffice but as the traffic situation changed he had re-planned the DHC8 to exit the Sector at FL240.

THE LAC SECTOR 23 TACTICAL CONTROLLER (S23 TAC) reports that S23 PLAN advised that he 'gave away' a climb on the DHC8 - outbound from Exeter to Belfast City - to S8 PLAN climbing to FL220; this while the flight was not yet in S8's airspace. A southbound B737 was inbound to Newquay passing W of BRECON (BCN) at FL230 under a RCS. When the two ac were 15nm apart, she checked with S23 PLAN that he had given only FL220 thereby maintaining vertical separation. STCA triggered and the two ac's TDB's started flashing but this was expected as S8 TAC was climbing the DHC8 to 1000ft below the B737 which was in a level cruise at FL230. When she saw the DHC8's Mode C pass FL222, she turned round and shouted across the control room at the S8 TAC controller to confirm he was only climbing to FL220 - as did S23 PLAN. Hearing S8 TAC issue avoiding action, she made a decision that the best thing to do, "because of the angles of attack", was to keep the B737 on track. She told the B737 crew that an ac was passing behind, whilst with another controller, and the crew confirmed that they had the ac displayed on TCAS. Prescribed separation was eroded to 200ft V at 2·8nm H.

THE LAC SECTOR 23 PLANNER CONTROLLER (S23 PLAN) reports that he received a call from S8 PLAN asking for climb in his airspace for the DHC8: he agreed that the ac could be climbed to FL220. About 5min later, an erosion of prescribed separation occurred as the DHC8 climbed above FL220 into conflict with a B737 at FL230.

THE DHC8 PILOT reports that he was flying from Exeter to Belfast City under IFR and in receipt of a RCS from London CONTROL on 129·375MHz. Mode S & TCAS are fitted.

On track to STRUMBLE at 200kt, after turning westbound on LIMA 9 at BRECON, they were in a slow climb and about to level off at FL230 in VMC when TCAS enunciated a TA "TRAFFIC TRAFFIC". ATC then instructed them to turn R and reported an ac in their 1 o'clock. Further position reports were given by ATC before the other ac – the B737 - was spotted visually as it emerged from a cloudbank and crossed some 4-6nm ahead from R – L about 300ft above his ac. Although ATC was working numerous frequencies, the other ac was not on their frequency. An ASR was filed upon landing.

Adding that he was under a low workload at the time, since TCAS and ATC both spotted the threat he assessed the risk as *"low"*, but he opined that without intervention from ATC and the TCAS TA the threat would have been *"very high"*.

THE B737-300 PILOT reports that he was bound for Newquay under IFR and in receipt of a RCS from London Control on 133·6MHz. Flying in VMC some 5000ft above cloud in a level cruise at FL230, heading 230° approaching a position 5nm NW of BRECON at 260kt they had been cleared direct to the SMG – ST MAWGAN – when TCAS enunciated a TA "TRAFFIC TRAFFIC". No RA followed so he maintained his course 'straight and level' before ATC warned them of other traffic that was not on the same frequency. The other ac – recognised as a high wing DHC8 – was spotted 5nm away in a climbing R turn as it passed astern about 4-5nm away off their port quarter some 2-300ft below his ac. He assessed the Risk as *"Medium".*

ATSI reports that the B737 was routeing from Manchester to Newquay, under the control of LAC S23, at FL230 and the DHC8 from Exeter to Belfast City, with S8 & 35 Sectors combined. The DHC8 was transferred to S8 TAC, by Cardiff ATC [to whom a portion of this airspace is delegated], climbing to FL160. The LAC MATS Part 2 requires co-ordination to be carried out with S6 and S23 before traffic is climbed above FL160. Accordingly, the S8 PLAN carried out the co-ordination, requesting a climb to FL220 from S23 PLAN. The DHC8 crew had requested FL240 but the S8 PLAN had realised there would be a potential confliction [another ac, not the subject B737] at that level. The S8 PLAN advised the S8 TAC that co-ordination was agreed but did not mention the level. He set the electronic indicators to FL220 as the Sector Exit Level for the DHC8. However, the S8 TAC believed a climb was approved, with no level restriction, and annotated the paper fps accordingly.

About 3min later, the S8 PLAN realised that the previously conflicting traffic would not affect the DHC8's climb to FL240 and re-planned it at FL240 and changed the Sector Exit Level to FL240. However, S23 PLAN believed it would not be climbed above FL220 until it was within S8's airspace. When the DHC8 established communication with S8, it was cleared to climb to FL200 initially. However, before it reached that level S8 TAC cleared it, at 1200:05, to climb to FL240, the Sector Exit Level, whilst under the mistaken impression that this level had been co-ordinated. The S8 PLAN did not hear the climb clearance being issued to the DHC8 crew. The B737, at FL230, was showing as a background track, reportedly overlapped by a foreground track, as it was not planned to enter S8's airspace.

S23 TAC was aware that the DHC8 had been co-ordinated by S8 PLAN to climb to FL220. Subsequently, she saw the ac passing FL222 and, together with the S23 PLAN, asked S8 TAC, seated behind them, to confirm the DHC8's level. She heard S8 TAC issue an avoiding action turn to the DHC8 just after 1203:30, *"avoiding action turn right heading 3-6-0 degrees"*. After the pilot's reply, traffic information was passed *"traffic 12 o'clock at Flight Level 2-3-0"*. The pilot reported *"Got it on TCAS"*. The information was updated *"Traffic 12 o'clock 2 miles".* Shortly afterwards the DHC8 pilot was instructed *"that traffic now in your 9 o'clock turn left heading of 3-0-0 degrees"*. The pilot reported visual with the traffic. At the same time S23 TAC informed the B737 pilot of traffic just passing behind, descending out of FL220, who reported at 1203:50, it had *"just set off our TCAS".* The minimum separation of 2·9nm/200ft, occurred at 1204:04.

In summary, the S8 TAC climbed the DHC8 because he believed that S8 PLAN had co-ordinated an unrestricted climb for the flight, which was not the case. The S8 PLAN had not informed the S8 TAC of the co-ordinated level because he did not think it necessary.

AIRPROX REPORT No 105/08

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The comprehensive ATSI report had made it plain that after S8 PLAN had established co-ordination with the next sector, the controller had not then made it clear to S8 TAC that whilst the DHC8's climb was restricted to FL220 because of another ac, this also ensured 1000ft vertical separation beneath the subject B737 at FL230. When the previously conflicting traffic was no longer a factor, S8 TAC was unaware that the DHC8's climb was still restricted to FL220 because of the co-ordination against the B737. The ATSI Advisor emphasised that although the FPS had been annotated that co-ordination had been agreed (with S23 PLAN) it did not clearly indicate that a restriction was placed on the DHC8's climb of FL220, below the DHC8 crew's desired cruising level of FL240. Thus S8 TAC believed a climb was approved, without restriction, to the Sector exit level of FL240 and had annotated his paper fps accordingly, subsequently instructing the DHC8 crew to climb to this level. The NATS Ltd Advisor briefed the Board that this salutary learning point had already been widely disseminated to controllers at Swanwick. An experienced controller Member emphasised the necessity for sector PLANNER controllers to keep their TACTICAL controllers closely briefed, which was an essential element of the teamwork required in running busy Sectors in this complex airspace structure. One Area Controller Member also questioned why these two ac were operating on different frequencies, which had certainly prevented the respective crews from forming a mental air picture of the traffic around them. The NATS Ltd Advisor explained that the airspace was split N-S and E-W resulting in traffic crossing in the vicinity of BRECON operating on two different Sectors and thus two separate frequencies. It was clear that S8 PLAN should have taken more care to ensure that S8 TAC was cognisant of the restriction and with little further debate Members agreed, unanimously, that this Airprox had resulted when the LAC S8 control team climbed the DHC8 into conflict with the B737.

Turning to Risk, it was clear that S8 TAC had subsequently spotted the conflict with the B737 following the activation of STCA and had promptly issued an avoiding action turn to the DHC8 crew. Although the resultant separation was a little less than the crew's estimate, the radar recording reflected the crew's prompt compliance with this instruction which ensured that horizontal separation was not eroded below 2·9nm and even at this range the B737 had already crossed ahead of the DHC8, which was off the other ac's port quarter as the B737 cleared rapidly to the SW. It was also evident that S23 TAC was content to leave the B737 on a steady course, also passing traffic information to the crew about the DHC8. Moreover both crews had spotted each other's ac visually and could have taken more robust action if needs be, which had not been necessary. From the pilots' helpful accounts it was plain that both crews had also been alerted to the presence of each other's ac by the TCAS TAs enunciated in both cockpits. Whilst pilot Members recognised the concerns expressed in the DHC8 pilot's report that without intervention from ATC and the TCAS TA the threat would have been *"very high"*, the controller had provided effective avoiding action and the geometry was such that TCAS had not triggered an RA. When assessing Airprox, the Board was mindful that it could only deal with what had actually occurred, not what might have happened if circumstances had been significantly different. Therefore Members agreed unanimously that no risk of a collision had existed in the circumstances conscientiously reported here.

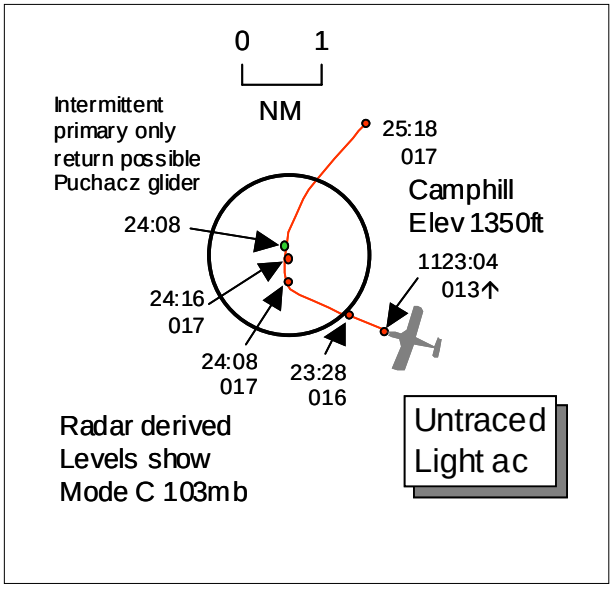
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LAC S8 control team climbed the DHC8 into conflict with the B737.

Degree of Risk: C.

AIRPROX REPORT NO 106/08

Date/Time:	20 Jul 1125 (Sunday)	
Position:	5318N 00144W (0·5nm SW Camphill G/S - elev 1350ft)	
Airspace:	FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Puchacz Glider	Untraced
		Light ac
Operator:	Civ Club	NK
Alt/FL:	700ft	NK
	(QFE)	
Weather	VMC CLBC	NK
Visibility:	>30km	NK
Reported Separation:		
	200ft V/100yd H	NK
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PUCHACZ GLIDER PILOT reports flying a dual training sortie from Camphill and was in communication with the gliding club on 129·975MHz. The visibility was >30km flying 1300ft below cloud in VMC and the ac was coloured white. The wind was 280/15-20kt with several gliders soaring on the ridge on the Western boundary of the airfield as well as picking up thermals and drifting downwind; heights varied between 600ft to 1000ft. Launches were via winches placed halfway along the Western boundary. He was instructing and soaring at 700ft QFE over the Southern end of the Western boundary heading 330° and tracking 350° at 45kt. He first saw the other ac, a low wing single engine ac coloured cream/navy as it appeared from under his starboard wing about 200ft below and 100yd to his E. The ac was flying straight and level at about 100kt N'bound, just W of the C/L of the airfield. This course was held for about 3-4km and he then turned his attention back to his student's progress. As the other ac passed over the Northern end of the airfield it was seen to give a brief wiggle to indicate its pilot had seen other traffic and was reacting suddenly. He opined that had he been flying S'bound such that he could see the approaching ac he would have taken precautionary evasive action. He believed that there was a high risk of collision with his glider and with several others. Also, had the ground crew been unaware of its presence and initiated a launch, as they were ready to do at that moment, there was every likelihood of a collision with the launch cable.

RAC MIL reports that despite extensive tracing action the identity of the reported ac remains untraced. The radar return squawking 7000 that passes O/H Camphill faded from radar 3min post Airprox 6nm N of the glider site heading N. This radar return was backtracked and is seen to appear in the vicinity of Netherthorpe airfield at 1106. The airfield operator was contacted but no movement log is held. Two flying schools operate from the airfield and visiting ac pilots are asked to book in and out. Following a lengthy delay in obtaining information 1 ac was initially identified as being a possible candidate but its registration was illegible from the airfield booking sheet. An attempt was made to trace a 7000 radar return which appears 6nm N of Camphill 2min after the first ac faded which it is seen to change squawk to a Doncaster conspicuity code. However over 3 months had elapsed and Doncaster had destroyed the fpss for the month of July which led to the reported ac remaining untraced.

UKAB Note (1): Met Office archive data provided a local QNH of 1017mb.

UKAB Note (2): The UK AIP at ENR 5-5-1-1 promulgates Camphill as a Glider Launching Site centred on 531818N 0014353W where winch launches take place up to 2000ft agl during daylight hours; site elevation 1350ft amsl.

UKAB Note (3): The Claxby radar recording does not capture the Airprox but clearly shows the untraced light ac's flight profile. At 1123:04 the radar shows a 7000 squawk 1·5nm SE of Camphill Glider Site tracking 290° indicating unverified FL013 (1420ft QNH 1017mb) and climbing. Twenty-four seconds later the radar response is seen levelling at FL016 (1720ft QNH) whilst still approaching Camphill with 1nm to run. At 1124:08 the 7000 squawk is seen to be turning R through a NNW'ly heading at FL017 (1820ft QNH) as a single pop-up primary only return appears, possibly the Puchacz glider, 0·4nm to its N. On the next radar sweep the 7000 squawk passes O/H Camphill still at FL017 (1820ft QNH) turning through N before rolling out on a NE'ly heading. At the time of the Airprox, the Puchacz pilot reported flying at 700ft QFE (2050ft QNH).

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members agreed that this had had the potential for a more serious incident. Although Camphill is promulgated in the UK AIP and clearly marked on both 1:250000 and 1:500000 topographical charts, the untraced light ac pilot had flown overhead a notified and active glider site and into conflict with the Puchacz which had caused the Airprox. An experienced GA Member was keen to remind people of the obvious fact that if you fly over or very close to a glider site you have a very good chance of encountering gliding activity, and of the importance of taking due regard of the promulgated activity height/altitude where winch launching takes place. Gliders can still be attached to the launch cable O/H the site, possibly up to the altitude appended to the glider site chart symbol.

With regards to the risk, the recorded radar had shown the untraced light ac passing through the Camphill O/H at FL017 (equivalent to an altitude of 1820ft) whilst the Puchacz pilot reported at 700ft QFE which equates to 2050ft altitude. This vertical separation, about 200ft, accords with that reported visually by the Puchacz pilot. The Puchacz pilot reports only seeing the light ac as it passed 100yd away to his R and 200ft below after it had approached from behind; it is not known whether the untraced light ac pilot saw the reporting pilot's glider. However, taking all of these elements into account, on the balance of probability and the separation distances stated, the Board believed that no risk of collision existed during this encounter.

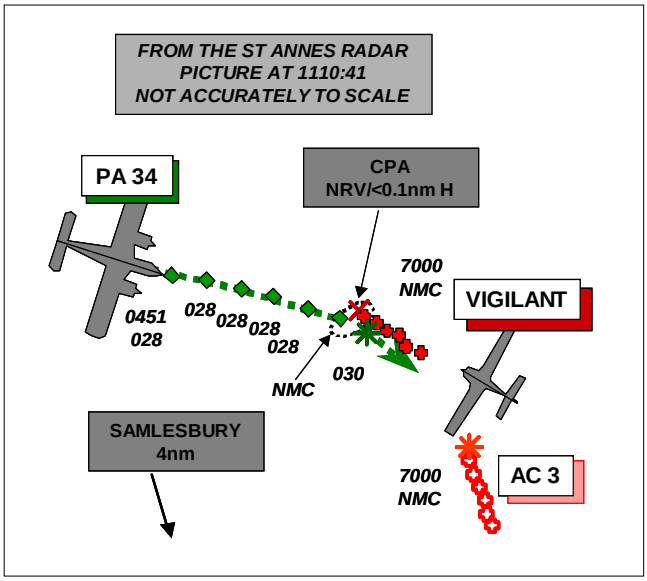
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The untraced light ac pilot flew overhead a notified and active glider site and into conflict with the Puchacz.

Degree of Risk: C.

AIRPROX REPORT NO 107/08

Date/Time:	27 Jul 1105 (Sunday)	
Position:	5349N 00233W (4nm NNW of Samlesbury)	
Airspace:	Lon FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	PA 34 Seneca	Vigilant TI
Operator:	Civ Pte	HQ Air (Trg)
Alt/FL:	3000ft	NR
	(RPS 1015 mb)	(N/K)
Weather	VMC HAZE	VMC CLOC
Visibility:	5 Km	>5nm
Reported Separation:		
	150ft V/300m H	800-1000ft V /3000m H
Recorded Separation:		
	NR V/<0.1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA34 SENECA PILOT reports flying solo with a passenger in a blue and white ac with strobes, nav lights and the anti-coll beacon switched on, on a private IFR flight from Ronaldsway to Gamston. He was in the cruise at 3000ft on RPS 1015mb, heading 107° at 162kt in receipt of a RIS from Blackpool and squawking as directed with Mode C when he was informed of traffic at 4nm in his 12 o'clock with no height displayed. He replied that he was good VMC on top and looking but he could not see the ac. Slightly later Blackpool said the traffic was then at 2nm still in the 12 o'clock with no height and there was a further ac to the south also with no height, probably Samlesbury based gliders. He continued to scan and caught sight of an ac about 500m away straight ahead so he immediately disengaged the autopilot and turned right and climbed. The other ac did not manoeuvre and passed below his port wing. He specifically noted that the other ac had no lights on [see Vigilant pilot's report below]. He reported the incident to Blackpool and after landing telephoned them to inform them that he would be filing an Airprox. He assessed the risk as being very high.

He added that the service from Blackpool had been excellent and he was relieved that he had asked for a RIS.

THE VIGILANT TI PILOT reports that he was instructing a student pilot in a day-glo and white ac with strobes, nav lights and the landing light switched on, on a local training flight from Samlesbury and was listening out on Samlesbury Radio while squawking 7000: Mode C was not fitted. While heading NW (down sun) at 60kt, with the student at the controls, he saw a predominantly white light twin engined ac about 3km away in his 1 o'clock. It passed about 1000ft overhead tracking from NW→SE. He did not consider there to have been any conflict and they did not take any avoiding action - therefore he did not file a report.

UKAB Note (1): Due to the considerable difference in the separation reported by the two pilots the Vigilant unit was contacted. The CFI had previously seen a copy of the radar recording and, from the timings and sortie profiles, he was certain that the correct Vigilant had been identified. Due to the elapsed time between the incident and the submission of the Vigilant pilot's report (almost a month) he could not recall some of the sortie details. The pilot did, however, recall seeing the other ac but did not register it as being in conflict.

ATSI reports that the PA34 pilot contacted Blackpool APR at 1056:24, requesting a RIS. Shortly afterwards, he reported his flight details as en route from the IOM to Gamston via Pole Hill and was *"currently abeam the rigs"* at 3000ft. The ac was identified 20nm WNW Blackpool Airport and was placed on a RIS.

Subsequently at 1106, APR asked the pilot if he was aware of the position of Samlesbury Airfield. He confirmed that he was and the controller said, *"they're active this morning there's about three or four contacts all milling*

around in within the vicinity of the airfield at the moment but there's no Mode Charlie on any of them", to which the PA34 pilot replied *"good Victor Mike Charlie on top and looking out".* Just over 2 min later, the TI was updated *"the contacts at Samlesbury one in your twelve o'clock by four miles manoeuvring and the other one slightly south of that so it's put him into your one o'clock again similar distance manoeuvring"*. Approximately a minute later, the PA34 pilot reported *"contact with the traffic he was at the same level coming straight towards me"*.

The Blackpool APR Controller complied with the procedures, as stated in the MATS Part 1, Section 1, Chapter 5, for the provision of a RIS.

UKAB Note (1): The recording of the St Annes radar shows the incident. The PA34 approaches the area from the NW tracking about 110° at a constant level of FL028 as the Vigilant approaches from the SE tracking about 300° but with no Mode C showing. The ac continue to close and the Vigilant is under 0.1nm to the left of the PA34 which turns hard right and climbs by 200ft. Since the Vigilant pilot did not report his alt and there was no Mode C data, the Vertical Separation reported by the respective pilots could not be verified.

HQ AIR (TRG) comments that it is standard operating procedures for Vigilant Motor Gliders to display nav, landing and strobe lights whenever airborne: these lights are all switched on as part of the pre-flight preparations. As the PA34 was flying into sun and haze, it is possible that its pilot could not differentiate between glare from the aircraft surfaces and the lights displayed. Timely TI was given to the PA34 pilot who saw the Vigilant late but with sufficient time to take avoiding action. The Vigilant pilot saw the PA34 at a range of 3km and did not consider it a threat and therefore did not take any avoiding action. Without radar altitude data it is difficult to assess the CPA altitude from the pilot reports but as both pilots were visual with the other's aircraft the actual risk of a collision was much reduced.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members agreed that this incident had been a fairly straightforward conflict between IFR and VFR traffic in Class G airspace where both pilots had an equal and shared responsibility to see and avoid other ac. GA specialist Members thought that an altitude of 3000ft (RPS), as flown by the PA34 pilot, although legal was inadvisable. These Members agreed that a quadrantal level (FL35 in this instance) would potentially have provided better separation against both the majority of VFR and other IFR traffic.

Members noted that Blackpool APR had provided accurate and timely TI to the PA34 pilot when requested and agreed that this had been a significant factor in enabling him to acquire the Vigilant visually at 500m in the reduced visibility into Sun, albeit later than optimum.

In assessing the risk, Members noted that the Vigilant pilot had seen the PA34 also slightly late but he considered that the vertical separation had been such that there was no conflict and that no action was required. Members noted that the estimated horizontal sighting distance reported by the Vigilant pilot was greater than the estimated distance of 500m that the PA34 reported seeing the Vigilant and manoeuvring to avoid it. One explanation might be that despite reporting that he had seen the PA34 at 3km, the Vigilant pilot had actually seen the ac after its pilot had taken avoiding action by turning and climbing. However the radar had shown that the horizontal separation had been much nearer to that reported by the PA34 pilot than that reported by the Vigilant pilot. Although not indisputable, the majority of Members considered that since both pilots had seen the opposing ac in time to take action (if considered necessary), there had been no collision risk.

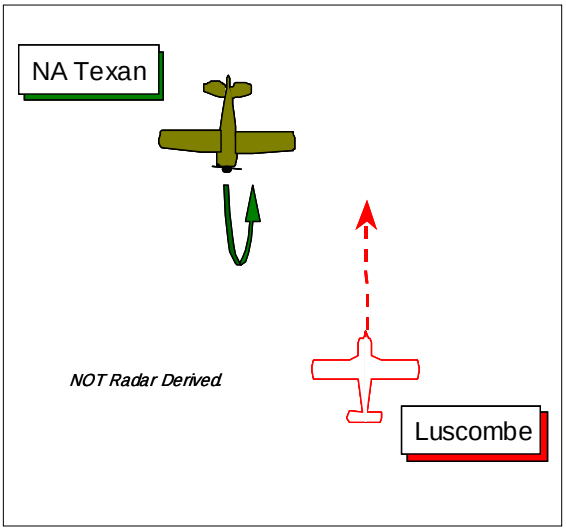
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G Airspace resolved by the PA34 pilot.

Degree of Risk: C.

AIRPROX REPORT NO 108/08

Date/Time:	27 July 1310 (Sunday)	
Position:	5048N 00107W (Portsmouth Harbour)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	NA AT6D Texan	Luscombe Silvaire
Operator:	Civ Pte	Civ Pte
Alt/FL:	1500ft	2000ft
	QNH (1017mb)	QNH (1019mb)
Weather	VMC Sunny	VMC CLNC
Visibility:	10km	10Km
Reported Separation:		
	300ft V/200m H	Not seen
Recorded Separation:		
	Not Recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE NORTH AMERICAN AT6D TEXAN PILOT provided a very full account reporting that his ac has a vintage Dark Green USAAC colour scheme but the anti-collision beacon was on whilst participating in a flying display over Portsmouth Dockyard. Operating VFR in VMC, he was in communication with HMS ILLUSTRIOUS through FLYCO on 122·1MHz and the Flying Display Director (FDD) - the controlling & co-ordinating authority for the display. A squawk of A7000 was selected with Mode C 'on'.

The commencement of his display from the 'on top' had been delayed beyond the scheduled display start time because of an unknown civilian ac observed flying N – S to the east of Portsmouth, within the NOTAM'd display area. When the unknown ac was seen to clear the vicinity he was called in and given clearance to start his flying display. He cleared the area visually as thoroughly as he could for both ships and ac before diving down from about 2500ft ALT at 200kt to level off at 800ft amsl. He pulled into a loop, having cleared above him, but heading 170° at 190kt at about 50-60° nose up, he first saw the other ac - the Luscombe Silvaire – slightly above and displaced about 200m to his left flying a reciprocal course straight and level at about 1500ft. At this point his Texan was in line with the buoys marking the display line and the Luscombe was above the crowd in Portsmouth dockyard. He recognised that there was no risk of collision at that stage and so he continued into the loop whilst maintaining visual contact with the other ac virtually throughout the manoeuvre and quite definitely clear of the Luscombe both going up and coming down. No avoiding action was taken but he had the option to roll to the R, to increase the horizontal separation, but this would have taken him over Gosport, which he considered unnecessary. Minimum vertical separation was about 300ft and 200m to port. At the same time that he saw the Luscombe, ILLUSTRIOUS called to him to stop his display, whereupon he followed the Luscombe to the N to obtain the ac's registration. After both he and ILLUSTRIOUS were sure that the area was again clear he re-commenced his display.

He stressed that a NOTAM had been issued and was in force during the period of his display, which was also covered by AUS ACN 2008-07-0048. 'Terrain blanking', caused by the close proximity of ships and tall buildings in the direction that the Luscombe had approached from, had prevented both ground observers and himself from spotting the other ac earlier. Moreover, the Luscombe's nose-on profile and white colour-scheme against the background of the Isle of Wight but amongst masses of white wakes from boats and jet-skis had masked the ac's presence from him before the dive whilst he was well above the other ac on this lovely sunny day. It seemed from his very steady straight & level flight that the Luscombe pilot might not have seen his aeroplane.

THE LUSCOMBE SILVAIRE PILOT reports that he had departed from Popham A/D at 1245UTC with a passenger for a sightseeing trip down to Portsmouth via New Alresford. On leaving the Popham A/G frequency he switched to Solent RADAR on 120·225MHz but found them quite busy and elected to just maintain a listening watch. (He felt this was more appropriate for this flight, as he had experienced a delayed response due to ATC being too busy

4 days previously, when flying from Popham to Bembridge. On that occasion both on the outbound and return legs he was put on hold by Solent and by the time communication could be established he was on the point of leaving the frequency as he was approaching his destination.)

Continuing the flight onward from New Alresford he flew down to Portsmouth Harbour at 2000ft QNH (1019mb) where he executed a right turn to continue on a northerly direction. A few minutes later heading N at 80kt he noticed another aeroplane – the Texan - through his overhead skylight passing about 1500ft above his aeroplane. This was the first sighting of the Texan ac as it had not been spotted previously.

Prior to this flight he had checked NOTAMs and the 'freefone' telephone number [0500 354802] but unfortunately and inexplicably he had not noticed this event was taking place at Portsmouth. Indeed, he first found out about it when contacted by the RAC during tracing.

He offered his apologies for any inconvenience that may have been caused to the reporting Texan pilot and any other persons, adding that in 28 years of flying this was the first Airprox that he had been involved in. He emphasised that in future he will double check NOTAMs and ensure that he works the relevant radio/radar ATSUs even though they may be busy.

His aeroplane has a white & red colour-scheme with wingtip HISLs.

THE AIR DISPLAY CO-ORDINATOR reports that an Airspace Co-ordination Notice (ACN No 2008-07-0048 - Meet the Navy Air Display - Portsmouth 25–27 July 2008) had been promulgated for the event, which detailed the measures agreed to accommodate this Unusual Aerial Activity.

Portsmouth Harbour was closed to all shipping and a NOTAM had been released to notify other airspace users of the flying activity. The Flying Display Director (FDD) was located on the bridge roof of HMS ILLUSTRIOUS, whilst display clearances and weather information were relayed by a military ATCO stationed in the FLYCO position beneath. Radar was not in use; a FIS was provided to the Texan pilot during the display. The 230-metre display line was visibly marked by yacht racing buoys, laterally displaced from the crowd who were situated on the upper decks of ships between Middle Slip and South Railway jetties.

About 5min prior to the start of the display a light aircraft (LA) had been observed some 3nm E of the display area, heading S and in no confliction with the planned flying display. The ac disappeared from sight, still heading S as it passed behind the superstructure of the ship and various high buildings to the E.

At 1310 the Texan pilot was cleared to begin his aerobatic display and commenced his first run from N to S at approximately 800ft QNH (1017mb). One min later as the Texan pulled up to enter a loop, the FDD ordered the display to stop because an unidentified ac had entered the display area tracking S - N at approximately 1500ft amsl. At around 40° nose up the Texan pilot called visual with the unknown ac and continued his climb, converted to a wing over manoeuvre and passed through the same altitude as the other ac.

Both the FDD and the Texan pilot identified the unknown ac visually - that was white with red markings - as the Luscombe Silvaire. The Texan remained on a northerly course, tracking the Luscombe until it had cleared to the N of the display area. After further visual checks to confirm that the display area was clear the FDD gave permission for the Texan pilot to recommence his display, which was completed without further incident.

SOLENT Approach was contacted by landline but was unable to provide any information on the Luscombe as the pilot had not worked their frequency. It is estimated that the closest both ac came before TEXAN called visual was 200m horizontally and 700ft vertically.

The visibility at the time of the incident was very good although the position of the Sun may have been a contributory factor in preventing the Texan pilot from spotting the Luscombe earlier.

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

UKAB Note (2): AUS advises that a NOTAM was issued [H2697/08], promulgating activity for this day between 1145-1600 from the surface to 3000ft amsl for "DISPLAYS BY MIL AND SAR HEL AND HISTORIC ACFT WI 3NM RADIUS 5048N 00107W (PORTSMOUTH DOCKYARD)."

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 air display co-ordinator.

It seemed plain that the catalyst for this Airprox was set even before the Texan pilot commenced his display. The laudably frank and comprehensive account by the Luscombe Silvaire pilot had revealed that he was unaware of the Air Display before he left Popham. He had reported that inexplicably, despite a review of current NOTAMs, he had not noticed this event was taking place at Portsmouth and when planning his flight had not taken account of the actual NOTAM promulgating the display. The GA pilot Member was surprised that it had not been evident from flight information displays at the Silvaire's departure aerodrome. In his experience, most GA aerodromes have them to make it easier for pilots to brief themselves on relevant warnings. It appears that if the Luscombe pilot's base has such a display, he had patently missed the Air Display entry. Clearly, the existence of the NOTAM did not grant exclusive use of this airspace to Air Display participants unless a Restricted Area (Temporary) had been established which, for the Texan's display, it had not. Nevertheless, the basic principle of conducting thorough pre-flight planning, including a conscientious trawl through NOTAMs, was an important lesson from this Airprox and worth repeating here. Moreover it was most unwise for non-participating pilots to enter the display area.

It was evident that the Air Display organisation had established a lookout regimen to ensure that the airspace was clear of uninvited participants. This had revealed an earlier unknown ac - the recorded radar data suggested this was another ac and not the Luscombe - which had delayed the commencement of the Texan pilot's display. Despite searching for 'intruders' the Luscombe was not seen before the Texan pilot commenced his display run-in. Members understood the difficulties of spotting the small Luscombe against the harbour area, the seascape of the Solent and the background of the IOW. Fortunately, the Texan pilot spotted the Luscombe in time, albeit that he was 50-60° nose up when he first saw it, slightly above and displaced about 200m to his left flying a reciprocal course straight and level at about 1500ft, the Texan pilot reported. Unfortunately, the recorded radar sources did not capture the Airprox as it was below coverage and thus the relative geometry of this close quarter's situation could not be ascertained independently. Nonetheless, the Luscombe pilot had not seen the Texan at all at this point and was unaware of the other aeroplane looping to port. It seemed clear that the Luscombe pilot only saw the Texan when the display pilot flew N to identify the other aeroplane and overflew it.

The Board had no reason to doubt the veracity of the Texan pilot's account of events. Moreover it was plain that he would have been able to break-off and clear to the W if needs be. The Board concluded that this Airprox had resulted because the Luscombe Silvaire pilot entered a NOTAM'd air display area and flew into conflict with the Texan which he did not see. Despite this, however, the Luscombe was seen in time – simultaneously it seems by both the ADD and the Texan pilot - which enabled the latter to remain clear of the other aeroplane. After weighing all these factors carefully, the Members agreed unanimously that no risk of a collision had existed in the circumstances conscientiously and candidly reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

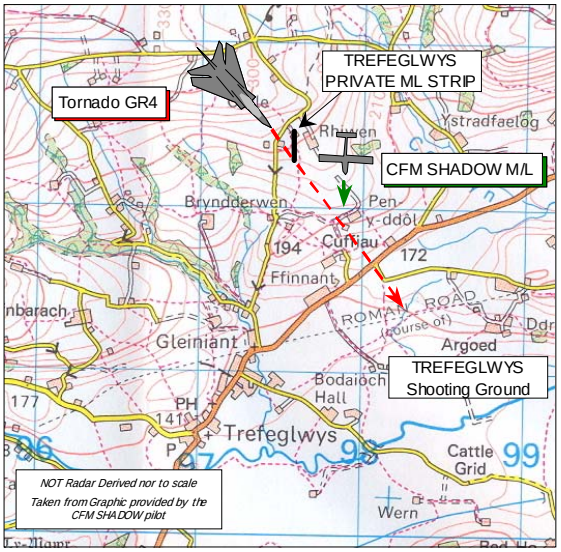
Cause: The Luscombe Silvaire pilot entered a NOTAM'd air display area and flew into conflict with the Texan which he did not see.

Degree of Risk: C.

AIRPROX REPORT No 110/08

AIRPROX REPORT NO 110/08

Date/Time:	23 Jul 1906	
Position:	5231N 00330W (Vicinity of private strip at Trefeglwys)	
Airspace:	London FIR/LFA7	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	CFM Shadow	Tornado GR4
Operator:	Civ Pte	HQ Air (Ops)
Alt/FL:	300ft agl	250ft agl
Weather	VMC CLOC	VMC CLOC
Visibility:	15km	10km
Reported Separation:	100ft V/250ft H	1000ft V/500m H
Recorded Separation:	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CFM SHADOW MICROLIGHT PILOT reports he was inbound to his private airstrip at Trefeglwys [OS Grid SN 977 923] in his red and white coloured 2-seater machine in VMC with "good" visibility. A radio is not fitted but the 2 strobe lights were on.

He was turning R onto the southerly DOWNWIND leg at 70kt, flying at 300ft agl, for landing on the strip in a northerly direction, when a Tornado jet was spotted about 250-300ft to starboard and 100ft below his microlight as it passed at high speed some 250ft away at the closest point with a *"very high"* risk of a collision. The Tornado was descending into the Trefeglwys Valley heading SSE, and flew away over the shooting ground before it pulled up to clear the hill toward Llandinam wind farm. In his opinion if the jet had passed by approx 20-30 sec later it could have collided with his microlight ac as he was descending and turning in the circuit to land. The following morning he rang Shawbury to report the Airprox.

THE TORNADO GR4 PILOT provided a brief account reporting that he was flying at 420kt in company with 2 other Tornado GR4 ac on a low-level evasion exercise over Wales in VMC at 250ft agl. Various light ac were seen and all ac spotted appeared to be more than 1000ft away with all three GR4's either visual or not in confliction. In his view it did not seem close enough for an Airprox.

UKAB Note (1): This Airprox is not illustrated by recorded radar. Understandably, the LATCC (Mil) recording of the Clee Hill Radar does not show the CFM Shadow Micro light at all. However, a A7001 squawk, without supporting primary data, which may or may not be the specific jet flown by the reported GR4 pilot, is shown approaching the reported position of the Airprox at Trefeglwys Landing Strip (LS) descending from 1600ft (1013mb). The ac maintains a steady course toward the reported co-ordinates and is last shown at 1905:19, indicating 1300ft Mode C (1013mb) 0·7nm NW of Trefeglwys LS heading SE before fading from coverage. At about 1906:18, a A7001 contact is again evident some 6nm SE of Trefeglwys LS in company with another A7001 squawk on a SE'ly course indicating 1300ft Mode C (1013mb).

HQ AIR (OPS) comments that without any radar trace from the Shadow it is difficult to say much about this encounter. Although the Tornado crew report seeing, and remaining clear of, a number of light ac, it is possible that the Shadow was not seen as it appears to have been quite low at the time.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

In the 'see and avoid' environment of Class G airspace, it was evident to the Members that a camouflaged fast jet at low-level, approaching at a virtually head-on aspect to the micro-light, would be difficult to spot. Nonetheless, the Shadow pilot had seen a single GR4 as it passed by some 250ft away and 100ft below his machine. However, he had not mentioned spotting the other jets, which from the reported pilot's account were apparently flying in the general vicinity. Members noted his comment that if the jet he saw had flown by 20-30 sec later it could have collided with his microlight ac as he would have been descending in the circuit and turning onto FINALs to land on a northerly heading. However, the Board could only assess Airprox reports on the basis of what had actually occurred and not what might have happened if circumstances had been somewhat different. It seemed that no avoiding action was either taken or warranted as the jet crossed ahead and then cleared to the SE, a Member observing that it was fortunate that the Shadow pilot had spotted the jet when he did which had at least allowed him to maintain a careful watch and to judge the geometry such that he turned onto FINALS after the jet had cleared. Furthermore, it was not clear which of the three GR4s reported to be operating in the area was the ac spotted by the Shadow pilot. A Member queried whether it was feasible to promulgate the position of this individual LS to fast-jet crews; the Board was subsequently advised by Low-Flying Ops that, in consultation with the BMAA, it had been agreed to promulgate up to 150 Microlight sites in Flight Information Publications (FLIPs) available to military crews but it was the BMAA that chose which ones to include. Thus private LSs such as this might not fulfil the criteria established such that this one was not highlighted to Military crews in FLIPs.

From the GR4 pilot's perspective he was operating legitimately in the UK Day Low-flying System (UKDLFS) and Members recognised that he and his fellow fast jet crews were operating under a very high workload - principally looking out of the cockpit in order to detect the 'bounce' ac. Thus the Tornado crews would have been highly focussed on look-out for other ac and indeed the GR4 pilot had reported sighting various light ac, all of which had appeared to the GR4 pilots to be displaced more than 1000ft laterally from each of the three jets. Nevertheless, it was not clear to the Members whether the reported GR4 pilot had indeed spotted the specific Shadow micro-light flown by the reporting pilot, it being entirely feasible that he had not.

Although the radar recording had shown two jets low-flying in the area at the time and it was clear that one had flown a track comparable to that reported by the Shadow pilot through this vicinity, in this area of the UK solid radar coverage does not extend down to the levels involved here. In the absence of more complete radar data illustrating the encounter, it was not feasible to resolve the significant anomaly of the reported separation. Therefore it was difficult for the Board to come to any more definite conclusions. On the basis of the limited information available, the Members agreed unanimously that this Airprox had been the result of a conflict in the FIR/UKDFLS but in the Board's view no risk of a collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

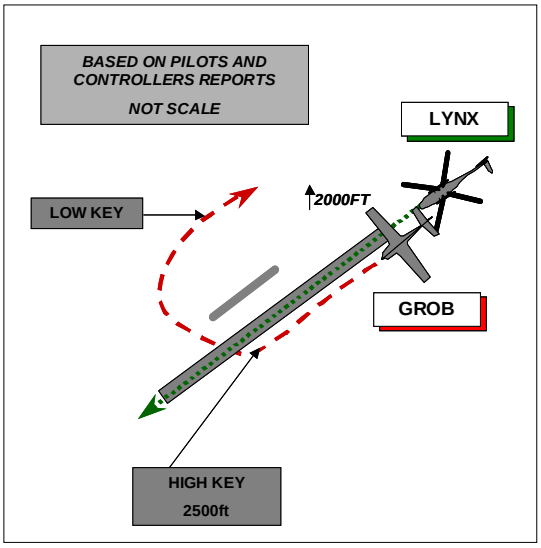
Cause: Conflict in the FIR/UKDLFS.

Degree of Risk: C.

AIRPROX REPORT No 111/08

AIRPROX REPORT NO 111/08

Date/Time:	7 Aug 1336	
Position:	5109N 00145W (Boscombe Down - elev 407ft)	
Airspace:	ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Lynx AH7	Grob Tutor
Operator:	HQ DAAvn	HQ AIR (Trg)
Alt/FL:	1950ft (QFE 991mb)	2500ft (QFE 991mb)
Weather	VMC CLBC	VMC CLOC
Visibility:	>20km	Good Visibility
Reported Separation:	NR V /100ft H	NR
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LYNX AH7 PILOT reports flying a training sortie with another QHI in a camouflage grey/green ac with nav lights and the anti-coll beacon switched on. He was in receipt of a RIS from Boscombe Down, squawking 2634 with Mode C, and was overshooting from RW23 at 100kt on a radar climbout. Upon commencing level off at 2000ft QFE, the reported ac, a white and blue 2 seat light ac with RAF roundels, appeared from above and slightly left about 150ft away, drifting to the right across their track right and directly in front of them. His ac was closing from their rear. He estimated that his avoiding action climbing turn away was made when the ac were about 100ft apart.

He was completely unaware of this aircraft being in the MATZ [ATZ] and it was not possible to see this ac which was descending from above: the left hand roof of the Lynx is solid.

He estimated the risk as being high and reported the incident to Boscombe APP.

THE GROB TUTOR PILOT reports flying an Air Experience flight with a cadet in a white ac with nav lights, landing lights and strobes switched on. He was squawking with Mode C. At the time of the incident he was flying at 75kt and had requested a visual recovery from S of Boscombe Down for a PFL. When approving the PFL, Boscombe APP [on UHF] advised him of a rotary wing ac carrying out an instrument approach to RW23 to overshoot for a further approach. The visibility was good and there was no significant cloud and when he called TWR for the PFL join the controller advised him again of the instrument traffic. He located the radar traffic visually about 2-3nm away and adjusted his arrival at High Key for RW23 Main RH to afford the radar traffic priority. As far as he could recollect, his height at High Key was about 2500ft on the QFE. There was nothing noteworthy between High Key and his landing and he knew where the rotary wing was throughout. At no time did he consider that he was in his way: had he assessed otherwise, he would have orbited at High Key or applied power to return there if any conflict became apparent later.

He flew 7 “back-to-back” sorties that afternoon, the sequence of events above occurring on the first one, but it was not until a telephone call with the ATC Duty Supervisor after landing from his last sortie that he became aware that the pilot of the helicopter was concerned about the separation between them 6 sorties earlier. He considered the risk as being none and if he had had any concerns about safe separation, or if he had been aware at the time that the pilot of the rotary ac had been concerned, he would have fixed the details in his mind. As there had been nothing noteworthy during the PFL on the first sortie and as he had flown 6 subsequent sorties lasting a total of 3 hours, he had no further recollection of the circumstances.

MIL ACC reports that at 1333:13 a Grob Tutor (Grob) recovered from the SSE of Boscombe Down for a visual PFL to RW23 RHC with Boscombe Down Approach (APP) frequency 233.85 MHz. The Grob had checked in on

the APP frequency and was passed the airfield details and instructed not to descend below 2500ft QFE 991mb before free-calling TWR on frequency 338.47 MHz. At 1336:52 a Lynx AH7 (Lynx) had overshot from an IFR approach, having completed a PAR to RW23. The Lynx was passed climb-out instructions to climb on RW track to 2000ft by APP on frequency 233.85 MHz.

At 1333:13 the Grob pilot called APP, *'Boscombe Approach, C/S request a visual recovery PFL altitude 2500ft'* and the controller replied, *'C/S Information J 1300, Boscombe RW23, surface wind 220/11 colour Blu fully serviceable, QFE 9-9-1 not below 2500ft QFE report aerodrome in sight, changing to stud 3'.* The APP controller made a landline call to TWR at 1333:38, *'APP, Inbound visual PFL from the South C/S not below 2500ft QFE',* TWR acknowledged the call. At 1333:52, the pilot then called TWR, *'Tower C/S join PFL',* and they responded, *'C/S Boscombe Tower, join visual PFL RW23 QFE 9-9-1, 1 in, 1 South-side and radar traffic, a rotary, approaching 4 miles final'* which the pilot acknowledged. At 1334:17 the radar clearance line (RCL) was activated by PAR, *'4 miles 1200ft C/S overshoot',* but TWR issued a delayed clearance, *'C/S call by 2'.* TWR then transmitted on the tower frequency, *'Lynx 3.5 miles continuing'.* At 1334:34 TWR transmitted to the Grob, *'C/S report high key with intentions'.* 6sec later the RCL was activated by PAR, *'Two and a quarter miles, C/S to overshoot'* and TWR responded, *'C/S cleared to overshoot, 1 in, 1 South-side and Tutor descending to High Key'.* The PAR controller then read back the clearance, (this is done with the RCL whilst simultaneously transmitting on the PAR frequency). At 1335.37 the TWR transmitted, *'Lynx 2 miles, overshoot for further'* and one min later the Grob pilot transmitted, *'C/S is High Key main to land'* but TWR replied, *'C/S position for the North'* and the pilot acknowledged. High Key is considered similar to the down-wind call and would normally require more detailed TI.

Some 10sec later the Lynx pilot contacted APP, *'Boscombe, C/S on handover, on the overshoot'* to which the controller responded, *'C/S Boscombe Approach, not yet identified, climb on runway track, 2000ft, report level'* which the pilot acknowledged. At 1337.27 the Lynx pilot transmitted an exclamation; 8sec later he notified APP that they would be filing an Airprox.

The Lynx Pilot reported that he had not been given any prior warning on any ac being in the vicinity. This was not the case however as TI was passed when the clearance to overshoot was given by PAR (1334.40 the RCL is activated by PAR, *'Two and a quarter miles, C/S to overshoot'* and TWR responded, *'C/S cleared to overshoot, 1 in, 1 South-side and Tutor descending to High Key.*').

The Radar Replay timings appear to be up to 15sec behind the tape transcript. The radar QNH is set as 1004mb. Therefore, the Mode C of an ac flying at 2500ft QFE 991mb would read 029 or 028 and that of an ac flying at 2000ft QFE 991mb would read 023 or 024. The Grob is seen on the replay at 1336.24, slightly upwind of RW23, entering the overhead in a left hand turn with its Mode C displaying 028. The Grob maintained RW track and descended slightly to FL025. The Lynx does not show on the radar until 1337.20 when the SSR was garbled with that of the Grob.

[UKAB Note(1): Although both ac can be seen intermittently on the recordings, the actual CPA is not seen. Further the ADC did not see the incident. That being the case the significant differences between the separation distances reported by the pilots could not be resolved.]

Visual circuits at military airfields are controlled by passing TI to pilots therein. Pilots are then expected to position their ac accordingly and afford radar traffic priority. The Grob pilot did not report changing frequency to APP and did not acknowledge the descent stop of 2500ft QFE. However, on changing to Tower the TWR passed accurate TI on the radar traffic at 4 miles to the Grob. In addition 2 further references to the Lynx were made by TWR on the Tower frequency: the 3.5 miles continuing and the 2 and a quarter mile clearance which also gave the Lynx's further intentions. Once the Grob pilot was visual with all of the traffic the pilot would be expected to descend into the visual circuit.

The Lynx was also passed TI on the Grob as part of the clearance to overshoot. A further update to the TI was not passed when the Grob reported High Key, however, the TWR instead instructing the Grob to position for the North. The use of the northern circuit is part of the flexible controlling required for routine operations at Boscombe Down *(all TWR controllers are trained and examined during dual RW ops)*. Switching operations from the main runway to the Northern is a common occurrence to integrate traffic in the visual circuit. Additionally, TWR trainees are briefed on the possibility of confliction between descending VPFL traffic and IFR departures and the various means available to de-conflict them.

HQ AAC comments that it would appear that all three participants of the incident were doing what was expected of them but two ac still came into close proximity with one another. Being cleared to High Key on the N taxiway at Boscombe, the Grob was thus (at 2200ft QFE) on or just S of the active centreline of a RW to which a helicopter had been cleared (to 2000ft) while carrying out an overshoot. The 500ft difference in cleared heights seems to have been eroded (FL25) at a point close to where the 2 ac's tracks were intersecting.

HQ AIR (Trg) comments that it appears the Lynx pilot did not register the TI about the Tutor ac descending to High Key, consequently the Tutor caused him concern when he became visual during the overshoot.

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.

Members were briefed by the Secretariat that although the circuit direction for RW23(Main) is left hand, RW23(North) is available for locally-based light ac (only) and has a right hand circuit direction. Although the positions of High Key (Grob Tutor) for RW23(Main) and RW23(North) are close, they are on opposite sides of the Main RW. This would not be of great significance to the Grob Tutor pilot but it did however mean that when flying the visual PFL procedure to the North RW he had to cross the Main RW from S to N after he had left High Key and started his descent. This would put his ac slightly below 2500ft QFE as it crossed the Main RW.

Accepting that the Grob Tutor pilot's report contained only what he could remember of what was, from his perspective, an uneventful flight, Members noted that although he had seen the Lynx at some stage he did not state that he had maintained visual contact with it. That being the case, Members deduced that while joining from the SSE he had seen the Lynx descending on the GCA. At that stage he had been well above it and it had indeed not been a significant factor as he turned left to fly down the RW23 centreline (slightly to the S) at 2500ft QFE between 2 and 1nm from the threshold. As he did this the Grob pilot would not have been able to see that the Lynx had commenced an overshoot at DH and was climbing quite rapidly, almost directly below him (perhaps slightly ahead), and similarly the Lynx pilot would not have been able to see the Grob. It was surmised that the Grob must have been very slightly faster than the Lynx and had overtaken it very slowly, slightly to the S, and commenced its descent from High Key, turning R towards Low Key as, or just after, the Lynx had reached its cleared height of 2000ft.

Although the transcript showed that TI regarding the Grob had been transmitted to the Lynx pilot as part of the overshoot clearance, during the high workload period of breaking off the approach the significance of the information was apparently not assimilated. Nevertheless, it is standard practise at military units for visual circuit traffic to give way to instrument traffic; in this case the Grob had been on a visual PFL, the pilot had been given TI regarding the Lynx but apparently he had not thought that it would be at 2000ft and therefore just below and very slightly behind him. Although based on a little supposition, this analysis explained the sequence of events, was supported by the facts in the recordings and the impressions reported by the pilots. Members determined therefore that the Grob's descent had caused the Airprox.

In assessing the degree of risk Members noted that, although warned of each other's presence, neither pilot had reacted to the information and neither had seen the opposing ac until after the CPA. In the absence of any other information regarding the separation between the two ac, Members accepted the Lynx pilot's assessment of 100ft and considered that there had therefore been a significant degradation of normal safety standards. The Board also considered the safety of the Boscombe Down procedures and Members were briefed that these had been changed in the recent past due to another incident. On balance, it was decided not to make a safety recommendation as Members were assured by the Mil ACC Advisor that procedures there and elsewhere were under continuous scrutiny.

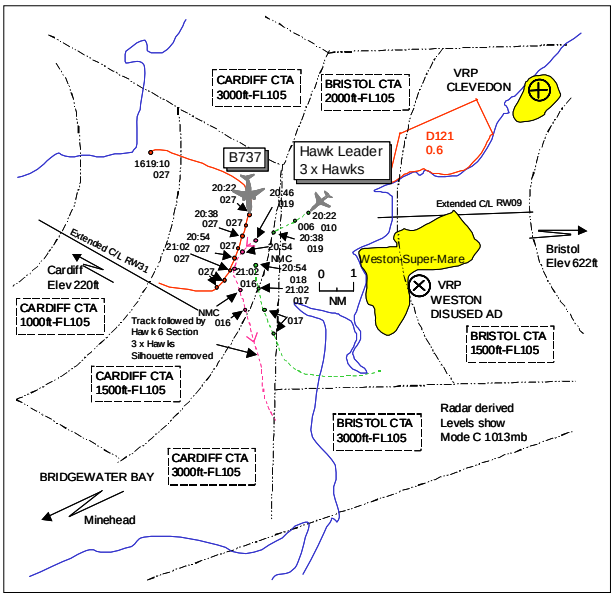
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Grob Tutor pilot descended into conflict with the Lynx AH7.

Degree of Risk: B.

AIRPROX REPORT NO 112/08

Date/Time:	9 Aug 1621 (Saturday)	
Position:	5121N 00304W (13nm WSW Bristol Airport - elev 622ft)	
Airspace:	FIR/CTA	(Class: G/D)
	Reporting Ac	*Reported Ac*
Type:	9 x Hawks	B737-800
Operator:	HQ AIR (Trg)	CAT
Alt/FL:	1000ft↑ (QNH 1007mb)	2500ft (QNH)
Weather	VMC CLBC	IMC CLOC
Visibility:	5000m	
Reported Separation:	1000ft V/0·5nm H	NR
Recorded Separation:	Leader 900ft V/0·7nm H Hawk 6 1100ft V/0·2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK FORMATION LEADER reports inbound to Bristol VFR and in receipt of a RIS from Bristol on 136·075MHz squawking 7003 with Mode C. Following a low level transit and during the recovery phase, he decided that a VFR approach could not be flown owing to poor weather at Bristol Airport. Maintaining VMC in 5000m visibility at low-level over the Bristol Channel, the formation was split into 3 elements of 3 ac. ATC were requested to allocate squawks for the 2 trail elements with Lead element retaining the discrete code 7003. The Lead element was identified, he thought, and was cleared to climb to 2500ft. Heading 260° at 360kt and climbing through 1200ft QNH, the Leader noticed an airliner, a B737, through a gap in the clouds and subsequently levelled-off at 1500ft, the B737 passing 1000ft above and 0·5nm clear. At no point was he informed of the conflicting traffic and had the Lead element been IMC at the point of visual contact he felt that the risk of collision would have been extremely high. Owing to the proximity of the airliner to the formation, an Airprox was filed on landing.

THE B737 PILOT reports approaching Cardiff from the S via EXMOR and London handed them over to Cardiff Radar. The FO was PF during strong tailwind conditions with Cardiff landing RW30. They were a little high on approach so Cardiff took them through the LLZ with a RH turn to intercept from the N. During this turn Cardiff transmitted *"If you look below and you're VMC you may see (formation c/s) flying at 300ft"*. At the time they were flying at about 2500-3000ft and actually in IMC but they duly looked through holes in the cloud and spotted 4 Hawks, he thought, in formation on each side. The Hawks' nose lights were on (total 8) but way below over the Bristol Channel. They informed Cardiff ATC, the Hawks were by then gone and the approach was completed. At no time were the Hawks close enough to cause them concern. Being under positive control from Cardiff and complying with instructions, they thought no more of it.

THE BRISTOL APR reports operating with positions bandboxed, the traffic situation light with poor weather at times as showers passed through the area reducing the amount of LARS traffic. There was also a performance issue with the primary radar which was serviceable but was flashing 'in and out' and there was considerable Wx clutter with circular polarisation selected. The Hawk Formation Lead called shortly after she assumed control and advised that they were in the vicinity of Minehead at low-level and requesting a radar service. She advised them that they were too low and was unable to provide a radar service. She contacted Cardiff Radar and informed them of the Hawk Formation's position and asked whether they had [radar] contact with them. She was told that Cardiff could see them and that they could see nothing to affect them; this information was passed to the Hawk Formation Leader. The Hawk Leader informed her that they wished to enter CAS VFR at Clevedon VRP but all of his radio calls were very difficult to understand and she had to ask him to repeat several transmissions. She contacted Tower and requested coordination for the VFR entry which was agreed but the ADC made comment about the Wx being marginal although the broadcast Wx indicated suitability for a VFR join. Hawk Leader then requested to

enter CAS via Weston VRP, which was again coordinated with ADC, and a full VFR clearance was passed to Hawk Leader to join downwind LH for RW27. Hawk Leader reported passing Weston and was transferred to the Tower frequency but Lead called again advising that there were showers ahead so they wished to enter IFR and he requested a climb. With assistance from the ATSA, she thought she understood the request after the third transmission. At the time she still did not have radar contact on the Hawk Formation but she believed them to be in the Weston area on the Bristol side of the Cardiff/Bristol airspace 'buffer'. At no time did she notice a D/F trace to indicate their position, relying solely on Hawk Leader's position reports to form her estimate of their position. She instructed Hawk Leader to climb to altitude 2500ft to try and obtain radar contact. Hawk Leader then advised her that he had stopped climb at 1500ft owing to traffic which he assumed to be Cardiff traffic [the subject B737]. She instructed Hawk Leader to maintain 1500ft and she advised Cardiff of this fact. She did not notice the conflicting B737 until after the Hawk Leader's report. Subsequently she radar identified the 3 groups of the split formation and vectored them for an ILS approach for RW27.

THE CARDIFF APR reports operating bandboxed with all frequencies cross-coupled. He was vectoring the B737 in a RH pattern for the ILS RW30 level at 2500ft and issued the flight with a R turn onto heading 210° when about 7-8nm downwind. He saw the Hawk Formation's squawk coasting out at Portishead [3nm NE Clevedon VRP] at about 300ft and TI to the B737 crew as 'you may see or get TCAS on Hawk Formation c/s 10 o'clock range 2-3nm at about 300ft'. The crew replied they were in cloud but were looking out. He turned the B737 onto the ILS at about 8·5nm still level at 2500ft. At about this time he received a telephone call from the Bristol APR saying that their Hawk Formation squawk code was remaining at 1500ft. He replied that the B737 was maintaining 2500ft and was turning to establish on the ILS. After the B737 crew reported established, he saw the Hawk Formation clearing to the SE and he transferred the B737 to Tower. He then saw the Hawk Formation split into 3 groups, 1 group retaining its discrete code and the other 2 groups squawking discrete Bristol codes with all elements at 2500ft clear of Cardiff CAS.

ATSI reports that the Hawk formation had planned to arrive at Bristol from Exeter on a VFR flight. The Bristol Radar positions were bandboxed when the formation established communication with Bristol at 1613. The traffic situation was light at the time. They reported *"Hawk Formation c/s we are squawking Seven Double Oh Three approaching Minehead from the south low level currently and we'd like to request Radar Information when available"*. The APR asked if they were planning to climb out of low level. The Hawk Leader replied *"we'd like to maintain low level heading north to transit the Bristol Channel for recovery"*. In answer to the controller's enquiry about the flight rules they reported *"VFR initially"* and requested the QNH, which was passed. The full weather report was never passed to the formation nor any indication received that the ATIS had been copied. The Bristol METAR, applicable when the Hawk Formation Leader made his initial call, was: '20011kt 9999 VCSH FEW004 SCT006 BKN015 17/16 Q1007'.

Thereafter, the following transmissions were made between 1614 and 1621, to/from ATC and the Hawk Formation:

ATC*"Hawk Formation c/s confirm you want to enter controlled airspace via Clevedon VFR".*

Hawk Formation*"Affirmative Hawk Formation c/s".*

ATC*"Roger report approaching Clevedon and w- enter controlled airspace joining downwind righthand for runway Two Seven the QNH One Zero Zero Seven runway Two Seven threshold QFE Nine Eight Five millibars".*

Hawk Formation*"Two seven Nine Eight Five Hawk Formation c/s".*

Hawk Formation*"Bristol Hawk Formation c/s we're coasting out northbound requesting Radar Information".*

ATC*"Roger you're not on radar contact and report your altitude".*

Hawk Formation*"Hawk Formation c/s are Five Hundred feet".* ATC*"And report your position now".*

Hawk Formation*"Hawk Formation c/s north of Minehead".*

ATC*"???? Rog-".*

Hawk Formation*"That is northeast of Minehead".*

ATC*"Roger can you accept a climb or do you want to remain low level".*

Hawk Formation*"Hawk Formation c/s we'd like to maintain low level er ????".*

ATC*Roger I won't be able to give you a radar service er it's beyond my radar cover so Flight Information Service report passing aper- abeam of Weston Super Mare inbound to Clevedon low level".*

Hawk Formation*"Okay Hawk Formation c/s".*

ATC*"And Hawk Formation c/s the Cardiff advise that they can see you and they advise you've got nothing on your track and report passing Weston Super Mare".*

Hawk Formation*"Hawk Formation c/s that's copied and what we'd like to do is er transit to the south of Weston Super Mare to join downwind for runway Two Seven".*

ATC*"That is approved enter controlled airspace as required via Weston not above Two Thousand feet QNH One Zero Zero Seven report passing Weston Super Mare to join downwind lefthand".*

Hawk Formation*"Clear enter not above Two Thousand feet Hawk Formation c/s wilco".*

Hawk Formation*"Bristol Hawk Formation c/s confirm we're number one".*

ATC*"Say again".*

Hawk Formation*"Confirm we're number one for recovery".*

ATC*"Erm Hawk Formation c/s your er er contact the Tower now One Three Three decimal Eight Five Zero they have your i- your intentions".*

Hawk Formation*"Hawk Formation c/s we'd just like to remain with you for a couple of minutes confirm we're number one for recovery though".*

ATC*"And Hawk Formation c/s you are number one".*

Hawk Formation*"Hawk Formation c/s that's copied we're passing Weston now".*

ATC*"Roger contact the Tower One Three Three decimal Eight Five Zero you are number one the aircraft I'm bringing in from the east I'll bring in after you".*

Hawk Formation*"Hawk Formation c/s we'd just like to remain ????? ????? we're going through quite a heavy shower then need come up".*

ATC*"Roger keep me advised".*

Hawk Formation*"Hawk Formation c/s".*

ATC*"And Hawk Formation c/s I've got an aircraft inbound from the east with twenty-five miles to run are you happy if I bring that in ahead of you".*

Hawk Formation*"Hawk Formation c/s er negative er we'd like to be number one".*

ATC*"Roger advise".*

Hawk Formation*"Thank you".*

Hawk Formation(1619:00)*"Bristol Hawk Formation c/s".*

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TC*"Hawk Formation c/s"*

Hawk Formation*"Yes we would like to go to an IFR approach er happy for your eastern traffic to get ahead of us request a squawk for for Six Section and Seven Section for IFR approaches".*

At this point the Watch Manager, who had been listening to the frequency in the VCR, decided to split the radar frequencies and went to take over the LARS position. The Hawk Formation remained under the control of the original controller.

ATC*"Roger first one squawk Four Six One Five and say the first callsign and climb altitude Two Thousand Five Hundred feet".*

Hawk Formation*"Bristol Hawk Formation c/s er Hawk Lead ????? squawk Seven Double Oh Three and Four Six One Five for Hawk Six Section".*

ATC(1619:30)*"Hawk Six Section Four Six One Five is and climb Two Thousand Five Hundred feet".*

Hawk Formation*"?????Hawk Formation c/s".*

ATC*"Hawk Lead can squawk Four Six One Six".*

Hawk Lead*"?????er Hawk Lead c/s would like to maintain Seven Double Oh Three ????? and the Hawk Seven for Four Six One Six".*

ATC*"Hawk Seven Four Six One Six is approved".*

Hawk 7*"Thank you".*

ATC*"Hawk Six report when you're at Two Thousand Five Hundred feet".*

Hawk Lead*"????? Bristol Hawk Lead Section I'm visual with that airliner* (the subject B737) *I'm levelling Fifteen Hundred feet in a lefthand turn onto south at the moment".*

ATC*"Is that Hawk Six calling".*

Hawk Lead*"This is Hawk Lead Section Seven Double Oh Three suspect its Cardiff traffic".*

ATC(1621:00)*"It is Cardiff traffic maintaining Two Thousand Five Hundred feet inbound to Cardiff* (there was a telephone call just after 1621:10 to Cardiff, confirming the '7003' was maintaining 1500ft and the B737 was at 2500ft to establish on the ILS) *can you take up an easterly track to get into Bristol controlled airspace".*

Hawk Lead*"Affirm I'm at er Fifteen Hundred feet at the moment and er what heading would you like me to come onto now".*

ATC*"I've got you radar identified now and er you are one three miles westsouthwest of Bristol fly heading Zero Nine Zero degrees".*

Hawk Lead*"Zero Nine Zero climb to Two and a Half Thousand feet Hawk Lead Section".*

Hawk 6*"Bristol Hawk Six is southbound at One Thousand Five Hundred feet One Double Oh Seven".*

Thereafter, Hawk 6 was identified 14nm SW of Bristol and climbed to 2500ft, by now Hawk 7 had reported visual with Hawk 6 Section.

As indicated by the gaps in the RT recording above, during the incident it was difficult for the controller to understand all the messages transmitted by the Hawk Formation. Additionally, local investigation revealed that there was a reduction in the primary radar performance. This was due to weather clutter and intermittent faults with one transmitter. The controller described the display as *"flashing on and off"* at times.

At the time of the Airprox, the Hawk Formation was being provided with a FIS as they were below radar cover. The Bristol APR believed, having received a position report from the Hawk Formation Leader at Weston Super Mare, that the ac were en route to join downwind LH RW27, within the Bristol area of operation i.e. clear of Cardiff's airspace. Consequently, when the formation requested an IFR approach, the APR cleared the flight to climb to 2500ft as there was no known traffic in the Bristol area at the time. The Bristol MATS Part 2, Page APR 1.6, states: *'Aircraft being radar vectored for ILS, LLZ or NDB approaches are to establish on the localiser or the inbound track not below 2500ft'*.

It is understood that Cardiff ATC had agreed with Exeter ATC, earlier in the day, to provide a service to the Hawk Formation after transfer from Exeter. However, the Hawk Formation stated they did not wish to communicate with Cardiff when Exeter tried to transfer them. In the event, Cardiff would have had better radar contact with the formation than Bristol. The local TOI (021/08) states the following, with reference to the Hawk Formation's arrival: *'It is expected that the Hawk Formation will arrive at Bristol International Airport on Saturday 9th August, with 9 arriving at 1632z and a further 1 at 1750z. The APR ATCO shall ascertain the preferred method of circuit-joining (ie loop including max altitude, "run and break", stream-landing etc) and the intentions of the formation prior to transferring them to the Tower frequency.'*

HQ AIR (TRG) comments that as Bristol Radar did not have radar contact the controller was relying on the formation's position reports for SA and thought that the formation was inside Bristol's airspace en route to join downwind LH RW27 when she instructed them to climb. Had the formation transferred from Exeter to Cardiff the formation would have been in radar contact for the recovery.

UKAB Note (1): The Clee Hill radar recording only captures the situation immediately before the Airprox occurs. Earlier, the B737 is seen to the E of Cardiff turning R at 1619:10 onto a downwind heading for a RH pattern to RW31 level at FL027 (2520ft QNH 1007mb); this level is maintained throughout the encounter. After a short downwind leg the B737 is seen turning R onto a R base leg and when steady tracking 200° at 1620:22 the Hawk Leader formation first appears on radar 1·8nm to its E tracking 240° indicating FL010 (820ft QNH). The next sweep shows the Hawk Leader Formation at FL006 (420ft QNH) and the next sweep at 1620:54 at FL019 (1720ft QNH), with the B737 800ft above in its 1 o'clock range 1nm. Hawk Leader Formation fades on the next sweep: however, Hawk 6 Section pops up 0·6nm to the NE of the B737, tracking 230° at FL019 (1720ft QNH). The first CPA occurs on the next radar sweep at 1620:54, Hawk Leader Formation appears at FL018 tracking 160° 0·7nm to the ESE of, and 900ft below, the B737. Hawk 6 Section has by now closed to a range of 0·4nm from the B737, in its 12 o'clock, but is showing NMC. The second CPA occurs on the next radar sweep at 1621:02, Hawk 6 Section turning L through 180° at FL016, 1100ft below and 0·2nm from the B737's in its 8 o'clock. Thereafter both Hawk Leader Formation and Hawk Section 6 diverge from the B737 on a track of 160°, maintaining at least 1000ft vertical separation below it, before climbing up to the E when SW of Weston Super Mare.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that the formation Leader had elected to call Bristol, their destination, after declining the option offered by Exeter *viz* to contact Cardiff initially. At the time of the first call, the formation was outside Bristol's radar cover, the NATS Advisor commenting that without radar contact at Bristol, the APR was reliant on position reports from the Hawk formation. Members acknowledged this comment and agreed with the ATSI statement that Cardiff could have afforded the formation a better service owing to better low-level radar coverage in the Bristol Channel.

The DARS Advisor commented that the situation that occurred had 'fallen out' of what had been briefed during the formation's planning stage at Exeter. In the event, the Wx had been unsuitable for the intended VFR recovery and an early decision to change to IFR was not made. Once the change in flight rules was made, the Hawk Lead had expected the Bristol APR to split the formation into 3 elements, a situation that would in general be unfamiliar to controllers at civil aerodromes. Members opined that perhaps the tactics for splitting a large formation should in future be included in any ATC brief to the ATSUs concerned. Hawk Lead had changed his intended entry point into Bristol airspace from Clevedon to Weston and informed the APR that his intention was to pass S of Weston to join downwind LH for RW27. It was evident from the RT transcript that the Lead had not subsequently updated the Bristol APR as regards the formation's position after reporting at Weston. When the Hawk Lead had requested

an IFR approach about 1min after reporting at Weston, the Bristol APR therefore believed the formation was to the E of Weston, tracking E'ly and following the intended routeing within Bristol airspace. Not unreasonably, she therefore gave the formation immediate climb to 2500ft to bring the ac into radar cover and to a terrain-safe level. However, the Cardiff controller noted the formation at Portishead and recorded radar later shows the formation tracking SW'ly to the W of Weston as the ac climbed into radar coverage. Members agreed that the Hawk Lead's position report "...passing Weston now" had been somewhat ambiguous as it did not include the formation's heading or level and thereafter Lead had made no mention of any change to his intended visual downwind join routeing.

It was also apparent from the RT transcript that valuable time was then taken up with allocation of squawk codes. The APR had tried to allocate discrete codes but the Hawk Lead was reluctant to relinquish his conspicuity code: this led to a protracted RT exchange at a critical time. An ATCO Member opined that had each formation element used an assigned code from Bristol then adjacent SSR ATSUs would be in no doubt as to who was controlling the ac which was not evident from the retained conspicuity code. Members agreed that in the absence of any further position reports or flight information from the Hawk formation, the Bristol APR had acted in good faith in the belief the formation was within Bristol airspace but had, in the end, instructed the Hawks to climb to the level occupied by the B737 and this had caused the Airprox.

Fortunately, shortly after commencing climb the Hawk Lead had seen the B737 and had immediately levelled-off at 1500ft and informed ATC of the potential confliction. These timely actions left the Board in no doubt that any risk of collision had been quickly and effectively removed.

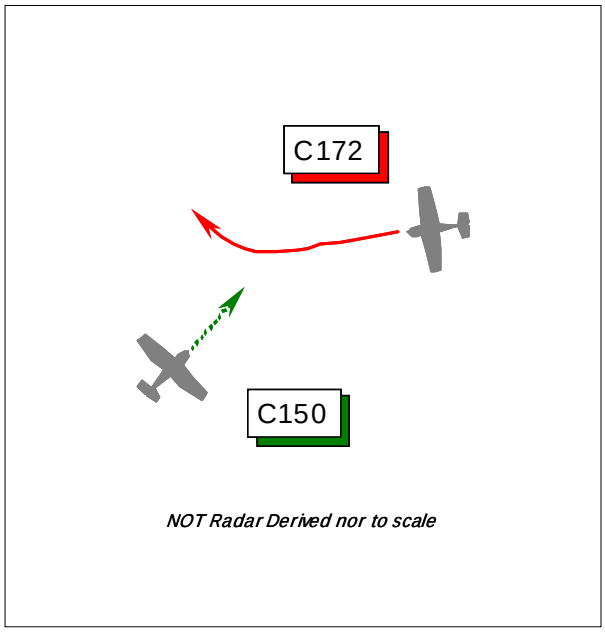
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Having been given an ambiguous position report and in the belief that the formation was in Bristol airspace, the Bristol APR instructed the Hawks to climb to the level occupied by the B737.

Degree of Risk: C.

AIRPROX REPORT NO 113/08

Date/Time:	30 Jul 0944	
Position:	5242N 00207W (14nm WSW of Tatenhill)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Cessna 150	Cessna 172
Operator:	Civ Pte	Civ Com
Alt/FL:	1800ft	1700ft
	QNH (1015mb)	QNH
Weather	VMC CLBC	VMC CLBC
Visibility:	25km	15-20km
Reported Separation:		
	300ft V/0·2nm H	800m H
Recorded Separation:		
	Contacts merged in azimuth (Birmingham ASR)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CESSNA 150 PILOT reports he was en-route from Wolverhampton/Halfpenny Green to Tatenhill under VFR in VMC some 3000ft clear below cloud. He was neither under any form of ATS nor listening-out with any ATC unit. A squawk of A7000 was selected with Mode C; Mode S was not fitted.

Approaching a position about 10nm SW of Tatenhill [he believed at 5244N 00200W] heading 040° at 90kt, in a level cruise at 1800ft QNH (1015mb), the other ac – a white high-wing C172 - was first seen by his passenger ahead and below in their 1 o'clock position, tracking R – L about 500ft away in a level attitude. The other ac crossed ahead, passing some 300ft below them, to their port side before banking to the L and clearing astern on a SW'ly heading. No avoiding action was taken as the other ac had already passed ahead and below. Minimum horizontal separation was about 0·2nm – 400yd – and he assessed the Risk as high, adding that the ac must have been blocked from his view by his ac's door hinge line and coaming. He is aware of this potential blind spot and performed a look-out scan with "constant vigilance" however, on this occasion the relative geometry and altitude of the other ac was such that he did not spot it earlier.

He has started using a portable collision avoidance tool to aid visual acquisition of possible conflicting traffic however, on this occasion no alert was received, so the other ac may not have been squawking.

THE C172 PILOT reports that he departed from Fenland at 0855 for a day's aerial photography work by a photographer around the West Midlands and London CTR. Their planned track took them towards the N of Tamworth and shortly after crossing the M42 he turned to the NW and tracked towards the LIC (Lichfield) NDB. After a slight deviation, their planned track was regained about 3nm NE of Lichfield and he switched from East Midlands APR to Birmingham APR, from whom he received a FIS; a squawk was selected but Mode C was not fitted.

The Airprox occurred W of Lichfield while he was heading 260° at 100kt, though he is unable to remember the exact location. At the time he was flying in a level cruise at 1700ft on the Birmingham QNH of 1015mb, 500ft clear below cloud and he spotted a small high-wing ac - possibly a Cessna 150/152 - at a range of about ½nm, which appeared to be at a similar level (or possibly lower) and it approached on a converging heading from his 11:30 position. The other ac was silhouetted against the dark grey sky but he was unable to determine the colour nor see any lights. He decided to take avoiding action by turning steeply to the R through about 60° and the other ac passed about 800m to port with a medium risk of a collision. Once clear of the conflict he turned L back toward his planned track.

He added that the weather ahead was deteriorating due to an occluded front and although visibility was not low the contrast was poor in the low-lighting conditions.

ATSI reports that there are no apparent ATC causal factors in this Airprox which occurred at 0944, about 14nm SW of Tatenhill in Class G airspace. Following transfer from East Midlands APR, from whom he had been receiving a FIS, the C172 pilot established communications with Birmingham APR at 0938. The pilot reported conducting an aerial photography detail from Fenland. At the time he was 1nm N of Lichfield at 1500ft (1006mb) and requested a FIS. Responding, the controller confirmed the provision of a FIS and issued the flight with the Birmingham QNH of 1015mb. No further transmissions were received from this flight until 0955:35, when the pilot reported completing a task at Telford, some 27nm SW of Tatenhill. The RT recording shows no evidence that the C150 pilot established contact with Birmingham APR.

UKAB Note (1): The Claxby Radar recording does not illustrate this encounter and the Clee Hill Radar was Out of Service at the time. Through the helpful assistance of ATSI, Birmingham ATC provided a copy of their Birmingham Watchman primary ASR recording supplemented with Claxby SSR data. This shows at 0944 the primary contacts of two ac, which in all probability is the subject ac, converging on a point some 14nm WSW of Tatenhill in the vicinity of Otherton at 5242N 00207W. Although the [large] primary contacts merged in azimuth, at the scale given it is not possible to determine either the relative geometry or the minimum separation that obtained, neither is any SSR return evident from either ac at the time.

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 a report from the appropriate ATC authority.

Whilst recognising that the C172 was only receiving a FIS from Birmingham ATC, the provision of this form of ATS to flights in Class G airspace would have been a very low priority for the controller who was possibly more closely involved with traffic in CAS. A pilot Member mentioned that he was disappointed that the C150 pilot had not chosen to communicate with ATC enroute. Whilst it was only a remote possibility, the Member suggested that if the C150 pilot had been listening out with Birmingham he might have heard the C172 pilot on RT and been alerted to the presence of the other aircraft in the vicinity beforehand.

Evidently this Airprox occurred in the 'see & avoid' environment of Class G airspace. With both ac approaching on converging tracks, the C150 pilot was responsible under the 'Rules of the Air' to give way in this situation and ensure that appropriate separation was maintained against the C172 to the right of his ac's nose. It was clear to Members from the reporting C150 pilot's own laudably frank account that he had not spotted the C172 until he was alerted by his passenger when he then saw the other ac crossing ahead from R - L some 500ft away. Members also noted the C172 pilot's report that he spotted the C150 at a range of about ½nm, at a similar level, as it approached on a converging heading from his 11:30 position, and that both pilots had reported flying in VMC. The GA Member explained that the visibility from the cockpit of these two high-wing ac is not conducive to a good all-round scan. That said, he opined that at the relative juxtaposition of the ac here, there should have been little difficulty in sighting the other ac. As it was the C172 pilot spotted the C150 and took action whilst the C150 pilot's view had been blocked, he had himself suggested, by his ac's door hinge line and coaming: thus no avoiding action was taken by him as the C172 had already passed ahead and below before he could react. The C150 pilot had himself highlighted the main lesson from this Airprox insofar as he was aware of the potential blind spot but his thorough scan had still been defeated by the C172 approaching on a constant relative bearing such that he did not spot it earlier. The C172 pilot mentioned the poor lighting conditions and lack of contrast which pilot Members understood could impede sighting ranges significantly. Nonetheless, in the GA pilot Member's view the two ac were evidently there to be seen and the pilots involved should have detected each other's ac sooner. The message here was to maintain a strict lookout scan regimen – regularly moving one's head as necessary to clear blind spots - in addition to moving the ac to ensure that the whole sky was scanned as much as practically possible on a regular basis.

One pilot Member suggested that this Airprox was the result of an effective non-sighting by the C150 pilot as he was unable to do anything to resolve the situation before he saw the C172. Moreover, by that stage the conflict was already being resolved, the Member adding that the situation was compounded by a late sighting by the C172 pilot. Whilst a sighting range of ½nm was certainly less than ideal, other pilot Members believed that the C172 pilot has seen the C150 just in time to recognise the conflict and he had taken prompt action to resolve it. However,

both pilot's estimates of the minimum separation that obtained at the time varied significantly between the 0·2nm – broadly 400m or so – estimated by the C150 pilot but double that from the C172 pilot's perspective at 800m. The only radar recording which illustrated the encounter was not clear enough to resolve this anomaly. Therefore, the Board concluded that this Airprox had resulted from a conflict in Class G airspace resolved by the C172 pilot who had seen the C150 in time to take robust avoiding action. Even at the minimum range reported here of 0·2nm this was, in the Board's view, sufficient to ensure that any risk of a collision was effectively removed and that safety had not been compromised in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

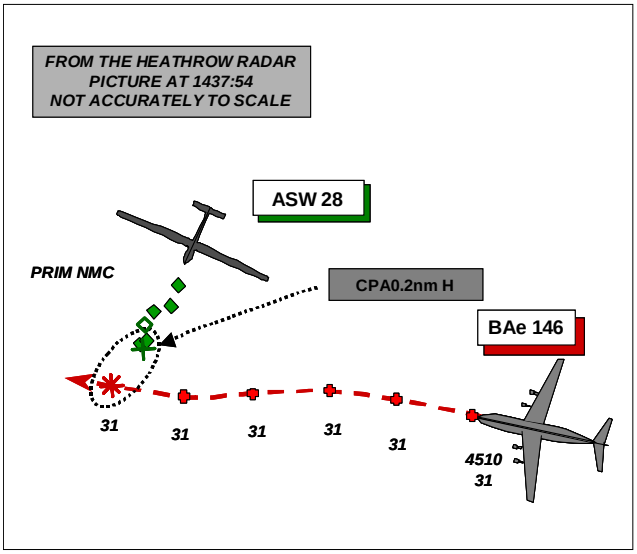
Cause: A conflict in Class G airspace resolved by the C172 pilot.

Degree of Risk: C.

AIRPROX REPORT No 114/08

AIRPROX REPORT NO 114/08

Date/Time:	7 Aug 1438	
Position:	5124 00135W (3nm WSW of Hungerford)	
Airspace:	Lon FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	ASW28 Glider	BAe146
Operator:	Civ Pte	HQ Air Ops
Alt/FL:	3000ft (Lasham QFE)	3000ft (RPS)
Weather	VMC CLBC	VMC CLBC
Visibility:	>20km	40 km
Reported Separation:	200ft V/ 200m H	Not Seen
Recorded Separation:	~50ft V (calculated) /0.2nm (370m) H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ASW28 GLIDER PILOT reports flying a local soaring flight from Lasham in a white glider when he saw a white BAe146 500m away crossing from left to right about 200m ahead of him and just below his altitude; at the time he was heading 220° at 65-70kt. Immediately on sighting the other ac, he turned abruptly towards it which reduced the collision risk. He turned back as the other ac passed ahead and beneath him and he returned to his original heading about 15sec after initiating the avoiding action turn. While the original trajectories of the 2 ac probably did not merge [in altitude], had the other ac climbed slightly, or had he flown through sinking air, they would have. He did not assess the risk, reporting the incident to his CFI on landing back at Lasham.

THE BAe146 PILOT reports that he has completed the report as accurately as possible bearing in mind that no crewmember of his ac saw the glider involved. He was in the area at the reported time of the incident, transiting from Northolt to Lyneham on a routine training flight with strobes, nav lights and landing lights switched on. He could not recall which ATC unit he was working or his squawk at the time and, although he thinks it likely that his ac was the one involved, he was not certain.

There were a lot of gliders airborne to the N of his track at the time and also a lot of GA traffic. The visibility was good, the crew were vigilant in their lookout, and they carried a 3rd pilot to assist. They saw many light ac and a few gliders but did not see any gliders as close as the one involved in this Airprox. He could not recall his heading at the time but they were flying at 3000ft on the Cotswold RPS and at 230kt.

Given that gliders are notoriously difficult to spot, as they are white and spend a lot of time soaring beneath white cumulus clouds, he considers that a more conspicuous paint scheme, such as has been applied to RAF training ac, would help other pilots to see them. Also a basic transponder would allow other ac with TCAS (such as military and commercial ac) to avoid them.

UKAB Note (1): The incident is seen clearly on the recording of the Heathrow radar. The BAe146, squawking 4510 (Lyneham) approaches the incident area tracking about 270° at 3100ft amsl while a primary-only contact, presumed to be the glider, approaches, tracking about 220° but manoeuvring. The BAe146 passes through the glider's 12 o'clock from its left to right at a distance of 0.2nm (370m); at the time the BAe146 was at 3100ft amsl, the altitude of the glider could not be determined positively but was assumed to be 3050ft amsl (corrected), as reported by the pilot with reference to his data-logger.

UKAB Note (2): The Lyneham METARs for the period were:

EGDL 071450Z 25009KT 9999 FEW025 BKN050 BKN080 19/13 Q1005 BLU NOSIG=
EGDL 071550Z 27008KT 9999 FEW028 BKN050 20/14 Q1005 BLU TEMPO 5000 -SHRA SCT020 WHT=

The 1500 Cotswold RPS was 1000mb.

HQ AIR OPS comments that although it may not seem normal for an ac of this type to transit VFR, the task of the Sqn sometimes requires that they do so. Unfortunately, this training flight took them through a notoriously busy area on a good flying day and, despite the third pilot, they came close to one glider which they did not see.

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 that this incident had taken place in Class G airspace where the pilots had an equal and shared responsibility to see and avoid other ac. Members noted that the BAe146 had been flying through an area of considerable gliding activity and, in an attempt to reduce the risk, they had wisely been flying with an extra pilot to assist with the lookout. Notwithstanding this, although the BAe146 crew had seen other gliders (many showed on the radar recording) they had not seen the glider concerned, probably due to it being white in colour, apparently almost stationary against a background of white cumulus clouds.

As is very often the case, having not seen the glider nor been aware of it by means of electronic equipment or TI from ATC, the crew of the airliner had not been in a position to avoid it as they were required to do under the Rules of the Air. The Board was advised by the specialist gliding Member that although it is not always effective, on days when weather conditions are such that there will be many gliders airborne, powered ac flying as high as practicable can mitigate the risk significantly.

In this instance, since the BAe146 (augmented) crew had not seen the glider and the miss-distance was significantly less than optimum, Members concluded that safety had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

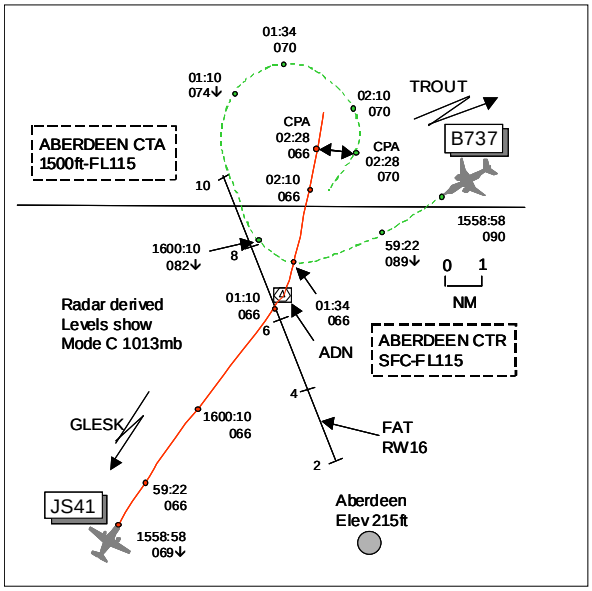
Cause: Non sighting by the BAe146 crew and a late sighting by the ASW28 pilot.

Degree of Risk: B.

AIRPROX REPORT No 115/08

AIRPROX REPORT NO 115/08

Date/Time:	12 Aug 1602	
Position:	5722N 00214W (4nm NNE ADN)	
Airspace:	Aberdeen CTA	(Class: D)
Reporter:	Aberdeen INT DIR	
	First Ac	*Second Ac*
Type:	B737-600	JS41
Operator:	CAT	CAT
Alt/FL:	FL70	6000ft (QNH 990mb)
Weather	IMC KLWD	IMC IICL
Visibility:		>10km
Reported Separation:	400ft V/1nm H	400ft V/2.5nm H
Recorded Separation:	400ft V/1·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ABERDEEN INTERMEDIATE DIRECTOR reports working during a reasonably busy session with a number of inbounds all arriving at the same time. He formulated a plan in conjunction with the FIN DIR to route a number of the fixed wing inbounds to the ADN hold, allowing the rest, including a number of helicopters, to make an approach. With 4 fixed wing ac in or approaching the hold he allocated vertically separated levels before speaking to Leuchars regarding 2 military squawks operating from the S right up to the CTA boundary as he had a S'bound departure to pass through the area. He monitored all the ac that were in or approaching the ADN hold to ensure they were at the correct levels and following coordination with FIN, he descended each ac 1000ft above all others as the levels became vacant. One flight, the subject B737, queried the level of the ac below him in the hold, the subject JS41, as he could see it. As he, INT, was certain it was 1000ft below he checked his radar display to confirm this and told the flight that it was. The JS41 crew then stated that they had the B737 visual and that it was showing on TCAS 400ft above. He then realised a loss of separation had occurred and immediately issued headings to fly as he felt this was the quickest means of reinstating separation.

THE B737 PILOT reports inbound to Aberdeen IFR and in communication with Aberdeen. They entered the ADN hold on a parallel entry at FL70 and 210kt leading them to the N and then a R turn back onto the inbound course of 162°. During the turn to intercept the inbound radial, traffic popped-up 400ft below them 1nm in front and on the R side. In the holding pattern in IMC they had no visual contact with the other ac but a TA then an RA aural warning was received 'monitor flightpath' with a 'red box' and 'no-fly' sector just below on the ADI. They monitored the situation which was resolved after 2-3sec. At the time they were No 8 in the sequence and with the QNH being 990mb there was 600ft difference to levels on 1013mb. The traffic causing the TCAS warnings was obviously the preceding ac and after the incident they were given a heading onto W and further vectors with descent. He assessed the risk as low.

THE JS41 PILOT reports inbound to Aberdeen IFR and in receipt of an ATS from Aberdeen Radar on 119·05MHz squawking with Mode C. During a teardrop entry to the ADN hold heading 020° at 190kt level at 6000ft QNH 990mb they saw an ac on TCAS in their 1 o'clock range 12nm showing +400ft. The Capt, PF, prepared to take evasive action but a rapid closure rate precluded discussion with ATC. They then received a TCAS RA 'monitor v/s' and complied with the instruction by maintaining level flight and a constant heading. Although flying intermittently in cloud, the FO glimpsed traffic at 4 o'clock range 3nm 400ft above, a B737, and TCAS confirmed the range as 2·5nm; the TCAS RA then ceased. ATC were not advised of the RA as it did not involve a deviation from their assigned flightpath and their attention was properly focussed upon their flightpath. They advised ATC of the traffic's position upon first sighting and ATC gave headings to both flights presumably to avoid both ac entering the hold and creating a further conflict. He assessed the risk as low.

ATSI reports that the Intermediate Director (INT DIR) had been in position for 55min prior to the Airprox. He described his workload as medium to high, at the time of the incident. He explained that, when he took over, he and the Final Director (FIN DIR) decided to combine the 2 positions to facilitate breaks. However, after 30min, he realised that the traffic was building, both with fixed wing ac and helicopters. In view of the increase in movements, which, due to the weather, would be operating under IFR, he arranged for the positions to be split again.

The Aberdeen Weather observation, timed at 1553: Surface wind 100°/8kt; Visibility 8km; Cloud overcast 300ft; QNH 990mb. The Transition Altitude at Aberdeen is 6000ft.

The JS41 was inbound to Aberdeen N'bound on Airway P600. The pilot established communication with Aberdeen Approach at 1549, reporting descending to FL120 towards GLESK and requesting further descent. The INT DIR instructed the flight to descend to FL90 to expect vectoring to the ILS RW16. Just over 1min later the pilot enquired about his routeing after GLESK, whether it was to the airfield or to the ADN. The ac was routed direct to the ADN and shortly afterwards the pilot was informed *"...you're number seven take up the hold expect a delay of less than twenty minutes"*. After the routeing was acknowledged by the JS41's pilot, he was cleared to descend to FL80.

The B737 flight made its initial call to Aberdeen Approach at 1552, reporting descending to FL120. The INT DIR advised the pilot *"...you're identified five to the north of TROUT Radar Advisory Service route to the Alpha Delta November to take up the hold* (one or two words unintelligible) *number eight at the moment it will be vectors ILS runway One Six"*. The B737 was inbound to Aberdeen via Advisory Route P600D, which routes from TROUT to ADN (lowest level FL90). The pilot of the B737 was, subsequently, not informed about the change of ATC service, as required by MATS Part 1, when the ac routed from Class F airspace of the ADR into Aberdeen's Class D airspace. However, this omission is not considered to be a causal factor to the Airprox. The JS41 flight requested to reduce speed, which was approved, and then the B737 was instructed to descend to FL100. Approximately 2min later, both pilots were advised of their approach sequence number i.e. the JS41 No 6 and the B737 No 7.

At 1557:27, the INT DIR instructed the JS41 crew to descend to 6000ft on QNH 990mb and annotated the level box on its fps appropriately. The pilot read back the clearance correctly. Following this transmission, the B737 was cleared to descend to FL90 as that level was now vacated. The 2 ac in the sequence, ahead of the subject flights, were transferred to the FIN DIR. Straight afterwards, at 1558:57, the B737 flight was instructed to descend to FL70. The JS41 was at 6000ft on QNH 990mb, equivalent to FL66 [1mb=27ft] and the B737 had been cleared to descend to FL70. As a result, both ac were now cleared to enter the ADN hold at levels which did not provide standard 1000ft vertical separation. The INT DIR stated he was aware of the low pressure setting and the affect it would have on the Transition Level i.e. the lowest Flight Level available for use above the Transition Altitude. He commented that he does not usually use an altitude of 6000ft in these pressure conditions (although on this occasion he had also cleared the ac ahead of the JS41 to that altitude) in case he makes the error, as occurred, to descend an aircraft above to FL70. He could not explain why he had instructed the B737 to descend to FL70, especially as he had told himself mentally not to carry out this action. In the case of the JS41 and the ac ahead, he had consciously not descended the former below FL80 until the other aircraft had left 6000ft. Having instructed the B737 flight to descend to FL70, he turned his attention to other traffic, including telephone coordination with Leuchars and the passing of departure times to ScACC. The radar display at Aberdeen shows Mode C data as 2 numbers for altitude and 3 numbers for a Flight Level. Apparently, according to the local ATC investigation, whilst the INT DIR was engaged in the telephone call to Leuchars, the JS41's SSR label, momentarily, toggled twice between 2 and 3 numbers i.e. 60 (altitude) and 067 (FL). The controller did not notice these fluctuations. He explained that the INT DIR position is equipped with 2 radar displays, the lower set to a range of about 30nm and the upper to about 60nm. Whilst talking to Leuchars he was using the longer range display: therefore, he would not have closely observed the SSR returns of the subject ac which were nearer to the airport. Aberdeen is not yet equipped with STCA.

[UKAB Note (1): The Perwinnes radar recording provided to UKAB by Aberdeen ATC was not altitude corrected so all levels shown by Mode C are Flight Levels on 1013mb. At 1600:10 the B737 is by now establishing on the outbound leg of the parallel entry into the hold descending through FL82 with the JS41 3·9nm SW of the ADN tracking NE'ly level at 6000ft QNH 990mb (showing FL66 on the radar recording). As the B737 levels at FL70 6nm N of ADN turning through a E'ly heading towards the ADN the JS41 has passed O/H the VOR and is now established on the outbound leg of the off-set/teardrop procedure 1nm N of ADN still indicating FL66 tracking towards the B737.]

At 1602:09, the pilot of the B737 commented *"we have some traffic to our right"*. The INT DIR later commented that he looked at the radar display and observing the JS41 at, he believed, FL60, thought, erroneously, that the subject ac were vertically separated i.e. FL60/FL70. NB The display was, actually, correctly showing the JS41 at an altitude of 6000ft and the SSR returns of the subject aircraft were not overlapping. Consequently, he replied *"...that's traffic in the hold at er Flight Level Six Zero"*. There were then part simultaneous transmissions, one of which was by the JS41 crew *"we're maintaining altitude* (word emphasised) *six thousand feet as previously cleared"*. The following transmissions occurred:

ATC*"Er yeah that'll still be one thousand feet so maintain that level"*.

JS41*"Roger we was visual with traffic in our four o'clock now is indicating four hundred above on er TCAS and it certainly looks at a similar level"*.

Now realising there was problem, the controller continued:

ATC*"Er roger JS41 c/s continue present heading report that heading"*.

JS41*"Heading er zero two zero degrees JS41 c/s"*

ATC*"Roger continue on that heading"*.

JS41*"Zero two zero"*.

The B737 was also instructed to continue on its present heading (225°), thereby routing both ac away from the hold, on diverging tracks. Horizontal separation reduced to a minimum of 1·1nm at 1602:28, as the JS41 was on the outbound leg of the joining procedures and the B737 was on the inbound leg, 400ft above. The INT DIR continued to vector the subject ac for the next 4min until he handed over the position.

At the time of the Airprox the only aide memoir information concerning the lowest available Flight Level during low pressure conditions was a table, which determined the Transition Level, positioned above and to the side of the INT DIR position. The INT DIR commented that this was not easy to see. Since the incident, a strip has been produced showing the lowest Flight Levels available for each QNH pressure band below 1013mb and this is placed within the fps display. Additionally, it is planned that all Aberdeen Approach Radar Controllers are to have at least 2 simulator runs, one for each main RW, in order to practice holding scenarios.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The NATS Advisor informed Members that the MATS Part 2 has been amended to provide guidance to controllers on holding ac at Aberdeen. In addition, altitude 6000ft is now no longer used as a holding level.

Members could add little 'meat' to this slightly unusual incident. The INT DIR was fully aware of the low pressure and its effect on the Transition Level and, although not his usual practice, he had descended the JS41 to 6000ft as it approached the ADN from the SW to enter the hold. Next, even though he had previously made a mental note not to do so, he descended the B737 to FL70, whilst it too was joining the hold, which had brought it into conflict with the JS41 and this had caused the Airprox. Later, when the B737 crew had made comment about the JS41's proximity, the INT DIR was sure that the JS41 was at FL60 and therefore separated, even though he had annotated the JS41's fps level box correctly with 6000ft. Immediately after this, the JS41 crew commented that they were at altitude 6000ft but he, the INT DIR, was convinced that 1000ft separation existed between the subject ac. It was only after it was pointed out that 400ft separation was being shown by TCAS that the INT DIR realised his error, issuing headings to both flights to ensure divergent tracks. Both crews were aware from TCAS of the presence of each other's ac, receiving TAs and then passive 'monitor v/s' RAs i.e. do nothing. The JS41 crew also visually acquired the B737 400ft above and to their R. Although both ac ended up on opposing tracks joining the ADN hold, they were both maintaining levels separated by about 400ft. This allowed the Board to conclude that no risk of collision existed during this encounter.

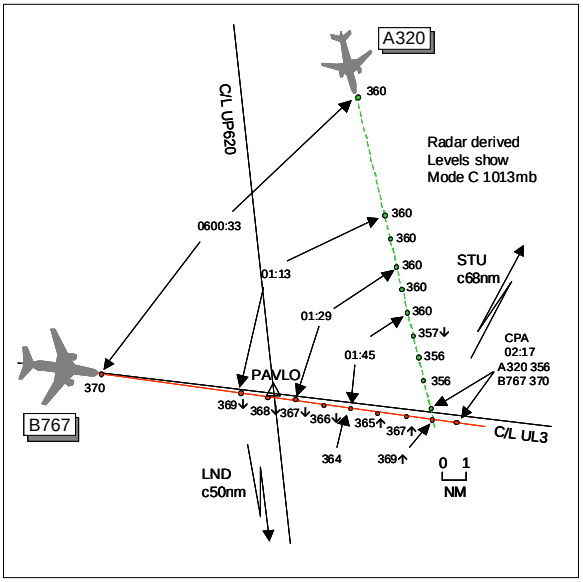
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Aberdeen INT DIR descended the B737 into conflict with the JS41 near the ADN hold.

Degree of Risk: C.

AIRPROX REPORT NO 116/08

Date/Time:	11 Aug 0602	
Position:	5055N 00543W (50nm N LND)	
Airspace:	UAR UP620/UL3	(Class: C)
	Reporting Ac	*Reported Ac*
Type:	A320	B767-400
Operator:	CAT	CAT
Alt/FL:	FL360	↓FL360
Weather	IMC CLAC	VMC CLNC
Visibility:	5nm	Unltd
Reported Separation:		
	500ft V/1-2nm	600ft V/NR H
Recorded Separation:		
	400ft V/4·4nm H	
	or 1400ft V/1·2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A320 PILOT reports outbound from Dublin IFR at M0.78 in receipt of an ATS from London squawking with Modes C and S. Flying en-route to GANTO heading 180° at FL360 but requesting FL370, he monitored another ac's [the subject B767] closing track on TCAS from 20nm. When passing abeam PAVLO as separation was <10nm with the B767 in his 1 o'clock, it commenced descent from FL370. An ACAS TA was received followed immediately by an RA 'descend' which was carried out with the B767 flight carrying out a TCAS RA climb. ATC were informed of the TCAS RA but he [the A320 pilot] omitted to use the word 'Airprox'. Minimum vertical separation was 500ft at about 6nm with both ac's tracks crossing at 90° with the B767 crossing 1-2nm ahead. He assessed the risk as medium.

THE B767-400 PILOT reports inbound to Gatwick IFR and in receipt of an ATS from London squawking with Modes C and S. They were given descent clearance from FL370 to FL360 which was heard by all 3 pilots and acknowledged. Whilst descending, a TCAS TA was received followed immediately by an RA 'climb'. The FO, PF, disconnected the A/P and started to climb. London came on frequency and instructed them to climb to FL370 but no explanation was offered. He then reported they were level at FL370 having responded to an RA climb during their descent. The other ac was seen but not recognised with minimum vertical separation being 600ft. During the moments leading up to this event and for some time afterwards, they could hear Shannon and London, as well as other flights, trying to contact another flight, AC3, on 121·5MHz. He thought that this may have been the ac with which they had the TCAS encounter but no other information was provided by London.

THE LAC S6/9/36 TACTICAL CONTROLLER reports that traffic level was medium but, as traffic was predicted to build, S6 and S36 were arranged to be split-off from S9. It was during the handover between himself and the controller taking over S6/36 that the incident occurred at a time when the Planner position on S9 was also being handed over. The B767 flight had called from Shannon at FL370 and was given routeing to GIBSO. It was noted that there was a potential confliction in the BHD area with S'bound traffic, AC4, also at FL370. As the PFSs were indicating times close to each other, he made a mental note to descend the B767 underneath AC4 before BHD. The A320 flight called from Shannon requesting FL370 to cruise and was given routeing to GANTO. He climbed the A320 to FL360 underneath the B767 as he could see they were going to crossover SW of MERLY. The LAS then decided to split-off S6/36 and he started to transfer flights onto those frequencies as necessary. At this point he had AC3 inbound to Brussels that needed descending before transferring to S1 but this flight did not answer repeated calls. He then started giving the incoming Tactical a handover of what was going on in S6/36 airspace, pointing out that he had cocked-out the PFSs on the B767 and AC4 and told her that he would give the B767 at FL360 to solve the confliction. He then descended the B767, forgetting the A320 underneath it. The A320 crew called with a questioning tone and when he looked at the radar he realised his mistake. He told the A320 flight to descend immediately to FL350 which the pilot read back, informing him that he had a TCAS RA 'descend' as well.

He then told the B767 to climb to FL370 which was read back. At this point he was aware that the Planners beside him were handing over and he then handed over the S9 Tactical position to an incoming controller.

ATSI reports that the LAC Sectors 6/9 and 36 were bandboxed. The Tactical Controller described his workload as medium. The B767 was E'bound to Gatwick at FL370. The A320 was S'bound from Dublin to Madrid and, on initial contact with the sector, the flight was instructed to climb from FL310 to FL330, direct to GANTO (pilot requested FL370 for the cruise). Approximately 2min later, the B767 flight established communication with the sector at FL370 and was routed direct to GIBSO. The Tactical realised the possible confliction between the 2 flights and instructed the A320 flight to climb to FL360. He was aware that further climb, to FL370, would be necessary for the A320, in order for it to reach its planned exit level. Thereafter, he was distracted by trying, unsuccessfully, to contact another flight. This action, he believed, increased his workload.

The LAS decided to split the sector. The incumbent Tactical began to handover S6/36 to the oncoming Tactical. This involved leaning over to the other controller's display, which did not show the subject ac. In order to assist the oncoming controller, he decided to descend the B767 to ensure that separation would exist from another ac, AC4, at FL370. He instructed the B767 flight to descend to FL360 (0630:30) but did not check either his radar display or his paper fps. He had forgotten the presence of the A320 and although he annotated the B767's fps with its descent he did not realise the confliction as the fpss of the 2 ac were not adjacent. At the time, the ac were on conflicting tracks 15nm apart. It was only when the A320 crew transmitted, in a questioning tone, at 0601:30 *"And er A320 c/s"* that the Tactical returned his attention to his display. He observed STCA activating and immediately realised his mistake. The subject ac were now 6·6nm apart, with the B767 passing FL367. He transmitted *"A320 c/s descend immediately Flight Level Three Five Zero"*. The A320 pilot responded *"A320 c/s TCAS descent"*. The Tactical then transmitted to the B767 pilot *"B767 c/s climb Flight Level Three Seven Zero"*. This instruction was repeated before the pilot responded "*Three Seven Zero we're in the climb"*. Neither instruction included the phrase "avoiding action". Minimum separation at 0601:45 was 4·4nm/400ft. At the CPA (0602:17), which occurred after they had passed, the horizontal separation was 1·2nm. By this time, due to the relative TCAS alerts, the vertical separation was 1400ft. (The B767 was at FL370 and the A320 at FL356.)

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members could add little to the analysis of this incident as detailed above. The Tactical had formulated a sound plan; had identified where action needed to be taken to resolve potential traffic conflictions but had 'taken his eye off the ball' whilst carrying out a handover to the oncoming controller on the adjacent console during the sector split. ATCO Members reiterated the fact that the handover phase was a time when the controllers involved should take extra care to ensure that nothing is overlooked during this period. However, at the end of the day, the LAC S6/9/36 Tactical descended the B767 into conflict with the A320 and this had caused the Airprox.

The A320 crew had seen the crossing B767 on TCAS and had observed it commence descent from FL370. A TA was received, then an RA 'descend' was generated: the TCAS guidance was followed, the B767 being seen to pass ahead and above. The A320 crew had called on frequency to question the B767's flightpath and the Tactical had then seen the confliction. STCA had activated and he issued the A320 crew with descent and the B767 with climb, the A320 crew reporting their TCAS RA manoeuvre. The B767 crew had received a complementary TCAS RA 'climb' and followed the guidance, visually acquiring the A320 whilst manoeuvring. All of these actions when combined allowed the Board to conclude that any risk of collision had been removed.

PART C: ASSESSMENT OF CAUSE AND RISK

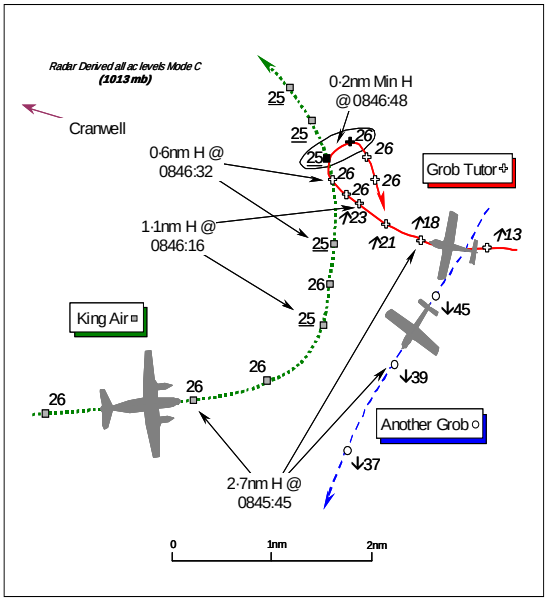
Cause: The LAC S6/9/36 Tactical descended the B767 into conflict with the A320.

Degree of Risk: C.

AIRPROX REPORT No 118/08

AIRPROX REPORT NO 118/08

Date/Time:	13 Aug 0846	
Position:	5300N 00012W (10½nm E of Cranwell - elev 218ft)	
Airspace:	CMATZ/FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	BE200 King Air	Grob Tutor
Operator:	HQ Air (Trg)	HQ Air (Trg)
Alt/FL:	1800ft	2000ft
	QFE (987mb)	RPS
Weather	VMC CLBC	VMC CLBL
Visibility:	5-10km	5-10km
Reported Separation:		
	50-100ftV/300-500m H	200ftV/H 2000m
Recorded Separation:		
	100ft V/0·2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BEECH BE200 KING AIR PILOT, a QFI, reports he was conducting a local IFR training sortie from Cranwell with a student pilot as the PF. They were in communication with Cranwell APPROACH (APP) on 280·775MHz under a RIS and the allocated squawk of A2601 was selected; TCAS and Mode S are fitted.

Cranwell were operating on RW19 RHC with instrument approaches to RW27. They had departed off RW27 on a SID 1 and carried out an exercise single-engine failure after take-off (SEFATO) at 200ft on the climbout. The student executed the drill in accordance with the SOP, which was completed upon reaching 2500ft QFE (987mb) whereupon their ac was about 7-9nm range on the CWZ TACAN on the extended centreline for RW27. ATC was informed and the ac vectored onto about 110° and then 090° for a LHD DOWNWIND instrument pattern at 160kt in VMC. On passing the overhead of Barkston Heath, some 3½ – 4nm to the S of Cranwell, their ac was descended to 1800ft QFE under direction from ATC, being some 600ft below cloud. The ac was partially configured 'flap only' as the ac was being flown simulated asymmetric and therefore the gear is not lowered until about 1nm before intercepting the glidepath on final approach. One TCAS contact was of particular note at this point - there may have been others – which appeared 200ft above them (+200) on the 10nm range scale, ahead in the 11 o'clock to 12:30 arc. This contact was monitored by them as it was deemed a possible confliction near the BASE-LEG of the instrument pattern and at approximately 8½nm from the I-CW they were vectored onto BASE-LEG. He could not remember the exact heading - believed to be 360° - as their focus was on the contact, which TCAS had now enunciated as a TA. At this time the traffic was also called by ATC and he, as the PNF, became visual with the ac – a service Grob Tutor - which was flying from R - L maintaining a constant bearing in their 12:00 o'clock to 12:30 position. TCAS now showed the Grob to be at the same level as his ac and he advised the student PF that he might have to take control of the ac to carry out avoiding action. Approximately 2-3secs later he took control and broke left. Almost immediately they received a TCAS RA to CLIMB: however, as his avoiding action manoeuvre had already been initiated, he elected to maintain separation visually. During the manoeuvre, the Grob Tutor was seen to commence a right turn – but no climb was observed. They noted positional details shortly after the incident, believing that at the CPA they were approximately 1·5nm S of the Cranwell ILS approach centreline at a range of 8·8-9nm. At this point the Grob was believed to be no more than 50-100ft above his ac and approx 300-500m away at the closest point in their 12:00 to 12:30 position with a *"high"* risk of a collision. APP was advised that they had broken-off their approach whereupon the Grob Tutor crew made themselves known to ATC. When deconfliction was assured, they resumed the controller's vectoring instructions to intercept the ILS localizer.

THE GROB TUTOR PILOT, a QFI, reports he was conducting a local training sortie from Cranwell with a student pilot. Whilst climbing away from a practice forced landing (PFL) and simulated emergency – during which his

student had allowed the aeroplane to drift to the N - a King Air was sighted about 2km away. He as the instructor took control from the student and continued in a climbing turn keeping the King Air in visual contact, assessing the King Air's trajectory to be sufficiently clear of their path not to require any avoiding action. He then initiated a gently climbing right hand turn to separate their trajectories still further. Prior to the occurrence they had been listening out with APP but not in receipt of an ATS and had been awaiting an opportunity to make contact as the frequency was busy. As they sighted the King Air they also heard traffic information being passed to its crew, which he assessed to be about his Grob Tutor. This was confirmed when the King Air crew stated that they already had their Grob on TCAS and had been monitoring them throughout and that they would alter course to ensure avoidance. Climbing through 2000ft RPS at 80kt, no avoiding action was taken in his white Grob and he continued to monitor the King Air visually, which he assessed had passed his Grob vertically separated by 200ft and in excess of 1000m away with a *"low"* risk of a collision. He then heard the King Air crew report that they were resuming their course. As Cranwell was operating on RW19 with instrument traffic to RW27 this further limited available airspace in the locality.

A squawk of A7000 was selected with Mode C & S on. All the ac's lighting including the HISLS and the landing lamp were on.

THE CRANWELL APPROACH CONTROLLER (APP) reports that he was controlling the King Air in the radar pattern for a monitored ILS to RW27 under a RIS. On the DOWNWIND leg he instructed the King Air crew to descend to 1800ft QFE (987mb) and to report 'cockpit checks' complete. Another Grob Tutor crew, not the subject Grob ac, called about 1min later for a radar recovery. Having identified the other Grob, just S of Coningsby, he passed traffic information on an unknown manoeuvring ac – the subject Grob - that was within 2nm. After the Tutor crew had reported visual with the King Air, he descended it on a southwesterly heading to feed them in behind the King Air.

Once the King Air had reached the 8nm DOWNWIND point, he instructed the crew to turn L onto N and called the unknown conflicting ac, which was indicating FL50 Mode C, using cardinal points at a range of about 2nm. The King Air crew responded with "Roger".

As the King Air was in the L turn, the pilot reported that he was turning away from the heading given as the conflicting ac had made a rapid descent and was in direct confliction, which he acknowledged. The King Air pilot then reported there was no further conflict and that he was happy to resume vectors for the approach. A heading of 310° was given and the ac handed over to TALKDOWN.

The pilot of the subject Grob Tutor then called on the APP frequency and said that he believed it was his ac that was in confliction and that he would be flying away to the S to continue his manoeuvres.

The controller opined that he felt at the time that he might have been a little late in passing traffic information on the conflicting Grob to the King Air crew, but when called, the indicated vertical separation on Mode C was 2500ft so there was no direct conflict. He can appreciate that the cloud was fairly broken, and there were few gaps, but to make a rapid descent in the area of the standard radar pattern showed poor awareness by the Grob pilot.

THE CRANWELL ATC SUPERVISOR (SUP) reports that he was in the approach room supervising the APP controller but not listening to the frequencies on a headset. The TALKDOWN controller was also waiting for the King Air to enter PAR coverage so as to monitor the ILS approach.

The King Air was flying simulated IMC under a RIS in the RW27 ILS pattern and radar services were 'limited' due to poor radar performance, in accordance with the FOB. The APP controller was fully in control of his workload, working 2 ac at the time that were both on 280·775MHz and passed traffic information on the conflicting ac to the King Air crew. The crew of the conflicting ac had not called any Cranwell ATC position at that point but commenced a rapid descent close to the King Air on his BASE-LEG turn. After the King Air crew reported avoiding the Tutor, both he and the APP controller tracked the ac until the subject Grob Tutor pilot called for recovery which was only a minute or so after the Airprox.

MIL ACC reports that the King Air was conducting instrument training in the Cranwell Radar Training Circuit. The King Air crew was being provided with a radar directed approach to a PAR monitored ILS to RW27. (The visual circuit was being flown to RW19RHC.) Cranwell APPROACH (APP) was providing a RIS on 280·775MHz and the service was limited due to poor radar performance, in accordance with the Cranwell Flying Order Book (FOB). The Ground

Clutter Inhibit Filter was in use to reduce the surface clutter on the Watchman primary radar display. Whilst recovering from a PFL squawking A7000 with Mode C, the Grob Tutor crew was listening-out on the Cranwell APP frequency, but not under an ATS at the time of the Airprox.

The Cranwell weather was surface wind: 210/15-20; 30km visibility, Nil weather; cloud FEW at 1800ft; CC BLUE. The APP controller had received a 15min break prior to the Airprox, which occurred at 0846:33.

The King Air QFI's report states they had exercised a SEFATO whilst departing on a SID1 RW27 at Cranwell prior to advising ATC that the King Air was ready for vectors for a PAR monitored ILS to RW27. The King Air Pilot's report is consistent with the radar replay that on passing overhead Barkston Heath APP instructed the King Air to descend. The recording of the Claxby Radar is about 15sec ahead of the timings used on the Cranwell RT transcript. At 0843:49, APP transmitted, "[C/S] *descend, report level 1800ft limited checks report complete."* The King Air responded, *"Descend 1800ft checks on the glide."* Another Grob not associated with the incident then checked-in on the frequency before at 0845:43, APP instructed the B200 crew to "*..turn left heading 3-6-0."* The Claxby Radar replay shows the subject Grob in the King Air's 10 o'clock - 2·7nm indicating 800ft at about this time (0845:45) below the King Air in a slow climb on Mode C. After acknowledging the turn, the King Air crew was then passed traffic information about the subject Grob Tutor "[C/S] *traffic north east, 2 miles, tracking north west, indicating 600 feet below believed to be a Tutor.'* The King Air crew responded, "[C/S]*..visual."* At 0846:33 the King Air crew advised, "[C/S] *breaking off for the traffic."* APP then provided a vector and updates on the Grob's position until 0846:53, when the King Air crew advised, *"Thank you I'm clear now happy to resume vectors."*

This incident took place in Class G airspace in a particularly busy traffic environment between Cranwell and Coningsby. The traffic information passed by APP to the King Air crew, although possibly late, was accurate and fulfilled the requirements of a RIS. This coupled with good look out by the Grob pilot and the TCAS onboard the King Air prevented a more serious incident developing.

Both the military ac operators and ATC at Cranwell are aware of the complexity and reduced availability of airspace in which the different operators may conduct their manoeuvres. SATCO at Cranwell has highlighted this incident to her own staff, stressing the importance of early traffic information, and has encouraged the wider Lincolnshire flying community to call ATC.

UKAB Note (1): The Claxby Radar recording illustrates this Airprox relatively clearly. The King Air is shown eastbound at the end of the DOWNWIND leg indicating 2600ft Mode C (1013mb) as the Subject Grob Tutor commences a R turn climbing through 1300ft Mode C (1013mb) some 4·7nm away. Meanwhile another ac is shown heading SW – the other Grob that called APP – descending through FL45. At 0845:45 - about the time that APP instructed the King Air crew to turn L onto N – the subject Grob is shown 2·7nm away - climbing through 1800ft and some 800ft below the King Air. The King Air turns L and descends slightly to 2500ft (1013mb) – equating to about 1720ft QFE (987mb) – as both ac close toward one another. The subject Grob Tutor continues in a wide turn to the R as the King Air steadies on a track of about 010° at a range of 1·1nm from the Grob, which has climbed to 2300ft (1013mb). At 0846:32, the Grob is 0·6nm ahead of the King Air having climbed through the twin's level and now 100ft above it, subsequently turning sharply R as the King Air recommences the L turn away from it. The CPA occurs at 0846:48, at a position 100°(M) Cranwell 10·5nm – just at the boundary of the Cranwell/ Coningsby CMATZ (196°(M) Coningsby A/D 5nm), the Grob Tutor turning about through E off the King Air's starboard wing as the latter passes 0·2nm astern and 100ft below the Grob. Horizontal separation then starts to increase as the ac diverge.

HQ AIR (TRG) comments that both crews involved in this incident were aware of each other before the Airprox and therefore the risk of an actual collision was low. The Class G airspace where this Airprox took place is dimensionally restricted by the Cranwell/Coningsby CMATZ and had the Tutor crew conducted their instructional sortie in a less restrictive area they would not have come into conflict with traffic in the Cranwell instrument pattern.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The absence of traffic information about 'another' Grob was surprising to one controller Member, it seeming to him that the APP controller's recollection of events had been confused between the descent of 'another Grob' with that of the climb of the reported ac. However, the RT transcript had reflected that the controller had correctly assessed the situation at the time and provided accurate traffic information. The Board was advised that the close proximity of the three ac had resulted in significant SSR label overlap on the radar recording which had necessitated considerable manipulation of the individual labels to achieve a clear indication of the true situation. This might also have been the case with APP's display and perhaps explains in part why the controller delivered the traffic information at a range of only 2nm. Overall however, controller Members were of the view that APP had reacted as best he could at this point.

The Board was clear that the reporting pilot was legitimately complying with ATC instructions as they were vectored toward the localizer for their simulated asymmetric, PAR-monitored ILS approach. Whilst the King Air crew were evidently executing their IFR approach under simulated conditions in the prevailing good weather, the QFI safety pilot in the LH seat was effectively operating visually and was therefore ultimately responsible for separation against other observed traffic in this 'See & Avoid' environment of Class G airspace at the MATZ boundary. Equally, under the RIS provided by APP no separation was provided against other ac – which was entirely the responsibility of the King Air crew - other than sequencing in the pattern. It was clear from the Mil ACC report that the controller had turned the King Air onto a base-leg for the approach and provided accurate traffic information - the limit of APP's remit under the RIS - about the subject Grob Tutor, albeit somewhat late in their view and that of controller Members. Clearly, the location of this turn was predicated upon intercepting the localizer at the appropriate point to enable a safe descent on the glidepath but the traffic information provided, coupled with the TCAS TA, had assisted the King Air crew in acquiring the subject Grob Tutor and enabled the QFI to initiate his own visual traffic avoidance against it before the TCAS CLIMB RA was triggered. The King Air crew elected not to comply with the RA, civilian CAT pilot Members stressing that compliance with the RA was mandated under civilian protocols. However, it was pointed out that an asymmetric configuration is one example of where pilots may fly with TCAS selected to 'TA only'. Whether the Command allowed this when simulating an asymmetric approach with one engine at flight idle was not clear and the DARS Advisor was tasked with researching this point outwith the meeting.

From the reported pilot's perspective, pilot Members were surprised that the Grob Tutor QFI had allowed his student to stray into the vicinity of the Cranwell Instrument Pattern - and indeed this close to the boundary of the Coningsby MATZ - without communicating with ATC. Although the Grob QFI had reported that his student had allowed the ac to drift too far to the N, Members thought the instructor was unwise in allowing his student to do so. As captain of the ac, the QFI had sole responsibility in this respect unless his situational awareness had misled him to believing they were further to the S of the Coningsby MATZ boundary. Furthermore, an Advisor pointed out that two UKDLFS Flow Arrows are situated around the Coningsby MATZ, funnelling low flying traffic through this vicinity and another good reason not to be doing a PFL here at low-level! Controller Members intimately familiar with this locale explained that this is a very busy piece of airspace indeed. This high traffic intensity; twin runways in use at the time (because of the Tutor's cross-wind limitations) coupled with the overlapping instrument procedures from several individual airfields suggested that this was not a good location to exercise a PFL and moreover the base-leg turn location was not a good place to operate without being in contact with ATC - albeit that the Grob QFI had been listening out on the frequency but had not been able to make contact because the frequency had been busy. Nevertheless, the Board agreed that it was unwise to operate here in this manner and this Airprox was a good illustration of what can occur when non–participating VFR flights get entwined in instrument patterns.

Fortunately the Grob Tutor QFI was aware of the presence of the King Air as he had heard traffic information being passed to its crew about an ac, which he astutely realised was his own, and subsequently spotted the King Air 2km away. Pilot Members were somewhat surprised that he had not taken more robust action to clear away from the path of the King Air. It was evident from the recorded radar data that the Grob QFI's assessment of the minimum range was somewhat over optimistic: he reported 2000m minimum horizontal and 200ft vertical separation whereas the King Air pilot's estimate was spot-on at 100ft and 0·2nm – 400yd – at the closest point. The Grob pilot's reported gentle climbing RH turn to separate their trajectories did little to help the situation and although he reports that the situation did not demand any avoiding action, it was clear to the Board that the Grob QFI's assessment of the twin's trajectory was perhaps somewhat inaccurate as he turned 'tail-on' to the King Air. After this wide-ranging debate the Board concluded that the cause of this Airprox was a conflict resolved by the King Air pilot. Given both pilots' sighting of each other's ac, coupled with the action taken and the minimum

horizontal separation of 0·2nm as they turned away from one another, the Member's agreed unanimously that any risk of a collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict resolved by the King Air pilot.

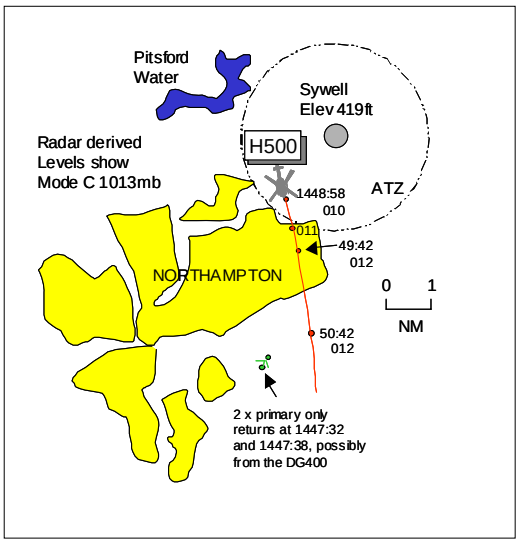
Degree of Risk: C.

AIRPROX REPORT NO 119/08

Date/Time:	15 Aug 1450	
Position:	5215N 00049W (3nm SSW Sywell)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	DG400 Glider	H500
Operator:	Civ Pte	Civ Pte
Alt/FL:	1500ft (QNH)	1500ft (QNH)
Weather	VMC CLBC	VMC NR
Visibility:	30km	NR

Reported Separation:
10ft V/NR H Not seen

Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DG400 GLIDER PILOT reports departing Rattlesden flying a solo cross-country via Finmere, Eyebrook [nr Leicester] before returning and was listening out on Glider Common frequency 130·1MHz. The visibility was 30km flying 3000ft below cloud in VMC and the ac was coloured white/red; no transponder or lighting fitted. The ac was a retractable engine type and FLARM was fitted [basic ACAS but only provides relative positions of other ac fitted with FLARM]. After getting fairly low to cross all of Northampton he modified his track more E'ly, about 015°, towards Sywell for 3nm whilst gliding down to 1500ft amsl at 65kt. About 3·5nm SSW Sywell whilst gliding clear of the E suburbs of Northampton, a helicopter appeared from the forward RH lower blindspot 100-200m away between his 12 and 1 o'clock. He banked immediately L and the helicopter passed about 10ft below and close under his R wing without any apparent course deviation. He assessed the risk as very high. This encounter had shaken him up leading to a loss of concentration and after being unable to thermal climb he used his engine whilst close to Sywell.

UKAB Note (1): The DG400 pilot was contacted to clarify the separation at the time of the Airprox and his flight path post incident, as his provided IGC file trace showed the glider routeing to the S and then the E of Northampton and into the Sywell ATZ. The pilot was unable to give an estimate of distance at the CPA, stating that as he rolled L the helicopter then passed through the area he had been occupying. On looking back the helicopter was climbing on the same course and was now above. Also, he stated that he had been heading for Pitsford Lake hoping to pick up thermals from the N side of the suburbs. However, in his state of shock, he did not contact lift properly and drifted into the ATZ without calling and subsequently cleared away to the E after his engine had started.

THE H500 PILOT reports he was unaware of an Airprox but provided brief details of his flight departing Sywell en route to a private site near Shenley Hertfordshire. The helicopter was coloured silver/red and he was in communication with Sywell Information on 122·7MHz squawking 7000 with Modes C and S. He departed heading 180° at 120kt climbing to 1500ft but did not see the reporting glider. Sywell did not mention any glider traffic nor did he hear any RT calls from a glider so he presumed the glider was not on the Sywell frequency.

UKAB Note (2): Met Office archive data provided a local QNH of 1014mb.

UKAB Note (3): Recorded radar does not capture the Airprox. A primary only return is seen for 2 successive radar sweeps at 1447:32 and 1447:38, which could possibly be the DG400, about 5nm SSW of Sywell tracking NNE'ly (position correlates with IGC trace) before fading completely. A 7000 squawk is first seen at 1448:58 1·75nm SW of Sywell, believed to be the H500 (Sywell ATD 1446), tracking 170° indicating unverified FL010 (1030ft QNH 1014mb). About 1min later, as the H500 reaches 3nm SSW of Sywell and just over the E side of Northampton, its Mode C is showing FL012 (1230ft QNH) which is maintained as it passes the position of the reported Airprox.

AIRPROX REPORT No 119/08

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

This Airprox occurred in Class G airspace where pilots are responsible for maintaining their own separation from other traffic through 'see and avoid'. The DG400 pilot had become concerned with his flightpath close to a built-up area and turned to pass to the E of Northampton. He was then surprised to see the H500 as it suddenly appeared in his 12-1 o'clock 100-200m away which Members agreed had been a late sighting, whilst the glider passed unseen by the H500 pilot. A pilot Member opined that the H500 pilot would have been looking into sun with the white DG400 approaching almost head-on, sky-lined under cloud which would have made the glider more difficult to acquire visually in the circumstances. The DG400 pilot had immediately banked L and watched the helicopter pass close to his R and just below. Some Members wondered whether the very late avoiding action taken had actually been effective and that an actual risk of collision had existed. Other Members, who thought that the action taken by the DG400 pilot had removed the actual collision risk but the ac had passed with safety not being assured, did not share this view. After a 'show of hands' vote, which resulted in a tie, the Director cast his vote, deciding that the DG400 pilot had done just enough to avert a collision but safety had been compromised during the encounter.

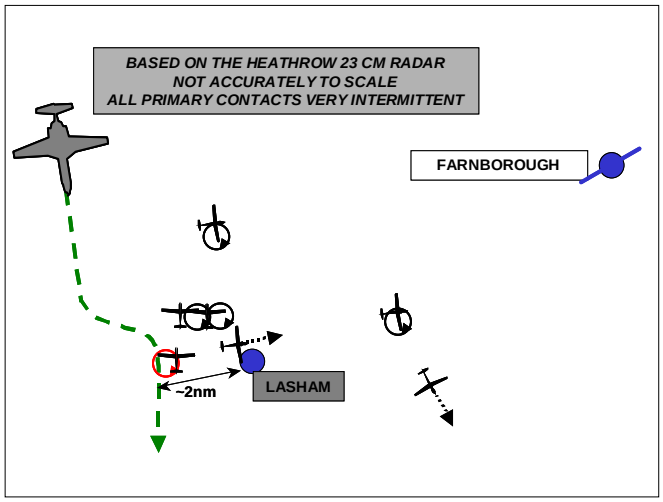
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the H500 pilot and a late sighting by the DG400 pilot.

Degree of Risk: B.

AIRPROX REPORT NO 120/08

Date/Time:	20 August 1311	
Position:	5111N 00103W	(2nm W Lasham)
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Citation CJ525	Untraced
Operator:	Civ Comm	NK
Alt/FL:	5000ft (QNH 1012 mb)	NK
Weather	IMC In Cloud	NK
Visibility:	N/A	NK
Reported Separation:	Not seen	NK
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CITATION CJ525 PILOT reports flying a positioning flight to Farnborough under IFR in an ac with TCAS1 fitted; they were squawking as directed with Mode C but Mode S was not fitted. While heading 165° at 220kt, London Control cleared them to leave CAS by descent to 5000ft on the London QNH of 1012mb and to contact Farnborough Radar. On handover, the controller immediately advised them of two, he thought, conflicting ac and, when the type of service was established [as a RAS], they were given one turn prior to an immediate 'avoiding action' right turn onto 180°. At the same time a TCAS TRAFFIC warning was received so the Captain disconnected the AP and steeply banked the ac onto the designated heading.

On contacting Radar on the ground he was advised that the conflicting traffic [UKAB Note (1): from the RT transcript, not the ac that was the subject of the TCAS warning] was within ½ mile of them. He assessed the risk as being high.

UKAB Note (2): The recording of the Heathrow 23cm radar shows the Citation throughout its approach. It also shows many other contacts, including more than 7 intermittent primary-only returns that are probably gliders, within 5nm of Lasham. The Citation is in a descent tracking 170°/180° and at 1310 commences a left turn towards ODIMI but almost immediately reverses the turn onto a track of 180°. As the ac rolls out to track 180° there is another ac, omitted from the diagram above for clarity, also inbound to Farnborough, in its 11 o'clock, descending through 7300ft to pass 3.8nm abeam and 2300ft above. After the Citation passes abeam the other ac at 1312 the former turns left at a position 4nm SW of Lasham to recommence its approach. It then passes about 1nm to the N of another very slow moving primary only contact, thought also to be a glider. There was a NOTAMED gliding competition at Lasham on the day of the incident but, despite extensive tracing action, the identity of glider could not be determined.

ATSI reports that the incident took place at 1311, 2nm W of Lasham aerodrome in Class G airspace.

The Citation was inbound to Farnborough IFR from Gamston, initially via the Airways system. Prior to leaving Class A CAS to the S of CPT, the flight was receiving an Area Control service from LTC SW Deps controller.

By 1308, the Citation was at FL90 on a radar heading of 180° and approximately 6nm S of CPT. In accordance with the 'Silent Handover Procedure with Farnborough ATC–Arrivals via CPT' (LTC MATS Part 2, STH-25, para 5.1.1.3), the SC issued the pilot with a clearance to "……*leave controlled airspace by descent Farnborough will accept you at altitude five thousand feet the London QNH is one zero one two millibars".* The LTC MATS Part 2 also states (at para 5.1.1.1) 'All inbounds are to be transferred to Farnborough ATC routeing on their own navigation towards ODIMI, unless an alternative routeing is specified by Farnborough. Due to intense gliding activity at Lasham, whenever possible inbounds should not be positioned within 3nm of Lasham (marked on

NODE-L 'Airspace' map)' [ATSI Note: The area is marked as a circle, 3nm radius, on relevant LTC radar displays, as a guide to controllers].

Lasham is 11nm SW of Farnborough and situated within the Odiham MATZ, in Class G airspace and beneath the LTMA where the base of CAS is 5500ft amsl. Lasham airfield is shown on UK aeronautical charts, annotated with 'INTENSE GLIDER ACTIVITY'. There is also a warning to pilots of Airways flights to and from Farnborough in the UK AIP page AD 2-EGLF-1-9, para 2 ii (a) "Due to intense glider activity pilots should avoid flying within 2.5nm of Lasham aerodrome below 5000ft ALT. When available Farnborough Radar will provide navigational assistance as necessary." In addition, on the day of the incident a gliding competition was taking place at Lasham and was the subject of a NOTAM. Item E) stated:

"MAJOR BGA GLIDING COMPETITION INCLUDING X-COUNTRY RTE. MAIN ACTIVITY WI 5NM RAD PSN 5111N 00102W (LASHAM AD, HANTS). UP TO 70 GLIDERS AND 8 TUG ACFT MAY PARTICIPATE. GLIDERS WILL NORMALLY OPR BELOW THE INVERSION LEVEL OR BTN THE TOPS OF ANY CU AND 500FT AGL. AFTER LAUNCH MOST ACFT MAY BE CONCENTRATED JUST UPWIND OF THE SITE OR ON THE FIRST LEG OF THE X-COUNTRY RTE." Item F) stated the vertical extent of the activity as Surface to 5000ft amsl.

ODIMI is coincident with Odiham airfield and is 4.5nm NE of Lasham. Its use for Farnborough inbounds is described in UK AIP, AD 2-EGLF-1-10, Note 1 to the Routes table, where its position is defined by VOR/DME fixes from CPT, SAM and GWC VORs. At 1309:44, the SC instructed the Citation to *"…resume own navigation ODIMI contact Farnborough Radar (frequency)",* and this was readback by the pilot. The radar recording shows that at this point the ac was 6nm NW of Lasham.

At 1310:02, the Citation made its first call to Farnborough Radar. The pilot reported descending to 5000ft direct to ODIMI and in receipt of ATIS Information with the QNH 1012mb. The Farnborough 1250 weather was reported as 230/12kts Visibility >10km Cloud Scattered at 3800ft Temperatures 19/11 QNH 1012. Responding to the call, the controller advised that it was vectoring for an ILS to RW24 at Farnborough. By this time, the radar recording shows the Citation about 5nm WNW of Lasham and just commencing a left turn (to ODIMI). It is noted that in the 30sec since the flight was released to ODIMI, it travelled a further 3nm S before commencing the turn. Quickly recognising that if allowed to continue the ac would pass very close to the Lasham overhead, the Farnborough controller transmitted, at 1310:20 *"…if you could stop your left turn heading of one six zero degrees"*: the ac had however already passed that heading and had to reverse the turn to comply. The controller then advised *"…it's just that that heading would have taken you right overhead Lasham er which is active gliders there is one contact believed to be south-east of you by a mile eastbound no height information",* which was acknowledged by the pilot. Then, after reaching an agreement that the flight would be provided with a RAS, the controller transmitted *"… avoiding action turn right immediately heading of one eight zero degrees traffic twelve o'clock half a mile no height information".* The pilot readback the heading but made no comment about the other traffic. At this time, the radar recording shows the Citation about 2nm W of Lasham, at 5000ft and just commencing a turn to the right in response to the previous instruction (160°). The controller reported later that she did not consider telephoning Lasham as in her experience the contact telephone number is a mobile and 'frequently goes unanswered'.

The Farnborough controller's intervention was in accordance with the guidance for the provision of RAS in MATS Part 1, Section 1, Chapter 5, Page 2, para 1.4 states that *"A Radar Advisory Service is an ATS surveillance 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. Where time does not permit this procedure to be adopted, the controller shall pass advice on avoiding action followed by information on the conflicting traffic. Even though the service is an advisory one, controller shall pass the 'advice' in the form of instructions."* Also, one of the conditions that apply is at sub para e) "*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 5nm or 3000 feet, except when specified otherwise by the CAA. However, it is recognised that in the event of the sudden appearance of unknown traffic, and when unknown aircraft make unpredictable changes in flight path, it is not always possible to achieve these minima."*

Farnborough radar is not recorded and the radar recording available to ATSI does not show the targets that were the subject of TI and the avoiding action instruction. Consequently, a CPA cannot be assessed. The Citation subsequently adopted the heading of 180°, clearing the Lasham area, after which it was positioned to land at Farnborough without further incident.

LTC report that in the period leading up to the incident, the SW Deps Sector was particularly busy and complex. This is corroborated by the RTF recording which shows a high level of activity. The report added, *"Because of priorities regarding other aircraft in the sector the (Citation) ventured further south than the controller would have liked before instructing it to route to ODIMI. The controller (concerned) would usually endeavour to miss the gliding area".* In addition, Farnborough ATC spoke to Lasham after the incident and report that *"They have confirmed that there have been no reports made from any glider pilots flying that day in respect to an AIRPROX and that on the day in question the weather conditions were such that no gliders would have been operating above approximately 3000ft* (whether AGL or AMSL, is not stated*)."* However the (Lasham) CFI still expressed concern that an ac was in the vicinity of Lasham at the reported level and was assured that procedures were being looked at in relation to this issue."

Following the LTC initial investigation, a TOI was issued to LTC South staff which amends the MATS Part 2 inbound procedures for Farnborough. It now states *"All inbounds are to be transferred to Farnborough ATC routeing on their own navigation towards ODIMI, unless an alternative routeing is specified by Farnborough. Due to intense gliding activity at Lasham, inbounds* ***shall not be*** *positioned so that they fly within 3nm of Lasham whilst outside CAS (marked on NODE-L 'Airspace' map)."*

UKAB Note (3): At 1311 the majority of the (more than 10) primary-only contacts displayed on the Heathrow 23cm radar are outside 3nm of Lasham and at least 2 to the E are very close to the approach routeing being used inbound to Farnborough RW24.

The Unit investigation also made a number of recommendations including setting up two working groups: one between LTC and Farnborough and the other between Lasham and Farnborough. Each is tasked to review inter-Unit procedures which, in the case of Lasham and Farnborough, will include improving communications facilities. Another recommends that the airport authority at Farnborough install radar recording equipment in accordance with the ICAO standards and detailed in ATSD ATSIN 127: 'Automatic Recording of Surveillance Data by ATS Units'. A final recommendation asks the Farnborough GM to review the requirement to display the Lasham gliding area on the Farnborough radar displays (as that installed at LTC).

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members observed that although the Citation had come very close horizontally to an intermittent, primary-only radar contact, presumed to be a glider, and the initial avoiding action given had been with respect to that contact, the Citation had been IMC in cloud at the time: therefore, it had most likely been separated vertically from the (presumed) glider. Since the Citation pilot observed the TCAS contact at about the same time as the Farnborough Controller had passed him avoiding action, he had most likely associated the two pieces of information as being in respect of the same confliction. However, when all the facts emerged, it was apparent that the two events had been unconnected. The Board thought that the contact that the Citation pilot had observed on his TCAS 1 had most likely been the other ac that was inbound to Farnborough ahead of him which was well separated both vertically and horizontally although, at the time, probably on the same relative bearing as the (presumed) glider. That being the case, the Board agreed that the incident had been a TCAS sighting report with no inherent risk.

The NATS Advisor noted that notwithstanding that the investigation had revealed that the second ac involved had not been a glider from Lasham, much work had taken place recently to try to offer more protection to Lasham-based gliders from Farnborough inbound traffic.

PART C: ASSESSMENT OF CAUSE AND RISK

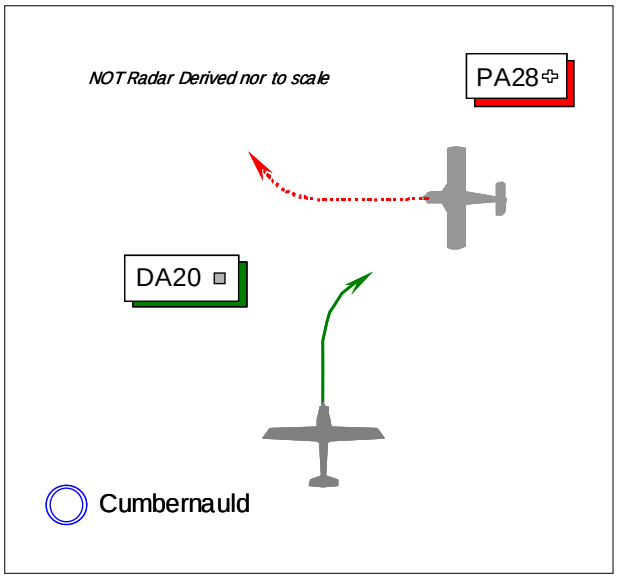
Cause: Sighting report (TCAS).

Degree of Risk: C.

AIRPROX REPORT No 121/08

AIRPROX REPORT NO 121/08

Date/Time:	16 Aug 1025 (Saturday)	
Position:	5559N 00357W (Cumbernauld A/D circuit - elev 176ft)	
Airspace:	Cumbernauld ATZ (Class: G)	
	Reporting Ac	*Reported Ac*
Type:	DA20	PA28-161
Operator:	Civ Trg	Civ Trg
Alt/FL:	950ft↑	1000ft
	QFE	QFE
Weather	VMC CLBC	VMC NR
Visibility:	>10km	NR
Reported Separation:		
	100ft V/200m H	400ft V/½nm H
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DIAMOND DA20 KATANA PILOT reports flying in the cct to RW08 at Cumbernauld and in receipt of a FIS, he thought, from Cumbernauld on 120·60MHz [actually an A/G - Cumbernauld RADIO]. A squawk of A7000 was selected with Mode C. Flying in VMC some 2000ft below cloud with an in-flight visibility of >10km climbing through 950ft QFE heading 350° CROSSWIND at 65kt, a PA28 was sighted 200-300m away. To avoid the other ac, a descending steep turn to the R was initiated as the Piper passed about 100ft above, some 200m away, whilst crossing from R – L ahead.

The Katana pilot added that the PA28 pilot had reported at POLMONT VRP on RT, inbound to Cumbernauld, and joined the RW08 cct DOWNWIND without any further RT calls.

THE PA28-161 PILOT provided a comprehensive account reporting that he was the pilot-in-command occupying the RH seat with a student pilot in the LH seat. They had departed from Edinburgh and had flown to Cumbernauld for a cct training detail. Exiting the Edinburgh CTR at POLMONT VRP, they contacted Cumbernauld Air/Ground Station - C/S Cumbernauld RADIO - on 120·6MHz and ascertained the RW in use to be RW08, which has a LH cct direction, with one other ac in the cct – the DA20. They were also given an 'advisory' QFE, which was set once the airfield was in sight.

Polmont is situated E of Cumbernauld which meant that they approached the cct from that direction, thereby facilitating a cct join via the DOWNWIND leg. He cannot remember the exact weather conditions except that it was very good VMC and the wind was from the SE. They could see the RW from at least 5-6nm away so his student set the QFE and descended to cct height of 1000ft positioning to join DOWNWIND, heading 260° (M) at 90kt, following the valley to the N of Cumbernauld. A radio call was made stating their intentions which were to join DOWNWIND for a 'touch and go'. As they entered the DOWNWIND leg, but before they had reached a point abeam the upwind end of RW08, he first saw a low-wing ac – the DA20 - climbing out CROSSWIND from RW08. The DA20 was in his 10–11o'clock position and below him and he expected its pilot to continue into the LH cct. He estimates that the DA20 was at 500ft and had just turned CROSSWIND when he first saw it. Pointing this traffic out to his student, he then took control of the ac to position them further out on a wider DOWNWIND leg thereby creating horizontal separation whilst expecting the DA20 pilot to turn L into the cct inside them. However, the pilot of the other ac turned R and was lost to sight astern in his 5–7 o'clock below him. Not knowing whether this ac was in the cct or departing, he called the A/G Operator and asked if the DA20 was in the cct or leaving to the NE. The A/G Operator stated that the other ac was in the cct and that "he had cut in front of them". Making no comment about this he continued DOWNWIND and carried on with his cct detail.

On completion they landed at Cumbernauld, went to the aerodrome control/radio room, where he spoke to the A/G operator. They spent several minutes conversing there but no mention was made of the "alleged incident" and he gave it no further thought.

In his opinion there was absolutely no risk of collision: he saw the other ac, which was below him, and manoeuvred to facilitate his entry to the DOWNWIND leg. The DA20 passed some 800m to port in his 10 o'clock and some 400ft below his ac at the closest point. Indeed, in his view, the DA20 pilot had elected to give way to his PA28 in accordance with the 'Rules of the Air' as he was on his right (in his 1 – 2 o'clock) and had turned to the right. The fact that the DA20 pilot had manoeuvred indicated that he had seen his PA28.

Joining visual ccts at uncontrolled airfields involves an element of manoeuvring to ensure that ac are spaced out suitably for their respective approaches. Had the cct been busier he would have joined via the overhead but having been told that there was only one other ac in the cct, and seeing no other traffic, he decided a DOWNWIND join to be both expeditious and safe.

The first he was aware of the Airprox report was when contacted by UKAB Staff. He does not consider there to have been an Airprox and at no time did the pilot of the other ac declare an Airprox on RT. Nevertheless, he recognised that someone was concerned therefore he was happy to assist with the investigation.

ATSI reports that the RTF recording reflects that the PA28 pilot reported at POLMONT, inbound for ccts at Cumbernauld. He was advised that it was RW08 - left hand – with the circuit active and stated that he would join DOWNWIND for RW08. The next call from the PA28 pilots was to report 'wide' DOWNWIND behind the DA20. The A/G operator asked the DA20 pilot if he had visual contact with the PA28, whereupon the former confirmed having the PA28 in sight. When the PA28 pilot asked if the DA20 was leaving the cct, the A/G operator said that he had turned in front of the DA20. The PA28 pilot reported that he had turned R to avoid it, but then the DA20 pilot had also turned R and he lost sight of the other ac. The A/G operator commented that the DA20 was already in the cct. No further comments were made on the frequency about the occurrence, the Katana continuing DOWNWIND behind the PA28.

UKAB Note (1): The UK AIP at AD 2-EGPG-1-2 promulgates that Cumbernauld Aerodrome Traffic Zone (ATZ) is a circle radius 2nm centred on the longest notified runway (08/26), extending from the surface to 2000ft above the aerodrome elevation of 176ft. The ATZ is active in summer 0800-1900, concurrent with the provision of an A/G Service operating on 120·6MHz, C/S Cumbernauld RADIO. At AD 2.22 it is stated that cct height is 1000ft QFE and LHD on RW08. Furthermore, pilots are to *"Join overhead at 2000ft QFE, descending DEADSIDE to join the circuit".*

UKAB Note (2): ScACC helpfully provided still images of the Lowther Hill Radar recording. However, the recording is somewhat inconclusive as, at the scale shown, it is difficult to determine the geometry of the final stages of this close quarters encounter with any certainty. Although both ac are squawking A7000 with unverified Mode C, the supporting primary return is absent on most of the frames. The contact believed to be the DA20 is shown crosswind at 1024:46, climbing through an altitude of 900ft. The contact believed to be the PA28 is shown descending through an altitude of 1500ft in the DA20's 1 o'clock at a range of about 0·8nm. Later at 1025:12, the PA28 is just about to cross ahead of the DA20 at a range of about 0·2nm, with the PA28 indicating no Mode C (NMC) and the DA20 indicating 1100ft but without supporting primary data on either contact. The frame timed at 1025:25 shows the PA28 at 1300ft altitude with the DA20 descending through 1000ft, less than 0·2nm away and apparently turning R astern of the PA28 in conformity with the pilot's reported avoiding action. This occurs at a position about 2nm NNE of the aerodrome at the boundary of the ATZ. Some 28 sec later the PA28 appears to be established DOWNWIND N abeam the aerodrome at an altitude of 1400ft with the DA20 manoeuvring astern.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, radar video stills recordings and a report from the appropriate ATC authority.

It was evident to the Board that when operating at an uncontrolled aerodrome where merely a FIS or A/G Service is provided it was incumbent on pilots to ensure that appropriate and accurate RT calls were made, in good time, to ensure that all pilots either arriving/departing or operating in the cct were aware of each others intentions. In one experienced pilot's view, the importance of informative RT calls could not be over emphasised and here with

only an A/G Service, it was entirely the pilots' responsibility to ensure that when joining the cct they had sufficient information about other cct traffic to ensure that they could fit in with the established pattern. Moreover, broadcasting their intentions to other pilots was helpful and if the PA28 pilot had done so it might well have allayed the DA20 pilot's concerns here.

When the PA28 pilot called to join from the E, he had been advised that the circuit was active and so informed the A/G Operator that he would join DOWNWIND for RW08. That the reporting pilot was aware of the PA28 joining DOWNWIND from the E as a result of this call was clear to Members from his account and as such the DA20 pilot should have been keeping a careful watch for the other ac as it approached to join the cct. It was a joining pilot's responsibility to ensure that they correctly integrated into the established traffic pattern but with the single DA20 in the cct that had just climbed up into the cross-wind leg - the extent of that pattern – especially the width of the cct - might have been difficult to judge at that stage as the DA20 was apparently the only other circuiting ac. Nevertheless, the PA28 pilot said he had seen the Katana as he entered the DOWNWIND leg – just as it climbed out CROSSWIND – and he was thus able to gauge where to fit into the cct. Members identified that the PA28 instructor had recognised the potential for a conflict when he took control of his aeroplane from his student and turned away to the R onto a wider DOWNWIND leg, in order to allow the DA20 pilot to turn L inside him. However, it appeared that this was still not wide enough even though radar stills suggested that the PA28 crew had set up for a DOWNWIND leg displaced about 2nm out and thus adjacent to the ATZ boundary. But it would appear that the DA20 pilot was concerned that there was insufficient spacing when he spotted the PA28 for the first time some 2-300m away and elected to take robust avoiding action himself by executing a descending steep turn to the R. The GA Member opined that having seen the DA20, the PA28 pilot had himself manoeuvred to remain clear and the radar recording suggested that this was in the order of 400m away – which in GA circles is a lot - although the accuracy of this range was indeed questionable. Nevertheless, it was evident to the Board that the manner in which the PA28 had joined the cct had caused the DA20 pilot concern. One Member thought that the PA28 pilot had acted reasonably and this was merely a conflict in the cct resolved by both pilots. But experienced CAT pilot Members were of the view that, having elected to join DOWNWIND and thus forego the standard overhead join required by the AIP, it was entirely the PA28 pilot's responsibility to ensure he gave way to the DA20 already in the cct. Thus the Board was convinced that this Airprox had resulted because the PA28 pilot did not integrate into the cct correctly and caused the DA20 pilot concern. Whereas both pilots had seen each other's ac, the PA28 pilot had thought he had given the DA20 pilot sufficient room on the DOWNWIND leg but the DA20 pilot took further avoiding action. Nevertheless, in the Boards view, there was no risk of a collision in the circumstances conscientiously reported here.

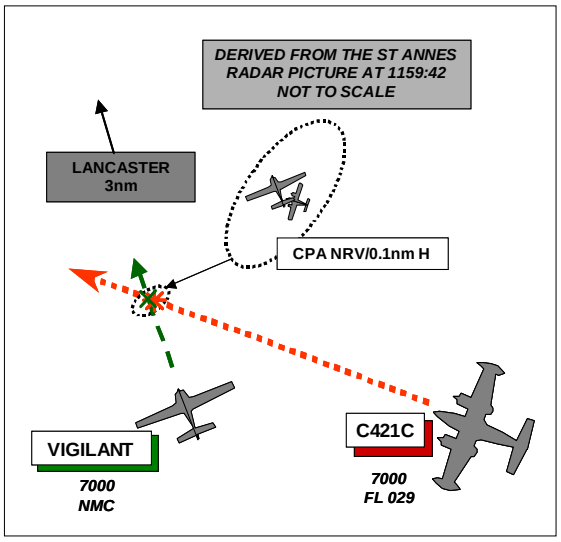
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA28 pilot did not integrate into the cct correctly and caused the DA20 pilot concern.

Degree of Risk: C.

AIRPROX REPORT NO 123/08

Date/Time:	23 Aug 1200 (Saturday)	
Position:	5349N 00236W (3nm SE Lancaster)	
Airspace:	Lon FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Vigilant T1	C421C
Operator:	HQ AIR (Trg)	Civ Pte
Alt/FL:	3000ft	3400ft
	(QFE 1005mb)	(N/K)
Weather	VMC CLBC	VMC NR
Visibility:	30km	NR
Reported Separation:		
	V 800ft/H 0	Not Seen
Recorded Separation:		
	NR V/0.1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VIGILANT T1 PILOT reports flying at 3,000ft (QFE) with a student on a local flight in a white ac with day-glo stripes with nav lights, the landing light and strobes switched on squawking 7000 but Mode C was not fitted; he was listening out with Samlesbury Radio. During the teach/practise phase of the flight, he was teaching pitch to his student and as they returned to straight and level flight heading 330° at 60kt, he saw a blue and white, low wing twin engined turboprop ac about 500-800m in front of his ac and at an angle of about 30^{o} above his eye level. From its flight profile it appeared that the ac had passed about 800ft above them from their 7 o'clock, he thought, and it did not deviate from its course.

As he first saw the ac after it had passed them, he did not take any avoiding action and assessed the risk as being medium. He reported the incident on the radio.

THE C421C PILOT reports flying VFR from Gamston to the Isle of Man. He could not recall the precise details of the flight but he usually gets a RIS from Leeds Bradford before contacting Blackpool. He was in the area of the incident at the time and would have been heading 290° at 165kt and at about 3400ft QNH, he thought, but he did not recall seeing any ac in the reported position.

UKAB Note (1): The recording of the St Annes radar shows the incident. The C421C is seen tracking about 290° at FL029 as it approaches the incident area with a contact squawking 7000 with no Mode C, presumed to be the Vigilant, in its 12 o'clock in a right hand turn before steadying for a short time on a Westerly track. The C421C continues to close with the Vigilant which then turns right again onto a NNW track passing through the C421C's (still at FL029) 12 o'clock at about 0.1nm. The C421C passes from the Vigilant's 4 o'clock to its 10 o'clock but, since the Vigilant had no Mode C, the vertical separation could not be determined. The QNH was 1015mb so the C421C was at an alt of about 3000ft at the time of the incident.

UKAB Note (2) Just as the C421C passed over the Vigilant, its squawk changed from 7000 to 0465 (Blackpool).

HQ AIR (TRG) comments that neither pilot saw the other ac (the Grob pilot only after the CPA) therefore avoiding action could not be taken. In the see and avoid environment the importance of aviators constantly maintaining a good look is obvious. In this case the actual separation between these ac was down to luck.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

AIRPROX REPORT No 123/08

The Board noted that both ac had been operating legitimately in the Class G airspace to the N of Samlesbury where the see and avoid principle pertains. The C421C had been approaching the Vigilant from its 4:30 position on a line of constant bearing and with a significant overtake; it would therefore have been very difficult for the Vigilant pilot, seated on the LHS, to see it.

From the Cessna pilot's perspective, although the visibility had been good, the Grob too would have appeared to be almost motionless; had been just below the horizon and was coloured predominantly white against a light background. Furthermore, it would appear from the RT transcript that at the precise time of the incident the C421C (single) pilot had been changing squawk and had just changed frequency and made his initial call to the Blackpool APR. Members thought therefore that he might have been distracted, perhaps looking inside the cockpit to change the SSR code.

In any case, although neither pilot had seen the other ac in time to take any avoidance, Members agreed that it had been the responsibility of the C421C pilot to avoid the Vigilant while overtaking: since he had not seen it he did not avoid it. This, the Board considered, had been the cause of the incident but since the vertical separation was reported as 800ft Members agreed that there had been no risk of collision.

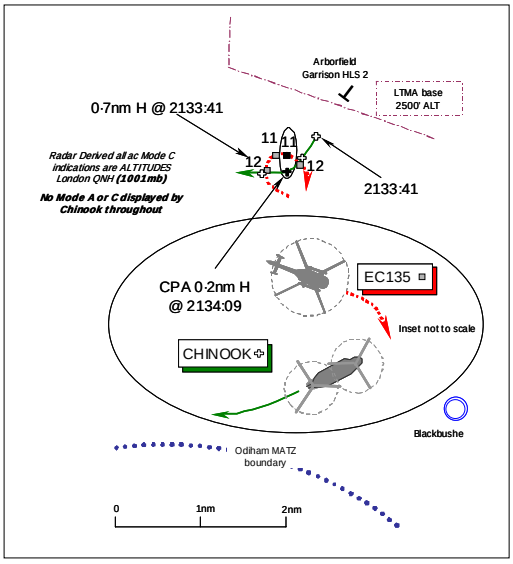
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the C421C pilot.

Degree of Risk: C.

AIRPROX REPORT NO 124/08

Date/Time:	2 September 2134 NIGHT	
Position:	5122N 00054W (1nm SW of Arborfield Garrison HLS 2 - elev 160ft)	
Airspace:	UKNLFS/FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Chinook Mk2	EC135
Operator:	HQ JHC	Civ Comm
Alt/FL:	700ft	900-1000ft
	QNH (1001mb)	agl
Weather	VMC Haze	VMC NR
Visibility:	10km	10km+
Reported Separation:		
	100ft V/250m H	Nil V/300-500m H
Recorded Separation:		
	0·2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CHINOOK MK2 HELICOPTER PILOT reports he was conducting a night troop insertion exercise in LFA1B, with a FIS from Odiham INFORMATION on 372·375MHz. Navigation lights and the red upper strobe were on whilst operating VFR in VMC at night, departing from Arborfield Garrison HLS - Site 2 - following a simulated troop insertion.

Heading 245° at 100kt, climbing through 700ft agl after take-off at a RoC of about 2000ft/min, he was returning to an Initial Point (IP) about 4nm to the SW of the HLS when one crewman reported to him an ac on a conflicting track and that he should continue to climb for avoidance. The unknown ac was spotted about 500m away on a track of about 120°, which passed through their 5 o'clock - 250m away some 100ft beneath the Chinook - levelling by the time it crossed directly astern of his helicopter with a *"high"* risk of a collision. The climb was continued to 1500ft QNH (1001mb) to avoid the unknown ac and visual separation was maintained. The other ac - subsequently established to be a helicopter - was displaying HISLs and navigation lights but was climbing in a level attitude on a conflicting track. Upon levelling they called for a radar recovery into Odiham and also asked ATC about any known traffic in the area. Odiham ATC then advised that an unknown ac was displayed on radar about 2nm to the SE of their Chinook.

He stressed that all crew members were looking out in the climb away from the HLS but that Night Vision Devices (NVDs) had restricted his crew member's field of view leading to late sighting of the other ac. His Chinook has an olive green camouflage scheme.

THE EC135 HELICOPTER PILOT reports he was operating single pilot orbiting over a police incident about 3½nm NW of Blackbushe A/D at 0 - 40kt at a height of 900-1000ft agl. Operating under a FIS from Benson ZONE on 120·9MHz, under VFR at night in VMC, a squawk of A0050 was selected with Mode C and TCAS I is fitted.

During the orbit over the static police incident on the ground they saw the Chinook helicopter 1½nm away approach at low-level (below them) from the SE preparing to fly an approach into Arborfield Garrison, which was about 1nm NE of their position. He switched on his EC135's landing light to highlight their presence and carried on orbiting. They asked Benson ZONE if they could see the Chinook on their radar who said they believed it was displaying an Odiham squawk. The Chinook then disappeared behind some trees/buildings on its final approach. Whilst the EC135 was still orbiting, a few minutes later the Chinook helicopter suddenly appeared in their 10 o'clock, then climbed through their level about 300-500m away at the closest point, heading W. He thought the Chinook crew was curious to see what his EC135 was doing and had flown in towards them for a closer look. Although he had the ac displayed on his TCAS, he considered the Chinook to be rather too close for comfort especially as it was at night, but no avoiding action was necessary.

He was somewhat surprised that the Chinook pilot had filed an Airprox as the two ac were not that close and the other crew had flown towards his EC135's position which had not changed since he first saw the Chinook and, presumably, its crew had seen his EC135. His police observer caught the other helicopter on their thermal camera and they could see that it was a Chinook. The Risk was assessed as *"low"*.

MIL ACC reports that the Chinook helicopter was conducting a night training sortie within Low Flying Area (LFA) 1B to Arborfield Garrison HLS. The flight had been booked into the LFA and the crew was in contact with Odiham (ODI) ATC on frequency 372.37MHz flying under VFR in VMC. ODI was operating a night service whereby all frequencies were being monitored from the VCR by the ADC under the callsign Odiham INFORMATION. A police helicopter was on an operational task 3·5nm NW of Blackbush Aerodrome orbiting over a ground police incident at approximately 1000ft agl. The flight had not been notified as being in the area through the CANP/PINS systems. The EC135 crew was in contact with Benson ZONE (ZONE) on frequency 120.960 MHz flying VFR in VMC. At the time of the incident the EC135 was in an orbit and the Chinook was departing Arborfield Garrison with a rate of climb of approximately 2000ft/min.

The Chinook crew called INFORMATION at 2123:39 and was given a FIS, the London QNH (1001mb) and advised that there was *"a pair of rotaries notified in the area to the south"*. The Chinook crew acknowledged the FIS, read back the London QNH and stated that they were en-route to Arborfield Garrison. No further communication was recorded between INFORMATION and the Chinook crew until they called for a PAR recovery at 2137:06, after the Airprox had occurred. No mention of any other ac was made by the Chinook crew.

The ADC [providing the FIS – INFORMATION] stated in his report that they had observed a police helicopter in the area throughout the evening which was subsequently identified as the EC135. However, information regarding the traffic was not passed to the Chinook because INFORMATION was not talking to the EC135 and the controller opined that it was not his practice to call traffic information to flights under a FIS. The controller also reports that at no time did they observe the squawks close to each other at similar levels.

Meanwhile, the EC135 pilot reports he was visual with the Chinook and had switched on his landing light to highlight his presence. The EC135 pilot asked Benson ZONE if they could see the traffic and was informed that ZONE believed the aircraft was displaying an Odiham squawk; the EC135 then continued with its task.

In summary, the Chinook was climbing away from Arborfield Garrison whilst the EC135 was orbiting an incident in the vicinity. ATC had been aware of the presence of a police helicopter in the area throughout the evening but traffic information regarding the EC135 was not passed to the Chinook crew. If traffic information had been passed, the situational awareness of the Chinook crew may have been enhanced such that they might have scanned for the EC135 before their departure from Arborfield Garrison. The Chinook crew was using NVDs that restricted their field of vision and may be why the EC135 was seen late.

UKAB Note (1): The Heathrow Radar recording shows the EC135, identified from its assigned squawk, orbiting R at between 1100-1200ft London QNH (1001mb) as reported. The Chinook is first shown as a primary contact ½nm SW of Arborfield Garrison at 2133:41, presumably climbing into coverage as it departs from the vicinity of the HLS on a steady SW'ly course. No Mode A or C is evident from the Chinook on the recording as it departed from the HLS, or throughout the encounter. At this point the EC135 is in the Chinook's 12:30 position at a range of 0·7nm indicating 1200ft QNH. The EC135 turns about to the N of the Chinook which maintains a steady course as it closes to the CPA of 0·2nm at 2134:09. The Chinook is due S of the EC135 at this point which itself is indicating 1100ft London QNH (1001mb) and moving into the Chinook crew's 5 o'clock. The Chinook then turned R onto W and cleared the vicinity to the W as the EC135 drew astern.

HQ JHC comments that the Chinook crew were unaware of the EC135 as they climbed away from the Arborfield HLS. Although the ADC had no requirement to pass TI to the Chinook crew, an early indication of the presence of the EC135 may well have provided them with the situational awareness to enable them see the conflicting helicopter earlier and thus have prevented 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 frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

The JHC Member stressed to the Board that the use of NVDs resulted in a restricted field of view for the Chinook pilots whose ability to visually scan and spot other ac – especially above their helicopter - was somewhat limited. The Member confirmed that both pilots in the Chinook would have been wearing NVDs, the other crew member conducting look-out duties. Moreover, a crew's perception of the range of another ac when viewed through these devices can be deceptive, especially insofar as HISLs and other powerful lights are concerned which in themselves can impair the effectiveness of the NVD. That said, when scanning for other traffic another ac's HISL might 'bloom' significantly in the 'goggles' and thereby draw attention to that ac so it was unfortunate that the Chinook crew had not spotted the EC135 as they routed inbound to the HLS. It was emphasised that the Chinook crewman would have the best chance of sighting traffic above their helicopter, as it departed from the HLS, but it was not until the Chinook had climbed to about 700ft agl that the EC135 was indeed spotted by the crewman, just above them out to starboard. For their part, the Chinook pilots had evidently not seen the EC135 beforehand even though the radar recording had shown that it should have been plainly in sight during its orbit and crossing directly ahead about 1-1½ nm away - some 940ft above the elevation of the HLS, the radar recording suggested – as the Chinook departed. Whilst the EC135 was there to be seen with all lights illuminated and the landing light wisely selected 'on' to highlight its presence, Members recognised the Chinook crew's difficulty in acquiring with NVDs a very slow moving (0-40kt, i.e. relatively stationary) helicopter against the background ambient lighting from the many built-up areas in the vicinity that masked the presence of the other helicopter from them beforehand. This Airprox was a salutary example of the difficulties of sighting other ac at night when relying on advanced technology to discharge responsibilities under the principles of 'see & avoid' in the Class G environment of the LFS. A salutary point here also was that the airspace below 2000ft msd which constituted the LFS was not the exclusive preserve of military ac at night and pilots must be aware that other airspace users will be encountered operating legitimately in Class G airspace.

On another tack, the Mil ACC report had made it plain that the ADC had observed the presence of the Police EC135 beforehand. Whilst Members recognised the limitations of the FIS being provided to the Chinook crew by Odiham INFORMATION and the controller might not have been aware of the exact nature of the operations undertaken, he did know that the Chinook was operating to a HLS in its vicinity. In the Board's view, the presence of the Police helicopter did constitute a hazard and the ADC might reasonably have been able to highlight the presence of the EC135 to the Chinook crew. As it was, the orbiting EC135 went unseen by the Chinook crew, as they climbed up towards it on departure from the HLS, until it had closed to about 500m away. Given these circumstances the Board agreed with the reporting pilot's view that a late sighting by the Chinook crew was part of the Cause.

It was clear that the Police EC135 pilot was proceeding about his lawful occasions and engaged on an operation which possibly prevented him from straying too far from the location of his task. A controller Member was of the view that special consideration should be given to assisting police helicopters engaged on such operations, which can focus a pilot's attention considerably. Nevertheless, other Controller Members recognised that a controller's priorities might lay elsewhere - with other IFR traffic for example - and should balance carefully the provision of assistance to such flights against their individual traffic priorities and the controller's workload at the time. Benson ZONE had a similar responsibility under the FIS to assist the EC135 pilot here and highlight any hazards that might become apparent. However, without further detail on this aspect it could be that the Chinook, climbing up from low-level, was either below their radar coverage or not seen on the controller's display until after the event. It was stressed that the Police observers have no responsibility for lookout under 'see & avoid' so although they might draw the pilot's attention to other observed ac, traffic avoidance was purely the pilot's responsibility. That said the EC135 crew had detected themselves the presence of the Chinook and its subsequent approach to the HLS and so should have been prepared for it to depart not long afterwards. Therefore, the EC135 pilot should not have been surprised to encounter it when he did. Moreover the Chinook crew was evidently not curious to see what his EC135 was doing nor flown in for a closer look and were unaware of his presence, apparently until after he had spotted the larger helicopter himself. The Board concluded that having lost sight of the Chinook as it approached the HLS, the EC135 pilot subsequently sighted it again at a late stage, which was the other part of the Cause.

It was clear from his account that the EC135 pilot felt no compunction to take avoiding action in these circumstances and when the EC135 was eventually spotted off their starboard quarter, the Chinook pilots simply carried on climbing. An element of surprise might have been a factor here, notwithstanding that this encounter happened at night with the EC135 displaying plenty of lights. At the closest point the radar recording evinced horizontal separation of about 0·2nm as the EC135 pilot turned in his orbit to pass astern. Unfortunately, vertical separation could not be determined due to the absence of recorded Mode C data from the Chinook. This anomaly could not be explained as the EC135 pilot had reported holding the Chinook on his TCAS suggesting the Chinook

was transponding. Furthermore, Benson subsequently reported an Odiham squawk – but perhaps this was after the encounter when the Chinook crew had called for recovery and selected their assigned code later. Weighing all these factors carefully, the Member's concluded unanimously that no Risk of a collision had existed in these circumstances.

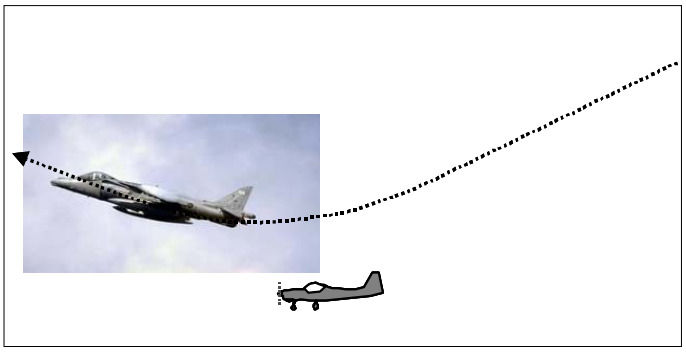
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by the EC135 pilot and the Chinook crew.

Degree of Risk: C.

AIRPROX REPORT NO 125/08

Date/Time:	3 Sep 1040	
Position:	5256N 00022W (6nm SE Cranwell)	
Airspace:	Lincs AIAA	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Firefly T67M	Harrier GR9
Operator:	HQ Air (Trg)	HQ Air (Ops)
Alt/FL:	6500ft (RPS 989mb)	~6000ft (NR)
Weather	VMC CLAC	VMC NR
Visibility:	UNL	NR
Reported Separation:	150ft V/200ft H	Not Seen
Recorded Separation:	NR V/<0.1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE FIREFLY PILOT reports flying a GH training flight with a student pilot in a yellow and black ac with HISL and landing light switched on. They were listening out on a 'quiet frequency' and were squawking 2642 [Cranwell conspicuity] with Mode C. They were conducting max rate turn training at medium level and were straight and level between turns, heading 240° at 120kt and 6500ft on the RPS, when a Harrier flew past from their six o' clock in a descent. It then pulled up and climbed away about 200ft ahead of them. The Harrier was on their right side passing slightly above and 200ft away - he did not see it until after it had passed them. He reported the incident immediately to Cranwell APP, assessing the risk as being high.

THE HARRIER GR9 PILOT provided an incomplete report 8 weeks after the event stating that he was in the area conducting high [angle] dive practise attacks at 450kt. At the time he was in a very high workload situation and was most likely bottoming out of the dive at about 6000ft. He did not see any other ac but was informed of the incident [immediately on landing] by telephone.

UKAB Note (1): Despite the Harrier Unit being hastened on several occasions, the pilot's report was not received until 8 weeks after the incident. It was only then that it emerged that he had been in receipt of a RIS from London Military Radar; by that time all the RT tapes had been returned to service and the controller concerned could not recall any details of the incident which was not reported to his unit at the time.

UKAB Note (2): The Harrier was part of a 2-ship formation conducting high energy manoeuvres in Class G airspace of the Lincolnshire AIAA, about 6nm SE of Cranwell. There are 13 other ac with VFR squawks at various (lower) altitudes within 10nm of the incident position. The Harriers appear to be flying a steep dive profile with very rapid changes of heading and alt, the Mode C of both ac dropping out frequently. The Firefly is also conducting tight turns at about FL073. At 1039:15 the Harrier (leader) is at FL177. It passes less than 0.1nm behind the Firefly at 1039:37 but its Mode C had dropped out at the CPA, reappearing level at FL094 at 1040:00. Assuming the ac descended at a constant rate that would equate to an RoD of about 11000 fpm. Bearing the pilots' reports in mind however, it is probable that the Harrier had descended through the Firefly's level and climbed back up to FL094. This would explain the description of the event as reported by the Firefly pilot. The Harrier SSR is 'code callsign converted' which means that they were in receipt of an ATS.

MIL ACC stated that due to the lateness of the report being received by them, they were unable to contribute a meaningful report.

HQ Air (OPS) comments that it is disappointing that the pilot involved was not able to provide a report in time to allow all the recorded data to be collected. However, such data may well not have provided much more information

other than miss distance as the Harrier pilot saw nothing himself. The Harrier force need to keep current at high angle dive attack profiles to keep their skills honed for their operational task. That said, the Lincolnshire AIAA was not, perhaps, the best place to practice.

HQ Air (TRG) comments that the Harrier pilot's late report resulted in detail not being remembered and potentially useful RT tapes being returned to service. This Airprox occurred in Class G airspace and both pilots were fully entitled to conduct their respective tasks. However, the Harrier's high speed and rates of altitude change may have been better flown outside the AIAA.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were concerned that valuable information was not available to them due to the very tardy report by the Harrier pilot. A London Mil Controller Member reminded the Secretariat that as soon as it was apparent that the Harrier's SSR was code/callsign converted it could reasonably be assumed that its pilot was in receipt of an ATS. Further, although this incident was reported to Cranwell ATC by the Firefly pilot, that report was not forwarded to the UKAB nor to the RAC which would also have resulted in it going to London Mil. Had either action taken place and London Mil been informed then the tapes would have been retained and a controller's report requested. It was noted that earlier this year HQ Air (ATC) had stressed the importance of timely and correct reporting to all SATCOS; the DARS Advisor stated that they were about to publicise the same.

Although this had been a very serious incident taking place in the Class G airspace of the Lincolnshire AIAA where see and avoid is the primary means of collision avoidance, even without a controller's report and a transcript, it was fairly straightforward to analyse. Neither pilot had seen the other ac prior to the CPA, the Firefly pilot because his ac was being overtaken, and the ac had passed within about 100m horizontally of one another at about the same level, the Harrier with more than 300kt overtake.

Members noted that the radar recording verified that at the time of the incident the Lincolnshire AIAA in the vicinity of Cranwell was very busy indeed with military VFR traffic. A Military Controller Member observed that this is not at all unusual: on many occasions she had seen more than the 13 ac displayed in this case operating in the AIAA under VFR. The Board was informed that in order to mitigate the risk during high-angle dive manoeuvres, Harrier pilots are required to operate in receipt of a radar service. However, an experienced controller Member observed that when ac are conducting high energy manoeuvres a RIS would not necessarily provide any significant safety enhancement as controllers have insufficient time to pass any meaningful information unless it is specifically requested on each dive manoeuvre. While accepting that high-angle dive bombing practise is essential to maintain skill levels, controller and pilot Members agreed that it is unwise to fly such manoeuvres in congested airspace. The DARS Advisor informed the Board that he had contacted the Harrier Ops Staff regarding this incident. He was informed that this was the only area available for such activity; this however was not accepted, specialist Members agreeing that it should be conducted only in either (radar verified) very quiet or segregated airspace.

Members noted also that high-angle dive is a very high workload task necessarily involving a degree of 'tunnel vision' when lookout in the dive can be less imperative than acquiring the simulated target from some distance and avoiding terrain when recovering; this is even more so in a single-seat ac.

One Member observed that the Firefly had been squawking with Mode C: had the Harrier been TCAS equipped its pilot would have been warned of the Firefly's presence and position.

Since the Firefly pilot(s) had no opportunity to see the Harrier approaching very rapidly from their high 6 o'clock and the Harrier pilot had not seen the Firefly, transiting only 100m or so to the left of his quickly changing flightpath, the Board agreed unanimously that there had been an actual risk that the ac could have collided.

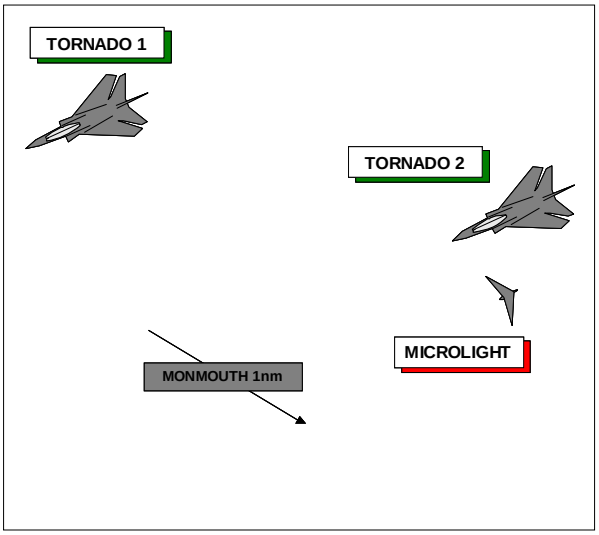
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the Harrier pilot.

Degree of Risk: A.

AIRPROX REPORT NO 126/08

Date/Time:	8 Sep 1254	
Position:	5149N 00245W (1nm W of Monmouth)	
Airspace:	UKDLFS	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Tornado GR4	Microlight
Operator:	HQ Air (Ops)	NK
Alt/FL:	530ft agl (QNH 1007 mb)	NK
Weather	VMC CLBC	NK
Visibility:	8km	NK
Reported Separation:	0V / 30-50ft H	NK
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO GR4 PILOT reports flying as No2 of a bounced 3-ship tactical low level sortie in a grey ac with all lights switched on and squawking 7001 with Mode C. While they were heading 230° at 430kt in LFA7, the navigator saw a Microlight ac just as it passed very close down the LHS of their ac at the same height. The Microlight had a red top and the pilot was facing forwards in a sitting position. Due to the late acquisition, they were not able to take any avoiding action. The sortie was continued without further incident. They assessed the risk as being very high and reported the incident on landing at their base.

UKAB Note (1): Although the Tornado formation are seen squawking 7001 almost throughout their manoeuvring in LFA 7, the Microlight is not seen at any time. Despite extensive procedural tracing action, including contacting all known clubs in the area, the Microlight could not be traced.

UKAB Note (2): The Tornado unit was contacted by the UKAB. Although a HUD video was not available, they confirmed that the Microlight was very close indeed to the Tornado, the navigator clearly recalling seeing the Microlight pilot's helmet.

HQ AIR (OPS) comments that it is very surprising that nobody from the Microlight community spoke up when the Tornado appears to have been this close. However, there is little to be learned without any other report.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the Tornado crew, radar video recordings and a report from the Tornado operating authority.

Bearing in mind the reported proximity of the Microlight to the No 2 Tornado, the high closure rate and the noise and turbulence caused by the Tornado, Members were most surprised that the Microlight pilot was not very startled and had not also reported the incident. Members were also surprised that a most serious incident such as this had not become 'folklore' locally and well known in the Microlight community. Nevertheless, the Microlight was not seen on radar and could not be traced. Fully accepting its accuracy, the Board therefore had to rely solely on the information provided by the navigator of the No 2 Tornado since his pilot had not seen the Microlight.

The Tornado crews had both been in a very high workload situation at low level and would most likely have been concentrating their lookout upwards and outwards in trying to acquire the 'bounce' ac. Further, it is well known that small slow moving Microlights are very difficult to see, particularly in reduced visibility. Both pilots had an equal right to operate there and had an equal and shared responsibility to see and avoid other ac and when in a formation this responsibility is also shared by other formation members.

Even though a significant amount of military flying is conducted at medium level, LFA7 is still very busy particularly in the 250ft to 500ft agl height band. The high speed of military ac and the undulating terrain leave other pilots very short of time to see and avoid fast jet ac.

Since neither pilot had apparently seen the other ac in time to react and the separation reported by the Tornado navigator was very small, Members agreed unanimously that there had been an actual risk that the two ac could have collided.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effective non-sighting by the Tornado crews.

Degree of Risk: A.

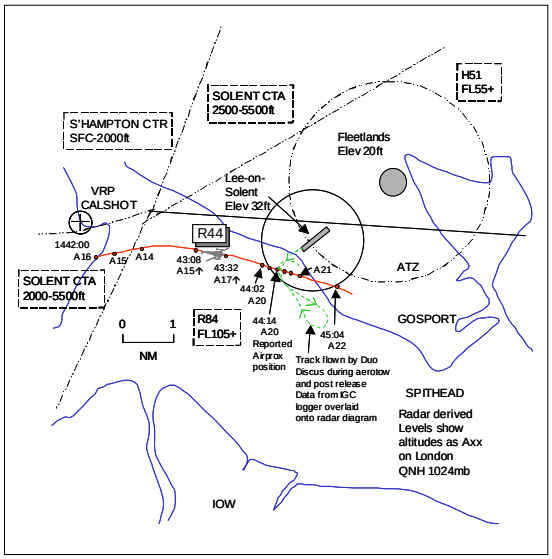
AIRPROX REPORT No 127/08

AIRPROX REPORT NO 127/08

Date/Time:	14 Sep 1444 (Sunday)	
Position:	5048N 00113W (1nm SW Lee-on-Solent - elev 32ft)	
Airspace:	FIR	(Class: G)
	Reporting Ac	*Reporting Ac*
Type:	Tug+Duo Discus	R44
Operator:	Civ Pte	Civ Trg
Alt/FL:	1800ft↑ (QFE)	2300ft (RPS)
Weather	VMC CLBC	VMC NR
Visibility:	>20km	NR

Reported Separation:
20-30ft V/50m H 1-200ft V/10-20m H

Recorded Separation:
NR



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DUO DISCUS PILOT reports flying a local sortie from Lee-on-Solent with another pilot and in communication with Lee-on-Solent A/G; no transponder was fitted. The visibility was >20km with slight haze although there was a clear view of the entire IOW. The ac was coloured white; no lighting was fitted. At 1540A, he departed from Lee-on-Solent aero-towed by a Chipmunk and routed out over the Solent, turned L along the coast and then turned R to fly back towards Lee-on-Solent. Less than 5sec before the Airprox and whilst in a gentle R turn through heading 360° at 60kt climbing through 1800ft QFE (1829ft altitude from GPS trace) he noticed a helicopter in his 10 o'clock flying slightly above their level, approaching at high speed towards their climbing flightpath. He radio'd the tug pilot to draw his attention to the helicopter but received no acknowledgement. As the combination continued their climb he mentioned the helicopter to his pilot passenger and monitored the situation. At this stage he estimated that they would pass uncomfortably close beneath the helicopter but not so close that he would have to release the aerotow early. In a very short space of time the helicopter, a green/light grey coloured R44, passed slightly above and behind the Tug and in front of his glider from L to R, between the combination which was separated by a 200ft towrope. As they were still climbing and the R44 pilot was making no attempt to alter course he judged there was a severe risk of collision so released the tow and flew 20-30ft below and 50m behind the R44. He caught a glimpse of the R44's registration but did not reliably note it down and believed the R44 pilot had not seen them. He immediately radio'd Lee-on-Solent A/G and reported the Airprox having been shaken up with the encounter. After this incident he deployed the self-sustaining engine, as he had previously planned, and climbed to 3000ft flying towards the IOW. After further discussion with the A/G operator he contacted Solent Radar to report the Airprox and enquire about the identity of the helicopter but as they were busy he completed the discussion later by telephone. He assessed the risk as very high.

UKAB Note (1): The Tug pilot did not complete a CA1094, as he did not see the R44 until after the glider had released from the tow. Also, he had not heard the RT warning given by the glider pilot immediately prior to the Airprox and following glider release, he had turned R and descended in accordance with standard SOPs.

THE R44 PILOT reports flying a dual training sortie with one pax seated in the RH rear seat en route to Wycombe Air Park VFR and not in communication with any ATSU squawking 7000 with Mode C. The Wx was VMC and the helicopter was coloured green/silver. Tracking E'bound along the S coast intending to turn N'bound at Thorney Island, he had just been released by Solent at Calshot having received a FIS on 120·22MHz and had been told that there were no contacts/traffic ahead to affect them on their route. As they passed Lee-on-Solent they were looking at Lee and also were trying to identify Fleetlands, both aerodromes being on the port side. Flying level 2300ft RPS, he thought, at 110kt at this point, a Chipmunk passed 100-200ft below and 10-20m ahead from R to

L with a towline attached; this had been their first sighting. He was immediately unsure whether it was towing a glider or banner so, as he was seated on the LHS, he looked over his L shoulder and then saw a glider passing behind and below, which he assumed had broken tow, with roughly the same separation margins as when the Chipmunk passed. He was alarmed at how close to his helicopter must have been the point at which the tug and glider had broken tow and he assessed the risk as very high. Considering that there were 3 persons onboard and at least 1 person in each of the Chipmunk and glider, making at least 5 pairs of eyes, he found it hard to believe how they all got so close.

UKAB Note (2): Met Office archive data provided the Portland RPS 1400-1500Z as 1019mb and the Lee-on-Solent QNH was calculated to be 1023mb. The Southampton METAR shows EGHI 1420Z VRB02KT 9999 FEW021 SCT043 17/10 Q1023=

THE SOLENT APR reports that a glider pilot called on his frequency to advise that he had had an Airprox with a green helicopter at 1800ft over Lee-on-Solent at 1546A whilst under aero-tow but the glider flight was not on the Solent frequency at the time. The glider pilot requested the helicopter be traced. The subject R44 flight had been under a FIS squawking 3666 routeing Compton Abbas to Wycombe Air Park via Stoney Cross, Beaulieu, Calshot and then along the coast at 1500ft QNH 1023mb. When the R44 pilot reported Calshot at 1442Z, he terminated the service and instructed the flight to free-call his enroute frequency which was acknowledged.

UKAB Note (3): The UK AIP at ENR 5-5-1-3 promulgates Lee-on-Solent as a Glider Launching Site centred on 504855N 0011225W where aerotow launches may be encountered and winch/ground tow launches take place up to 2000ft agl during daylight hours; site elevation 32ft.

UKAB Note (4): The UK AIP at ENR 2-2-2-4 promulgates Portsmouth/Fleetlands ATZ as a circle 2nm radius centred on 505007N 0011010W surface to 2000ft aal; site elevation 20ft. A Government Aerodrome with hours of operation Mon-Thu 0830-1700, Fri 0830-1500 (1hr earlier in Summer); AFIS provided on 135·7MHz. Aircraft operations may be encountered outside of published hours.

UKAB Note (5): Recorded radar does not capture this Airprox, as the Tug and Duo Discus are not seen. The R44 is identified from its Solent Radar squawk and is seen passing S abeam Calshot at 1442:00 tracking 080° indicating altitude 1600ft London QNH 1024mb in a slow descent, eventually levelling at 1400ft QNH. At 1443:08 when 2nm W of Lee-on-Solent the R44 is now tracking 105° and is seen to commence a slow climb. The R44 is seen to stop climbing at 1444:02 indicating altitude 2000ft whilst 1·1nm SW of Lee-on-Solent. The Duo Discus pilot's reported position of the Airprox was given by GPS coordinates places the Tug and Duo Discus combination 0·9nm SW of Lee-on-Solent. At the time the Duo Discus pilot reported climbing through 1829ft amsl whilst the R44 passes this position at 1444:14 still tracking 105° still indicating altitude 2000ft QNH 1024mb. Shortly after this the R44 indicates altitude 2100ft before levelling at 2200ft QNH (1445:04) 1nm SSE of Lee-on-Solent remaining outside the Fleetlands ATZ.

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 air traffic controller involved.

An experienced GA Member opined that this incident occurred in Class G where both crews were responsible for maintaining their own separation from other traffic through 'see and avoid'. The initial discussion focussed on the flight planning aspects of the incident. The R44 pilot had planned to fly close to Lee-on-Solent, where aerotow and winch launches take place, so the onus was on him to take due regard of the aerial activities and airspace and to deconflict his flightpath from glider operations through increased lookout and/or adopting a plan to give the glider site a wider berth as an alternative option. The Tug/Glider combination had departed Lee-on-Solent and flown a teardrop pattern to the S, offshore, before returning towards the glider site O/H. At the time of the Airprox, the Chipmunk pilot was wholly responsible both for his ac and for the Duo Discus under tow, being the 'commander' of the combination until tow was broken. Although the combination had right of way under the Rules of the Air (Rule 9), compliance with the rules to avoid aerial collisions required at least one of the parties to visually acquire the other and then take action. From the geometry of the encounter, it was evident that the opportunity was there for the Chipmunk pilot to see the approaching R44 from above and the L but, for whatever reason, he had not seen it at all. Conversely, the R44 flight had left the Solent frequency a couple of minutes earlier and was not in communication with any ATSU at the time, the pilot reporting that he was concentrating on looking towards Lee-

on-Solent and Fleetlands which, Members believed, could have been to the detriment of scanning to the R looking for traffic from off-shore and the IOW area. The same opportunity was there for the R44 pilot to see the Tug/Glider combination approaching from their R and below but the R44 instructor only saw the Chipmunk and towrope at the last minute, as it passed immediately ahead and below. These facts led Members to agree that the cause of this Airprox was a non-sighting by the Chipmunk pilot and an effective non-sighting by the R44 pilot.

Members agreed that the passing of these 2 flights had been purely fortuitous. The usual flying attitude during aerotow operations is for the glider to be slightly lower than the tug ac ahead. The Duo Discus pilot had tried to warn the Chipmunk pilot of the approaching R44 but his RT call went unheard. After monitoring the R44's track and initially believing that no action would be required, the Duo Discus pilot had released from tow when it was apparent that there was a risk of a collision. However, the Chipmunk pilot had not seen the R44 at all whilst the R44 pilot saw the Chipmunk and towrope too late to take any action. These elements were enough to persuade the Board that an actual risk of collision existed during these latter stages of the encounter. Members also noted that it was fortunate that the R44 overflew the Tug/Glider combination: had the helicopter been below then there would have been the additional hazard of a collision not with an ac but with the towrope.

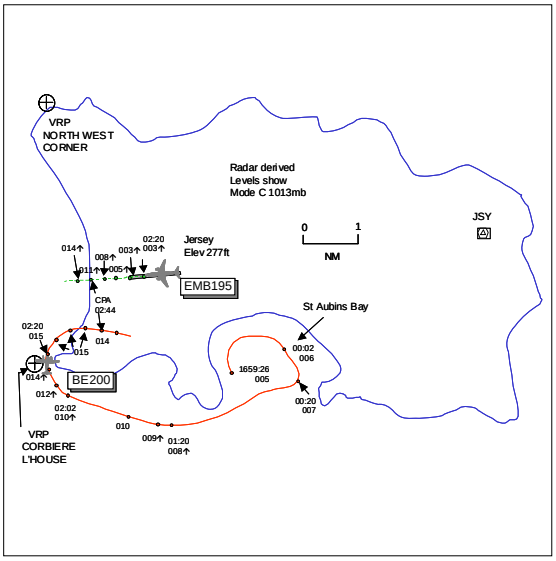
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the Chipmunk pilot and an effective non-sighting by the R44 pilot.

Degree of Risk: A.

AIRPROX REPORT NO 128/08

Date/Time:	10 Sep 1703	
Position:	4912N 00213W (1·25nm WSW Jersey - elev 277ft)	
Airspace:	ATZ	(Class: D)
	Reporting Ac	*Reported Ac*
Type:	EMB195	BE200
Operator:	CAT	HQ Air (Trg)
Alt/FL:	600ft↑ (QNH 1011mb)	1500ft (QNH)
Weather	VMC CLBC	VMC CLBC
Visibility:	45km	>10km
Reported Separation:	200ft V/0·5nm H	1000ft V/1nm H
Recorded Separation:	300ft V/0·9nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EMB195 PILOT reports departing Jersey IFR from RW27 and in communication with Jersey Tower on 119·45MHz squawking with Mode C. They were cleared for take-off in the normal manner with no information passed about ac on the climbout or in the visual cct. After a normal take-off run and shortly after gear up being selected, at 600ft QNH a TCAS RA 'descend' was received which lasted 2sec. Upon rotation, the FO, PF, had looked at his Primary Flight Display (PFD) to check pitch attitude and simultaneously noticed a yellow TCAS alert on his Multi Function Display (MFD) at +800ft and within the 2·5nm range ring. At the RA, heading 270° at 190kt, the FO became visual with a King Air to the L of their ac's nose (S of the RW C/L) on an opposite direction heading and in a steep turn to the R. The Capt became visual with the King Air as it passed down the LHS range 0·5nm and 200ft above. He assessed the risk as moderate/high. At the time the ADC stated that the King Air was working Approach on 120·3MHz.

THE BE200 PILOT reports inbound to Jersey from Guernsey VFR and in communication with Jersey Tower, he thought [actually Approach], squawking with Modes C and S. At the time of the incident they were recovering from the SE and had been cleared to join the visual cct from the downwind position. This entailed a RH turn just S of the climb-out lane to position for the downwind leg of the LH cct pattern flying at 1500ft QNH and 170kt. They were informed of departing traffic and stayed 1nm S of the extended C/L. They saw the departing ac, an EMB195 from the start of its take-off roll and during its initial climb, maintaining visual contact with it throughout, estimating it passed 1000ft vertically and 1nm horizontally clear of them. Although fitted with ACAS he did not recall his TCAS giving any RA information. They continued their visual join and landed from their first approach. He assessed the risk as nil.

THE JERSEY ADC reports it was a busy afternoon with many ac to the S of Jersey participating in an air display. The EMB195 was lined-up for departure on RW27 for a R turnout ORTAC departure; the flight was released by Radar. Approach called to advise that a BE200 to the S was routeing E to W downwind with a 180° turn to join LH base leg for RW27. At this point the subject ac were not in conflict as the EMB195 was starting its take-off run and the King Air was W'bound. As he saw the EMB195 rotate he noticed from the ATM that the BE200 was in a tight R turn towards the C/L. As the EMB195 had just become airborne he could not give TI at that critical stage of flight. He quickly called Approach to enquire about the BE200 and was told that the APR was getting the BE200 to route back downwind for L base. The EMB195 crew then informed him that they had received a TCAS RA alert but had seen the King Air pass down the LHS of their ac. The King Air flight had been given TI by Approach. He had seen both ac during the encounter, separation was less than 0·5nm.

The Jersey METARs show EGJJ 1650Z 19014KT 160V230 9999 FEW020 SCT030 19/14 Q1011= and EGJJ 1720Z 19014KT 9999 SCT040 19/14 Q1011=

AIRPROX REPORT No 128/08

THE JERSEY APP/APR reports the King Air was proceeding W'bound along the S Coast of the Island with the intention of performing a 180° turn at the SW corner to join LH downwind RW27. ADC had advised him of an EMB195 lining-up to depart to the N. As the King Air reached the SW corner he saw the ac start to make a R turn towards the climb-out simultaneously with hearing the EMB195 rolling. At this point he passed TI to the King Air flight whose crew reported the EMB195 in sight. He had previously not specified the direction of turn to be taken by the King Air crew to join downwind. On observing the King Air start to turn R the ADC had telephoned him and he told ADC that the King Air pilot had the EMB195 in sight.

ATSI did not investigate owing to no contractual arrangement being in place between CAA International and the Crown Dependencies of the Channel Islands. A summary of the Jersey Unit Investigation, interspersed with additional UKAB information – MATS Part 1 references, RT and deskside exchanges from a copy CD provided by Jersey ATC - between [ ] brackets, are included in lieu of an ATSI report. In addition, the Jersey Director of Civil Aviation (DCA) has provided a report. The RT copy CD did not include time injection marks (the export of timings was not possible) so timings quoted are approximate.

UKAB Note (1): The incident took place 1·25nm SW of Jersey Airport within the Jersey ATZ which lies within the Class D airspace of the Jersey CTR, a circle 8nm radius of Jersey Airport from surface to 2000ft.

UKAB Note (2): The UK AIP at AD 2-EGJJ-1-5 promulgates the Jersey ATZ as the airspace extending from the surface to a height of 2000ft above the level of the aerodrome and within the distance of 1·5nm of the aerodrome boundary in accordance with the Air Navigation (Jersey) Order 2000. At AD 2-EGJJ-1-10 para 2·22 Flight Procedures Circuit Heights states *"a) Circuit height 1000ft agl with the majority of the circuit carried out over the sea".*

THE JERSEY ATS UNIT INVESTIGATION reports that the airspace surrounding the airport had been closed earlier in the day for a period of 30min to allow a National Display team to perform a practice display in the display arena which is the Eastern portion of St Aubins Bay, display datum being 3·3nm ESE of the ARP. The airspace closure was planned to take place between commercial movements. There was a minor impact on ac movements immediately prior to closure and immediately after re-opening the airspace.

Immediately prior to the incident the ADC was involved in a handover/takeover process from another controller and GMC was closing and being absorbed into the ADC position.

[The BE200 flight, inbound to Jersey from Guernsey, made its initial call on the APP frequency at 1650:40 and the APP replied *"BE200 c/s good afternoon continue not above altitude 1000ft route towards the NW corner of Jersey initially QNH 1011"*. The BE200 pilot replied *"Route towards the NW corner and (BE200 c/s) is looking for an anti-clockwise orbit of the island er looking for a recce of the display area before recovering to the field"*. The APP cleared the BE200 pilot to the NW corner *"….for the moment and I'll give you onward clearance from there"* which the BE200 pilot acknowledged. No readback of the altitude restriction or QNH was given by the BE200 pilot and this went unchallenged by the APP. Shortly after this the BE200 pilot requested and was given the RW in use, RW27. At 1651:45 the APP contacted the ADC and informed him of the BE200 *"...from the NW corner he wants to go anti-clockwise so across the bay along the S coast into the, hang on, disregard I'll call you back"*. It was during this coordination that the BE200 pilot called on the APP frequency stating *"...change of intentions if we go from the NW corner clockwise around that'll be better for us please"*. The APP replied *"…from the NW corner you can route E'bound along the N coast*" and this was correctly readback by the BE200 pilot. At 1654:00 the APP passed TI to the BE200 pilot on DHC8 traffic inbound to Jersey crossing ahead and above, the BE200 pilot reporting *"Visual with him BE200 c/s"*.

Immediately after this the APP contacted the ADC stating *"The King Air's going clockwise around the island to the display area for a recce..."* followed by TI on another ac taking up the hold at the JSY at 3000ft. As the ADC read back the TI on the holding ac followed by the word *"...clockwise"* the APP interrupted the ADC's readback with *"Yeah yeah you got it all*"; the ADC replied *"Yeah"*.

One minute and 40sec later (1656:00) the APP cleared the BE200 flight to *"…continue clockwise around the island to enter the display area just report when you're ready to rejoin on final"*. The BE200 pilot replied *"Wilco BE200 c/s and for information we'd like to fly past the airport and come back to join downwind please"*. The APP then queried this, transmitting *"Roger just to confirm that's, would that, is that, a go-around erm you just wanna fly sort of S abeam and then make a L turn"*. The pilot replied *"Wilco along the S coast all the way to the W end of the*

island erm past the La Moye golfcourse and back in to join downwind for 27, is it ccts N or S of the field". The APP informed the BE200 flight that ccts were generally S of field for RW27 to which the BE200 pilot replied that he would join downwind S of the field for RW27. The APP acknowledged this and continued *"…that's all approved sir join downwind at your discretion just report when you're ready to turn base"*. The BE200 pilot then added that *"…just gonna have a run through the display area and have a look first"* to which the APP replied *"no problem"*.

About 30sec later at 1057:25, the EMB195 crew called on the Tower frequency requesting taxi clearance and was cleared by the ADC to the Alpha 1 hold for RW27 QNH 1011mb.]

Just under 1 min later the APP made communication with the ADC of the BE200 at 1658:35 as the BE200 was entering the display arena. This communication occurred during the handover/takeover of the ADC position, the APP stating *"BE200 W'bound gone through the display area to the SW corner L or R turn, I don't know which, but to join downwind for a L base"*. This information was 'stepped on' by traffic transmitting on TWR frequency and the ADC answered 'over the top' of the TI given by the APP. The APP asked *"Did you get that"* and the ADC requested a repeat of the TI. When this was repeated by the APP it was notably rushed and the content differed from the original information passed using non-standard phraseology [*BE200 c/s …W'bound run through the display area to the SW corner then downwind for L base*]; the ADC acknowledged the TI.

[The APP then gave TI to the BE200 flight at 1659:12 on another ac inbound at 2nm final with which the pilot reported visual.

Just under 2min later at 1700:55 the ADC cleared the EMB195 to line up and wait on RW27 which the crew read back. The ADC then telephoned Jersey Zone requesting a departure release on the EMB195 via ORTAC. This was approved by Zone but with a restriction of *"…straight ahead please"* which the ADC acknowledged. The ADC relayed this clearance, which included an initial stop off at FL50, to the EMB195 crew. After the departure restrictions were correctly read back by the EMB195 crew, the flight was cleared for take-off.

As the EMB195 were being giving their departure release by the ADC, the BE200 pilot reported (1701:10) leaving the display area and continuing along the coast, the APP replying *"…report turning downwind at the SW corner"* which was acknowledged by the BE200 pilot.

Just over 1min later at 1702:30 the ADC telephoned the APP stating *"That BE200 c/s just be advised the Embraer is now getting airborne to go straight ahead*". The APP replied *"I'll give him traffic and you see the Hawk"*. The ADC stated he could and was told by the APP that the Hawk will be No 1 for a run and break to land and probably be RH into the cct. The ADC replied *"OK and BE200 c/s where's he going now"* to which the APP answered *"He's going LH downwind but I'll keep him out of the way of the Hawk"* which the ADC acknowledged.

At the same time as the ADC commenced this coordination with the APP the BE200 pilot transmitted on the APP frequency *"BE200 c/s is at the Corbiere lighthouse ready to join downwind*". When the ADC/APP coordination was complete the APP transmitted *"BE200 c/s that's fine continue downwind until advised I've got a Hawk to the N who's gonna be No 1 I'll advise you once he's er he's made his run and break*". The BE200 pilot replied *"Roger"* and the APP then transmitted *"BE200 c/s just be advised there is an Embraer* (the subject EMB195) *just rolling off RW27 this time"*. The BE200 pilot replied *"Visual with him and BE200 c/s is downwind this time to land if possible"*. The APP acknowledged this call and told the pilot to standby. The Hawk pilot then offered to hold at the N coast and this was accepted by the APP who, after coordinating with the ADC, told the BE200 pilot to turn final when ready and transfer to Tower frequency.

After completion of this coordination (1703:45) the ADC transmitted *"EMB195 c/s report your heading to Jersey Zone on 125 decimal 2"*. The EMB195 crew replied *"1252 EMB195 c/s we just had an ac cross ahead of us er just after take-off*". The ADC replied *"EMB195 c/s roger that ac was with Approach apologies it wasn't er supposed to do that"*.

The Jersey radar recording at 1659:26 shows the BE200 turning R through a NNW'ly heading over St Aubins Bay, the display area, at FL005 (approx 440ft QNH 1011mb) GS 150kt. The BE200 continues its R turn and rolls out on a WSW'ly track just after 1700:20 indicating FL007 (640ft QNH) before following the S coast of Jersey generally in a W'ly direction. A climb is seen to commence at 1701:20, when the BE200 is 3nm S abeam Jersey Airport, as well as a slow R turn towards the VRP at Corbiere Lighthouse, GS 160kt. The EMB195 is first seen at 1702:20 O/H RW27 indicating FL003 (240ft QNH) whilst the BE200 is seen 2·25nm to its SW turning R through a N'ly

heading at Corbiere Lighthouse level at FL015 (1440ft QNH) GS 180kt. The EMB195 continues climbing on the extended C/L of the RW whilst the BE200 continues its R turn to establish onto the downwind leg. The CPA occurs at 1702:44 with the EMB195 climbing through FL011 (1060ft QNH) passing 0·9nm to the N of the BE200 which is steady tracking 100° level at FL014 (1340ft QNH), 300ft above.]

The ADC saw the BE200 on the ATM routing towards the SW corner and then as the EMB195 was rotating the ADC saw on the ATM that the BE200 was turning R and heading towards the RW extended C/L. The ADC elected not to pass TI to the EMB195 flight at this critical stage of flight.

The BE200 had departed St Aubins Bay following a visual inspection of the display arena. The APP's plan for the BE200 was for it to continue along the S coast of Jersey with the intention of performing a 180° turn, L or R hand at the SW corner of the island for downwind LH RW27. The APP telephoned the ADC for a second time to inform him of the BE200's routeing and intentions of joining LH. The ADC informed the APP of the EMB195 lining-up for a RW27 departure to the N released by Jersey Zone.

When the BE200 reached the SW corner its pilot reported his position and ready to join downwind. The APP cleared the flight to continue downwind until advised, as the ac was No 2 to a Hawk off the N coast; no direction of turn was specified by the APP. The BE200 pilot did not give a full read back and this went unchallenged by the APP. The BE200 was observed starting a RH turn at the SW corner which potentially placed the ac into confliction with any departing ac. The ADC telephoned the APP to discuss the R turn. The APP passed TI on the departing EMB195 to the BE200 pilot who reported that the EMB195 was in sight.

Traffic departing Jersey can be released by APP or Zone depending on a number of pre-determined factors derived from the flight plan including requested FLs, airspace exit point and planned destination. As coordination took place between ADC, APP and Zone it is not possible to determine whether this method of releasing traffic is an aggravating factor in the subject incident.

The APP did not apply appropriate separation between the BE200 and the EMB195.

The BE200 was above average speed for ac in close vicinity to the aerodrome.

THE JERSEY DIRECTOR OF CIVIL AVIATION reports that the Jersey APP did not specify the direction of turn to the pilot of the BE200 when the flight was turning to join the visual cct. The BE200 pilot also elected to turn R when positioning into the LH cct, aware that normal commercial traffic was continuing to operate from the aerodrome on IFR clearances.

UKAB Note (3): The MATS Part 1 Section 1 Chapter 2 Flight Rules Page 1 Para 2 Classification of Airspace determines the flight rules which apply and the minimum services that are to be provided by an ATSU. For Class D airspace:- *a) Separate IFR flights form other IFR flights; b) Pass traffic information to IFR flights on VFR flights and give traffic avoidance advice if requested; c) Pass traffic information to VFR flights on IFR flights and other VFR flights*.

UKAB Note (4): The MATS Part 1 Section 2 Aerodrome Services Chapter 1 Page 1 Aerodrome Control, Para 2 Responsibilities states:- *Aerodrome Control is responsible for issuing information and instructions to aircraft under its control to achieve a safe, orderly and expeditious flow of air traffic and to assist pilots in preventing collisions between: a) aircraft flying in, and in the vicinity of, the ATZ; b) aircraft taking-off and landing.*

UKAB Note (5): The MATS Part 1 Section 3 Approach Services Chapter 1 Page 5 Para 8 Approach Services, VFR Flights states:- *Approach Control shall retain all arriving VFR flights under its jurisdiction until appropriate traffic information on IFR flights and other VFR flights had been issued and coordination effected with aerodrome Control. Approach Control must ensure that VFR flights are transferred in sufficient time for Aerodrome Control to pass additional information in respect of local traffic*. Chapter 4 Integration of VFR Flights with IFR Traffic states:- *This Chapter provides advice and guidance to controllers on the safe integration of VFR flights with the IFR traffic flow in the vicinity of aerodromes. Separation standards are not prescribed for application by ATC between VFR flights or between VFR and IFR flights*. Para 3 Control of VFR flights states:- *Although in Class D, E, F and G airspace separation standards are not applied, ATC had a responsibility to prevent collisions between known flights and to maintain a safe, orderly and expeditious flow of traffic. This objective is met by passing sufficient traffic information and instructions to assist pilots to 'see and avoid' each other. Instructions issued to*

VFR flights in Class D airspace are mandatory. These may comprise routeing instructions, visual holding instructions and level restrictions in order to establish a safe, orderly and expeditious flow of traffic and to provide for effective management of overall ATC workload. For example, routeing instructions may be issued which will reduce or eliminate points of conflict with other flights, such as final approach tracks and circuit areas, with a consequent reduction in the workload associated with passing extensive traffic information. Approach radar controllers in particular should exercise extreme caution in vectoring VFR flights – a geographical routeing instruction is preferable.

HQ AIR (TRG) comments that the King Air crew had the departing EMB195 in sight throughout the Airprox. The lack of TI about the non-standard joining King Air caused concern to the EMB195 crew when they received a TCAS RA just after take-off.

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 were surprised that a TCAS RA was reportedly generated on the EMB195 flightdeck when the ac was climbing through 600ft QNH as the equipment is designed to inhibit all RAs below 1000ft agl. The presence of the BE200 was detected by the EMB195 crew, upon rotation, as a TA alert on the MFD, a yellow symbol, but any aural warning would not have been generated until the ac was climbing through about 500ft agl. Although ATC did not have to separate the subject ac, they did have an option of passing instructions to deconflict the situation in addition to passing TI. The Unit's investigation report revealed that the APP-to-ADC intercom/telephone exchange, 4min prior to the Airprox, had clashed with RT transmissions which had caused the conversation to be broken and the information that was repeated for the second time by the APP and acknowledged by the ADC had been abbreviated. Also noteworthy was that a handover/takeover of the ADC position was in progress and the GMC position was being bandboxed which had undoubtedly increased the workload of the combined position immediately prior to the Airprox. It was clear that in the end the ATC team did not establish a coordinated plan for the integration of the BE200 into the visual cct. The TI on the joining BE200 passed by the APP to the ADC was acknowledged but was not passed to the EMB195 crew. The BE200 pilot had been told by the APP to join 'at his discretion' and had turned R at the Corbiere Lighthouse to join downwind. The ADC seemed to be unsure as to where the BE200 was going when he informed the APP about the departing EMB195, which call apparently prompted the APP to give TI to the BE200 pilot. At this stage the ADC believed that he could not pass TI to the EMB195 crew as the ac was at a critical stage of flight. A discussion then followed on this aspect between ATCO and pilot Members that ended with the recommendation that when TI was safety critical ATCOs should pass it as soon as practicable to avert any compromise of flight safety.

The EMB195 crew were undoubtedly surprised when they had encountered the BE200 immediately after departure without warning and its presence had generated a TCAS alert, albeit briefly. The EMB195 crew had reported, erroneously, that the BE200 had crossed ahead but this was not borne out from the radar recording. Members opined that if TI on the BE200 joining the cct had been passed prior to take-off, the EMB195 crew would have been in the position to decide whether or not to take-off. These factors lead Members to agree that the combination of a lack of TI and a TCAS alert after take-off had caused the EMB195 crew concern and this had caused the Airprox. The BE200 pilot had complied with the ATC instructions issued and had elected to turn R towards the airport for a LH downwind join, visually acquiring the departing EMB195 from the start of its take-off roll and throughout his visual join, happy with the separation distance he had chosen. This manoeuvre had breached the TCAS 'safety bubble' and triggered a brief alert even though adequate visual separation margins pertained. This highlighted the need for pilots to always consider using wider separation margins during VFR operations when ac are TCAS equipped to eliminate unwanted alerts being generated. The early visual sighting of the EMB195 by the BE200 pilot was enough to persuade the Board that any risk of collision had been effectively removed during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

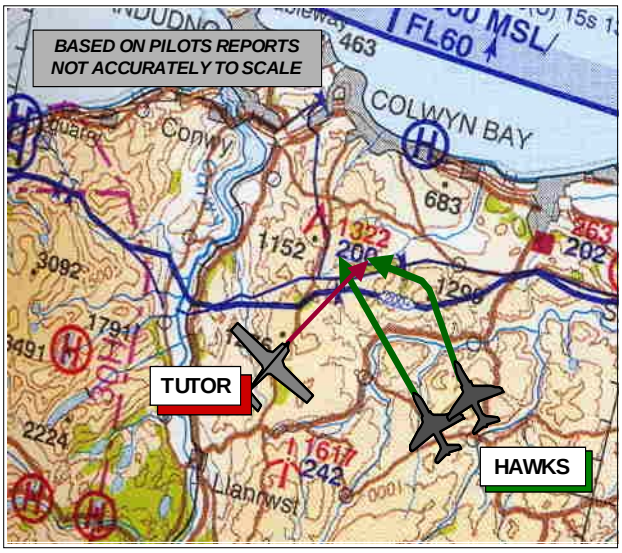
Cause: The combination of a lack of TI and a TCAS alert after take-off caused the EMB195 crew concern.

Degree of Risk: C.

AIRPROX REPORT No 129/08

AIRPROX REPORT NO 129/08

Date/Time:	19 September 1437	
Position:	5314N 00340W (4nm SSE of Conwy)	
Airspace:	UKDLFS	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Hawk TMk1	Grob Tutor
Operator:	HQ AIR (Trg)	HQ AIR (Trg)
Alt/FL:	250ft agl	500ft agl
	(RPS 1023)	(RPS N/R)
Weather	VMC CLBC	VMC CAVOK
Visibility:	>10km	30nm
Reported Separation:		
	V 30ft/H 30-50m	V 0/H 50m
Recorded Separation:		
	300ft V/<0.1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK TMK1 PILOT reports leading a pair of ac on a bounced tactical low level sortie in LFA7 with another pilot in the rear seat and a solo student in the second ac. They were both squawking 7001 with Mode C and had all lights, including the nose light, switched on. They were operating on a tactical frequency, not in contact with any unit, and TCAS was not fitted. While heading 325° at 420kt on a simulated IP to Target run as leader of the pair with about 20sec to run to the Target, he looked to his 3 o'clock to ensure that the student had pulled up for his dive profile at the correct point. On resuming his lookout scan he saw a Tutor ac in his 11 o'clock at roughly the same alt and close aboard so he bunted his ac down to about 150ft agl to avoid a collision and simultaneously called his wingman to break off the attack and maintain height. The Tutor continued on its northerly course. He reported the incident on first radio contact with ATC and assessed the risk as being very high.

THE GROB TUTOR PILOT reports flying a low level Navex in Wales with another qualified pilot. They were squawking 7001 with Modes C and S but TCAS was not fitted and he was not in contact with any unit. Before the flight, [although not technically in the LFS] he contacted the Low Flying Booking Cell to determine what traffic had booked into the LFS and he was advised that the booked traffic included a 3-ship of Hawks flying evasion training. Whilst flying at 500ft agl and heading 040° at 120kt, just to the N of some pylons to the S of Colwyn Bay, he caught sight of a single Hawk in his 1 o'clock, heading about 330° climbing gently from low level, possibly to clear the pylons. Although there was no threat from this Hawk [the No2 ac] which was clearly going to pass in front of him, he selected a slightly lower nose attitude to increase his vertical separation in case it had a wingman at the same height. Although he was looking for a second or third ac, the threat came from another previously unseen and much closer Hawk that crossed his nose, slightly low and only about 50m away. It was the left hand element of a battle pair and he spotted the ac too late to flash his wings or take any avoiding action. He assessed the risk as being high and telephoned Valley after landing to ascertain the details of the other ac.

UKAB Note (1): The recording of the St Annes radar shows all 3 ac throughout. The Hawk pair approach the incident both squawking 7001, tracking 325°, with the No2 on the right and both at FL009. The Tutor is also squawking 7001; is at FL 011 tracking 040°; is much slower than the Hawks and in the Leader's 1130 position. As the ac continue to close, the Hawks descend by 100ft, probably after they crossed the electricity pylons and the Tutor remains on a line of constant bearing in the Leader's 1130 position. The CPA is at 1437:08 as the Lead Hawk passes just under 0.1nm (under 180m) in front of the Tutor. As they cross, the Tutor remains at FL011 and the Hawk FL008. The No2 Hawk is in the Tutor's 0130 position at FL021 and turns left to pass above and behind it. While not disputing that the Lead Hawk pilot bunted his ac as reported, this is not evident on the radar recording. The terrain in the immediate vicinity of the incident is very undulating with hills up to 1250ft and valleys down almost to Sea Level. The QNH at the time of the incident was 1028mb so FL008 would equate to an alt of 1250ft; as far as can be determined the terrain is about 280m (900ft) in the immediate vicinity of the incident and the pylons to the S of the incident position are above 200ft agl.

HQ AIR (TRG) comments that visually acquiring aircraft at low-level in undulating terrain is difficult. Each of the pilots involved in this Airprox saw the other's aircraft at a stage where they could do very little to alter the outcome of the incident.

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 ac operating authority.

The Board noted that this was a very straightforward but nonetheless serious occurrence. Members noted that the Tutor pilot had conscientiously followed best practise and determined that there were 3 Hawk ac in LFA7 (the whole of Wales) but since the Tutor is classified as being a 'light aircraft' it is exempt from many normal Low Flying procedures and importantly from 'booking in' to the LFS. It follows therefore that the Hawk formation leader had no means of knowing that the Tutor was operating there and would thus have been unaware of its presence prior to the incident.

A military fast-jet pilot explained to the Board that newer aircraft have mission planning systems that can warn pilots of the planned time and position of other LFA traffic but in this case there was no means of alerting the Hawk pilots to the Tutor's planned operating areas or times. The deputy HQ Air (Trg) Member informed the Board that, in common with larger ac, Tutor ac only low fly when necessary for training purposes and even then normally only down to 500ft agl.

Members noted that the immediate area of the incident was very hilly and since both elements of the Hawk formation would have been 'terrain screening' it was only when the Hawk wingman had pulled up for his simulated attack, about 15sec from the CPA, that the No2 Hawk would have first become visible to the Tutor pilot. It was also probable that up to about this time the Tutor would have been hidden from both Hawk elements, again due to terrain screening. For these reasons the Board determined that the Tutor pilot and the Hawk leader had seen the opposing ac as early as could have been reasonably expected and that the cause of the incident had been largely happenstance.

When assessing the risk, Members took into consideration the separation which had been almost solely vertical. Within the accuracy of the SSR, although initially it had been less, at the actual CPA vertical separation had increased to be in the region of 300ft. Additionally, although the ac had been fairly close, the Hawk Leader had seen the opposing ac, initiating his bunt in sufficient time for his ac to react and increase the vertical separation (slightly); Members therefore agreed that although safety had been compromised, there had been no actual risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

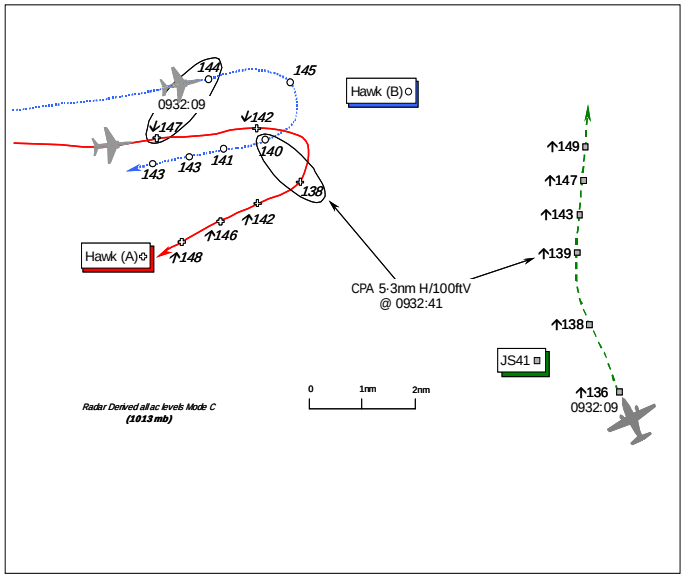
Cause: A conflict in the UKDLFS/FIR resolved by the lead Hawk pilot.

Degree of Risk: B.

AIRPROX REPORT No 130/08

AIRPROX REPORT NO 130/08

Date/Time:	11 Sept 0932	
Position:	5422N 00046W (24nm ESE of Durham Tees Valley Airport)	
Airspace:	Vale of York AIAA	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Jetstream 41	Hawk x 2
Operator:	CAT	HQ Air (Ops)
Alt/FL:	FL135	8000-18000ft RPS (994mb)
Weather	VMC CLAC	VMC CLOC
Visibility:	10km+	10km+
Reported Separation:	800ft V/500m H	N/R
Recorded Separation:	100ft V @5·3nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JETSTREAM 41 (JS41) PILOT reports that whilst in transit to Aberdeen from Humberside under IFR a RAS was obtained from London MILITARY on 135·275MHz. Some 65nm SE of ALASO, during their en-route climb at 210kt, the controller advised them of two Hawk jets operating in their vicinity. To avoid the two jets the controller placed them on a heading of 360° and instructed the Hawk pilot's – who were operating on a UHF frequency – to operate no further E of their position. As they climbed through FL135, the two Hawk pilots seemed to disregard this instruction and executed a wide sweeping R turn in their direction, resulting in a TCAS TA followed by a 'CLIMB' RA, which because of the avoiding action caused the cabin crew to fall backwards. Minimum separation was 800ft vertically and about 500m as the Hawk pair passed to port. He assessed the risk as *"high"*. The Airprox was reported to London MILITARY on RT.

THE LEAD HAWK PILOT reports he was leading a pair of Black Hawk ac conducting a local VFR instructional air combat sortie in the Vale of York Area of Intense Aerial Activity (AIAA). He thought the formation was in receipt of a FIS from London MILITARY, [but actually a RIS] on a discrete UHF frequency, whilst operating in a block from 8000-18000ft BARNSLEY RPS performing 1v1 high energy air combat manoeuvres (ACM) in VMC at about 350kt.

As part of their operational flexibility, they are constantly adjusting the area in which they practice ACM, in order to facilitate a better fusion between the needs of all operators, both military and civilian, within Class G airspace. Practically, this is achieved by a combination of traffic information from London Military and their own judgement. Before they commit to hi-energy manoeuvring they perform detailed lookout and consider any relevant information passed by ATC. Whilst performing their exercises, they continually update that process and if there is any doubt as to the safety of any ac, they will terminate their exercise and move to a clear area. In this incident, his formation was operating under VFR in an area appropriate for the exercise that was being carried out.

He does not have any recollection whatsoever of the reported incident, nor was he informed by ATC that Airprox action would ensue. With no knowledge of their proximity to, or conflict with any other traffic, this leads him to conclude that there was never any doubt in his mind as to the safety of his formation.

He added that the HISLs and hi-intensity nose lamp were on in both ac.

LATCC (MIL) CONTROLLER 13 (CON13) reports he was controlling the Hawk pair S of Durham Tees Valley under a RIS conducting 1v1 ACMs. Additionally, the slow climbing JS41 en route to Aberdeen was under a RAS. As he could see there was potential for confliction between these ac he requested that the Hawk Section manoeuvre no further E than their then current location and informed them about the civilian JS41. The Hawk leader agreed to this, however, the two jets then proceeded further to the E. He informed the JS41 crew of the

position of the Hawk pair as they were on a discreet UHF, and advised them to alter course onto a NE'ly heading. At this point the JS41 pilot informed him that they were responding to a TCAS RA and that an Airprox would be filed.

He assessed his workload as low - medium.

MIL ACC reports that LATCC (Mil) Con13 had been controlling for 20mins with a low to medium workload. Con 13 was operating 2 frequencies with the formation of 2 Hawks receiving a RIS on frequency 397·175 MHz in a 'block' from FL50 to FL240. The aircraft flown by the JS41 reporting pilot was in a slow climb passing FL135 for FL185 transiting northbound to Aberdeen in receipt of a RAS also under the control of Con13 operating on frequency 131.225 MHz. The Hawks and the JS41 were operating in Class G airspace. The timings on the tape transcript provided by NATS Ltd are only given in whole minutes. However, the incident duration is contained in a relatively brief period.

The JS41 crew first called Con13 at 0926, *"London Mil good morning* [C/S] *passing Flight Level 9-3 climbing Flight Level 1-8-5 direct UMBEL request Radar Advisory'.* Con 13 responded, *"*[C/S] *London Mil good morning identified and climb Flight Level 1-8-5 Radar Advisory own navigation report steady with heading'.* Traffic information was then passed to the Hawks on traffic to the SE of Teesside that was not a factor in this incident. Con13 transmitted to the Hawks at 0932, *"*[C/S] *I've got civil traffic currently South-East 7 miles Northbound passing through Flight Level 1-3-5. Can you manoeuvre no further East than your current position for the next 5 minutes",* which the Hawks acknowledged. Con13 transmitted in reply to this acknowledgment just prior to instructing the JS41 crew, *"*[C/S] *London turn right heading 3-6-0 I've got 2 Hawks er general handling currently left at 10 o'clock 7 miles manoeuvring Flight Level 1-4-5."* The JS41 crew responded, *'Right 3-6-0* [C/S] *er we got a TCAS advisory".* Con13 acknowledged the TCAS RA before transmitting, *"*[C/S] *roger they're turning away I asked them to..manoeuvre no further East than their current position they should be turning back onto a Westerly heading."* The initial part of the response from the JS41 is slightly garbled, *'Er T C* [C/S] *we are actually following TCAS Advisory filing AIRPROX."*

At 0926 the JS41 was first placed under service with the Hawks established VFR, conducting simulated ACM 30nm to the NW. Although Con13 provided the required horizontal separation to the JS41 under the RAS, an avoiding action turn should have been given to the JS41 rather than a standard turn onto 360° following upon the controller's lack of forward planning. The action taken was over reliant on the Hawks ability to manoeuvre immediately onto a Westerly course. The radar replay clearly depicts the effect of the restriction placed on the Hawks, to manoeuvre no further east, and the turn given to the JS41 - right onto 360°. The minimum horizontal separation was 5·3nms co-level. The Unit investigation noted that the controller involved had a plan and executed it, but this was purely reactive.

UKAB Note (1): The LATCC (Mil) Great Dun Fell radar recording clearly illustrates this encounter in the Class G airspace of the Vale of York AIAA - Hawk (A) is the No1 and Hawk (B) the No2 of the pair. At 0932:09, Hawk (B) is shown just before turning about indicating FL144 with Hawk (A) descending through FL147. At this point the No1 is at a range of 9·4nm from the JS41 shown tracking NNW'ly climbing through FL136. The JS41 commences the R turn onto a track of about 010° two sweeps later at 0932:25, whilst passing FL138 in conformity with CON13's instruction, meanwhile the Hawk pair turn R. The CPA occurs at a minimum horizontal separation of 5·3nm as the Hawk pair steadies on a WSW'ly course; the closest jet - Hawk (A) – bottoming out at FL138, some 100ft below the JS41 which is passing FL139. The pair then climbs whilst maintaining their WSW'ly course as the JS41 continued to climb at a higher RoC and perhaps indicative of the crew's response to the reported TCAS RA CLIMB.

HQ AIR (OPS) comments that the Hawk pair was taking advantage of a radar service whilst carrying out ACT in Class G airspace. However, although they were informed of the conflicting traffic, their turn, even with a CPA of 5·3nm, caused a TCAS RA to be generated in the JS41. This incident, again, highlights the need for military crews to understand the interaction between manoeuvring FJ ac and TCAS systems.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

A fast-jet pilot Advisor contended that - assuming there to be no conflicting traffic to the N - in this instance it would have been preferable for the controller to have advised the lead Hawk pilot to turn L about (instead of the R turn actually flown) which ultimately brought the Hawk pair closer to the twin-turboprop. A L turn here might have reduced the potential for a TCAS RA as it seemed that the Hawk crews did not spot the JS41 visually. It was pointed out that a L turn would have ensured that the forward vector of the Hawk jets did not sweep through the 'safety bubble' surveyed by TCAS ahead and around the JS41. In the view of several Members, it was the R turn coupled with the jets' descent towards the JS41 as the latter climbed that triggered the RA. The salient point here was clearly to give CAT ac fitted with TCAS as wide a berth as feasible and preferably not to let the jet's nose turn through the other ac. However, the recorded radar data had evinced convincingly that the minimum horizontal separation of 5·3nm was still in excess of the prescribed separation minimum of 5nm that CON13 was seeking to achieve under the RAS for the CAT ac – significantly more than the horizontal separation of 500m reported by the JS41 pilot. As it was, unbeknownst to the JS41's TCAS computer at the time, the Hawks were intending to clear to the west, which TCAS subsequently detected, such that the 'intruder' threat from the fast-jets subsided and TCAS reported 'clear of conflict' to the JS41 crew.

Whilst the Hawk pair was operating quite legitimately in Class G airspace under the RIS, perhaps a vertical solution would have been preferable. With the agreement of the pilots, an earlier level restriction placed on the Hawk pair for a short while, until they had steadied westbound, coupled with a short 'stop climb' on the JS41 until the jets were clear would have ensured prescribed separation was maintained for the short period that the Hawks were proximate traffic. Moreover, given the reduction in the vertical closing component this would also have greatly reduced the potential for a TCAS RA, which can only perform conflict resolution in the vertical plane. The Mil ACC report had highlighted the importance of sound forward planning and it was clear to controller Members that prompt recognition of the conflict; earlier traffic information about the JS41 and advice to the Hawk crews to turn L about might have been advantageous. It was difficult to determine from the RT transcript when this traffic information was issued given the 1min timing interval: nevertheless, even at the start of the minute at 0932, this was a late stage to be initiating action to effect separation between two nimble Hawks and the climbing JS41. However, the controller's turn instruction onto 360° and prompt compliance by the JS41 crew - just as the TCAS RA was enunciated, it would seem - enabled prescribed horizontal separation to be maintained. However controller Members pointed out that when issued, the instruction should have been emphasised to the JS41 crew as an 'avoiding action' turn.

The turn about by the Hawk pair coupled with the avoiding action turn instigated by CON13 resulted in separation being maintained. Therefore, the Board concluded unanimously that this Airprox had resulted from a sighting by the JS41 crew of the Hawk pair and that no risk of a collision had existed in the circumstances conscientiously reported here.

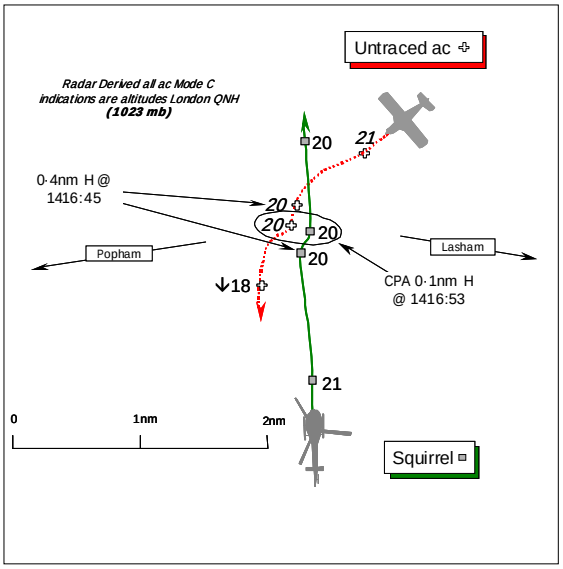
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report (TCAS)

Degree of Risk: C.

AIRPROX REPORT NO 131/08

Date/Time:	18 September 1416	
Position:	5112N 00109W (257° Odiham 8·1nm - elev 405ft)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Squirrel HT2	Untraced
Operator:	HQ AAC	N/K
Alt/FL:	1500ft QFE (1008mb)	N/K
Weather	VMC Haze	NK
Visibility:	10km	N/K
Reported Separation:	Nil V/250ft H	N/K
Recorded Separation:	Nil V/200yd H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SQUIRREL HT2 HELICOPTER PILOT, a QHI, reports he was the ac commander flying his ac from the RHS as PF whilst conducting an IF training sortie under a RIS from Odiham ATC. The controller had passed traffic information on multiple radar contacts to them prior to the Airprox but none presented any undue risk. The in-flight visibility was 10km in Haze.

The Airprox occurred approaching a position about 7nm WSW of Odiham, heading 360° at 90kt in level flight at 1500ft QFE (1008mb) whilst flying under IFR in VMC. The LHS PNF momentarily went 'head-in' working the radios and navigation equipment when the RHS PF caught sight of something in his peripheral vision despite flying 'head-in' on instruments. On looking up, the PF saw a glider type ac [later believed to be a low-wing white composite structure powered glider - though it might have been unpowered] 300ft away in an avoiding action turn to their L front, turning R from a reciprocal heading and at the same height. The PF assessed the risk of collision to be *"high"* and thus also executed an avoiding action turn to the R. Minimum horizontal separation was estimated at 250ft.

The ac commander's [RHS PF] assessment was that if the pilot of the other ac had not executed an avoiding action R turn, there was a very high risk of a head-on collision.

THE RADAR ANALYSIS CELL (RAC) AT LATCC (MIL) reports that despite exhaustive enquiries they have been unable to trace the reported ac, the identity of which remains unknown.

MIL ACC reports that the Squirrel helicopter climbed out from low-level for an IFR approach to Odiham for a PAR to overshoot for a further PAR. Lasham and Popham were very busy with a high level of activity within a 7nm radius, most of these tracks being non-squawking primary contacts. Although the reported aircraft was believed to be a glider - possibly a powered glider squawking 7000 with Mode C - attempts to trace the pilot were unsuccessful. The RAC recorded radar replay is with reference to the **Heathrow** 23cm Radar/SSR and does not reflect the Mode A/C data that was available to APP at the time.

The Odiham APPROACH Controller (APP) had been controlling for about 1½ hours since the last break at a low traffic intensity increasing to medium whilst reporting all traffic in the vicinity of aircraft under control. The equipment in use was the Odiham Watchman ASR supplemented with SSR data from the remote **Pease Pottage** SSR source. All equipment was reported as serviceable with no filters in use. The Squirrel crew called APP at 1402:16, approaching Goodwood climbing to 2000ft requesting radar vectors for a PAR to overshoot for a further PAR. At 1403:05, a discreet squawk was allocated to the Squirrel which enabled APP to identify the helicopter *"..identified Radar Information Odiham QFE 1-0-0-8 climb report level 1600".* However, the service was not limited

as the Squirrel climbed from below the Radar Vector Chart (RVC) height and a reminder with regard to terrain clearance responsibilities was not given. Once the Squirrel crew reported level at 1600ft the helicopter was vectored onto a heading of 320°. Traffic information was passed regarding a contact not involved with the Airprox and then various admin calls relating to the weather and recovery details were completed. The Squirrel's heading was refined to 310° and the ac descended to 1500ft QFE (1008mb) before further admin calls after which the Squirrel crew was placed in 'cockpit checks'. Further [unrelated] traffic information on 2 tracks was passed; the radar service was then limited due to high traffic density.

The untraced reported ac is shown on the radar recording at 1414:02, some 5·5nm W of Odiham squawking A7000 indicating 1300ft London QNH (1023mb) Mode C tracking WSW; the Squirrel bears 240° Odiham 8·5nm squawking A3651 indicating 2000ft London QNH (1023mb) Mode C. The untraced ac bears 010° - 5.5nm from the Squirrel at this point. At 1415:10, the Squirrel was vectored onto a heading of 360° whereupon the untraced ac bears 015° - 4nm from the Squirrel indicating 2000ft QNH at the same altitude as the Squirrel. APP called traffic information to the Squirrel at 1415:54 as *"traffic 12 o'clock 2 miles crossing right to left no height"*; which is the untraced ac. The Squirrel crew acknowledged the call but did not report visual sighting to APP - the Squirrel pilot's report states that the RHS pilot was flying 'head in on instruments' and the LHS pilot was, momentarily, head in working radios/nav at the time. Both ac maintained their respective headings with the relative geometry such that the untraced ac remains on a 'line of constant bearing', until 1416:45, at a range of about 0·4nm, when both ac indicate 2000ft QNH and alter course to the R. At the same time APP also called the untraced ac to the Squirrel crew "[C/S] *previously called traffic is now 12 o'clock half mile crossing right left no height".* [UKAB Note (1): The CPA occurred at 1416:53 at a position 257° Odiham 8·1nm (4½nm WbyN from Lasham) as both ac passed 'port to port' 0·1nm apart – 200yd - at the same altitude.] Meanwhile, at 1416:52 the Squirrel pilot acknowledged the traffic and stated *"I suppose technically we ought to call an Airprox",* which APP acknowledged. The Squirrel pilot then added *" head to head, avoiding action from both aircraft, probably within 100ft of each other".* APP asked the Squirrel pilot if the conflicting ac was a glider or powered ac to which the pilot opined that it could have been either but that he believed it was a powered glider. Subsequent to the Airprox, the Squirrel crew continued their PAR approach without further incident.

The Squirrel crew was provided with a RIS in accordance with JSP552. However, more timely traffic information to the helicopter crew regarding the untraced reported ac might have enhanced the Squirrel pilot's situational awareness such that the reported ac may have been visually identified earlier by the Squirrel's aircrew.

HQ AAC comments that, on the evidence provided in this report, the incident was avoidable and highlights the inadequacies of vectoring IFR traffic under a RIS in Class G airspace.

When turned onto 360°, the Squirrel was brought on to a constant closing bearing with the conflicting ac; a state that will have existed for approximately 70secs. Despite a traffic information call from the controller, the lack of relative movement – compounded by the small visual silhouette of the glider and the "no height" statement – will have made sighting more difficult for the Squirrel safety pilot.

The crews involved are fortunate that the untraced aircraft's pilot had presumably seen the Squirrel and taken avoiding action. It is regrettable however, that the same pilot didn't consider it necessary to report the incident in order that the aviation community could learn from it.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report solely from the pilot of the Squirrel helicopter, a transcript of the relevant RT frequency, radar video recordings, together with reports from the appropriate ATC and operating authorities.

Whereas the reporting Squirrel pilot considered at one point that the other ac might have been a non-powered glider, it seemed in all probability that the untraced ac was indeed powered since the Heathrow 23cm radar recording had clearly shown that it was transponding A7000 with Mode C. Whilst the remote possibility existed that it might have been one of the very few gliders equipped with a battery powered lightweight transponder, a glider pilot Member was of the view that this was not the case. The differing characteristics of self-launching gliders/motor gliders were explained to the Members who agreed on this basis that the reported ac was far more likely to have been a small, powered aeroplane. Whatever the case, it was unfortunate that its pilot had not reported this event himself, for had he done so a more complete picture would have emerged. As it turned out, the RAC had expended a considerable amount of effort trying to locate the reported ac but unfortunately this was

all to no avail. Therefore, with only the Squirrel pilot's account and the Mil ACC report on which to base their assessment of the events related here, it was difficult for the Board to come to meaningful conclusions about some aspects of this close-quarters encounter in Class G airspace.

Nevertheless, the ATC aspects of this Airprox had been recorded and it was clear to the Members from the Mil ACC report that APP had first called the unknown ac to the Squirrel crew when the two ac were 2nm apart and then again when the range had closed to a reported ½nm as the Squirrel was vectored for the PAR, but ultimately converging directly towards the unknown traffic. The Mil ACC Advisor explained that APP's workload was not high at the time and controller Members were acutely aware of the responsibilities of the APP controller in the provision of the RIS to the Squirrel crew, especially as he had 'limited' the radar service due to traffic density. However, the Mil ACC report had made it plain that the unknown ac could, potentially, have been displayed to the controller for some time and so the controller might have provided an earlier 'heads-up' about the unknown traffic, giving the crew earlier warning and more time to search for the conflicting traffic. The Board was aware that the radar recording used for the investigation of this Airprox – the Heathrow 23cm Radar/SSR was not the same as that displayed to the Odiham controller and it was not feasible to replicate exactly what the controller saw at the time, relying as he was on SSR data from the Pease Pottage Head. Nevertheless, the unknown ac - squawking A7000 - was evidently displayed on the Heathrow 23cm recording – with Mode C indicated fairly continually – but a different source to that provided remotely to Odiham. However it was significant that no altitude data was available to the controller from this source as neither Mode A nor Mode C data was evident on the recording of the Pease Pottage source before the Airprox occurred. Thus an essential element was missing from the traffic information provided by APP, who would have been entirely unaware that both ac were at the same relative altitude because the unknown ac's SSR was not displayed to him. This unfortunately resulted in an incomplete picture of the situation being passed to the Squirrel crew, it not being possible for APP to provide altitude information.

Pilot Members were keenly aware that if information that the other ac was at the same altitude had been included then this would have emphasised to the crew to concentrate on their lookout scan for the unknown ac. Certainly it was unfortunate that the safety pilot – the PNF - was 'heads-in' the cockpit at the critical moment as they closed on the unknown ac but the PF – who had clearly been flying 'heads-in' on instruments - had fortuitously spotted the other ac in his peripheral vision. Apparently this was only just in time, but this enabled the Squirrel PF sufficient warning to promptly turn R in avoidance. The Members perceived from the recorded radar data that, similarly, the pilot of the untraced ac seemed to have spotted the Squirrel helicopter at the same moment as the recording reflected a robust R turn almost simultaneously. Therefore the Board concluded unanimously that this Airprox had stemmed from a late sighting by the Squirrel crew and an apparent late sighting by the pilot of the untraced ac.

Turning to the inherent Risk, following these late sightings the combined effect of the two R turns resulted in a minimum horizontal separation of 0·1nm – 200yd – at the CPA with both ac indicating exactly the same altitude – on the Heathrow recording. Whilst at this range the avoiding action turns had ensured that an actual collision was narrowly averted, the Board agreed that the safety of the ac involved had certainly been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

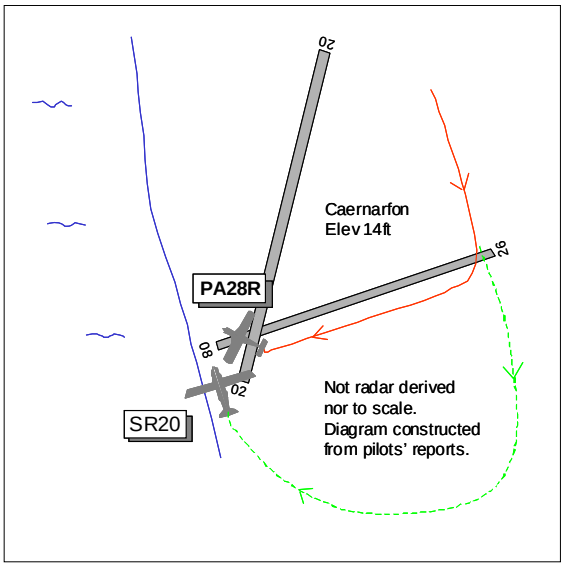
Cause: A late sighting by the Squirrel crew and an apparent late sighting by the pilot of the untraced ac.

Degree of Risk: B.

AIRPROX REPORT No 132/08

AIRPROX REPORT NO 132/08

Date/Time:	20 Sep 1253 (Saturday)	
Position:	5306N 00420W (O/H Caernarfon A/D - elev 14ft)	
Airspace:	ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Cirrus SR20	PA28R
Operator:	Civ Pte	Civ Pte
Alt/FL:	800ft (QFE)	↓800ft (QFE)
Weather	VMC CLBC	VMC CAVK
Visibility:	20km	>10km
Reported Separation:	Nil V/25m H	Not Seen
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CIRRUS SR20 PILOT reports inbound to Caernarfon VFR from Liverpool and in receipt of an A/G service from Caernarfon Radio on 122·25MHz squawking 7000 with Modes C and S. Approaching Caernarfon the Wx was excellent with a 6000ft cloudbase, the visibility being 20km flying 5000ft below cloud in VMC. The ac was coloured white/red with strobe lights switched on. He made initial contact with the A/G operator and was informed that the RW in use was 26 RH cct with an O/H join at 1300ft QFE. After positioning onto the deadside, he called 'descending deadside' which was acknowledged and he made his descent to cct height and turned back towards the upwind end of the active RW. As he crossed the upwind RW08 numbers, at 90° to the RW, heading 350° at 110kt and level at 800ft QFE suddenly an ac, a green and white coloured Piper Arrow IV, crossed his path from R to L about 50m away in an extreme RH bank and dive. The Arrow was belly-up to him and he had to take extreme manoeuvring action, a hard L turn, to avoid a collision with it; minimum separation was 25m horizontally and nil vertically. Although he informed the A/G operator of the 'near-miss' the PA28R's pilot did not acknowledge. After landing he was unable to locate the PA28R's pilot to discuss the incident. It appeared that the PA28R pilot had not crossed to the deadside and was descending on the live side of the RW and that its extreme AOB and ROD was because the pilot was trying to carry out a 180° turn and 500ft height loss within the length of the active RW (799m between thresholds). This manoeuvre was not in accordance with the teachings of a standard O/H join. He assessed the risk as very high.

THE PIPER PA28R ARROW PILOT reports that until informed by the UKAB Secretariat that the incident occurred during the O/H join, he had understood that the incident occurred 5nm SSE of Caernarfon. Inbound to Caernarfon VFR from Halfpenny Green he contacted the A/G operator on 122·25MHZ about 10nm out and was invited to join O/H at 1300ft QFE for RW26 RH cct, cct height 800ft. The visibility was >10km in CAVOK VMC and the ac was coloured green/cream with strobe lights switched on. He saw the airfield with 2nm to run and passed O/H the upwind end of RW26 at 1300ft heading 340° reporting O/H. He then turned R on the live side before turning R onto 170° to cross O/H the RW26 numbers. He then called descending deadside and turned tight in, and parallel to, the RW, just on the deadside, his normal practice at White Waltham where he usually flies, descending to 800ft before turning R O/H the 08 numbers onto crosswind. He did not remember hearing any calls from other acs' pilots joining the cct and did not see the SR20 during his manoeuvring.

UKAB Note (1): The Met Office provided a Caernarfon QNH of 1030mb.

UKAB Note (2): The UK AIP at AD 2-EGCK-1-3 promulgates Caernarfon ATZ as a circle 2nm radius centred on the longest RW (02/20) 530615N 0042025W from SFC to 2000ft aal; aerodrome elevation 14ft. Hours of operation Winter 0900-1630 and Summer 0800-1800 coincident with A/G availability. AD 2.21 Flight Procedures para d)

states: Circuit height 800ft aal. Aircraft are requested to join overhead not above 1300ft aal. Circuit direction: Runways 02 and 26 – RH.

UKAB Note (3): Recorded radar does not capture the Airprox. At 1245 a 7000 squawk is seen, believed to be the PA28R, 15nm SE of Caernarfon tracking W'ly at FL30 (3500ft QNH 1030mb) G/S 120kt whilst another 7000 squawk approaches Caernarfon from the E, believed to be the SR20, at FL45 with 20nm to run G/S 130kt. The PA28R fades at 1246:45 10nm SE of Caernarfon tracking 290° descending through FL24 (2900ft QNH). At this time the SR20 is 13nm NE of the PA28R, maintaining FL45 heading 270° with 13nm to run. One minute later at 1247:45 the SR20 is seen to commence descent with 12nm to run to Caernarfon, G/S 150kt, before fading at 1250:00 6·5nm E of Caernarfon descending through FL17 (2200ft QNH). It is believed that both ac reappear on radar after the Airprox occurs. The SR20 appearing at 1253:40 about 0·5nm to the NW of Caernarfon tracking NW'ly showing FL003 (800ft QNH) with the PA28R appearing 8sec later in the SR20's 1-2 o'clock range 0·2nm tracking N'ly at FL004 (900ft QNH). Thereafter the PA28R turns downwind whilst the SR20 continues NW'ly before also turning downwind wider than, and behind, the PA28R.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear that this incident occurred whilst both the SR20 and PA28R pilots were integrating into the Caernarfon visual cct. Members wondered why both pilots had apparently not heard each other's RT calls during the cct joining procedure. Although these position reports are there to be used to enhance situational awareness, allowing pilots to build a mental traffic picture from the RT calls, ultimately the primary method for safe integration is through 'see and avoid'. The SR20 pilot reported flying a normal O/H joining pattern, descending on the deadside to position his ac to cross the upwind threshold at cct height. It is during this phase that pilots are expected to lookout for other joining traffic; traffic already established in the pattern as well as scanning the RW for departing ac. However, the SR20 pilot only saw the PA28R as it turned across in front, belly-up, crossing R to L about 50m away, previously unheard on the RT and unseen. The SR20 pilot had immediately executed a hard L turn to avoid, estimating 25m separation. The PA28R pilot reported flying an abbreviated deadside letdown pattern, tight in to the RW whilst descending, before turning R, O/H the upwind threshold onto crosswind, ahead of the unseen SR20, unaware of its presence from the RT. Members noted the PA28R pilot's adoption of the White Waltham joining pattern. However, pilots should always ensure that they comply with the local flying regulations and procedures, pertinent to the airfield/aerodrome of intended landing, and not fly a procedure that are in use elsewhere. In the end, the Board believed that these 2 different flightpaths flown by the subject acs' pilots, whilst joining the Caernarfon cct, had resulted into a conflict which was resolved by the SR20 pilot but during which safety had not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

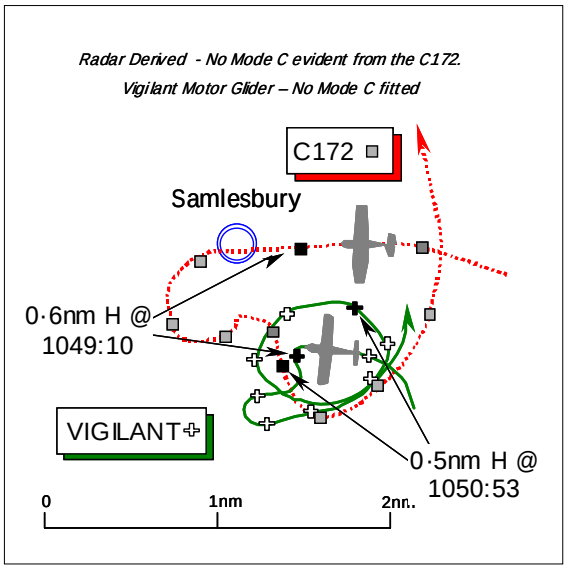
Cause: A conflict joining the Caernarfon cct resolved by the SR20 pilot.

Degree of Risk: B.

AIRPROX REPORT No 133/08

AIRPROX REPORT NO 133/08

Date/Time:	30 Aug 1049 (Saturday)	
Position:	5346N 00233W (0·5nm SE of Samlesbury elev: 269ft amsl)	
Airspace:	London FIR	(Class: G
	Reporting Ac	*Reported Ac*
Type:	Vigilant T1	Cessna 172
Operator:	HQ Air (Trg)	Civ Pte
Alt/FL:	↓1200ft	1200ft
	QFE (1008mb)	NR
Weather	VMC NR	VMC CAVOK
Visibility:	13km	10km+
Reported Separation:		
	300m	Nil V/30m H
Recorded Separation:		
	0·5nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VIGILANT T1 MOTOR GLIDER PILOT, a 'B' Category instructor with a student, reports making a radio call to Samlesbury RADIO A/G Station to inform them that they were rejoining the Samlesbury cct for RW25R using a PFL pattern from the S. Closer to the airfield they were able to see 3 ac on the ground and another Vigilant on short FINALS for RW25R. They turned parallel to the runway and approached HIGH KEY, descending from 1500ft to 1200ft QFE (1008mb). As they approached HIGH KEY heading 270° at 60kt, the pilot of the other Vigilant on FINALS made a broadcast call on RT to inform all Samlesbury ac that there was an unknown Cessna aeroplane flying parallel to the runway, heading W. After scanning the area described, they spotted the Cessna about 1nm away in their 5 o'clock position, descending past them to below their height. They informed the Duty Instructor over the RT that they were visual with the Cessna and that they were aborting their cct rejoin. As they made the radio call, they increased the power and started climbing, by which time the Cessna was around 200ft lower and the range was gradually increasing. Commencing a climbing turn to the L to increase separation, the Cessna then turned sharply to port, bringing it back towards their ac. To avoid it they increased their rate of turn and continued to climb, which maintained a safe distance between the two ac. They then observed the Cessna do another tight turn, parallel with the Duty Instructor's caravan, which ended up with the Cessna heading S again. The Cessna had by then lost most of its height and it passed about 1800ft below their aircraft before heading off to the E and then back around to the N. They last saw the aeroplane climbing over the village of Longridge. Minimum horizontal separation was 300m and he assessed the Risk as "low". A squawk of A7000 was selected but no Mode C is fitted.

His motor-glider is coloured white with red 'Day-Glow' stripes on the wing and red wingtips.

THE CESSNA 172N PILOT reports he had departed from Breighton under VFR and was conducting general handling in CAVOK conditions. He was not in receipt of any ATS. SSR was selected on with Mode C, he thought.

Orbiting left at 80kt in the vicinity of Samlesbury at about 1200ft, he first saw the other ac as it passed directly in front of him some 100ft away. As he was in a 45° angle of bank to the L at the time, he did not see the other ac until it was directly in front of his ac, as it crossed from L – R before it then passed to his R. He added that both ac were in the 'Open' FIR but in his view neither pilot saw the other's ac until it was to late to avoid each other so neither took avoiding action. He assessed the Risk as *"very high".*

UKAB Note (1): The UK AIP, at ENR 5-5-1-5, promulgates that Samlesbury Glider launching site is active during daylight hours for aerotow launches. The site elevation is 269ft amsl.

UKAB Note (2): The St Annes Radar recording shows a contact squawking A7000 which is believed to be the subject Vigilant manoeuvring to the SE of Samlesbury before turning R westbound. A contact which is also believed to be the subject C172 is shown on a parallel course approaching Samlesbury abaft the Vigilant's starboard beam, at 1049:10, before turning L; neither ac exhibits Mode C. The ac manoeuvre as shown on the diagram above in close proximity to Samlesbury, to the SE of the glider launch site. Minimum horizontal separation of 0·5nm occurred during these gyrations at 1050:53. The C172 then cleared to the NNW.

HQ AIR (TRG) comments that it appears the Cessna pilot elected to conduct part of his GH sortie in the overhead of Salmesbury not in communication with Samlesbury RADIO A/G Station. Consequently, he was not aware of the flying activity in the immediate vicinity.

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 wide disparity between the minimum separation reported by each pilot and that reflected by the radar recording suggested to some Members that the C172 pilot saw the Vigilant at a very late stage. There was no other ac evident on the St Annes Radar recording and whilst the presence of another undetected ac could not be ruled out, it seemed from the radar recording that both pilots' estimates of the minimum separation were significantly less than that which actually pertained. The Board could not resolve this anomaly but it was clear from the reports provided that both ac were manoeuvring in close proximity to Samlesbury, a promulgated glider launching site that is clearly marked as such on VFR charts. Whilst there was no ATZ or other form of restriction placed on other pilots to avoid the airspace surrounding this glider launching site, in a GA pilot Member's view it was not sensible to conduct GH in this vicinity. That said the Board recognised that both pilots were operating legitimately in Class G airspace where each was equally responsible for sighting other ac and affording appropriate separation as needs be. Here however, the C172 had flown through the cct and its presence had caused the reporting Vigilant instructor to abort his rejoin for a PFL. Given the instructional nature of this sortie and the presence of many glider pilots of limited experience at this location, the Board agreed that it was most unwise to fly through a glider/motor glider cct, of which the C172 pilot should have been aware from pre-flight planning and from perusal of his charts. Whilst there was no mandatory avoidance criteria specified for civilian pilots to avoid this promulgated glider launching site, this was strictly a matter of airmanship. However, the GA pilot Member opined that it seemed inconceivable that the C172 pilot could not have found a more suitable area for GH well away from this active glider launching site and thus he should have given it a wider berth.

The Board bases its assessment of Cause and Risk only on what actually occurred and not what might have happened if circumstances had been slightly different but nevertheless a GA Member, with his considerable gliding experience, commented that it was fortunate that winch launching was not conducted here with all the inherent dangers from the winch cables that this would entail. Fortunately, the Vigilant Motor Glider crew had been warned about the C172 whilst approaching HIGH KEY and when they saw it, had sensibly elected to turn out of the cct and give the C172 a wide berth. That they were subsequently thwarted in their endeavours by the subsequent gyrations of the C172 whose pilot, it seems, had not been aware of their Vigilant at that stage, was unfortunate. However, it was plain that the radar recording had reflected that horizontal separation was not eroded below 0·5nm and certainly more than the 30m reported by the C172 pilot. The Board concluded that the Cause of this Airprox was that whilst manoeuvring in the vicinity of a promulgated gliding site, the C172 pilot flew into conflict with the Vigilant. However, the Vigilant crew had been warned of the C172's presence; had seen it 1nm away and managed to maintain separation of not less than 0·5nm the radar recording had revealed. This had effectively resolved the subsequent conflict and Members agreed unanimously that no risk of a collision had existed in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

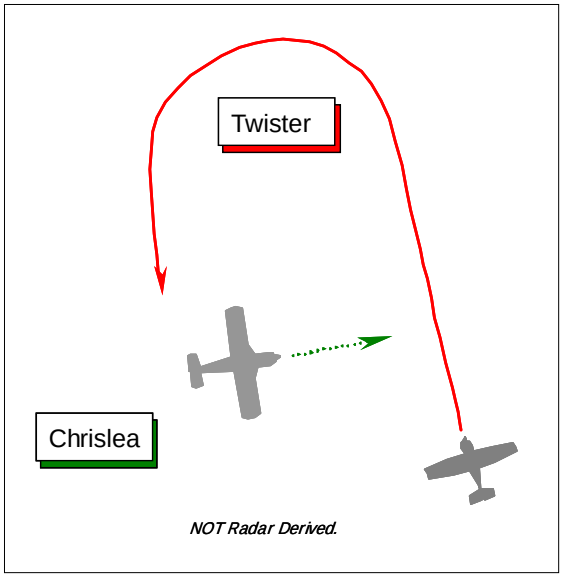
Cause: Whilst manoeuvring in the vicinity of a promulgated gliding site, the C172 pilot flew into conflict with the Vigilant.

Degree of Risk: C.

AIRPROX REPORT No 134/08

AIRPROX REPORT NO 134/08

Date/Time:	20 Sep 1343 (Saturday)	
Position:	5156N 00057W (4nm N of Westcott)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	C'lea Super Ace	Twister SA180
Operator:	Civ Pte	Civ Pte
Alt/FL:	1500ft	600-2000ft
	QNH (1030mb)	agl
Weather	VMC	VMC SKC
Visibility:	>10km	>25 km
Reported Separation:		
	Nil V/ 30-50ft H	50ft V/40m
Recorded Separation: H		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CHRISLEA SUPER ACE PILOT reports he had departed from Little Rissington bound for Old Warden under VFR in VMC in his silver and blue aeroplane; no HISLs are fitted. Approaching a position about 6nm N of Westcott [a Lat. & Long. of 51° 56' 40"N 000° 56' 50"W was given] heading 085° at 85kt at an altitude of 1500ft QNH (1030mb), he was listening out with Luton RADAR on 129·55MHz but had not established an ATS. To confirm his position, he was looking directly ahead towards Little Horwood disused aerodrome which was in his 11 o'clock about 3nm ahead. Prior to selecting his transponder to code A0013, another ac appeared directly in front of his aeroplane, filling the windscreen, with the registration mark on the fuselage clearly visible. The other ac, a low-wing single engine aeroplane coloured mainly white, appeared to be in a climbing L turn and rapidly went out of view as it crossed ahead from R – L some 30-50ft away with a *"very high"* risk of collision. After a short time, his peripheral vision picked up an object on his left side and when he turned to look out of the side window he saw that the pilot of the other ac had formated on his aeroplane; to port, behind and lower than his aeroplane. The other ac had not been seen at all prior to crossing ahead neither was there any radio contact from the other pilot nor time to take any avoiding action during the occurrence as the forward lower view from the Chrislea is restricted by the high instrument panel coaming and long nose cowling. The subject ac - the Twister SA180 - appeared to have approached from below and behind his aircraft during the formating manoeuvre.

THE TWISTER SA180 PILOT provided a frank account, supplemented with additional comment in a landline call with UKAB staff. He operates from a private farm landing strip and was conducting a local aerobatic practice whilst also running a smoke system to test a new nozzle size, using the railway line as an imaginary crowd line; SSR is not fitted.

He was not in communication with any ATSU whilst operating about 2-4nm N of Westcott disused aerodrome, near Calvert Railway Junction, [he perceived the Airprox occurred a little further S than as was reported by the Chrislea pilot] in a clear blue sky, between 600ft - 2000ft agl at 120kt with smoke on, but which he commented later might have been intermittent during the test. As he executed a vertical figure he spotted a light ac (LA) at the same height about 60m away. To avoid the other ac – a high-wing single engined aeroplane coloured silver and blue with a 'Lancaster style' twin tailplane – he pulled L and up with "full control" as he saw the other aeroplane - the Chrislea - pass about 50ft below his aeroplane some 40m away with a *"very high"* risk of collision as he rolled to keep the Chrislea ac in sight. From the way the other aeroplane was flown immediately after the Airprox, he assumed they had never noticed his ac as there was no change of heading or altitude apparent.

Amazed that the pilot of the Chrislea ac had apparently not seen him and as it was such a "split-second encounter" he was curious to see what the other aeroplane was and followed it on its steady course closing in from astern. For about 1min the pilot of the Chrislea was unaware of his presence, but eventually he noticed his Twister and

waved. He tried to signal visually to the Chrislea pilot that they had nearly hit each other but he felt he was wasting his time and he thought the Chrislea pilot had been unaware of anything.

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was perhaps understandable that the Chrislea pilot might have been perturbed when he suddenly encountered the nimble Twister as it crossed ahead - he reported some 30-50ft away from R – L - in a climbing L turn before it rapidly went out of view. For his part the reporting Super Ace pilot had been in a level cruise on a steady course when he suddenly spotted the Twister which, from the latter pilot's account, was apparently executing its vertical, avoiding action manoeuvre. It seemed clear that the Twister was seen at a very late stage indeed for the Chrislea pilot had reported that there was no time to take avoiding action. Whilst a GA Member reported that the visibility out of the Super Ace is satisfactory, the pilot had himself commented about the forward lower view being restricted by the high instrument panel coaming and long nose cowling. It was not evident if the small aerobatic ac was trailing smoke, given that the flight was a test of the smoke system, but as the Twister was executing an aerobatic manoeuvre at the time and was flying upwards from below the Super Ace it was not surprising that the reporting Chrislea pilot had not spotted it any earlier. Given the high–energy aerobatic manoeuvres being flown by the Twister pilot, Members appreciated that it would have been difficult for the Chrislea pilot to manoeuvre out of the way of the more nimble Twister, even if it had been seen a little earlier. This was, effectively, a non-sighting by the Chrislea Super Ace pilot who was unable to affect the outcome and thus part of the Cause.

It was evident to a GA pilot Member that the Super Ace pilot was not intending to obtain an ATS as he had set his transponder to A0013 - indicating that he was merely monitoring the Luton APP frequency and listening out without any form of ATS being requested or provided to him. Although not fundamental to the Cause, this Member was surprised that neither the Super Ace pilot nor the Twister pilot was in communication with an ATSU as in his opinion it is always useful to tell ATC what you are doing, especially in the latter's case when practising aerobatics.

Members were of the view that the Twister pilot would not have flown this close intentionally so it was indeed fortuitous that he had spotted the other aeroplane when he did. Evidently, the Twister pilot's own earlier visual scan for other ac before he started his high-energy manoeuvre had been defeated as he had not spotted the Super Ace beforehand. However, it was indeed providential that the Twister pilot had seen the Chrislea as he executed his "vertical figure" manoeuvre but he was clearly mistaken if he thought that his own ac had not been spotted when he took his avoiding action – albeit that the Super Ace pilot was apparently powerless to alter the situation. From the Twister pilot's own laudably frank account it was evident that he was able to pull out of this "vertical figure" and avoid the Super Ace - by 50ft vertically and about 40m from his perspective. Nevertheless, it was clear that this was a late sighting of the Super Ace, which the Members agreed unanimously was the other part of the Cause.

Both pilots involved here had reported somewhat different separation minima. However, without radar data the actual separation that existed could not be determined independently so it was not feasible to resolve this anomaly. Nevertheless, there was no reason to doubt the veracity of either report from the differing pilots' perspectives: regardless of the actual distance, it was clear to the Board that this was a very close encounter indeed. Whilst some might contend that the Twister pilot had spotted the Super Ace in time to ensure that a collision was averted, at these distances with one pilot unaware of the other aeroplane climbing up rapidly from below and the Super Ace itself spotted late, the Board concluded that an actual risk of collision had existed in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

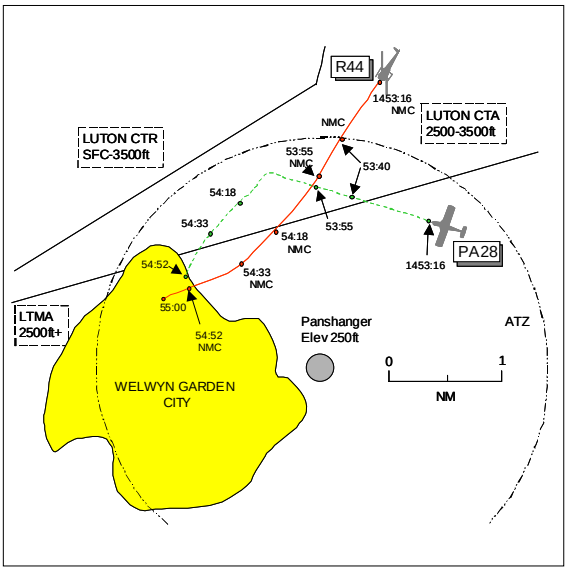
Cause: An effective non-sighting by the Chrislea Super Ace pilot and a late sighting by the Twister pilot.

Degree of Risk: A.

AIRPROX REPORT No 135/08

AIRPROX REPORT NO 135/08

Date/Time:	26 Sep 1455	
Position:	5149N 00011W (1·5nm WNW Panshanger - elev 250ft)	
Airspace:	ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	PA28	R44
Operator:	Civ Trg	Civ Pte
Alt/FL:	900ft↓ (QFE 1026mb)	800ft (QNH)
Weather	VMC NR	VMC CLBC
Visibility:	>10km	20km
Reported Separation:	75ft V/Nil H	200ft V/200m H
Recorded Separation:	<0·1nm	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA28 PILOT reports flying a dual cct training sortie from Panshanger VFR and in communication with Panshanger Radio on 120·25MHz; the transponder was switched off. The visibility was >10km in VMC and the ac was coloured white/green and anti-collision light was switched on. He was demonstrating a flapless base leg setup to his student. Whilst descending on L base RW11 heading 200° at 72kt about 1·5nm NW of the airfield, his student identified a black/dark red coloured R44 helicopter below their ac <200m away on a similar heading which crossed from L to R very close to them. This proximity had endangered their safety and the safety of the residents of Welwyn Garden City. He made a call on frequency requesting the helicopter pilot to identify himself but there was no reply and no call was heard from any transiting helicopter before or after the incident. At the time it passed 75ft below them, their height was just under 900ft QFE 1026mb. He levelled-off until he saw the helicopter on his RHS and recommenced descent again, levelling-off to read its registration, the altimeter read 800ft QFE. Subsequently he made calls to Luton and Farnborough N but neither ATSU had any R44 with that registration on frequency. He assessed the risk as high.

THE PA28 COMPANY'S CFI comments that this was far from being an isolated incident. Far too often, ac - especially helicopters - are flying through the Panshanger ATZ at cct levels without radio contact. The airfield lies in a corridor of airspace and he thought that his students should not be subjected to such risks when flying from this busy training airfield.

THE R44 PILOT reports flying en-route from a private site near Huddersfield to a private site 2nm SW of St Albans, VFR and in receipt of a FIS from Luton on 129·55MHz squawking 7000 with NMC. The visibility was 20km flying 1200ft below cloud in VMC and the ac was coloured burgandy/black with strobe and nav lights switched on. Initially routeing to the E of Stevenage, he then flew around the Luton CTR onto a heading of 230° at 800ft QNH and 100kt between the CTR and the Panshanger ATZ. The Airprox occurred to the N of Welwyn Garden City when a low wing single engine light ac, possibly a PA28, passed 200ft above and 200m in front from L to R; an immediate descent was made to avoid it. At the time he believed the PA28 was at the end of the downwind leg for Panshanger's RW11. Thereafter he did not see the PA28 again before landing at his destination.

UKAB Note (1): Owing to a procedural error, the R44 pilot was not contacted until over 3 months post incident. Consequently the RT recording and fpss from Luton were not available for analysis by ATSI and the UKAB Secretariat.

UKAB Note (2): The UK AIP at AD 2-EGLG-1-2 promulgates Panshanger ATZ as a circle radius 2nm centred on the longest notified RW (11/29) 514807N 0000930W from SFC to 2000ft aal, airfield elevation 250ft. An A/G

service is available during ATZ hours of operation – Winter 0900-SS and Summer 0800-1800. Para 2.22 Flight Procedures states Circuit directions: RW29 – RH; RW11 – LH. Circuit height 800ft aal.

UKAB Note (3): The Rules of the Air Regulations 2007 Rule 45 Flights within ATZs states *"During the notified hours of watch of the air/ground station .....the commander shall obtain information from the air/ground communication service to enable flight to be conducted safely within the zone. The commander of an aircraft flying within the aerodrome traffic zone of an aerodrome shall a) cause a continuous watch to be maintained on the appropriate radio frequency notified for communications at the aerodrome; or b) if this is not possible, cause a watch to be kept for such instructions as may be issued by visual means; and c) if the ac is fitted with means of communication by radio with the ground, communicate his position and height to the .....air/ground communication service at the aerodrome on entering the zone and immediately prior to leaving it*.

UKAB Note (4): The diagram is compiled from a composite radar picture incorporating Stansted 10cm, Debden, Heathrow 10 and 23cm radars. At 1453:16 a primary-only return is seen 1·6nm NNE of Panshanger tracking 290°, believed to be the PA28 downwind LH RW11, whilst a 7000 squawk with NMC is seen 1·3nm to its NNW tracking 215°, believed to be the R44. The R44 enters the ATZ at 1453:40 2nm N of the airfield as the ac continue to close to 0·5nm. Fifteen sec later, the PA28 is in the R44's 1130 position at 0·1nm crossing L to R; this is believed to be the encounter described by the R44 pilot. The R44 continues on a SSW'ly track whilst the PA28 turns L onto a base-leg and at 1454:18 is now positioned in the R44's 3 o'clock position range 0·4nm. The R44 starts a gentle R turn onto a more SW'ly heading which places the ac onto slowly converging tracks. The PA28 however does fade from radar on the outskirts of Welwyn Garden City, the last radar sweep at 1454:52 showing the R44 in the PA28's 10 o'clock range 0·1nm; this is believed to be the encounter reported by the PA28 pilot. The R44 then fades 1·5nm WNW of Panshanger tracking towards St Albans.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

An ATCO Member reminded others that the shape of the Luton CTR was designed many years ago especially so that the Panshanger ATZ was wholly outside Luton Class D airspace. The CAA topographical chart shows that the ATZ and CTR boundaries almost touch which would make any flight intending to route between these 2 pieces of airspace next to impossible. With the Luton CTA situated above the Northern part of the Panshanger ATZ, transiting traffic from the N would only be able to avoid the ATZ by flying above 2250ft and below 2500ft QNH or by routeing clear around to the E. The R44 pilot had intended to fly between the Panshanger ATZ and CTR but had entered the ATZ on a SSW'ly track whilst in communication with Luton ATC. In doing so, the R44 pilot had not fulfilled the requirements of the Rules of the Air Rule 45 by not communicating with Panshanger to obtain information to enable his flight to be conducted safely within the ATZ; this had caused the Airprox. Although Members were denied the benefit of an RT transcript from Luton so it was not possible to know what information was exchanged between the R44 pilot and ATC regarding the ATZ, as the helicopter was displaying a 7000 squawk an ATCO Member opined that almost certainly the R44 was not being tracked on radar by the Luton controller and, as the pilot was responsible at all times for ensuring compliance with Rule 45, there was no responsibility for ATC to ensure that the ac remained clear of the ATZ.

Looking at the geometry of the encounter, Members agreed that the R44 pilot had only seen the PA28 whilst it was downwind for RW11 as this was the only time that the PA28 was crossing the R44's projected track from L to R; the R44 pilot had then descended to avoid the PA28 whose pilot had not seen the R44 approaching from his R. However shortly after this the PA28 had turned L onto base leg on a roughly parallel track before the R44 pilot had turned slightly R onto a SW'ly track, placing the subject ac once again on conflicting tracks. The R44 pilot had not noticed the PA28 on his R, slightly above, whilst the PA28 student had alerted the instructor to the helicopter when it was <200m ahead and 75ft below. The instructor had taken prompt action to level the PA28 until the R44 cleared to the R of their track allowing them to continue descent. Members agreed that the action taken by the PA28 pilot had been sufficient to remove the actual risk of collision but the non-sighting of the PA28 by the R44 pilot and passage in close proximity led the Board to conclude that safety had been compromised during the encounter.

Members noted that the PA28 pilot had switched off his transponder in the cct. The recommended procedure promulgated in the UK AIP [ENR 1-6-2-1] is to select Mode A (in this case 7000) with Mode C unless otherwise instructed by an ATS unit. This ensures that ATC conflict alert systems and ACAS 'safety nets' are able to function fully.

AIRPROX REPORT No 135/08

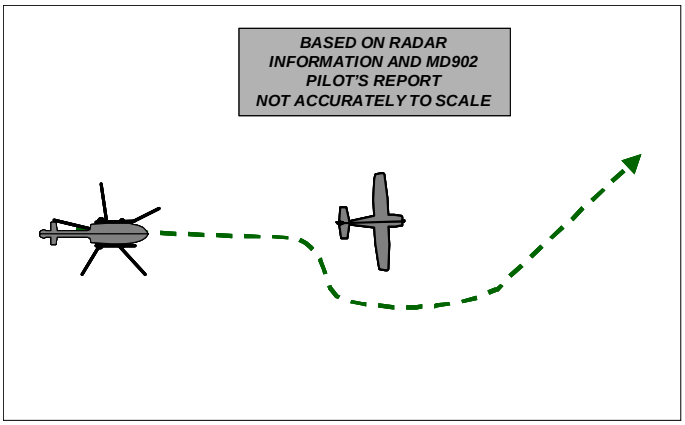
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The R44 pilot entered the Panshanger ATZ without fulfilling the requirements of Rule 45 of the Rules of the Air and flew into conflict with the PA28 which he did not see.

Degree of Risk: B.

AIRPROX REPORT NO 136/08

Date/Time:	26 September 1019	
Position:	5346N 00126W (10nm SE of Leeds Bradford)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	MD 902 Explorer	Microlight
Operator:	Civ Pol	Civ Pte
Alt/FL:	450ft	600ft
	(QNH 1037 mb)	(N/K)
Weather	VMC	VMC
	Haze below cloud	
Visibility:	5 km	5 km
Reported Separation:		
	0 V/200m H	N/K
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MD 902 EXPLORER PILOT reports flying a blue and white TCAS-equipped helicopter with all lights switched on, squawking 0052 (the Police ASU code) with Mode C and in receipt of a FIS from Leeds Bradford APP. The ac was crewed by one pilot, one front observer and one rear observer. At the time of the incident they were heading 090° at 120kt on routine police operations. At the point of first sight, he saw the blue and white Skyranger (Microlight). It was 250m dead ahead and level but the size, construction and colour made it difficult to see in the prevailing weather and light conditions; there was no TCAS alert and the other ac had no lights. Leeds Bradford APP confirmed that the Skyranger was not in communication with them nor was it in communication with Linton-on-Ouse [LARS]. The Microlight appeared to be following the motorway Eastbound at about 500ft agl. They slowed rapidly to an indicated airspeed of 45kt to check the registration of the Skyranger from astern, at a safe distance commensurate with the weather, and then turned R to avoid it.

He assessed the risk as being low to moderate.

He believed that this incident could have been totally avoided, simply by the pilot of the other ac informing ATC and allowing other aircraft the benefit of his/her position and intentions.

THE MICROLIGHT PILOT reports flying solo in a blue and white Skyranger Microlight with the strobe switched on, on a cross country flight from Crosland Moor to the East Coast via Rufforth. The ac was not SSR equipped but he was listening out with Leeds Bradford APP. He departed Crosland Moor at approx 0915 and initially flew E at 70kt, to the S of the Leeds Bradford Zone. Near Castleford he descended to about 700ft agl as the low cloud was increasing and he was concerned about remaining in sight of the ground. He then flew N on a track that joins the A1, keeping to the W of Church Fenton MATZ. He was flying down sun and the forward visibility was 'OK' despite some haze. The variable cloudbase required adjustments to his altitude but not his heading; although conditions were 'not perfect', at that stage he did not need to fly below 500ft. After the A1/A64 junction he turned E, planning to fly N of Tadcaster to Rufforth. However conditions deteriorated after Tadcaster requiring him to navigate around some low cloud to maintain safe altitude.

He remembers seeing a helicopter near Aberford [slightly NE of the incident position] but he cannot be more specific as he did not regard it as remarkable and did not consider it to be in unsafe proximity. It is possible that this was a different helicopter as that is a busy area.

UKAB Note(1): The MD 902 can be seen on the recording of the Great Dun Fell radar throughout the incident, squawking 0052 and indicating between FL002 and 000, tracking Eastwards along the M62 motorway; the

Microlight does not paint at any time. At 1018:30 the MD902 slows down to about half its previous speed and at 1019:06 it turns right briefly before turning left, increasing speed and departing to the NE.

ATSI reports that there were no ATC factors in 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 frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

Members noted that both ac had apparently been following the M62 motorway and both following the right hand traffic rule but, unsurprisingly, the MD902 had been flying significantly faster, at least initially, than the Skyranger microlight. The incident took place a few miles to the S of the Leeds Bradford CTA in Class G airspace. That being the case, the Board determined that both pilots had an equal and shared responsibility to see and avoid other ac. In order to assist with this responsibility and provide information to other airspace users, the MD902 pilot had wisely opted to make use of a FIS from Leeds Bradford. The Skyranger, although radio equipped, had no transponder and even if the pilot had opted to seek a FIS, the ac would not have been visible on radar. Therefore only very limited verbal positional information would have been available. While not wishing to discourage pilots from using a FIS where available, a GA pilot Member noted that, in these circumstances, it would have been of limited value to any of the participants. Members noted that the pilots agreed that the in-flight visibility had been 5km and that the MD902, before slowing down, had an overtake of 50kt. That being the case the Skyranger would theoretically have been visible to the MD902 pilot in his 12 o'clock for about 3½ min. Members also agreed that the microlight would have had no relative motion, had a very small aspect and may well have blended in with the background. These factors when combined persuaded a majority of Members that the cause had not been a late sighting by the MD902 pilot but simply a conflict in the FIR which was resolved at a fairly late stage by the MD902 pilot's manoeuvre.

The Board was concerned that after seeing the Skyranger the MD902 pilot had apparently continued to close on it to a point when he could read the fairly small registration markings before breaking away. As a general point of airmanship, deliberately continuing to close on an ac from an area where the other pilot may not be able to establish visual contact – as happened in this incident - was considered to be most unwise in that the pilot of the other ac may change his flight path unexpectedly. When assessing the degree of risk, Members accepted that although the Skyranger pilot had apparently not seen the MD902 until well after the CPA, the MD902 pilot had seen the former and avoided it, albeit at a late stage but not so late that there was any risk of a collision.

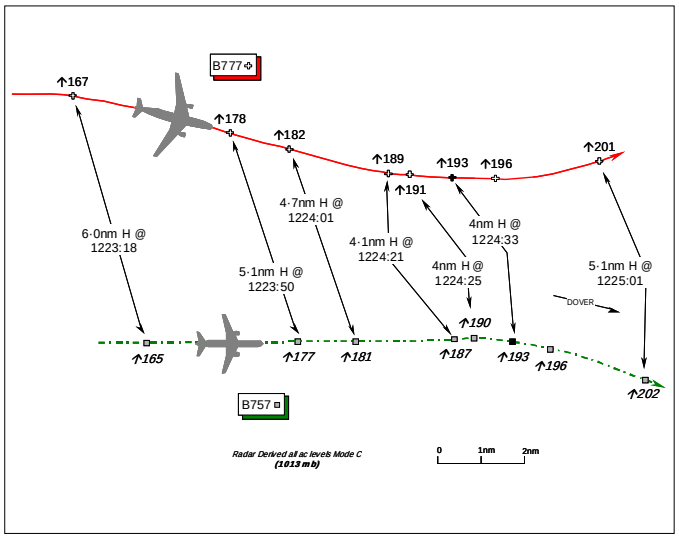
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT NO 138/08

Date/Time:	5 Oct 1224 (Sunday)	
Position:	5114N 00055E (17nm WNW of DOVER)	
Airspace:	AWY/UAR UL9	(Class: A)
Reporter:	LAC S15/16 TAC	
	First Ac	*Second Ac*
Type:	B777-200	B757-200
Operator:	CAT	CAT [Non-sched]
Alt/FL:	↑FL290	FL200↑
Weather	NR	VMC NR
Visibility:	NR	>10km
Reported Separation:		
	NR	nil V/4·9nm H
Recorded Separation:		
	Nil V/4nm H	



CONTROLLER REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LAC COMBINED SECTOR 15 & 16 TACTICAL CONTROLLER (S15/16 TAC) reports that whilst working IFR traffic on L9/UL9 in very light traffic conditions, the B777 crew called on frequency climbing to FL170 on a radar heading of 095°. He instructed the flight to continue on the heading and climb to FL290 under a RCS. Shortly afterwards the B757 crew also called climbing to FL170 on a heading of 095°, about 6nm to the S of and flying a parallel track to the B777. A short while later he observed the B777 turn R and take up a heading of approximately 110°, now rapidly converging with the B757 whose crew had been instructed to climb to FL280 under the RCS and which was now at approximately the same level as the B777.

He queried the B777's heading and just as he did so STCA triggered so he issued an avoiding action L turn to the B777 crew with traffic information about the B757. He also issued an avoiding action R turn to the B757 crew. As there were no other ac on the frequency at the time, he did not consider any vertical avoiding action as the turns were taking effect and the ac were at similar levels making the decision to 'stop descent' of one of the ac harder. Horizontal separation reduced to 3·5nm with both ac at the same level. Once standard horizontal separation [of 5nm] was regained, the flights were once again turned onto parallel courses and transferred to the next sector without incident.

THE B777-200 PILOT did not complete an Airprox report despite a request to do so. His company provided the following in an e-mail to the ANSP, which was also subsequently sent to the UKAB:

ATC cleared the B777 crew to climb to FL290 on a heading of 095°, with the 1st Officer as PF. While the Pilot-in-Command was checking the Computer FPL to calculate block time and fuel, it was realized that they were on a heading of 105° and the Primary Flight Display (PFD) was still showing "HDG SEL". He then asked the PF to turn L onto the required heading of 095°. The 1st Officer apologised, saying that he thought they were on 'LNAV'. He then updated the heading. At that point, ATC called them and asked them their heading whereupon they said 105° turning onto 095°. ATC gave them a heading of 070°, because of conflicting traffic the controller said. They advised the controller that they had the traffic displayed on TCAS and that it was clear. This was confirmed by the other flight and no TCAS "warning or advisory" was enunciated. However, the controller said that he would report the matter.

The Company added that the B777 crew had been briefed on the significance of task sharing, Flight Mode Annunciator (FMA) confirmation while flying and on the vigilance required at critical phases of the flight.

AIRPROX REPORT No 138/08

THE B757-200 PILOT provided a very comprehensive account reporting that they were outbound from London/ Gatwick under IFR in VMC and in receipt of a RCS from LONDON CONTROL. Whilst in the climb through FL200 heading 095°(M) at 300kt, they were instructed to "turn immediately right 20 degrees" – it might have been more but he cannot remember the precise figure. This instruction was acknowledged and the turn initiated using 'Heading Select' with the autopilot 'IN' all the time. Unaware of any loss of separation, they were however aware of the other ac from their TCAS display climbing on a parallel course: neither a TCAS RA nor TA was triggered at any time. The closure rate between their two ac seemed to be very slow and the risk of collision *"very low"*. ATC then informed the other crew [of the B777] that they had been given a heading to maintain but had not done so and that a loss of separation report would be filed by LAC and that he [the B757 pilot] should complete an Airprox report himself. They were thanked for their help and asked if they had suffered a TCAS advisory. He responded that they had not received any indication of a loss of separation until informed by ATC.

ATSI reports that at 1220, the B777 crew established contact with LAC S15/16 TAC, reporting climbing to FL170. The S15/16 TAC Controller asked *"are you on a radar heading"*. The pilot replied *"we are on 0-9-5"*. Shortly afterwards, the B757 crew contacted S15/16 TAC on the frequency, also reporting climbing to FL170, heading 095°. The flight was instructed to climb to FL280. This was followed by an instruction to the B777 crew to climb to FL290. At the time, the two ac were on parallel radar headings, 6nm apart, the B777 being NNW of the B757.

The flights continued on their parallel tracks, remaining at least 6nm apart, until 1223:18, when the radar recording shows the down linked Mode S of the B777 indicating a heading change to 098° (ATSI NOTE: Mode S Downlinked ac Parameters (DAP) are not available to LAC controllers.) At 1223:53, when the two ac were 5·2nm apart, the controller checked with the B777 crew to confirm their heading of 095°. When the B777 pilot reported heading 110° at 1224:00, the S15/16 TAC controller issued avoiding action, "*negative avoiding action turn left heading 0-7-0 degrees"*. Following this the B757 crew was also given avoiding action at 1224:10 *"avoiding action turn right immediately heading 1-1-5"*. Traffic information was passed to the B777 crew about the B757, *"traffic in your 1 o'clock range of 4 miles turning away from you now",* whereupon the pilot reported he had the other traffic on TCAS. There were no ATC causal factors.

UKAB Note (1): Separation reduced to a minimum of 4nm, when both ac were passing FL193.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a comment, also passed to the ANSP, from the B777 pilot's company; a report from the B757 pilot, a transcript of the relevant RT frequency; radar video recordings; a report from the air traffic controller involved and reports from the appropriate ATC authority.

The Board was dismayed that the Pilot-in-Command of the B777 had not provided an Airprox report when requested but it seemed from the comments provided by this pilot's company that their crew had not ensured that the ac was being flown in the correct FMC Mode. A CAT pilot Member explained that in LNAV the FMC will fly the ac along a programmed course whereas HDG SEL should be selected to maintain an assigned heading. This would have guaranteed that the B777 remained 'locked-on' to the vector issued by S15/16 TAC and thus with both ac flying on the same heading horizontal separation would have been maintained. It was plain from the recorded radar data that the B777 had strayed from the vector issued by S15/16 TAC just after 1223:18. The B777 crew's divergence from this vector had plainly taken it towards the B757, but fortunately S15/16 TAC had spotted this in good time to take action. The ATSI report had shown that the controller was able to provide immediate avoiding action instructions to both crews which ensured that both ac were turned away from one another. Thus the conflict was effectively resolved by the controller's prompt action and both crews' swift compliance. The Members agreed unanimously that this Airprox had resulted because the B777 crew deviated from their assigned heading and turned into conflict with the B757.

The Board recognised that this was not a close quarter's situation by any means. Nonetheless, from the controller's perspective standard separation was eroded and he was rightly concerned. However, the alert S15/ 16 TAC's prompt avoiding action coupled with traffic information to the B777 crew ensured minimum horizontal separation was not less that 4nm when the two ac were at the same level. CAT pilot Members considered it understandable that the B757 crew would have left the AP engaged given the gentle avoiding action turn of 20° and clearly the crews' own situational awareness was aided both by the RT exchanges and the TCAS information displayed to them. During the debate a TC controller Member highlighted that the display of selected Mode S DAPs available to controllers in the TC Ops room at Swanwick has proved very beneficial and has enabled

controllers to spot level errors. It is unfortunate that this valuable tool is not yet available to area controllers at LAC Swanwick. Nevertheless, the Members agreed unanimously that S15/16 TAC's prompt response to the deviation that he observed on radar and the swift reaction of both crews, coupled with the minimum horizontal separation evident here of 4nm, had removed entirely any risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The B777 crew deviated from their assigned heading and turned into conflict with the B757.

Degree of Risk: C.

AIRPROX REPORT NO 139/08

Date/Time: 21 Sept 0610 (Sunday)
Position: 5005N 00124W (S Coast of Isle of Wight)
Airspace: R84 Class: (See UKAB Note (3))

	Reporting Ac	*Reported Ac*
Type:	B757-200	Untraced Microlight
Operator:	CAT	NK
Alt/FL:	FL200	NK
Weather	VMC CAVOK	NK
Visibility:	50km	
Reported Separation:	V 1000ft/H 400m	N/K
Recorded Separation:	NR	

SIMULATION BASED ON B757 PILOT'S REPORT

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B757 PILOT reports inbound to London Gatwick in receipt of a RCS from LACC, squawking as directed with Modes C and S and heading 010° at 270kt. As he approached the S coast of the Isle of Wight, while descending through FL200 [see UKAB Note (3)] he glanced out of his left hand window and saw a blue and yellow weight-shift microlight disappearing from sight under their left wing about 1000ft below them. He had no TCAS indication so he assumed [confirmed by the radar recording] that the microlight was not SSR equipped.

He reported the incident to LACC and assessed the risk as being very high.

Since he found it hard to believe that microlights could operate at that alt, he contacted his local agent and was told that modern turbo-charged microlights can indeed operate at that alt.

UKAB Note (1): (Compiled from the Controllers' reports). A primary trail was briefly seen on the Hum radar at the time but it did not last long enough to be monitored. The B757 pilot contacted Gatwick ATC shortly after landing and offered a full description of the event. He stated that whilst at FL200 a microlight passed down his left side, 2000ft below his wing. The microlight was a weight shifting type with a blue gondola body and yellow wings and was on a South-westerly heading. The local area supervisor contacted Sandown Airfield shortly after the event. Sandown ATC stated that they were the only microlight base on the Isle of Wight but they had no microlight matching the description.

All subsequent aircraft routing towards GWC or MID were informed of the unknown traffic and told to keep a good look out. As a precaution these ac were turned right by the controller to remain clear of the position the primary was last seen operating.

UKAB Note (2): All known microlight flying locations and organisations within 50nm of the incident position were contacted in an attempt to trace the microlight pilot. The BMAA was also most helpful contacting members and clubs who may have become aware of such a flight, but none were.

UKAB Note (3): Sunrise on 21 Sep was at 0551. The OAT at 20000ft was –12.8° C and the wind was 024/12. It considered likely that the microlight pilot would have had to have been on oxygen at that alt. Also it is estimated that a microlight would take more than 19min to climb to 20,000ft. (Although initial rates of climb of 1000fpm are not unusual in modern turbocharged microlights, they are reduced markedly in the upper air). It follows therefore that the ac must have taken off before sunrise, contrary to the requirements of Article 11 (8) of the ANO (2005). Further, the radar recording confirms the pilot's report that the incident took place in Airway R84 (FL105-FL195 Class A, FL195-FL245 Class C). In any case the microlight was not displaying any SSR in CAS nor was it in receipt of an ATC RC service as required by the UKAIP ENR 1.1 et seq.

UKAB Note (4): The recording of the Heathrow 23cm radar at 0608 shows the B757 6nm S of the S coast of the Isle of Wight descending through FL230. A primary only contact pops up in its 11 o'clock at a distance of 5nm, just off the coast. As the B757 approaches the contact - which was initially tracking NW - it turns left to track SE before disappearing at 0608:29 in the B757's 11o'clock at a distance of just under 1nm as the 757 was descending through FL215. There are 2 other intermittent primary only contacts 5 and 10nm to the SE respectively. Although all recordings show the B757, none of the primary contacts show on the recordings of the Heathrow 10cm, the Gatwick, the Pease Pottage, Clee Hill or the Burrington radars.

UKAB Note (5): As a matter of coincidence there was a well organised and CAA approved Microlight World Altitude Record Attempt on the same date in a different part of the UK.

ATSI reports that there were no ATC causal factors. The presence of the microlight was not known to the Hurn Sector Controller until the B757 pilot commented that he had seen the other ac.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the B757 pilot, transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authority.

The Board was advised by a GA Member that portable oxygen equipment - as would have been required at 20000ft - is widely used in gliders and thus widely available. Following expert advice, he believed it would take 26min for a Microlight with a modern high-powered engine to reach 20000ft. Therefore in the Member's view the ac must have taken off at least 7min before sunrise when sky conditions would have been fairly light; nonetheless such a departure time would be illegal for a Microlight.

Members considered whether the Microlight could have come over the English Channel but this was thought unlikely since the radar recording showed it tracking along the S coast and it is 55nm (at least an hour) to the Cherbourg Peninsula which is the closest point. That being the case it was though most likely that the microlight had taken off from a remote, non-airfield location either on the Isle of Wight or in central Southern England.

One Member suggested that the 'Microlight' might have been a cockpit reflection or a Met balloon. Both however were ruled out, the former since the ac showed, albeit briefly, on radar and the latter due to the ac travelling cross wind then reversing. In any case, although he had flown a long overnight flight and had seen the microlight only briefly, the Board accepted that the B757 pilot's description both to ATC and in his report were too detailed to be inaccurate.

Although in this incident Members agreed that there had been no risk of collision, they also agreed that the Microlight pilot had apparently shown a total disregard for the air navigation regulations. The potential for a far more serious incident than had actually occurred was plain.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class C Airspace with an untraced Microlight

Degree of Risk: C.

AIRPROX REPORT No 140/08

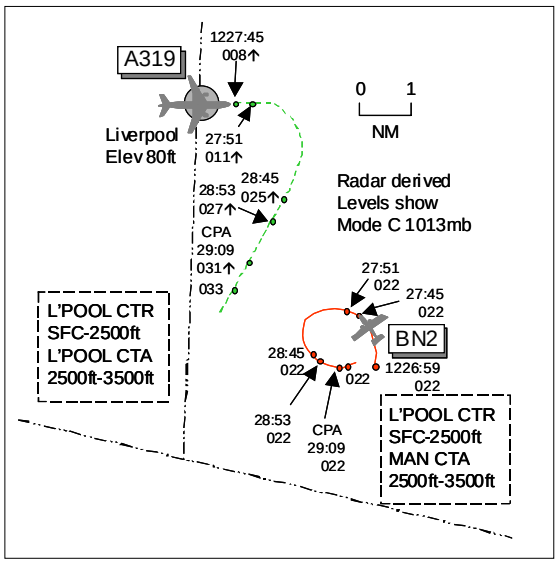
AIRPROX REPORT NO 140/08

Date/Time: 5 Oct 1229 (Sunday)

Position: 5316N 00248W (4nm SSE Liverpool - elev 80ft)

Airspace: CTR/CTA (Class: D)

	Reporting Ac	*Reported Ac*
Type:	A319	BN2 Islander
Operator:	CAT	Civ Comm
Alt/FL:	2400ft↑ (QNH 1000mb)	(QNH)
Weather	VMC CLBC	VMC
Visibility:	10km	
Reported Separation:	Nil V/2·5nm H	NR
Recorded Separation:	900ft/2·6nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A319 PILOT reports outbound from Liverpool IFR and in receipt of an ATS from Liverpool Tower on 126·35MHz squawking with Modes C and S. It was a busy Sunday afternoon with a number of light VFR ac operating and at least 2 IFR departures. With 1 IFR inbound on final they were told to 'line-up and be ready immediate'. Cleared for immediate take-off, they departed with a R turn at 580ft QNH onto heading 210° climbing to 3000ft. Thrust reduction and acceleration to 250kt at 1080ft was carried out and during the turn the Capt, PNF, observed and called TCAS traffic due S at approximately 2500ft, 1500ft above, range 4-5nm. This traffic was not far off the FMGS predicted routeing for a REXAM 2V course of 226°M. He advised the FO to be aware of traffic and both crewmembers raised their alertness for a TCAS advisory to 'very high'. The Capt continued to monitor instruments; the ACAS display; relative positions etc whilst the FO continued as PF. The FO spotted the other ac passing through their 12 o'clock, due S, and they continued the turn. TCAS indicated the traffic passed a minimum of 2·5nm away at the same level as they passed 2300-2500ft, within 500ft of their level-off altitude. No TCAS warnings were received (solid white diamond only) and they levelled at 3000ft. Owing to busy ATC workload, they were transferred to MACC. En-route climb was then given and initiated and he was then able to contact Liverpool Tower on Box 2 and after asking the controller if the traffic was known at the time of departure, he was told that it was not known, all traffic being below 1500ft. He passed the details of the proximity and later telephoned ATC to inform them of his Airprox report. ATC told him again that the traffic was unknown and had not shown on radar which caused him concern as it was clearly squawking Mode A and C and replying to interrogations and should have been visible to ATC on radar. He assessed the risk as medium.

UKAB Note (1): The UK AIP at AD 2-EGGP-6-2 promulgates the REXAM 2V SID from RW09 as *"Climb straight ahead. At I-LVR D1 or 580ft QNH (500ft QFE) if sooner, turn right onto POL VOR R226 to REXHAM. Crossing POL D44 at 3500ft or above. Crossing POL D50 at 4000ft.*

THE BN2 ISLANDER PILOT reports being unaware of the Airprox. He did not receive any alert on his TCAS 1 equipment and in his experience Liverpool ATC is consistent in passing TI on departing traffic.

THE LIVERPOOL ADC reports the A319 departed RW09 at 1228 on a non-standard departure heading 210° climbing to altitude 3000ft. The height readout was verified as the ac passed 2100ft and the flight was transferred to MACC on 133·05MHZ at 1229. He had been advised by APR of a BN2 operating over Helsby (5nm SE of Liverpool) not above altitude 2000ft.

THE LIVERPOOL APR reports that at approximately 1220 the BN2 flight requested permission to enter the CTR in the vicinity of Chester, VFR not above 1500ft QNH 1000mb to route to Helsby and stated that it was a Cat B flight. Subsequently the flight requested and was cleared to operate not above altitude 2000ft. TI on this ac was

passed to ADC who, at around this time, requested a release for departure on the subject A319. After coordination with MACC, the A319 was cleared by him to depart heading 210° climbing to 3000ft. ADC told him when the A319 was airborne and he requested the ADC 'check' the A319 through 2000ft and then transfer the flight to MACC. The BN2 flight was informed the A319 was airborne having previously given its crew TI on the departing ac; the BN2 crew reported visual with the A319. Later he heard that the A319 crew had reported an Airprox with the BN2.

UKAB Note (2): Met Office archive data shows the Liverpool METAR as EGGP 1220Z VRB07KT 9999 FEW030 12/05 Q1000=

ATSI reports that the Airprox occurred within Class D airspace to the SE of Liverpool Airport. The BN2 flight established communication with Liverpool Approach, at 1222, having departed RW04 at Hawarden. The pilot requested *"...zone entry please VFR Category Bravo to operate around Helsby"*. The pilot was cleared to *"...enter the Zone and report on site Helsby VFR fifteen hundred or below QNH One Thousand"*. Helsby is situated some 5nm SE of Liverpool airport.

At 1223, the ADC telephoned the APR to request a departure release for the A319. Having received an approval from Manchester for its departure, the APR released the ac on a non-standard departure, heading 210°, climbing to 3000ft.

The pilot of the BN2 requested, at 1225:37, to operate in the Helsby area at 2000ft. The APR answered, passing information about the subject A319 *"...affirm keep a lookout for a (company) Airbus shortly rolling off runway Zero Nine southwestbound towards Rexam initially stopping at three thousand"*. The pilot replied *"Okay recleared down* (sic) *to two thousand feet VFR and copied that traffic thank you BN2 c/s"*. The APR telephoned the ADC to pass information about the BN2 operating up to 2000ft at Helsby. The ADC responded *"Roger".* Shortly afterwards, the A319 was cleared for an immediate take-off RW09 ahead of a landing company ac, no mention being made about the presence of the BN2. At the time, the ADC was busy dealing with a number of inbound ac. The radar, timed at 1226:59, shows the BN2 turning through a N'ly heading, 5·9nm SE of Liverpool airport, at FL022 (1850ft QNH 1000mb [1mb=27ft]). Subsequently (1227:51), aware that the A319 was airborne, the APR informed the BN2 *"...that's the Airbus just airborne now be turning right"*; the BN2 pilot reporting *"visual"*. When the ADC telephoned the APR to pass the A319's departure time, the latter controller said it was to be transferred to Manchester after passing 2000ft. Accordingly, checking that the ac had passed 2100ft, the ADC transferred the A319 to Manchester. The radar, timed at 1228:45, shows the A319 tracking SW, passing FL025 (2150ft QNH). The BN2 is 3nm SSE of it, turning through a SE'ly heading, at FL022 (1850ft QNH).

UKAB Note (3): The horizontal separation decreases over the course of the next few sweeps, 8sec later at 1228:53, the subject ac being separated by 2·7nm and 500ft vertically. The CPA occurs at 1229:09 the BN2 turning through E at FL022 with the A319 2·6nm to its NW tracking SW'ly climbing through FL31, 900ft above; the A319 levels at FL033 (2950ft QNH) 8sec later.

Approximately 3min after the A319 flight was transferred to MACC the pilot returned to the frequency, asking *"...we just departed about five minutes ago ah just a quick question for you please on when we went through what was the downwind leg we there was a TCAS return at Two Thousand Five Hundred feet which came within about two miles of us were you aware of that traffic"*. The ADC replied *"...negative none of my traffic was above One Thousand Five Hundred"*. The pilot continued *"Okay well just to advise you then w- as we went over what would be the south bank there was a TCAS return showing two and a half thousand feet and it came within two miles of the aircraft"*.

There is no requirement to separate IFR and VFR traffic in Class D airspace. The minimum services to be provided by ATC in Class D airspace are to: Separate IFR flights from other IFR flights; Pass traffic information to IFR flights on VFR flights and give traffic avoidance advice if requested; Pass traffic information to VFR flights on IFR flights and other VFR flights. (MATS Part 1, Section 1, Chapter 2, Page 1.) On this occasion, the pilot of the BN2 was informed about the departure of the A319 and reported visual. The A319 pilot was not informed about the presence of the BN2.

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 agreed that the A319 crew had been mislead by information given to them when, post Airprox, they contacted Liverpool Tower to ask if the (BN2) traffic was known at the time of departure to be told that it was not known, all traffic being below 1500ft whereas the identity of the traffic was known. After being told that the traffic was unknown, the crew were understandably concerned that the squawking traffic was operating within CAS, apparently unseen by ATC. The APR had released the A319 for departure when the BN2 was routeing to Helsby at 1500ft and 2min later the BN2 pilot asked for clearance to operate up to 2000ft. The APR had passed this information to the ADC, who acknowledged 'Roger' but did not pass this TI, nor was told to by the APR, on to the A319 flight prior to departure. This omission, contrary to MATS Part 1, had reduced the A319 crew's situational awareness and denied them the option to request traffic avoidance if they thought it was necessary. The busy ADC then cleared the A319 flight for take-off and, without the benefit of TI, the proximity of the BN2 caused concern to the A319 and this had led to the Airprox being filed.

Looking at risk, the A319 crew had seen the BN2 on TCAS and monitored the relative flightpaths, the FO visually acquiring the BN2 during their R turn. The A319 crew then steadied on their assigned heading before the BN2 passed 2·5nm clear as they climbed to level at altitude 3000ft. The APR had passed TI to the BN2 flight prior to the A319's departure and, once told it was airborne, the BN2 pilot reported 'visual'. All of these elements when combined allowed the Board to conclude that any risk of collision had been effectively removed.

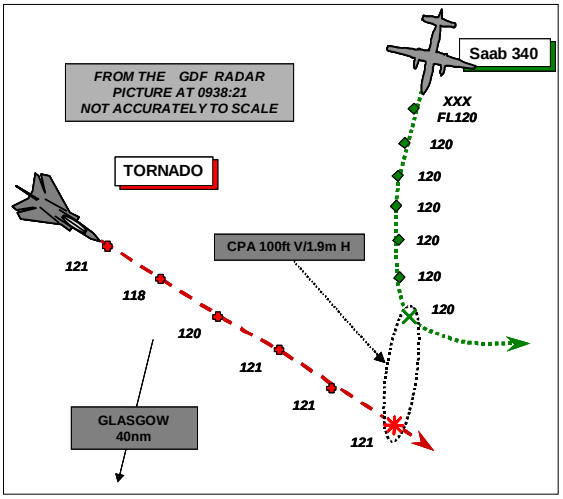
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Without the benefit of TI, the proximity of the BN2 caused concern to the A319 crew.

Degree of Risk: C.

AIRPROX REPORT NO 143/08

Date/Time:	13 Oct 0938	
Position:	5642N 00415W	(RANOK)
Airspace:	N560D	(Class: F)
	Reporting Ac	*Reported Ac*
Type:	SAAB 340B	Tornado F3
Operator:	CAT	HQ Air (Ops)
Alt/FL:	FL120	FL120
Weather	VMC N/R	VMC CLAC
Visibility:	15-20km	>50nm
Reported Separation:		
	0ft V/3-6nm H	Not Seen
Recorded Separation:		
	100ft V/1.9nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SAAB 340 PILOT reports flying a scheduled passenger service between Inverness and Edinburgh following ADR N560D heading 194° in contact with ScACC and squawking as directed with Modes C and S. ScACC advised them of military traffic off their right hand side and advised them of suggested headings to avoid it. They identified the military ac visually; maintained visual contact and turned left following the avoidance given by the Controller. Once clear of the military traffic they continued to turn left [through 360°] and rejoined the ADR. During their pre-flight briefing they noted a warning of a major military exercise and briefed to remain on the ADRs so that they could get a better service (RAS); they also briefed to keep a good look out for fast jet activity.

He considered that the effective RAS provided by the ScACC controller reduced the risk from high to medium. Scottish radar service; good visual scanning and ACAS increased their situational awareness and further reduced the risk to a 'managed event'.

THE TORNADO F3 PILOT reports returning from an exercise sortie as a singleton in a grey ac initially squawking 4715 with Mode C. They exited OTA B [some distance NW of RANOK] at 0932 climbing to 8000ft on the Exercise Pressure Setting of 997mb and heading 130°. They were returning mid-exercise because the ac had suffered a minor airframe problem. They had been under the control of a foreign E2C Hawkeye but due to communication issues, the Exercise was being controlled by CRC Scampton on the frequency designated as the check in and exercise departure frequency. In order to exit the area and return to base on a clear frequency, they attempted to contact Boulmer at 0933 but, although this frequency was quiet, communication was poor and Boulmer could not hear replies to their transmissions. At 0935:30, Boulmer, "transmitting blind", asked them to contact Scampton on the previous frequency, pass an exercise report and RTB. Knowing that this frequency was in constant use, such a call would complicate their recovery so at 0936 they attempted to contact ScACC(Mil) on their ICF but again although ScACC(Mil) could hear them, they could not hear the replies. They were reluctant to climb higher as they had limited knowledge of the exercise situation and the presence of opposition ac in the 10000-14000 exercise sanctuary block above them. At 0936:10 they climbed to 9000ft and at 0937 they cleared OTA B [the Exercise Area] and were therefore clear of Exercise traffic above and below them.

The cloud tops were rising so to maintain VMC the ac was gently climbed to FL120 to try to establish good 2-way communications with ScACC(Mil). This was in the vicinity of RANOK reporting point and they comment that they were aware of the Airway above them.

The post-flight Mission Tape analysis showed that at 0938 they had radar contact 55° left of the nose at 13000ft and at a range 7nm but the track dropped out after only 5sec and, although it was mentioned in the cockpit, it was subsequently disregarded as spurious. They were never able to established 2-way communications with ScACC(Mil) but at 0938 they squawked 7000 and successfully contacted Leuchars APP at a distance of 50nm.

They subsequently changed squawk to 0202, returning and landing uneventfully. Throughout the climbout and recovery they remained on a heading of 130° and were initially at 450kt.

Leuchars ATC informed them of the Airprox after landing but other than the brief radar contact they were not aware of the other ac.

THE ScACC CONTROLLER reported that a Saab 340 was Southbound from Inverness on ADR N560D at FL120, 5nm N of RANOK reporting point under a RAS, when a converging ac squawking 7000 was seen at FL90 but it disappeared from radar cover and then reappeared at FL122 at 5nm, closing with the Saab. He gave the Saab an avoiding action turn of *"left heading 090°"* and then reinforced this with *"further left heading 030°.* The other ac passed the Saab at the same level with lateral separation of 2nm.

MIL ACC reports that a Tornado F3 was recovering from an exercise sortie to RAF Leuchars with a minor technical problem. Despite checking several frequencies with Boulmer and Boulmer transmitting blind to the F3, the crew were unable to establish 2-way comms with them and elected to contact ScATCC(Mil) on their ICF; however, they were also unable to obtain two-way communications with them. The crew were reluctant to climb [for better comms] due to the lack of their SA regarding other exercise traffic and they successfully contacted Leuchars 50nm NW, well after the incident.

Despite multiple attempts to contact Boulmer and ScATCC (Mil) for a radar service, the F3 was unable to achieve satisfactory communications with either unit and was therefore left with no alternative but to conduct VFR transit without radar assistance. There were no Mil ATC aspects to this incident.

ATSI reports that the Westcoast Sector was being operated with the Planner and Tactical positions combined and the sector was being handed over in the period leading up to the Airprox.

The Saab 340 established communication with the Westcoast Sector at 0928, reporting passing FL92 climbing to FL120, its requested cruising level; the ac was identified and placed on a RAS. At the time the flight was flying Southbound on ADR N560D (FL60-FL190), inbound to Edinburgh.

Both the controllers involved in the sector handover observed unknown traffic (the subject Tornado) to the W of the ADR. The Stornoway radar photograph of 0936:54 shows a 4715 squawk, at FL90, about 10nm W of the Saab 340, on a conflicting track; the squawk changes from 4715 to 7000 and fades from the display. It next appears 25sec later at 0937:19, 7nm WSW of the Saab 340, showing a 7000 squawk and climbing through FL108. Shortly afterwards, the oncoming controller passed TI about the Tornado *"C/S traffic information right hand two o'clock range of six miles fast moving jet traffic showing Flight Level One Two Two climbing"* and the pilot reported looking; the controller then continued *"C/S if nothing sighted turn left heading Zero Nine Zero degrees"*. At the time, the ac were 5.3nm apart and the Tornado was 100ft below the Saab. As soon as the Saab pilot read back the turn instruction, the controller transmitted *"C/S (flight number only) traffic right hand two o'clock range of four miles Flight Level One Two Zero avoiding action turn left immediately heading Zero Seven Zero degrees acknowledge"*. The pilot reported the traffic in sight and was given a further left turn heading 030°. At 0938:20, just after this turn was issued, the closest point of approach occurred, as the Tornado passed 1.9nm ahead of the Saab 340 and 100ft above it. The Tornado then continued tracking away to the SE.

The MATS Part 1, Section 1, Chapter 5 describes the procedures for a RAS, including 'the controller 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'. Additionally: '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 5 nm or 3000feet, except when specified otherwise by the CAA. However, it is recognised that in the event of the sudden appearance of unknown traffic, and when unknown ac make unpredictable changes in flight path, it is not always possible to achieve these minima. Controllers shall continue to provide information on conflicting traffic until the confliction is resolved.'

The unknown ac, at FL90, was first observed on the radar display when it was about 10nm from the Saab 340. However, after this it disappeared from the display and the controller assumed it had descended to low level. He did not observe it subsequently reappearing showing at FL108 but noticed it at FL122, when it was approximately 6nm from the Saab. TI was passed promptly but an avoiding turn was slightly delayed. When the initial turn was given the term 'avoiding action' was not used: however, it was transmitted in the next call when a further turn was

given. Ideally, the avoiding action turn should have been given as soon as the unknown ac was observed to close with the Saab 340. The controller was undoubtedly surprised to see it appear, having believed it had descended to low level, and this might have delayed him issuing an avoiding action turn straight away. He did however, pass TI first and then issued the avoiding action turns.

The local ATC investigation revealed that the controller considered and then discarded a vertical solution, deciding to issue turns as the avoiding action solution because:

The military ac was on a constant track and had been for some time - therefore it gave the appearance of being predictable.

The Mode C readout had been displaying FL90 for some time before it showed no SSR readout for 25sec and the controller missed the next return which indicated FL108. On the next sweep no Mode C was shown and on the sweep after that the Mode C showed FL122 (with a climbing arrow), which reinforced the controller's belief that the ac was, and would continue, climbing. The controller was surprised on subsequent sweeps when it maintained FL120.

For these reasons the controller believed at the time that turns appeared to provide a better solution.

UKAB Note (1): ScACC confirmed that STCA did not activate.

UKAB Note (2): The recording of the Great Dun Fell (GDF) radar provided to the UKAB, and on which the diagram above is based, does not show the 4751 squawk at 0936:54; however the ScACC unit report with the prints taken from the Stornoway radar (being used by the controller) clearly show the Tornado squawking 4751 at FL090 with a track history of 5 previous returns, indicating that the ac should have been displayed to the controller(s) for at least 40sec. The GDF recording shows the Tornado appear at 0937:28 at FL120, tracking about 130° and 7nm to the W of the Saab, which is tracking 190°, also at FL120. The ac continue to converge until they are 2.7nm apart, the Tornado now at FL121 and the Saab still at FL120, when the Saab's left turn first becomes evident on the recording. At 0938:20 the Tornado passes 1.9nm ahead of the Saab, which continues its left turn, and 100ft above.

HQ AIR (OPS) comments that the relatively low alt of the Tornado made comms with the COC difficult and so the crew had no assistance with TI until much later. Had they levelled at a Quadrantal, they may not have surprised the SCACC Controller as much.

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.

While there was nothing to suggest that it had been a factor in this incident, Controller Members pointed out that extra vigilance is required during handovers to ensure that pop-up traffic or rapidly changing situations are not missed while briefing the oncoming controller(s).

The Tornado's contact was visible in the radar photographs, and therefore presumably to the controllers, for about 30 sec. That being the case, one experienced controller Member suggested that although there had never been any reduction in safety, a greater miss-distance could have been generated. Nevertheless, the Westcoast Controller had provided correct avoidance to the Saab pilot in accordance with current procedures and thereby avoided a conflict. That being the case, there had been no risk of collision.

A military pilot Member stressed the importance of being aware of ADRs, expecting (civilian) traffic to be there and using all possible assistance and information to avoid ac that are likely to be TCAS equipped by a wide margin.

Although not apparently a factor in this incident, one Member suggested that the Tornado pilot might have inadvertently left the Exercise QNH (997mb) set on his altimeter and actually thought that he had been flying at a correct quadrantal level for his transit (FL115) but was actually flying at 11500ft amsl. This had been a factor in previous incidents.

AIRPROX REPORT No 143/08

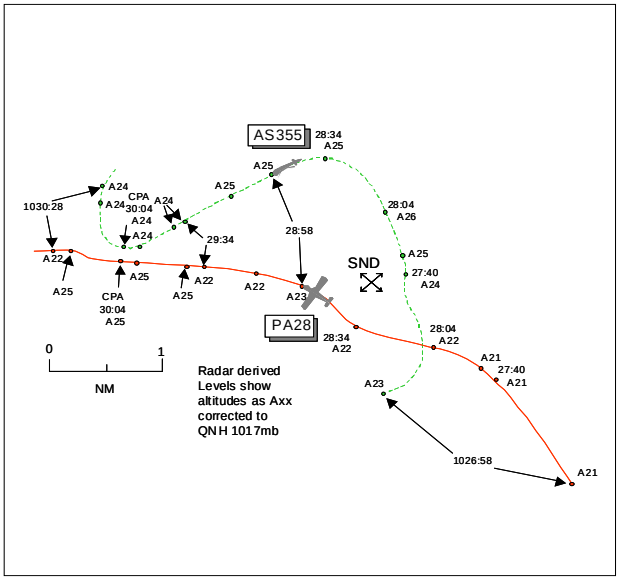
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in Class F airspace resolved by the ScACC Westcoast Controller.

Degree of Risk: C.

AIRPROX REPORT NO 144/08

Date/Time:	13 Oct 1030	
Position:	5151N 00105E (2·25nm W SND - elev 49ft)	
Airspace:	FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	AS355	PA28
Operator:	Civ Trg	Civ Club
Alt/FL:	2500ft	2200ft
	(QNH 1017mb)	(QNH 1016mb)
Weather	VMC CLBL	IMC KLWD
Visibility:	5000m	
Reported Separation:		
	100ft V/150m H	Not seen
Recorded Separation:		
	100ft V/0·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE AS355 PILOT reports flying a local sortie from Biggin Hill IFR in the SND hold at 2500ft QNH 1017mb, squawking 7000 with Mode C and under a procedural approach control service from Southend Approach on 130·775MHz. The visibility was 5000m flying 300ft above cloud but in between layers. The helicopter was coloured blue with HISLs switched on. The pilot was on an initial instrument rating test (IRT) under simulated IMC conditions. At the end of the hold outbound heading 245° at 110kt and about to turn L, the examiner in the front LH seat saw another ac appear from behind cloud 150m away in his 9 o'clock approximately 50-100ft above. The examiner told the pilot to turn R for avoiding action: to have turned L would have placed both ac in danger of collision. The other flight, a PA28 coloured white with red/blue stripes, had been cleared through the hold in VMC at 2100ft QNH but had apparently climbed to remain VMC, its pilot not informing ATC of its climb. He assessed the risk as high.

THE PA28 PILOT reports flying solo VFR from Manston to Oxford at 90kt and in receipt of a FIS from Southend Approach on 130·775MHz squawking with Mode C. A handover from Manston to Southend took place at the Eastern tip of the Isle of Sheppey [4nm ESE Eastchurch]. He had planned to approach SND NDB on a track of 323°M and then turn onto 281°M to the LAM VOR. The safety altitude was 1900ft and his planned altitude was 2100ft in preparation to fly under the LTMA at its boundary to the W of Brentwood. The flight earlier to Eastchurch [12·5nm SE of SND] under a Manston Approach service had been uneventful. Southend ATC required him to call abeam Sheerness [VRP 8nm SSE SND] and he then understood that he was offered a FIS and an unconditional clearance into the Southend ATZ at 2100ft to turn at the SND. The Wx conditions were deteriorating as he crossed the Thames Estuary. He was advised by the APC that there was traffic at the SND beacon and that he was required to look out for that traffic. On entry to the ATZ from the SE he entered cloud with significant turbulence and commenced an instrument scan. He lost sight of the surface and had no forward visibility but some visibility upwards through breaks in the cloud. The APC went to some lengths to require a lookout for other VFR traffic at the beacon. A fairly lengthy exchange took place to try and promote this. The need to look out for traffic, maintain an instrument scan and coordinate a turn at the beacon whilst in cloud and turbulent conditions was quite stressful. At the start of the turn, he was able to observe helicopter traffic that was high in his 2 o'clock that he assumed to be the object of the APC's advisory. The APC advised him that the helicopter was IFR traffic and was not the subject of the lookout and to maintain his lookout, he thought. At the conclusion of the turn the reporting ac announced his intention to file an Airprox. He checked his altitude at 2200ft after this announcement. At no point did the APC warn him about his altitude or issue instructions to alter course. He did not ever make visual contact with the reporting ac, he thought. The remainder of the flight to Oxford was uneventful as was the return flight later following the route in reverse.

AIRPROX REPORT No 144/08

THE SOUTHEND APC reports the AS355 was established in the SND holding pattern at 2500ft and in receipt of an Approach Control Service. The PA28 flight called by Eastchurch at 2100ft VFR requesting transit of the Southend O/H under a FIS. The pilot was asked to report passing Sheerness, which he did, and he was instructed to report O/H Southend. TI was passed in respect of both ac together with their flight rules and intentions. In the vicinity of the O/H the PA28 pilot reported the helicopter in sight and requested direct routeing to LAM; the AS355 flight was informed that the VFR traffic had them in sight. Several minutes later the AS355 pilot stated that he had taken avoiding action on another ac at a similar level and wished to file an Airprox. At no time did the PA28 pilot report any change of level.

UKAB Note (1): The Southend METAR shows EGMC1020Z 24006KT 9999 SCT014 18/15 Q1017=

ATSI reports that the AS355 was carrying out a holding pattern at the SND NDB at 2500ft IFR. The pilot had been advised that because the helicopter was within the radar O/H the radar service (RIS) had been terminated. Meanwhile, the PA28 flight had contacted Southend Approach reporting VFR en route from Manston to Oxford at 2100ft. He requested a FIS, to route into the O/H at the SND. A FIS was agreed and the controller asked the pilot to report passing Sheerness, inbound overhead Southend.

The PA28 flight reported E abeam Sheerness at 1023. The pilot was requested to report O/H Southend and informed *"...there is traffic in the holding pattern IFR altitude Two Thousand Five Hundred feet"*. The pilot acknowledged the TI. Shortly afterwards, the AS355 was advised about *"...transit VFR traffic shortly south to north a Cherokee Two Thousand One Hundred feet"*.

At 1026:58, the pilot of the PA28 reported *"...have helicopter in sight can I start to route direct Lima Alpha Mike please"*. This was approved *"...with the IFR traffic in sight"*. At the time, the PA28 was tracking NW at 2100ft. The AS355, turning L through east, was 1·9nm NW of the PA28. The AS355 was informed that the VFR traffic (the PA28) had the helicopter in sight. The pilot of the PA28 responded to this message, confirming *"...I have the VFR helicopter in sight about two hundred feet ahead of me"*. This was corrected to IFR by the controller. The call was made again to the AS355 flight, which was acknowledged, this time, by the correct pilot.

[UKAB Note (2): The Debden radar recording at 1028:04 shows the PA28 0·8nm SE of SND NDB tracking 280° squawking 7000 with unverified Mode C indicating 2200ft with the AS355 1·3nm to its N tracking 345° at 2600ft. The PA28 is seen to turn more NW'ly before steadying on a track of 280° at 1029:16 at 2200ft with the AS355 on a steady SW'ly track at 2500ft 0·75nm to the NNW. Thereafter the subject ac close on converging tracks with the radar revealing at 1029:34 the AS355 indicating 2400ft QNH and the PA28 at 2200ft. However on the next radar sweep the PA28's Mode C indicates 2500ft QNH which is maintained until after the Airprox.]

Subsequently (1030:00), the pilot of the AS355 commented that he had taken avoiding action from the PA28, which was, reportedly, at 2500ft. The radar recordings show that at the closest point of approach (1030:04), 0·1nm, the ac were 100ft apart vertically, the PA28 at 2500ft and the AS355 at 2400ft.

The Southend Approach Controller passed appropriate TI to both flights, resulting in the PA28 having early visual sighting of the AS355 (1·9nm). No comment was made on the frequency about the PA28 having difficulty maintaining VFR or visual contact with the AS355. The Airprox occurred within the Southend radar O/H: therefore it would not have been observed by the controller on his radar display.

In order to provide more information to overflying traffic, the following has now been added to the Southend MATS Part 2 (publication date 17/11/08): *"In the case of a potential confliction involving an aircraft in the holding pattern and overflying VFR traffic, traffic information to the VFR flight is to include the phrase* ***'..in the Southend holding pattern, which is over and west of Southend Airport'*** *"*.

UKAB Note (3): The UK AIP promulgates the SND hold as a 1min LH racetrack inbound QDM 056°.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear that there were 2 different viewpoints on this incident. Following the PA28 pilot's initial call stating that he was flying VFR, the Southend APR had acknowledged the pilot's request to transit via the SND at 2100ft and subsequently passed TI on the IFR AS355 at 2500ft. The AS355 crew were also given TI on the PA28 transiting at 2100ft. As the PA28 pilot approached the SND from the SE he saw the AS355 ahead, as it was turning towards the SND: he was cleared to route direct to LAM with the AS355 in sight. The AS355 pilot was then told that the PA28 pilot had his helicopter in sight. In these circumstances, no separation needed to be applied by the controller between the IFR and VFR traffic, only TI to be given. Although flying under IFR, there was equal onus on the AS355 pilot to maintain his own separation from all other traffic whilst flying in Class G airspace. Unbeknown to the APR, the PA28 pilot had entered cloud and so was no longer flying VFR and had lost sight of the holding AS355, believing that he had unconditional clearance through the Southend area. He had later, as seen from the radar recording, also climbed to 2500ft. Both of these changes should have been notified to ATC, as it would have required the APR to provide separation to both IFR flights. Members agreed that the cause of this Airprox was that the PA28 pilot did not inform Southend APR of his change in flight conditions or altitude and flew into conflict with the AS355.

With ATC unaware of the PA28 pilot's situation, the AS355 examiner was surprised when, as his flight was about to turn L inbound to SND, he saw the PA28 as it appeared from behind cloud in his 9 o'clock range 150m tracking W'ly about 50-100ft above. He told the PF to turn R to avoid a collision and this was executed immediately. These prompt actions were enough to remove the actual collision risk but the Board agreed that safety had been compromised during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

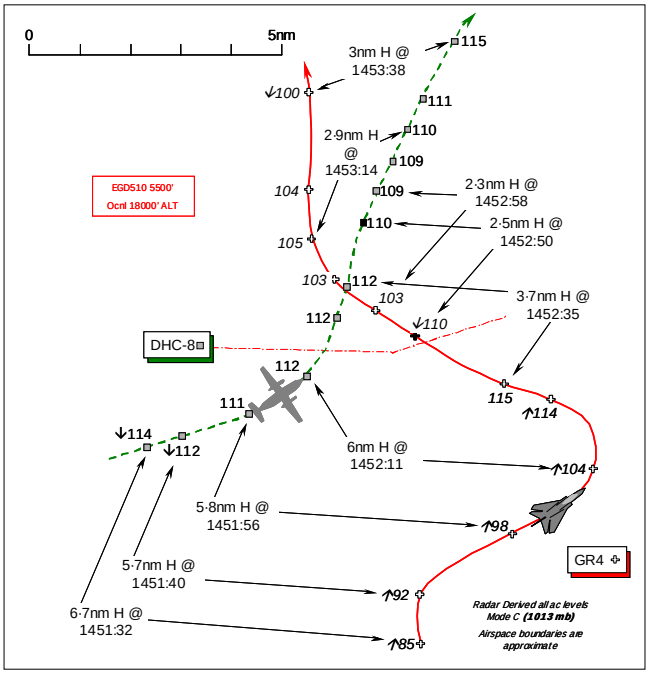
Cause: The PA28 pilot did not inform Southend ATC of his change in flight conditions or altitude and flew into conflict with the AS355.

Degree of Risk: B.

AIRPROX REPORT No 145/08

AIRPROX REPORT NO 145/08

Date/Time:	13 October 1452	
Position:	5502N 00229W (27nm W of Newcastle)	
Airspace:	FIR/Danger Area	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	DHC-8 Q400	Tornado GR4
Operator:	CAT	HQ Air (Ops)
Alt/FL:	FL110	6000-11000ft QNH
Weather	VMC CLOC	VMC CLOC
Visibility:	>10km	>10km
Reported Separation:		
	Nil V/3nm H	200ft V/3nm H
NEW RAD 1: Nil V/3½nm		
SPD: Nil V/2-3nm		
Recorded Separation:		
	Nil V @ 2·5nm H	
	600ftV @ 2·3nm Min H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE de HAVILLAND CANADA DHC-8 Q400 PILOT reports he was inbound to Newcastle and in receipt of a RAS from Newcastle RADAR on 124·375MHz; the assigned squawk of A3756 was selected.

Flying under IFR in VMC some 3000ft above and 10nm clear of cloud, they had initially routed via the CL at Carlisle and thence to the NT at Newcastle to avoid the Spadeadam Danger Area - EGD510. Approaching a position about 24nm W of Newcastle heading 056° at 245kt, they had been advised of low-level military traffic, he thought. Whilst descending to their assigned level of FL90 he thought they were given traffic information on climbing military traffic so he reduced their rate of descent to about 900ft/min. RADAR then instructed them to stop descent, firstly at FL100 then FL110. A TCAS TA was enunciated followed by an RA to DESCEND. In compliance with the RA they descended about 500ft whereupon ATC instructed them to turn [UKAB Note (1): This turn was issued for avoiding action onto 010° before he advised of the RA: traffic information was then passed on the GR4. The turn to 010° was acknowledged. The DHC-8 pilot then advised about the RA in response to RADAR's next instruction, to turn R onto 090°]. He responded that he was unable to comply with that instruction because of the TCAS RA. Once clear of the conflict they climbed back to FL110 and informed ATC. The controller issued a turn instruction onto 010°, which resulted in a second TCAS TA against what was believed to be a second Tornado jet but the military traffic was not on the Newcastle frequency. Neither ac was spotted visually but TCAS displayed the closest traffic [the first occurrence] at a minimum horizontal separation of 3nm as it climbed from below them, through their level to some 2000ft above his ac. Workload prior to the Airprox was *"low"* but he assessed the Risk as *"very high"*.

THE TORNADO GR4 PILOT reports that he was leading a 4-ship COMAO [Combined Air Operation] during Exercise Joint Warrior - a large-scale exercise - whilst conducting affiliation training against 2 Typhoon jets. They were in receipt of a RIS from Spadeadam and also a controller aboard an E-3 AWACS ac, he thought, and squawking A4752 with Mode C. Neither TCAS nor any other form of CWS is fitted.

The location and heading of the civilian ac – the DHC-8 - was passed by Spadeadam RADAR in accordance with the RIS. At the time of the Airprox they were operating under VFR, positioning to ensure correct weapon release parameters within their allocated 'time-on-target' bracket, when the DHC-8 was spotted at a range of 5nm. Climbing from 6000ft to 11000ft Force QNH in VMC and turning L through 305° at 420kt, the ac was manoeuvred visually both to ensure safe separation from the reported traffic and obtain correct release parameters for a practise attack run within the permitted 'time-on-target' bracket. Minimum vertical separation was about 200ft and

horizontal separation 3nm. When the ac was established straight and level on the attack track, Spadeadam RADAR advised that the traffic had received and complied with a TCAS RA. He assessed the Risk as *"low"*.

THE NEWCASTLE RADAR 1 CONTROLLER (NEW RAD 1) reports that the DHC-8 was inbound to Newcastle under IFR and in receipt of a RAS with a squawk of A3756. An unknown ac squawking A4752 [the subject Tornado GR4] was about 7nm SE of the DHC-8 indicating FL65 when he instructed the crew to stop descent. The unknown jet then climbed towards the DHC-8 so traffic information and an avoiding action instruction was issued to the DHC-8 crew to turn L onto 010°, whereupon the crew reported a TCAS RA. The DHC-8 crew descended about 500ft in compliance with the RA as the unknown jet passed about 3½nm astern of the twin-turboprop thereby eroding prescribed separation. When Spadeadam was contacted on the landline, they advised that the unknown military jet was receiving a 'service' from fighter controllers who were in contact with Spadeadam during the occurrence.

THE SPADEADAM RADAR CONTROLLER (SPD) – an air traffic controller - reports that he was called to the Operations Room following a 'free-call' from an Exercise Joint Warrior ac [which had been cleared into the Range]. On arrival the Range Controller informed him that he had told the calling ac to standby for a controller. After requesting confirmation of their allocated squawk, he identified the GR4 from their observed Exercise squawk, requested the ac's level and type of ATS required. The GR4 crew advised that they were receiving a service from an E3 AWACS ac so he queried if an ATC service from Spadeadam was required: the crew's reply was garbled. Traffic, which he believed to be inbound to Newcastle [the DHC-8], was observed 15nm NW of the GR4 tracking E that was called to the GR4 crew as the DHC-8 descended through FL125. Asking for confirmation that the GR4 crew was receiving a 'service' from the AWACS ac again, they replied in the affirmative so he asked if the E3 controller had called the traffic. The GR4 crew did not reply so he himself passed updated traffic information on the contact which was 7nm NW of the GR4 descending through FL115, suggesting it may be under a RAS, which the crew acknowledged.

He then rang Newcastle ATC on the landline to advise that although he was not controlling the Exercise ac squawking A4752 – the GR4 – he had passed traffic information on their traffic and asked if it was under a RAS. They confirmed this was so and that they were taking avoiding action against the GR4. Commenting to Newcastle that their DHC-8 had entered the range, he updated the GR4 crew on the position of the DHC-8 as it was now 3nm NW indicating a similar level. Advising the GR4 crew that the civilian traffic had entered the range whilst manoeuvring away from their jet, the GR4 crew stated they were 'knocking-off' and tracking behind the DHC-8. Confirming that the GR4 crew were visual with the DHC-8 he passed this on to Newcastle who informed him that the DHC-8 crew was responding to a TCAS RA. The GR4 crew reported clearing to the E and he updated the traffic information – the DHC-8 being 3nm to the ENE – adding that its crew was taking TCAS "avoiding action". The GR4 crew reaffirmed they were visual and clearing to the E so he reiterated that the DHC-8 crew was taking TCAS avoiding action against their jet and by clearing in that direction would mean the DHC-8 crew having to take further avoiding action – the GR4 crew subsequently cleared to the N.

In his view, the GR4 crew, whilst visual with the DHC-8 and operating within Class G but inside EGD510 (Spadeadam) towards the end of the occurrence, nevertheless operated close to the DHC-8 despite being advised initially the flight was likely to be under a RAS and latterly that the DHC-8 crew was responding to a TCAS RA against their jet. The DHC-8, known to require a RAS, was routed just S of EGD510 which was NOTAM'd active to 18,000ft amsl because of Exercise Joint Warrior. This airspace was also notified under an ACN. Therefore, the DHC-8 had little airspace for avoiding action against Exercise traffic displaying 'unverified' Mode C.

UKAB Note (2): NOTAM J4684 & J4685 notified the extended vertical limit of EG D510 & 510A between 0800-1600UTC this day, from the surface to 18000ft and 15000ft respectively.

THE E3D AWACS FIGHTER CONTROLLER (FC) reports that as part of Exercise Joint Warrior he was tasked to control a formation of 4 GR4 ac conducting an exercise mission against a variety of ground targets in the Spadeadam area. The formation came under his control in the vicinity of Teesside and was marshalled close to AARA5. Once the exercise scenario commenced, the formation split into 4 separate ac operating in the area between D609 and D510. The subject GR4 crew was asked to contact Spadeadam Range Control prior to entering D510 as the AWACS had not been able to co-ordinate the range entry clearance on their behalf. A moderate level of "stranger" traffic was observed along the Northumberland coastline but he had no recollection of the specific incident.

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THE E3D AWACS FIGHTER ALLOCATOR (FA) reports that nothing abnormal was reported during the flight and he has no recollection of anything unusual from this sortie. From his logbook, the GR4 checked in and were given a FIS before being passed to Spadeadam iaw E-3D SOPs. As the flight had been passed to Spadeadam, the fighter controller focused on other flights outside Spadeadam Range.

SATCO SPADEADAM comments that he did not witness this event but he is content that the SPD controller acted in the best interests of flight safety in giving timely and accurate traffic information to an ac not under his control but simply monitoring his frequency. The controller has pointed out that civil ac have very little room for manoeuvre as they approach Newcastle Airport and perhaps this serves as a salient reminder to CAT flights that the relative safety of CAS may be a better route to avoid exercise traffic in a NOTAM'd area. However, this event does not constitute an infringement of the Danger Area as the civil ac was manoeuvring in accordance with a TCAS RA.

As a learning point for his controllers, he has arranged some reciprocal visits for Spadeadam and Newcastle staffs to provide a better understanding of the airspace and to discuss further how we can provide a safe and efficient ATS in this confined area.

ATSI reports that at 1450:29, the DHC-8 crew established communications with Newcastle RADAR, reporting descending to FL90 and in receipt of the ATIS information. The Newcastle Radar controller responded *"…you are identified 3-6 miles west of Newcastle it's Radar Advisory Service vectoring ILS approach runway 2-5 fly heading 0-7-0 degrees".* On its current track, the DHC-8 would pass to the S of EGD510 Spadeadam. Once the pilot's readback was complete, the controller instructed the flight to stop descent at FL100, though gave no reason for this. The controller, using the Great Dun Fell (GDF) Radar source, explained in his written report that he had taken this action due to unknown military traffic 'SE indicating FL65', presumably to effect separation under the RAS. The GDF radar recording shows the DHC-8 passing FL124 Mode C with the 'unknown' GR4, wearing a Special Events SSR code - A4752 [an unvalidated and unverified squawk] - in its 1 o'clock 12nm, tracking SW.

MATS Part 1, Section 1, Chapter 5, Paragraph 1.4, describes a RAS as:

"..an ATS surveillance 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. Where time does not permit this procedure to be adopted, the controller shall pass advice on avoiding action followed by information on the conflicting traffic. Even though the service is an advisory one, controllers shall pass the 'advice' in the form of instructions."

In addition, the following sub-paragraphs are relevant:

"e) 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 5 nm or 3000 feet, except when specified otherwise by the CAA. However, it is recognised that in the event of the sudden appearance of unknown traffic, and when unknown aircraft make unpredictable changes in flight path, it is not always possible to achieve these minima.

f) Controllers shall continue to provide information on conflicting traffic until the confliction is resolved."

Over the next 30sec the 'unknown' ac – the GR4 - commenced a climb and made a R turn onto a track that converged with that of the DHC-8. At 1451:32, the DHC-8 crew was instructed to stop its descent at FL110 but no traffic information on the unknown was passed. The radar recording shows the DHC-8 at FL114 while the unknown is climbing through FL85 Mode C. Some 8sec later, at 1451:40, the controller transmitted to the DHC-8 *"…avoiding action turn left heading 0-1-0 degrees unknown traffic was right 3 o'clock range 4 miles manoeuvring - fast jet climbing up he's indicated 2 thousand feet above you climbing".* The radar recording, again using the GDF, places the unknown 2000ft below that of the DHC-8 at this time, rather than above it, as described by the controller: Mode C readouts show the GR4 at FL092 while the DHC-8 is at FL112. The passing of this incorrect and misleading information was not detected during the post-incident radar and RTF replay at the Unit. Unfortunately, the Unit's radar recording is no longer available for a re-examination. Without further information, the controller's action remains unexplained.

At 1451:48, just before the end of the above transmission, all SSR information on the unknown 'drops out'. However, the data returns in the next sweep, timed at 1451:56, when the Mode C indicates FL98. Thereafter, the range increases marginally to 6nm as the GR4 turns R, away from the DHC-8, towards the NE still climbing. Then, at 1452:11, when the GR4 is passing FL104 Mode C, it reverses the turn, back towards the DHC-8 once more. Whilst in the turn, the GR4's SSR 'drops out' again, returning in the next sweep. The DHC-8 is now in the L turn onto its assigned heading [of 010°] at FL112 Mode C but will soon penetrate the confines of the Spadeadam Danger Area. At 1452, the Spadeadam Radar controller telephoned Newcastle on the direct line, which was answered by another controller in the Newcastle Approach Control Room – not NEW RAD 1 controlling the DHC-8. Spadeadam reported that the A4752 traffic was receiving a service from an AWACS; however, he was in communication with this ac and had passed traffic information on the Newcastle traffic [the DHC-8]. Responding, Newcastle stated that the DHC-8 was maintaining FL110 and taking avoiding action. The Spadeadam controller then commented that the DHC-8 had entered the 'range' - EGD510 - to which Newcastle explained that this was a result of his ac manoeuvring for avoidance. The telephone line remained open. (Note: fortunately, no other aircraft appears within the Danger Area at the time).

The 'unknown' GR4 then moves into the DHC-8's 4 o'clock position, still turning L and by 1452:36 it is 300ft above the twin turboprop at FL115 Mode C. At this point, the NEW RAD 1 controller instructed the DHC-8 crew to turn right heading 090°: however, the response from the pilot was "[C/S] *er RA",* which was acknowledged. Over the course of the next few seconds, the GR4 settled on a NW'ly track that will pass astern of the DHC-8 and started a descent. Then, at 1452:52, and co-incident with the point of minimum vertical separation, the DHC-8 pilot announced *"…clear maintaining er 1-1-0".* At the CPA, both ac are indicating FL110, the DHC-8 now appearing steady on 010°; the GR4, meanwhile, is in its 5 o'clock at 2·5nm. Subsequently, the GR4 passed through the DHC-8's 6 o'clock [at the minimum range of 2·3nm] and then turned N, passing to the W of the Newcastle traffic and continuing in descent. After the 'avoiding action' transmission, updates in traffic information are notably absent and it was not until 1453:04, when a second traffic information call was provided, the controller stating, *"…previously reported traffic is now southwest of you 3 miles tracking northwest indicating 5 hundred feet above you I believe you to be clear and we're speaking to Spadeadam now".* The Mode C readouts on the radar recording show the unknown at FL103 and the DHC-8 at FL109, changing in the next sweep, immediately after the transmission, to, respectively, FL105 and FL110. It is again noted that incorrect vertical position information was provided to the DHC-8 pilot.

It would appear from the Mode C readout that during the TCAS RA manoeuvre, the DHC-8 descended approximately 300ft. Meanwhile, on the telephone, Newcastle notified Spadeadam that the DHC-8 had received an 'RA' in respect of the military traffic, Spadeadam replying that its traffic was now visual with the DHC-8. By 1454:01, respective tracks are diverging as the DHC-8 turns R to 090° and clears the Danger Area; the GR4 is now 4·2nm to the W and 1500ft below the twin's Mode C level.

Under the RAS being provided to the DHC-8, the Newcastle Radar controller took early action in an attempt to achieve the vertical separation minimum against the unknown traffic. Once this traffic commenced a climb and unexpectedly turned towards the DHC-8, he issued an avoiding action turn in an attempt to resolve the confliction. The turn took the DHC-8 into the Spadeadam Danger Area but fortunately no traffic was evident at the time and landline dialogue with the range was established. After the initial threat subsided, the 'unknown' GR4 turned back, once more into conflict with the DHC-8. The pilot reported receiving a TCAS RA, resulting in a descent of a few hundred feet. The traffic information issued by the controller was less than the pilot could have expected under a RAS, especially in a constantly changing situation. On the two occasions when it was passed, both contained incorrect information. According to the GDF radar recording, minimum separation was 2·5nm horizontally, with both ac at the same level as the GR4 passed astern of the DHC-8.

MIL ACC reports that Exercise Joint Warrior, the subject of a NOTAM and ACN, was taking place this day within and around Spadeadam Range up to 18000ft amsl. Exercise aircraft checked-in with an E-3D [AWACS], were placed under a FIS and then passed to Spadeadam Range for 'target prosecution'. The E-3D communications transcript was not available whilst compiling this report.

The Tornado GR4 formation came under the control of the AWACS whilst in the vicinity of Teesside and was marshalled close to AARA5. When the Exercise scenario commenced, the Tornado GR4 formation split into individual units. The GR4s were then asked to 'contact' Spadeadam Range Control before entering the range, as the AWACS was not able to co-ordinate their range entry clearance. Additionally, the GR4s were told to maintain communication with the AWACS on the 'back box'. No ATC handover took place between the AWACS and the

Spadeadam Radar controller nor did the AWACS inform the GR4s that their FIS was terminated. The subject GR4 crew established radio contact with Spadeadam Range at 1450:00, whereupon the formation was cleared into the Range and to standby for Air Traffic Control; the GR4 crew acknowledged the clearance into the Range. At 1450:22, the Spadeadam RADAR controller [SPD] identified the GR4 by confirming the ac's squawk and asked what type of radar service the GR4 crew required and at what levels. They replied *"currently working with the AWACS we're looking at pre-booked traffic for the range."* SPD acknowledged this and asked again *"do you require an ATC service?"* to which the GR4 crew replied *"Negative".* Although SPD was not providing an ATC service to the GR4 crew, traffic was called at 1450:49 *"..you do have traffic* [the DHC-8] *North-West of you by 15 miles tracking East inbound to Newcastle descending through FL125, that aircraft believed to be RAS."* The radar replay places the DHC-8 approximately 280°/14nm from the GR4 which was indicating FL80 descending. SPD went on to say to the GR4 crew *"…understand you're working the AWACS and do not require an ATC* [service] *from Spadeadam?"* The GR4 crew replied *"Affirm."* SPD asked if the AWACS had called the traffic to the GR4 but got no response. On the radar recording the GR4 is seen to make a R turn [towards the DHC-8] and climb. SPD updated the traffic information to the GR4 crew at 1451:26, *"…traffic information. The previous called traffic from Spadeadam, is now North-West by 7 miles tracking East descending through FL115 he will be RAS civil traffic inbound to Newcastle."* To which the GR4 crew replied *"… copied."* The radar recording places the DHC-8 335°/ 7nm from the GR4 which was indicating FL77 climbing. It should be noted that in the GR4 pilot's account he reports receiving a RIS from either Spadeadam or the AWACS when in fact he was not receiving a radar service from either unit. SPD then called Newcastle ATC to inform them that the GR4 was not under SPD's control but that the DHC-8 had been called to the GR4. Newcastle informed SPD that the DHC-8 was taking avoiding action against the GR4. SPD then advised Newcastle that the DHC-8 was inside Spadeadam Range. SATCO Spadeadam states in his report that he was content this did not constitute a range infringement as the DHC-8 was manoeuvring to avoid the GR4. SPD informed the GR4 crew that *"the previous reported traffic is now taking avoiding action is currently North-West of you by 3 miles indicating similar level"*, which was acknowledged. From the radar replay, both ac are shown indicating the same level when the DHC-8 bears 335° - 2·5nm from the GR4. SPD went on to inform the GR4 crew that the civilian traffic had entered the range due to the GR4's manoeuvring. The GR4 then reported to SPD "*knocking off there, attacking behind the traffic standby."* At 1452:54, SPD asked if the GR4 crew was visual with the traffic, that was reported to be 2nm due N, to which the GR4 replied *"Affirm*". SPD then informed Newcastle that the GR4 was visual with the DHC-8, Newcastle replying that DHC-8 was now manoeuvring in response to a TCAS RA. At 1453:16, the GR4 crew advised SPD *"We're now going to clear the range to the East, just trying to work what was going on there."* SPD updated the GR4 crew as to the DHC-8's position *"believe the aircraft is now East North East by 3 taking TCAS avoiding action from you."* The GR4 crew reiterated that they were visual with the traffic and clearing the range to the E. SPD informed the GR4 crew *"Okay Sir, but if you do clear the range to the East of you taking avoiding action against and he may have to do further avoiding action."* In response the GR4 replied "[we'll] *give him a wide berth on the way."* From the radar replay the GR4 is then observed turning N away from DHC-8. SPD updated Newcastle as to the GR4's intentions. From the radar replay, the CPA appears to be 2·3nmH/600ft V Mode C.

The Exercise taking place in Spadeadam Range was NOTAM'd and subject to an ACN. Despite believing that he was receiving a RIS from Spadeadam or the AWACS [from the GR4 pilot's report], the GR4 crew was actually operating without a radar service. In the interest of flight safety and under the auspices of 'duty-of-care', the Spadeadam RADAR controller provided traffic information to the GR4 crew despite not having any responsibility to do so.

HQ AIR (OPS) comments that this was a complex incident which took place during a busy NOTAM'd exercise. The GR4 crew were in contact with both the E3 and Spadeadam although unaware that they were not receiving a service from either. The Spadeadam Air Traffic Controller did well to provide the GR4 crew with the information they required.

The purpose of this major exercise, as with all training of this type, was to simulate weapons delivery on time – on target, but I am not sure that the crew did not place this too highly in their priorities. That said, they saw the DHC-8 and avoided it – 'though not by enough to avoid a TCAS RA.

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 ASACS Advisor stressed that the service provided by the control team on the AWACS to the Tornado formation during this Exercise would have been limited generally to tactical information about the Exercise mission. Although a transcript was not available of the mission RT from the E3D, it seemed clear from the Fighter Allocator's report that only a FIS was provided. Furthermore, the absence of a formal termination of the FIS provided by the Air Defence controller would not be unusual once the jets were inbound to their target area within the confines of the Spadeadam Danger Area. As the FC had related, it was preferable, from the tactical perspective, for crews to free-call Spadeadam soonest to ensure their range entry clearance could be obtained – as here directly by the crews themselves. The controllers onboard the E3D could then turn their attention to the next aspect of the mission.

A 'contract' had evidently not been established with Spadeadam for a radar service and the Spadeadam Air traffic controller (SPD) had endeavoured to clarify this point at an early stage. Thus the GR4 crew was mistaken if they believed that they had asked for or were in receipt of a RIS from either the E3D or SPD before or after they entered the confines of the Range. Controller Members commended SPD for his swift appreciation of the situation and the conscientious manner with which he tackled it, promptly recognising that the GR4 crews might not be aware of the DHC-8 that was in between them and their target area. Although the GR4 crew had said they did not require a radar service and SPD had not actually placing the flight under a radar service, he had to all intents and purposes given them a RIS, with a good flow of traffic information being provided. It was clear that SPD astutely provided accurate and pertinent traffic information to ensure that the GR4 crew was kept closely updated over what was happening so that they might spot the airliner at the earliest opportunity. Whilst some might contend that SPD had 'overstepped the mark', controller and pilot Members alike believed that SPD had acted conscientiously to avert a more serious problem, keeping the GR4 crew closely appraised about the DHC-8's TCAS RA and suggesting a suitable course to clear away from the DHC-8, albeit that the GR4 crew had the airliner in visual contact at that stage. Some pilot Members wondered if the GR4 crew were too fixated on their mission but others familiar with the nature of the practice attack being flown opined that the crew would have been endeavouring to complete a fairly complex task and would have been very surprised when the DHC-8 entered the Danger Area. It was explained to the Members that the normal entry for Range traffic cleared into D510 is either from the N or the S and the DHC-8 had crossed extremely close to the southern boundary of D510 thereby placing itself between the GR4 and the target area. For their part, the GR4 crew had obtained Range entry clearance and were plainly endeavouring to steer clear of the DHC-8 whilst still trying to salvage their Exercise attack run which needed a fairly precise set-up. The GR4 crew's Command had suggested that they might have chosen their priorities more carefully: it was however clear to the Board that they had deviated significantly from their planned route to remain clear astern of the airliner which should not have been in the Danger Area in the first place. However in doing so, it was plain that the GR4's projected vector would potentially penetrate the 'safety bubble' around the DHC-8 surveyed by TCAS at the time. Hence although the airliner had been sighted, the GR4 crew's avoiding action manoeuvres would still have triggered an RA in the DHC-8's TCAS, despite them flying no closer than 2·5nm at the same level as the DHC-8 whilst trying to avoid it and simultaneously adhering as closely as possible to their mission profile.

It was clear from the NOTAM that the raising of the upper limit of D510/510A had been promulgated specifically for this Exercise. From the DHC-8 pilot's comprehensive account it was apparent that they had specifically aimed to remain clear of the heightened activity. However, the Board was concerned that although they had taken care to route from the CL direct to the NT, this still took them close to the southern boundary of the Danger Area where Exercise traffic would be approaching the Range. Thus there remained a significant potential for a conflict with ac participating in the Exercise. An Area controller Member familiar with this airspace commented about the effectiveness of the NOTAM in highlighting so large a tract of airspace for this event and the DARS Advisor wondered if the Safety Case/Risk Analysis of this route through Class G airspace had taken account of the potential for encounters with Exercise traffic inbound to the Range from the S. The Board agreed it was unwise to fly CAT routes this close to an active and notified Danger Area at a time of heightened activity during a large-scale exercise. Nevertheless, this was Class G airspace and all airspace users were obliged to take account of the disparate needs of other operators – civilian or military.

Evidently, the radar recording showed that only the subject GR4 Tornado was in the immediate vicinity of the DHC-8 at the time of this Airprox and not two as the latter's pilot had thought. Furthermore, the GR4 had climbed to medium level after passing clear to the N of Newcastle, SW bound, to approach D510 from the S. Although the Newcastle Radar controller providing a RAS to the DHC-8 crew might have perceived that the GR4 was going to continue to the SW, it should have been evident to NEW RAD 1 that with a NOTAM'd exercise in progress in this area, also the subject of an ACN that should have been available within Newcastle ATC, there was a strong

possibility that the jet would turn into the range - as subsequently proved to be the case. Whilst this was clearly said with the benefit of all these details laid out before them, Members contended that those familiar with this airspace and range entry patterns into Spadeadam might have quickly surmised that a fast contact squawking a special events (Exercise) code might be a military jet participating in the promulgated Exercise Joint Warrior which included Spadeadam Range. Clearly the avoiding action instruction to the DHC-8 crew that resulted in their entry into the danger area unannounced was unwise, but controller Members were aware that NEW RAD 1 had little room to manoeuvre so close to the boundary of the Danger Area. When the GR4 turned inbound to the range climbing through FL85 the ATSI report had made it clear that the controller had already spotted the confliction and had stopped the DHC-8's descent, electing to issue an avoiding action L turn onto 010° moments later at 1451:40, as the GR4 steadied NE'ly. By this stage the GR4 crew had already been passed traffic information twice by SPD but it was not clear at exactly which point they had spotted the DHC-8, which was not confirmed on RT until 1452:54 when they were evidently crossing astern. From the profile flown by the GR4, Members believed that the crew had turned NE'ly to avoid the DHC-8 having spotted it at their reported visual acquisition range of about 5nm, as it was directly in the path of their simulated attack profile, although SPD was not actually advised of this until a little later as the crew would have been working very hard indeed. Some controller Members were of the view that it might have been wiser for NEW RAD 1 to have made the avoiding action turn to the R in these circumstances, taking the DHC-8 away from the active Danger Area towards more open airspace with more room for manoeuvre, whilst giving the crew a better chance to spot the jet and, with the benefit of a significant differential of nearly twice the speed, the much faster GR4 would have opened the range somewhat. However this was all with the benefit of hindsight. As it was NEW RAD 1 having elected to turn the DHC-8 L had placed the airliner exactly in between the GR4 and its target location. However, through sound appreciation of the situation, SPD recognised what was occurring and took appropriate action. The GDF radar recording reflected that the GR4 had turned L to pass astern of the DHC-8, but in doing so climbed to a maximum of 300ft just above the latter, at a range of 3·7nm at 1452:35. It was clear from the Newcastle RT transcript, included within the ATSI report, that the DHC-8 crew had reported their RA at this point as the GR4's nose would have swept through the 'safety bubble' surveyed by TCAS and not long afterwards that they were 'clear of conflict'. However, with confirmed visual contact to SPD, the GR4 was on course to cross 2·5nm behind the DHC-8 whilst descending through the level of the airliner just after the jet had crossed the southern boundary of the Danger Area itself. Thereafter, at the closest point of 2·3nm, the GR4 was already passing astern, some 600ft below the DHC-8, on a divergent heading towards the crew's target area after the controller had instructed the DHC-8 crew to turn E. That the DHC-8 crew had not spotted the Tornado visually at all throughout the encounter was not surprising. From the limited accuracy of the azimuth information displayed to them by TCAS, the incorrect traffic information from NEW RAD 1, which placed the jet above the airliner when it was actually below it, and later vice versa, the Board, understood why they would have been concerned at the time and thought there might be two jets about. However, from the comprehensive accounts provided to the Board it was clear that the GR4 crew, with the helpful assistance of SPD, had spotted the unexpected intrusion of the DHC-8 into D510/510A, had taken account of it and manoeuvred around the airliner whilst continuing as best they could with their Exercise attack profile.

In summary, the TCAS RA stemmed from the unintentional entry of the airliner into Spadeadam Range as a result of the avoiding action issued by NEW RAD1 whereupon the DHC-8 crew detected the presence of the jet whilst the GR4 crew were actively avoiding their airliner. The Board therefore concluded that the Cause of this Airprox was a sighting report (TCAS) with no inherent Risk of a collision.

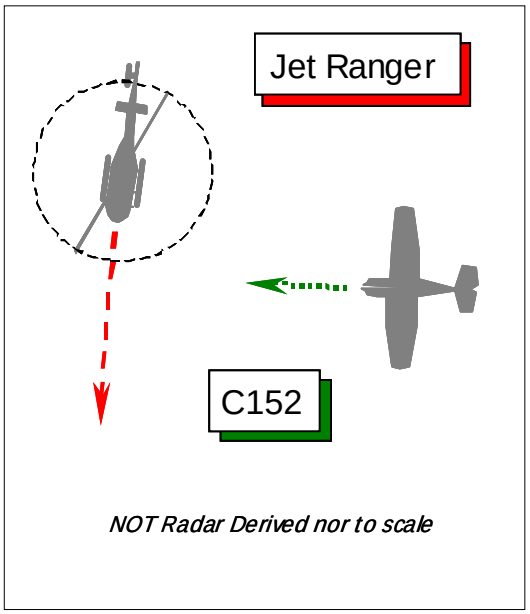
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report (TCAS).

Degree of Risk: C.

AIRPROX REPORT NO 146/08

Date/Time:	14 Oct 1031	
Position:	5121N 00121E (Manston A/D elev:178ft)	
Airspace:	Manston ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	C152	B206 JetRanger
Operator:	Civ Trg	Civ Comm
Alt/FL:	400ft↑	800ft
	QNH (1021mb)	Rad Alt
Weather	VMC	VMC
Visibility:	N/R	>20km
Reported Separation:		
	Nil V/200ft H	500ft V
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C152 PILOT, a flying instructor with a student, forwarded his report 5 months after the event stating that he was operating VFR in the RW28 cct at Manston and in communication with Manston TOWER on 119·925MHz. Whilst on climb-out from a 'touch & go' heading 283° climbing through 400ft, a helicopter pilot who was operating in the vicinity of the aerodrome – the B206 JetRanger pilot - was instructed by TOWER he thought to "pass behind the C152 on climb out". The helicopter pilot was heard on RT, he thought, to reply to the controller "I am visual with the R22" [actually an R44] helicopter holding waiting to cross the active RW28 behind his C152. The B206 started across the RW but TOWER did not register that the B206 JetRanger pilot had read-back the wrong ac type. Sighting the B206 JetRanger some 200ft away crossing ahead from R – L at the same height, he commenced the crosswind L turn early to avoid the JetRanger and assessed the Risk of collision as *"high".*

THE BELL B206 JETRANGER HELICOPTER PILOT reports that he departed from a private site N of Manston [within the ATZ] after 'booking-out' by telephone to cross the aerodrome from N to S towards Ash. Established RT procedures dictate a call to Manston TOWER on 119·925MHz before lifting so he called to take-off and was cleared to lift but to wait before crossing RW28. He lifted to the N, climbed to 800ft agl Rad Alt and turned onto a heading of 180° at 100kt, before being cleared to cross RW28 by TOWER. He thought he was asked if he was visual with the C152, which he was, below and to the E, before crossing the runway. Additionally, he was visual with an R44 helicopter at the eastern end of the aerodrome that was also crossing. At the point of crossing in front of the C152, his helicopter was ahead of and about 500ft above the aeroplane and clear of the centre line. The reporting C152 pilot then called TOWER on the RT and opined that he, the B206 JetRanger pilot, had not seen the C152. The Controller queried if he had seen the aeroplane and he confirmed he had. The C152 then turned slightly S before continuing on the runway heading.

THE MANSTON AERODROME CONTROLLER (ADC) reports that the B206 JetRanger helicopter was departing under VFR from a private site to the NW of Manston aerodrome. The B206 pilot was instructed to lift 'at his discretion' and to remain N of RW28. Traffic information was given to the B206 pilot about the C152 flown by the reporting pilot which was executing a 'touch and go' into the LH visual cct to RW28. He thought the B206 helicopter pilot reported visual with the C152 and so was instructed to cross the active RW28, whereupon the B206 helicopter was observed to pass above and he perceived behind the departing C152. Whereas, the C152 pilot stated that avoiding action was necessary against the helicopter, the B206 pilot reported he had the C152 in sight at all times. The pilot of the C152 advised that he would be filing an Airprox in a later follow-up conversation.

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ATSI reports that the C152 was carrying out left hand ccts to RW28 at Manston. At 1029, the flight was cleared for a 'touch & go'. At the time, there was an outbound R44 helicopter proceeding to holding point B1, on the N side of RW28, prior to its departure. Establishing that the pilot of the R44 was visual with the subject C152, he was cleared to lift when the aeroplane had passed.

Just after this, the B206 helicopter pilot established communication with Manston TOWER, reporting at the Helicopter Landing Site (HLS). The pilot requested to lift and cross the active RW28 outbound to Ash (W of Maidstone). The HLS complex is situated 750m due N of the RW10 threshold. The agreed procedures for the HLS, as stated in the Manston MATS Part 2:

"As the site is within the Manston ATZ, all movements to and from the site during Manston's hours of operation must establish communication with Manston ATC before entering the ATZ and for departures, before getting airborne. All departures to be booked out in advance with ATC."

The departure procedures, for low-level south-bound flights, are:

"Initial lift for crossing at 500ft QFE overhead E2 Hold. Height restriction may apply – ATC to advise. Orbiting hold action can occur for helicopters transiting N to S overhead E2 at 500ft, but remaining North of Alpha taxiway until cleared. Then depart South 175° (T) until clear of ATZ".

The B206 helicopter pilot was cleared to *"..lift at your discretion remain north side traffic information for you is a 1-5-2 just rolling into the lefthand circuit report if you get him in sight"*. The pilot reported looking and, shortly afterwards, *"ready for a cross visual with the Fortyfour"*. The controller replied "[C/S] *thanks with that aircraft in sight you can cross from north to south report south-side"*. The pilot confirmed *"Crossing will report on south-side"*. The controller advised the C152 crew that the Jet Ranger airborne from the helipad *"has you in sight going to be tracking southbound VFR"*. The pilot responded *"Yeah I think he had the Fortyfour in sight he's just above me"*. When the B206 helicopter pilot reported south-side he was given traffic information about the R44 leaving the ATZ to the south. The pilot reported visual. The pilot of the C152 then commented that he believed the B206 helicopter pilot had been visual with the R44 rather than his aeroplane. When the B206 helicopter pilot was asked "[C/S] *just confirm you did have the Cessna in sight"* he responded *"affirm".*

The controller believed that the pilot of the B206 helicopter had reported sighting the C152, whereas he had mentioned sighting the "…*the Fortyfour"*. Nonetheless, the pilot of the B206 did confirm he had sighted the C152, both on the frequency after the event and in his written report. It was noticeable in his written report that the B206 helicopter quoted the C152's C/S correctly, which included a particular figure. It is not known whether this similarity in numbers to another helicopters type led to any confusion on the frequency.

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was evident to the Members from the RT tape transcript that when TOWER reported the presence of the C152 "…*traffic information for you is a 1-5-2 just rolling into the lefthand circuit report if you get him in sight"*, the B206 pilot's reply shortly afterwards of *"ready for a cross visual with the Fortyfour"* was misleading. This was significant for although the B206 pilot had advised on the RT that he had the R44 in sight, he made no mention of the C152 and TOWER did not challenge this response. The ADC's account reflected, incorrectly, that he believed that the B206 pilot had reported the C152 in sight and consequently, the B206 pilot was allowed to cross the RW – "..*with that aircraft in sight you can cross from north to south report south-side"*. Whilst it subsequently transpired from both his later RT transmission and his report that the B206 pilot was indeed visual with the C152, controller Members recognised that this was not apparent from his RT reply beforehand and the C152 pilot was understandably concerned. Controller Members agreed that the ADC should have questioned the B206 pilot's reply immediately. Perhaps 'Human Factors' played a part here and the ADC heard what he expected to hear, but even if this was the case the ATSI Advisor suggested that the clearance issued to the B206 pilot to cross the RW should have specified more explicitly that the helicopter pilot could only cross astern of the C152: i.e. "after the departing C152 cross…". A civilian area controller Member took another view, however, insofar as he perceived

that the B206 pilot's reply implied visual contact with the C152 and that he was also telling the ADC in a roundabout way that he could also see the R44 without any further comment being necessary from TOWER. This Member believed that the crossing clearance issued was, therefore, satisfactory. However, this was a solitary view; other controller Members – both military and civilian - concurred completely that the ADC should have rechecked that the B206 pilot was visual with the C152 before issuing the crossing clearance which was considered to be ambiguous and did not require the B206 to cross astern of the C152 climbing into the cct that would clearly have been more appropriate. In the Board's view the unrestricted crossing clearance given to the pilot of the B206 JetRanger by the ADC was a contributory factor.

In these circumstances, pilot Members believed that the JetRanger pilot was under remit to give way to the aeroplane having reported, after the event, that he had had the aeroplane in sight. Plainly the C152 pilot climbing up from his 'touch & go' felt he was in a vulnerable situation at the time and undoubtedly he was restricted in his ability to manoeuvre as he climbed away. His ac was indeed 'traffic' to the B206 and had to be avoided by the helicopter pilot. Furthermore, the 'Rules of the Air' entreat pilots to *"…avoid passing over…the other ac, or crossing ahead of it, unless passing well clear".* Therefore, without a more restrictive clearance from TOWER, it was up the B206 pilot to choose where to cross the RW and what separation to afford the C152 – both vertically and horizontally. The C152 pilot reports that the JetRanger had passed some 200ft away crossing ahead from R – L at the same height so he commenced the crosswind L turn early to avoid it. From the JetRanger pilot's perspective, however, he was 500ft above the C152 when he crossed the RW ahead of the C152. It was not feasible to resolve this anomaly as this Airprox occurred well below the coverage of any recorded radar sources. Neither did the ADC's account help here as from his perspective in the Tower he reports that the JetRanger passed astern of the C152, at variance with the pilots' accounts. Whatever the geometry of the situation, the separation that existed here was plainly of the B206 pilot's choosing and it was apparently close enough to cause the C152 pilot concern, which the Board concluded was the overarching Cause of this Airprox. However, with both pilots in visual contact with each other's ac and broadly aware of what the other was doing, the Members agreed unanimously that no risk of a collision had existed in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The B206 JetRanger pilot flew close enough to the C152 to cause its pilot concern.

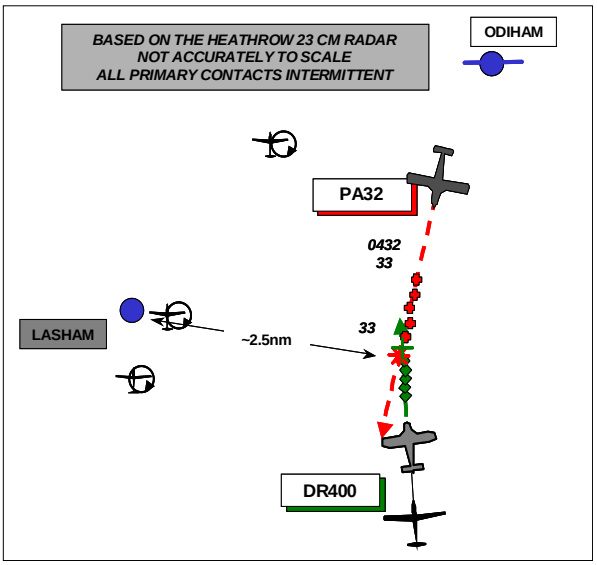
Degree of Risk: C.

Contributory Factors: The Manston ADC gave an unrestricted crossing clearance to the pilot of the B206 JetRanger.

AIRPROX REPORT No 147/08

AIRPROX REPORT NO 147/08

Date/Time:	12 October 1030 (Sunday)	
Position:	5110N 00057W - elev 618 ft)	(2nm ESE Lasham
Airspace:	London FIR	(Class: G)
	Reporting Ac	Reported Ac
Type:	Robin DR400	PA32
Operator:	Civ Club	Civ Pte
Alt/FL:	2700ft (QFE)	3000ft (QNH See Note 1)
Weather	VMC CAVOK	VMC NR
Visibility:	15km	10nm
Reported Separation:	50ft V/0 H	2-400ft V/0 H
Recorded Separation:	NR V/0 H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ROBIN DR400 PILOT reports that he was aero-towing a K13 Glider on an instructor re-validation flight from Lasham Airfield, in communication with Lasham and in an ac with no transponder fitted. He was about 1nm E of Lasham climbing at 65kt in a nose high attitude and passing 2700ft QFE [3300ft QNH] when he saw the flash of an ac passing below him and at the same time the glider manoeuvred abruptly and released from the tow. At the time, his heading was about 350° and he was turning gently left to drop the glider over Lasham Airfield.

After the glider released, he steepened the turn to the left and looked over his shoulder for the other ac, noting that it was a low wing light ac heading about S at a similar altitude to him. The other ac would have been flying more or less into sun.

At the position of the incident both ac would have been clear of Odiham ATZ and the circuit area of Lasham but just inside the vertical limit of the Odiham MATZ [UKAB Note (1): Odiham was closed at the time of the incident].

He assessed the risk as being high and he was unable to take any avoiding action due to his late acquisition of the other ac.

The prevailing weather conditions in the area of the incident were clear air but there was still fog in the Alton Valley to the W beyond Odiham and over Fleet and Farnborough.

THE PA32 PILOT reports flying a private flight under VFR to Alderney, in a red and white ac, under a FIS from Farnborough LARS and squawking as directed with Mode C. At the time of the incident he was in the cruise at 3000ft QNH and heading S in perfect VMC when Radar told them of traffic at 4nm [UKAB Note (2): The transcript shows it to be 2½ NM] which he immediately acknowledged. Following the call, he saw a tug and glider combination and watched them as they passed safely over the top; he did not adjust track or alt as he considered it unnecessary and assessed that the risk was low.

UKAB Note (3): The Secretariat contacted the glider pilot to get his perspective of the incident. He (the CFI) was flying the ac from the front seat with another instructor in the back carrying out an instructor revalidation exercise. Neither pilot saw the PA32 until it flashed below them. Although he released from the tug the threat had passed about 50ft below the glider before he had time to react. After the incident they recovered to Lasham uneventfully.

ATSI reports that the radar recording showed that the incident took place 2.5nm ESE of Lasham aerodrome, in Class G airspace. No report of an incident was made to the Farnborough LARS West controller by the PA32 at the time; hence the controller concerned had no recollection of an event and did not submit a report.

The Farnborough METARs for the period were:

EGLF 120950Z VRB02KT 0700 R24/P1500 FG VV/// 13/13 Q1024
EGLF 121020Z 13004KT 2500 BR VV/// 13/13 Q1024

On handover from Farnborough LARS North, the PA32 made its first call on the LARS West frequency at 1014. The pilot reported an SSR code 4651 (a North code) and *'just turned the corner at Heathrow*' i.e. abeam the NW corner of the London CTR. He then implied that his route would be via WOD and then direct to Bembridge IOW. The controller issued a West Sector discrete SSR code; advised that a FIS was now being provided and reminded the pilot to remain outside CAS. While not a factor in the incident, it is noted that the flight was not issued with the current Farnborough QNH, the setting used in LARS West (LARS North use London QNH). In the event, the pilot revealed in a later transmission that he was in fact flying on the correct QNH of 1024mb. The pilot did not report his alt at the time but it is shown on the radar recording as being 2300ft.

The FIS, applicable on the date of the incident, is described in MATS Part 1, Section 1, Chapter 1, Page 2, Paragraph 6, where it states:

"A FIS is a service provided without the use of ATS surveillance systems, either separately or in conjunction with other services, for the purpose of supplying information useful for the safe and efficient conduct of flights. Under a FIS the following (relevant) *conditions apply:*

b) A controller may attempt to identify a flight for monitoring and co-ordination purposes only. Such identification does not imply that an ATS surveillance service is being provided or that the controller will continuously monitor the flight. Pilots must be left in no doubt that they are not receiving such a service;

c) Controllers are not responsible for separating or sequencing aircraft.

In addition to the above, controllers will, subject to workload, provide pilots with information concerning collision hazards to aircraft operating in Class C, D, E, F or G airspace when 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."

Over the next few minutes, the PA32 passed abeam WOD and then turned S towards Odiham. To facilitate a departure from Farnborough, the flight was asked if it could accept a climb to 3400ft, which was agreed by the pilot. At 1021:30, the flight was informed, *"There are a number of contacts manoeuvring in and around the Odiham area believed to be gliders operating up to the base",* which was acknowledged. The 'base' of controlled airspace in

The PA32 pilot reported level at 3400ft and, at time 1024, the controller issued another warning *"…just caution for Lasham there's a number of contacts in that vicinity as well believed to be gliders",* to which the pilot replied *"Roger that we're good VMC…".* At this point, the radar shows the ac at 3300ft Mode C and about 4nm N of Odiham with Lasham at a distance of 7nm in its 1 o'clock position. Just over 3min later, the PA32 was given further information *"…got unknown traffic just to the south of you range about two and a half miles very slow moving possibly glider no height"* the pilot replying *"…we're looking at it thank you".* Nothing further was reported by the pilot until he read back a change of frequency to Solent Radar. When the PA32 was given the warning, slow moving primary only traffic is visible on the radar recording in the PA32's 12 o'clock at 2.7nm, tracking NE and then at range 1nm, it turns N onto an almost reciprocal track to that of the PA32. Radar returns merge at 1028:16; with track history suggesting the unknown was in the PA32's 11:30 position just before the two ac pass each other.

There are no apparent implications for ATC in this incident, the Farnborough LARS West controller providing timely and relevant collision hazard information to the PA32, required under the terms of a FIS.

UKAB Note (4): The recording of the Heathrow 23cm radar shows the incident. The PA32 approaches the CPA level at an alt of 3300ft and tracking about 190° but displays some track jitter. Meanwhile a primary-only contact, presumed to be the DR400 combination, approaches the CPA tracking N. Although the CPA takes place between sweeps, by projection the contacts overlap while the PA32 displays 3300ft and the DR400 displays no alt information.

AIRPROX REPORT No 147/08

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 was informed by the gliding specialist Member that the Robin DR400 combination would most likely have been climbing at about 1000fpm in a nose-up attitude, the glider being slightly above the tug ac. The tug pilot and the glider pilots would therefore have had restricted lookout capability, particularly downwards. That being the case, tug/glider combination pilots are encouraged by the BGA to change heading periodically to improve their lookout.

Members observed that the PA32 pilot was in receipt of a FIS in Class G airspace. Notwithstanding that he was not required to do so, the Farnborough LARS Controller had provided good TI to the pilot. Following accurate warnings at 7nm and 2.5nm the PA32 pilot saw the combination in his 12 o'clock at some distance. Having done this, some GA pilot Members were concerned that he then chose to underfly the combination directly, albeit in his view well separated from it. Following glider release, tugs generally break away and descend fairly sharply from their tow with the tow rope almost invisible and well below the ac. For this reason, the Board agreed that if possible it is wise to build in some lateral separation from a tug combination which has the added benefit of making other ac more visible to tug pilots rather than being completely obscured by the tug's nose.

Since the tug was not SSR equipped, it was not immediately possible for the Farnborough Controller to gain any more information regarding the flight profile. In the circumstances of this incident Mode C altitude information in particular would have been of considerable benefit to the controller as this could have enabled him to improve the TI to the PA32 pilot thereby improving the latter's mental air picture. Further, since no Mode C information was displayed by the tug and its pilot was not able to give an accurate estimate of the vertical miss-distance from his fleeting sighting, Members tended towards the estimate of 2-400ft (probably closer to the former) given by the PA32 pilot.

That being the case, the Board considered that the PA32 pilot had flown close enough to the DR400 (combination) to cause its pilot concern. While such a Cause would often attract a Degree of Risk of C, since in this case it had not been a single ac but a combination and the tug's intentions were totally unknown to the PA32 pilot, following specialist advice Members agreed that there had been a degradation of the standard of safety normally expected.

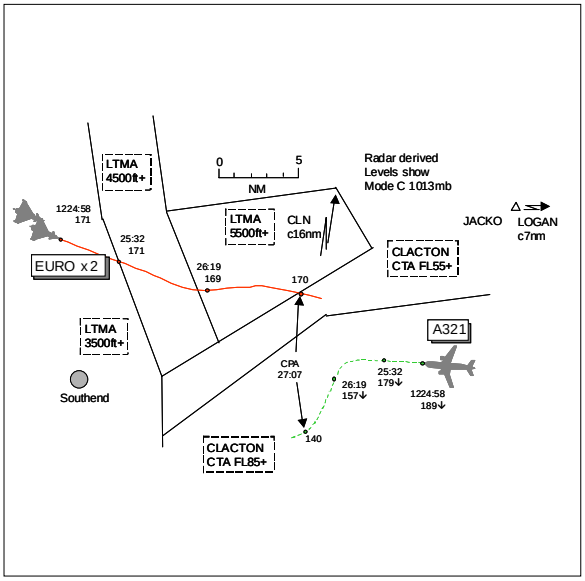
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA32 pilot flew close enough to the Robin DR400 to cause its pilot concern.

Degree of Risk: B.

AIRPROX REPORT NO 148/08

Date/Time:	15 Oct 1227	
Position:	5135N 00104E (16nm SSW CLN)	
Airspace:	CLN CTA	(Class: A)
Reporter:	LTC LAM	
	First Ac	*Second Ac*
Type:	A321	2x Eurofighter
Operator:	CAT	Foreign Mil
Alt/FL:	↓FL140	FL170
Weather	NK NR	VMC CLAC
Visibility:		10km
Reported Separation:		
	NR	1000ft V/6nm H
Recorded Separation:		
	3000ft V/8·4nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LTC LAM CONTROLLER reports working the A321 inbound to Heathrow via SABER. The ac was S of track descending to FL150 and she descended the flight to FL140. Shortly afterwards she observed SOS [emergency] traffic descending to FL170 on a conflicting route, 20nm away heading ESE. She turned the A321 flight L heading 210° to try and turn the ac away from the unknown traffic and since the SOS traffic appeared to be level at FL170 she expedited the A321's descent to FL140 and gave TI. Further TI was given as the SOS traffic was seen to pass to the N of the A321, the closest the ac passed was 8nm. The A321 was then vectored back to LAM. The SOS flight was believed to be working LJAO but no phone call was forthcoming giving the ac's actions or intentions.

THE LTC SABER CONTROLLER reports there were numerous ac given Cleared Flight Paths (CFPs) at FL190 routeing BANEM - JACKO working LJAO. The decision was made to split the sector. The REDFA/DAGGA controller noticed 2 fast-moving primary returns in potential confliction with his departure routes. The E Coordinator phoned LJAO to confirm the level of these returns but LJAO informed him that the ac were not in CAS and would remain so. A few minutes later the Coordinator pointed out an SOS squawk indicating FL172 abeam SPEAR heading roughly 100° in direct confliction with the A321 working LTC LAM. He phoned TC NE DEPS to point out the confliction and the controller turned the A321 out of the way. He then turned the next Heathrow inbound, an A319, to the N as he was not aware of the emergency ac's intentions. LAC S13P was informed and asked to slow further inbounds to give him a chance to recover the sector. Prior to this there was a CFP agreement between TC E and LJAO that all ac on a CFP would be at FL190 during their transit. On numerous occasions returns indicating FL220, 200 and 180 were observed, the FL180 returns were later coordinated. This provided uncertainty as regards the handling of departures in confliction with the CFP as there was no certainty of the level of the next ac to enter CAS.

THE A321 PILOT reports inbound to Heathrow IFR and in receipt of a RCS from London squawking with Modes C and S. On a LAM arrival heading 270° descending to FL140 at 300kt, ATC instructed them to turn L onto 210° which they thought was a shortcut towards the W'ly landing RW. Later ATC instructed them to expedite descent owing to military traffic with an emergency descending in their vicinity. He did not think that any loss of separation had occurred or seemed likely: no TCAS alerts/warnings were received so no ASR was filed. From his perspective it seemed little different from routine vectoring for traffic separation.

THE EUROFIGHTER LEAD PILOT reports that during his return to base from a TLP mission the flight established 2-way radio communication with London Mil on 371·55MHz squawking 1624 with Mode C. From the first communications established, the crews believed they were under radar control and were instructed to stand-by. The flight parameters at the time were such that an initial flow towards the coordinated waypoint was assured. Both crews believed, because of the 'stand-by' call, that they had to maintain the flying parameters - heading 230°

at 300kt and FL170 - pertaining on initial contact. The visibility at the time was 10km and they were cruising 2000ft above cloud in VMC. However, these parameters then began to be inappropriate as the ac started to head away from the planned route. Even after a lot of position reports and their expressed needs to establish a new heading to resume correct navigation, ATC never answered with proper directive calls and kept on saying 'stand-by'. This situation continued for quite a long time until their ac were roughly 90nm away from their planned route and, from the communications flow, it was evident that ATC did not have situational awareness on their position. At this point the crew realised that they were not under radar control and that they were inside CAS so they decided to declare an emergency for fuel owing to the large deviation from their route. He established the flight on their own navigation, stating on the radio the reason and their intention to recover to Belgium. After that ATC reported radar contact but never declared radar control, vectoring the flight towards its Base. During this phase they saw traffic on radar, bearing 150° range 12nm, and executed a L turn of 40° to avoid, the traffic passing 1000ft vertically and 6nm horizontally clear. He assessed the risk as low.

ATSI comments that on the morning of the incident, a Cleared Flight Path (CFP) agreement was in place between LTC E and LJAO to facilitate the transit of foreign military traffic through CAS, after participating in a Tactical Leadership Program (TLP) in East Anglia. The guidance for this procedure is published in the TC MATS Part 2 and advises that TLP aircraft may transit LTC E airspace, when coordinated, at FL190 routeing BANEM [18nm N LOGAN] – LOGAN - KOK [28nm SE LOGAN] 'outbound' from the UK. This route is broadly through the middle of TC East's airspace and runs N-S from BANEM to LOGAN and then SE to KOK. Over the course of the morning, several flights had been coordinated on the CFP route with more expected.

At 1217, the LTC E radar controller observed 2 primary-only targets in the vicinity of LAPRA (12nm SW of BANEM), tracking SW. As they appeared to be in formation and of similar performance to earlier 'CFP' traffic, he asked the E Coordinator to check with LJAO. The transcript of the telephone recording shows the following exchanges, starting with the LJAO's initial response:

LONDON MIL YE-YEAH IT LOOKS LIKE THEY MAYBE ONE OF OURS BUT THEY'RE NOT IDENTIFIED

REDFA THEY'RE NOT IDENTIFIED

LONDON MIL NO

REDFA THEY'RE NOT WORKING YOU

LONDON MIL THEY'RE NOT WORKING US

REDFA AND THEY'RE OUTSIDE CONTROLLED AIRSPACE

LONDON MIL NO

REDFA OK THEN

In his written report, the E Coordinator recalled a different interpretation of the last part of the conversation, stating that he understood *"…they would be outside controlled airspace."* Whatever the case, the MATS Part 1 guidance, current at the time, regarding **Unknown Aircraft,** Section 1, Chapter 5, Page 13, states the action to be taken by the controllers when they observe an unknown ac in Class A airspace:

"If radar derived, or other information, indicates that an aircraft is making an unauthorised penetration of the airspace, is lost, or has experienced a radio failure – avoiding action shall be given and traffic information shall be passed." In addition, the guidance states "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." The required minima would be 5000ft vertical separation or 5nm. At the time, however, these ac were not displaying SSR information and LJAO appeared to be unaware of their level. As a consequence of these 2 elements, Sector controllers did not have to take these unknown ac into account for separation purposes.

The subject A321 was inbound to Heathrow and had entered LTC E from the E under a RCS, tracking almost W towards the LAM hold. Initially descending to FL200, the TC SABER controller issued the flight further descent to FL150 at 1222:20. The 2 primary targets, meanwhile, had reached a position about 10nm E of Stansted Airport,

still on the same track. One minute later, however, they started a L turn onto a track of approximately 105°, line astern and a little under a mile apart. Meanwhile, the A321 was transferred to the LAM sector (LTC N), establishing contact moments later. The LAM controller then issued the flight with further descent to FL140.

At 1224:58, the second ac in the pair started squawking 7700 (displayed on the radar as 'SOS' and flashing). It was also displaying Mode C, indicating at FL171. Assuming they were still in formation, the pair, at FL171, now represented an unauthorised penetration of CAS. The SABER controller reports he recognised that this traffic was now in confliction with the A321 and telephoned LTC N to warn them. He then issued a turn to another Heathrow inbound (not involved in this Airprox) to ensure separation from the emergency traffic.

Alerted to the conflict, the LAM controller, at 1225:32, instructed the A321 to turn L heading 210°. Once this was readback, she then transmitted *"(A321's c/s) expedite your descent please there's SOS traffic that is aiming for you at the moment we're unknown of what he's actually gonna do expedite your descent"* and this was acknowledged. At the time the controller issued the turn, the radar recording shows the A321 passing FL181, with the emergency traffic in its 12:30 position at a range of 18·6nm. While this was taking place, the SABER Coordinator was in discussion with the LJAO, who advised the emergency traffic had free-called them. The Coordinator requested that their traffic be turned L to avoid 'company name' (the A321) and this was agreed.

The LAM controller issued further traffic updates to the A321 pilot on the relative position of the traffic. By 1226:19, the A321 appears established on the assigned heading and is passing FL160; the emergency traffic, meanwhile, has just turned E and is now in the former's 2:30 position, range 10nm. CPA is reached at 1227:07 when the A321, level at FL140, has just commenced a R turn on track to LAM once more and is due S of the traffic by 8·4nm. The military traffic's level remaining virtually unchanged at FL170 Mode C.

There are no apparent civil ATC causal factors in this incident, the LAM controller taking effective action in accordance with the MATS Part 1 guidance in respect of unknown traffic in CAS. Members of the various Sectors within LTC E and LTC N achieved the ultimately safe outcome through a team effort.

MIL ACC reports LJAO operate a sector with 2 TACTICAL controllers (TAC) and a PLANNER (PLNR) situated in between them, coordinating their operations. The TAC controller on the L (TAC L) manages the ICF, and after traffic has been identified control is then transferred to the TAC R controller. In certain conditions, ac may be free-called from TAC L to TAC R without identification. The PLNR carries out all the administrative actions, leaving the TAC controllers to concentrate on controlling the ac, and also obtains ATC coordination wherever required.

This incident occurred during the recovery of multiple ac to Florennes, Belgium on completion of a Tactical Leadership Phase (TLP) exercise over East Anglia. When the subject Eurofighter formation flight called, the recovery to Florennes was already well underway.

Of the eventual 13 speaking units that required recovery, 2 had already crossed into Belgium and a further 4 were already under the control of TAC R. They were established on route at the correct level. TAC L was speaking to 4 other units [all using the same c/s prefix but with different 2 digit suffix] who still required some work to establish sequencing. The subject Eurofighter flight [using the same c/s prefix] made initial contact with TAC L at 1214:56, the crew requesting *"…direct LOGAN from present position flight level 1-7-0"*. At this time non-squawking primary only contacts are seen 35nm E of Mildenhall tracking SW'ly within the Clacton CTA base FL165 which are later identified as the Eurofighter flight. TAC L queried the c/s and after the crew restated their c/s TAC L replied *"…remain clear of controlled airspace you are number 6 standby"*.] The recovery arrangements from the ACN state:

Up to 16 ac (usually in pairs) may be permitted to transit through LTC (Swanwick) E airspace at FL190 following a route BANEM-LOGAN-KOKSY. Pilots wishing to use this route should first free-call LATCC (Mil) LJAO on 371.55MHz. This call should be made **as soon as possible** when approaching the vicinity of Norwich (see Annex A), in the climb to FL190, but remaining well clear of regulated airspace. If necessary, participating aircrew must be prepared to establish an east-west orbit between North Dean and over the North Sea until positively identified and cleared to enter CAS by a LATCC(Mil) LJAO controller. **Under no circumstances are pilots to enter CAS until a positive clearance from the LATCC (Mil) LJAO controller has been given.**

TAC L continued to work on sequencing the 4 ac that were already under his control. Three of the flights working TAC L were issued with sequencing instructions. Another free-call was taken by TAC L from another flight at 1216

which is also told to standby and 1 of the 3 flights being sequenced was transferred to TAC R. At 1217:22 the subject Eurofighter flight re-initiated contact with TAC L stating *"…we would like to proceed left final heading 1-1-5"*. TAC L queried the c/s and the crew reiterated their request adding that they wished to proceed to LOGAN with the heading 115°. TAC L again told the flight to *"…standby please you are now number three"*. Another flight from the 2 ac being sequenced by TAC L was transferred to TAC R and 2 other flights were given further sequencing instructions. TAC L returned to the subject flight at 1218:42 and requested an ident squawk. At this point he was down to 2 ac under his control. As well as attempting to identify the subject Eurofighter flight, he also initiated contact with other exercise ac, based upon their squawks and locations. He then made a general broadcast asking if the ac with specific squawks were on frequency. This resulted in contact with 2 other flights. At this stage he was working hard again with 5 units on frequency. One of these new flights was identified and accepted a delay, continuing an orbit N of the LTMA. The other flight refused a delaying orbit due to fuel. This distracted TAC L from the subject Eurofighter flight as he attempted to sort this out, and another flight, which caused further distraction, with a request for a high level recovery. As a result, TAC L apparently did not realise that the instruction to the subject Eurofighter flight to squawk ident had not resulted in identification. The Eurofighter flight attempted contact again at 1221:02 transmitting *"Eurofighter c/s I am now from LOGAN two nine zero almost forty miles I am able to proceed inbound or I will be declaring emergency"*. TAC L issued descent instructions to 1 of the other flights on frequency before querying the c/s of the subject Eurofighter flight. The crew responded with their c/s and TAC L requested a position report which the crew gave reiterated as LOGAN 290 40nm [approx 15nm E of Stansted]. An ident squawk was again requested and when nothing was observed, TAC L again requested confirmation of the position report. The workload and pressure on the part of TAC L was evident by this point as the controller uses the wrong c/s (addressing a flight which had been transferred to TAC R 5min earlier), indicating callsign confusion. At 1222:34 he instructed this wrong flight (meaning the subject Eurofighter flight) to route to Marham, further indicating that he was not assimilating the position report that was being passed. The subject Eurofighter crew then replied to this transmission with *"...is now two seven zero forty five from LOGAN I need to proceed inbound Florennes now"*. TAC L replied *"...I am trying to find you on radar I have no contact there"*. It would appear that he was searching for the subject Eurofighter in the area that he should have been rather than where the ac were positioned. At 1223:10 the crew responded *"Roger c/s is now squawking seven seven zero zero LOGAN two seven zero four zero nautical miles proceeding inbound Florennes direct flight level one seven zero"*; this transmission was not acknowledged by TAC L. The crew called again at 1224:45 asking *"London could you confirm you copy Eurofighter c/s is now on an emergency squawk"*. TAC L replied *"...affirm however there is nothing showing on radar"*. This ac were still not apparent to TAC L as it was not until 1224:58 before the emergency squawk appeared on the radar. At 1225:20 TAC L made a broadcast transmission *"Station on standby with emergency say again your full callsign please you are identified"* which was rebroadcast 9sec later. The Eurofighter crew responded with their c/s and TAC L immediately issued avoiding action, [L heading 060 traffic was 12 o'clock 5nm converging indication slightly above] whilst his planner negotiated with TC to smooth the way. The crew replied *"...has a radar contact at the same altitude as this traffic"* and then transmitted *"...is showing traffic at flight level one eight zero confirm"*. TAC L replied *"c/s you're now identified at one seven zero avoiding action turn left heading zero eight zero"*. The crew requested confirmation of the heading and requested direct route to Florennes. TAC L acknowledged the request stating that direct routeing would be given shortly after avoiding the traffic into London [subject A321]. Whilst the avoiding action took effect, TAC L dealt with his other ac, transferring 3 of the 4 to TAC R. One ac had already been transferred at 1224 but had not switched frequencies, further adding to the stress of TAC L. At 1227:23, the Eurofighter flight was given a heading direct to KOKSI and they crossed into Belgium without further incident at 1232.

Throughout the period that the Eurofighter formation was in CAS without a clearance, they had 4 erosions of separation with CAT, 2 whilst they were non-squawking and 2 encounters whilst squawking emergency, 1 ac being the subject A321.

The Eurofighter formation entered CAS without the positive clearance required and whilst non-squawking. Whilst transiting CAS, they encountered 2 CAT ac neither of whom was offered avoiding action since, as non-squawkers, the Eurofighters were deemed to be clear of CAS and therefore not in confliction.

Although TLP takes place 6 times a year, the recovery varies, sometimes departing the UK via KOKSI (as in this case) and sometimes via NAVPI. NAVPI departures are handled by LATCC (Mil) E rather than LJAO. As a result, KOKSI recoveries are infrequent and it is difficult for controllers to maintain the relevant skills which are orientated around ac sequencing. This is not a normal part of the AC task. Furthermore, due to Dutch Mil being closed on the day, egress via NAVPI was not possible and all the recoveries were forced through KOKSI. The ACN specifies that 'up to16 ac (usually in pairs)' will be permitted to take this route. However, on this occasion, in an endeavour

to assist, LJAO agreed to take more than the usual number of ac with a NAVPI egress impossible. The eventual number was 13 formations. There are several contributory factors. The free-calling by AWACs of some ac to the transit frequency, rather than the ICF, contributed to workload, this required extra liaison within the controlling team. All the aircraft involved in TLP adopted the same c/s prefixes. At one point, the controller had 4 flights with similar suffixes on frequency. This, combined with the inevitable problems of assimilating accented English from foreign crews, caused considerable c/s confusion and exacerbated the controllers' workloads. Two formations called within CAS, and only a small proportion adhered to the requirement to call early. Throughout the recovery, crews were requesting non-standard levels. This contributed significantly to the controller's' workloads; the late calls in particular meant that the ac were calling up in each others' way and causing delays to their playmates. The crews did not appear to be prepared for delays; once incurred there was a high proportion of fuel priority calls.

The controlling team were working to capacity throughout the period. The workload, combined with the absence of pre-prepared flight strips (specified in the Air(C) Pt2) was a major factor in this incident which undoubtedly would not have occurred otherwise. In addition, although having participated in TLP recoveries before, this was the first one that the TAC controller had handled as the primary TAC controller. Notwithstanding the fact that the nature of this recovery was unusual due to the closure of Dutch Mil, this incident occurred for a number of reasons:

The Eurofighter flight called very late in terms of his proximity to CAS at a time where the controller was working to capacity. In addition, the ac's SSR was temporarily unserviceable. The flight was told to stand by, and the controller did not return to him for some time, until after the ac has initiated contact again. When the instruction to squawk ident did not work, the controller was distracted by other ac. When the subject flight was returned to, after he re-initiated contact for the third time, TAC L did not assimilate the position report. It is thought that he searched for the ac in the vicinity of where he should have been rather than where he was, since the primary contacts were fully visible. The lack of a squawk contributed to this problem. The primary contacts were barely visible in the melee, even when later reviewed.

The Unit examining officers reviewed a replay of the event immediately afterwards. The controller involved was interviewed and de-briefed on his performance. On several occasions he had not put ac under a service, these were not considered as latent factors in the cause of the incident.

Since the incident, LATCC (Mil) has supported the in-brief of new candidates onto TLP by providing a UK Airspace brief in Florennes during the first week of the TLP course. This is an ongoing commitment which will continue until TLP relocates to Spain from Jun 09. Further limits as to the volume of traffic that can transit through the London TMA have been imposed. Unit Supervisors are now aware of the problems that an excessive number of ac present. As such, it is unlikely that LJAO would agree to handle that volume of ac again. The Unit has reviewed TLP style procedures to ensure that MOps are appropriate to the task. The Unit has also reviewed the CRM elements of the TAC/PLNR MOps. The consensus was that had the procedures been carried out as briefed, the scenario would not have occurred; that the combination of latent elements listed above, a combination unlikely to occur again, served to align the holes in the swiss cheese and create the conditions for a serious incident. The incident raises the issue of c/s confusion. In this exercise, the participants all used a variation of the same c/s prefix. Given the pressure that the recovery presents, this introduces an unnecessary problem.

Although the recovery may not have appeared professional, TAC L performed well, offering appropriate avoiding action as soon as the requirement presented itself. CRM was sound throughout. Although this was not apparent from the recordings available, the Supervisor (also a Unit LEO) was more than content with the handling of the situation. The chain of events was significantly diverse from what was planned due to a number of external factors that are unlikely to be replicated in combination.

HQ AIR (OPS) have no comment to make.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board has a remit to assess only the subject Airprox but Members expressed concern that other events with significant flight safety implications had apparently occurred throughout the recovery phase of the TLP exercise.

During the Board's discussion, many shortcomings, from the planning stages of the TLP right through to the incidents highlighted on the day, were identified from the comprehensive reports received. Members agreed that all deficiencies needed to be identified and addressed to mitigate the risk of these circumstances reoccurring and the Board agreed to make this a Safety Recommendation to the MoD.

Members opined that the foreign military Eurofighter formation pilots were probably expecting a different level of ATS, being accustomed to such whilst flying in their own country's airspace. When the Formation Leader made his first call on the ICF, the two ac were seen to be already within CAS without clearance, not holding clear to the N. This was contrary to the TLP ACN, as reinforced by the TAC L's 'remain clear of CAS' instruction, and this was the underlying cause of the Airprox. Eventually, when the Eurofighter flight declared an emergency and the squawk appeared on the radar display, both military and civil controllers reacted appropriately through coordination and issuance of complementary avoiding action to the subject ac such that separation was not lost. These actions were enough to allow the Board to conclude that any risk of collision had been quickly and effectively removed during this particular encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

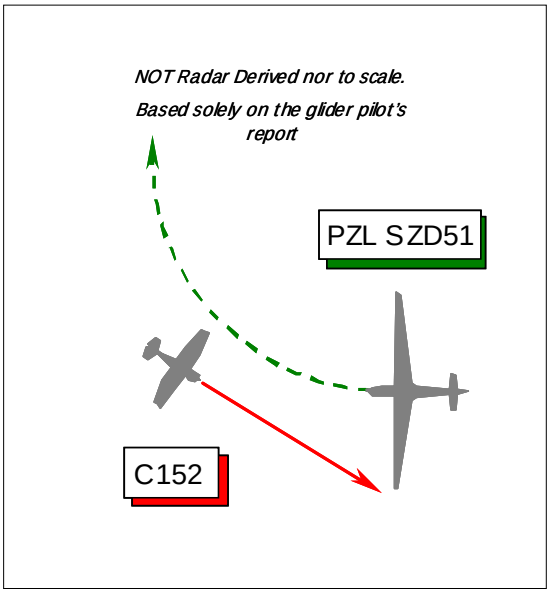
Cause: The Eurofighter formation did not comply with the recovery procedures specified in the TLP ACN and entered CAS without clearance.

Degree of Risk: C.

Recommendation: The MoD should conduct a thorough review of the recovery phase of the subject TLP to ensure that all lessons are identified and acted upon so that the risk of such circumstances occurring again is significantly reduced.

AIRPROX REPORT NO 149/08

Date/Time:	16 October 1315	
Position:	5212N 00145W (2nm SW of Snitterfield - elev 375ft)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	PZL szd51 Glider	Cessna C152
Operator:	Civ Club	Civ Trg
Alt/FL:	2000ft↑ QFE	N/K
Weather	VMC CLBC	VMC CLOC
Visibility:	50km+	10km+
Reported Separation:	150ft V/10m H	Not seen
Recorded Separation:	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PZL SZD 51-1 JUNIOR GLIDER PILOT reports he had departed from Snitterfield and was thermalling at about 2000ft QFE some 500ft below a cumulus cloud – 2km clear horizontally - in a position about 2nm SW of the Snitterfield (SNI) BGA turning point when he heard the sound of an engine. As he turned R from 200° through 270° at 40kt, he spotted a Cessna type ac slightly above his glider, about 150m away almost 'head-on' and heading about 120°. He maintained his turn at 45° AOB to avoid the other ac and within 5sec it had passed about 150ft below and slightly (10m) to the S of his "circle" with a *"high"* risk of collision. By the time he was turning through E the other ac was 300m away and tail-on. He was unable to spot any markings but he believed the high-winged fixed undercarriage ac might have been coloured blue. The impression he had was that the ac had dived to avoid him as its pilot might have lowered the nose but it was not more than 200ft below when it passed by. He later reported the Airprox to his CFI. He stressed that the view to the W was limited at the time because of his 45° AOB R turn and he added that he was climbing at a vertical speed of about 4kt. Later, he spoke to Coventry ATC who advised they had traffic in the area at the time. He was in communication with Snitterfield on 129·975MHz.

THE CESSNA C152 PILOT, a flying instructor, reports that he was conducting a VFR training flight from Coventry at an average speed of about 90kt and in receipt of a FIS from Coventry RADAR on 119·25MHz; A7000 was selected with Mode C on. His ac has a white colour-scheme with blue stripes and wingtips.

Exercises flown (7/8+9) included climbing, descending and turning but due to the nature of these manoeuvres he is not able to provide specific details of the flight or altitude and heading data. Usually, general handling flights are conducted to the SE of Coventry Airport between Daventry Town, Chipping Warden and Daventry VOR/DME. He does not have any recollection of any Airprox event. The glider flown by the reporting pilot was not seen and accurate recollection is not possible due to the intervening period that had elapsed.

UKAB Note (1): Tracing action was unfortunately hindered because an incorrect date was included on the reporting pilot's Airprox report form received three weeks after the occurrence. About 1 month transpired before it came to light that the Airprox date had been reported incorrectly. Unfortunately this delay, coupled with the intervening holiday season, resulted in the reported pilot not being contacted through his CFI until the New Year. Therefore, the reported pilot was not able to complete his report until some 14 weeks after the Airprox had occurred.

UKAB Note (2): This Airprox is not shown on radar recordings.

AIRPROX REPORT No 149/08

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was indeed unfortunate that a simple error on the PZL Szd Glider pilot's report was not picked up earlier as this had delayed identification of the other ac. Although the Airprox itself was not illustrated on the radar recording from LATCC (Mil), the C152 was shown approaching the area of the Airprox and subsequently tracked to landing at Coventry.

The glider pilot Member explained to the Board that this PZL Szd 51-1 was not a high performance glider. Nevertheless, during the period of the Airprox the glider pilot reports climbing at a vertical speed of 4kt, equating to a RoC of about 400ft/min. Thus the glider was climbing quite fast and close enough to the cloud base which in the Member's view might have affected visibility to the W and NW. The glider pilot reports hearing the C152 before sighting the light ac as it approached at a head-on aspect. Whilst he might have been concentrating on his thermalling R turn, the C152 was patently there to be seen and might well have been visible to him as he looked into the centre of his turn whilst passing through SW. However, the difficulties of sighting white-coloured light ac of small cross-sectional area, whilst approaching virtually head-on and with little crossing motion to draw attention to themselves, were well understood by the Members. Unfortunately, as the available recorded radar data had not captured this encounter the exact geometry could not be ascertained independently. Moreover the only description of this close quarter's situation was solely from the glider pilot's perspective. Nevertheless, there was no reason to doubt the veracity of the PZL Szd pilot's account of this encounter in Class G airspace. Sighting of the aeroplane at a reported range of 150m was clearly not ideal and the Board concluded that a late sighting by the PZL Szd glider pilot was part of the Cause.

From the C152 pilot's perspective it was entirely understandable that he was unable to recollect any significant details of this flight so long after the event and he would similarly have been susceptible to the same difficulties associated with visual acquisition encountered by the glider pilot. Evidently, there was little more that could be learned from this aspect but pilot Members were adamant that the C152 instructor pilot would not have flown as close to the reporting pilot's glider at the distances reported here – some 150ft below the climbing glider and some 10m away from its track - if he had seen it in good time. Once again the difficulties of sighting white gliders against a cloud-scape were revealed, as frequently recounted elsewhere in Airprox reports and well known to pilot Members. Therefore, on the limited information available the Board could only conclude that in all probability, whilst engaged in teaching basic lessons to his student, the C152 pilot had not seen the PZL Szd 51-1 glider as it passed to port and above his aeroplane and this non-sighting was the other part of the Cause.

Turning to the inherent Risk, the glider pilot had maintained his 45° AOB thermalling R turn to avoid the C152 and had to do nothing further it would seem. Whilst some would contend this was purely fortuitous, Members concluded from the glider pilot's account that the combination of the turn and his high vertical speed was sufficient to maintain vertical separation from the C152 as it passed by to the S. It had been shown that in the absence of recorded radar data it was not feasible to ascertain the actual separation that prevailed here. However, whilst plainly not desirable, what separation as did exist was sufficient to avert an actual collision. Nevertheless, with the C152 pilot unsighted and apparently not aware at all of the close proximity of the glider, whose pilot only saw the aeroplane at a late stage himself, Members agreed unanimously that the safety of the ac involved here had indeed been compromised.

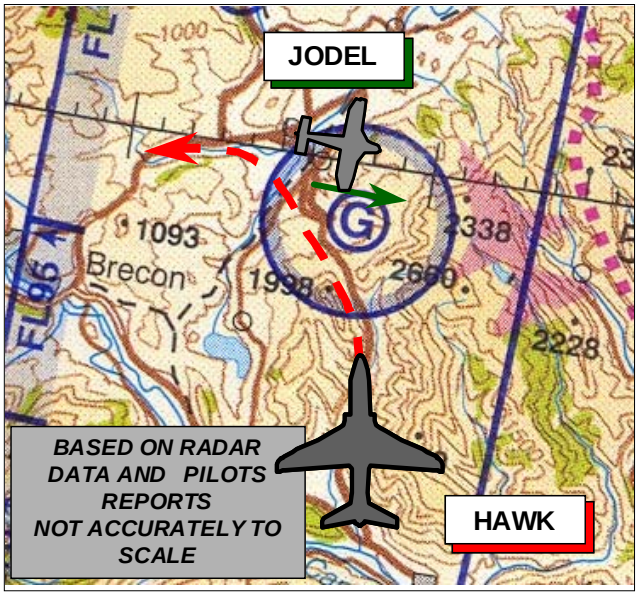
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the C152 pilot and a late sighting by the PZL glider pilot.

Degree of Risk: B.

AIRPROX REPORT NO 150/08

Date/Time:	22 Oct 0950	
Position:	5159N 00312W (abeam Talgarth Airfield - elev 970ft)	
Airspace:	London FIR/ UKDLFS(Class: G)	
	Reporting Ac	*Reported Ac*
Type:	Jodel D120	Hawk
Operator:	Civ Pte	MoD TESD
Alt/FL:	600ft agl	400ft agl
Weather	VMC CLBC	VMC CLBC
Visibility:	Unlimited	10km
Reported Separation:	0 V /300yd H	Not seen
Recorded Separation:	N/R	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JODEL D120 PILOT reports flying a white and blue ac with no strobes or SSR fitted, from Rhigos to Talgarth, listening out on a glider common frequency. He was heading 090° at 80kt and was descending through 600ft agl on the downwind leg to Talgarth when he saw a black Hawk ac 5-600yd away in his 3 o'clock on the far side of the RW, at the same altitude and almost on a reciprocal track. He was concerned by the proximity of the ac which was at circuit height and, from his viewpoint, was within the take off path of departing ac and gliders. He did not take any avoiding action and assessed the risk as being moderate.

THE BLACK MOUNTAINS GLIDING CLUB SAFETY OFFICER provided a report which is summarised as follows:

A black Hawk ac was seen to overfly Talgarth airfield on a track estimated as 300^{o} and a height of 600ft agl. This track and the weather conditions suggest that the Hawk had flown up the Cwmdu Valley and from that direction the view of the airfield is obscured by a sharp ridge.

At the time of the incident the cloud base was 2100ft amsl and the tops of the surrounding hills were in cloud but the visibility below was good. Winch launching is not undertaken at Talgarth because the runways are too short.

THE HAWK PILOT reports flying a black ac with strobes switched on as a singleton on a low level training flight. At the time of the incident he was in the Talgarth area heading about 280° at 420kt and maintaining a good lookout but did not see any other ac.

They were flying a low level route and had planned to transit the Vale of Ewyas but the student navigator misidentified the entry point resulting in them flying up a parallel valley about 1.2 miles further to the W. When he noted the navigation error they had already entered the valley and, after checking the map, it appeared that the best option was to attempt to fly to the S of the glider site along the ridgeline. He considered that this flightpath would allow them to remain just S of the Southern edge of the glider site airspace and would keep them well S of the circuit pattern to the N of the field. He thought that if they turned to a heading of about 280° about 1nm prior to the reservoir at the N end of valley they would be able to remain in clear weather but, due to mountain tops being obscured by cloud, the turn to the NW was slightly delayed and they had to initiate the turn over the reservoir instead of prior to it. They attempted to maintain a course as close to rising terrain and the ridgeline as weather would allow so that they remained clear of the glider site but they may have infringed it slightly due to the weather and the high terrain to the S. The planned modified course should have put them about 2.2 miles south of the glider site and they were maintaining 4-500ft agl.

He was unfamiliar with this area prior to the flight, which allowed the student navigator's initial error to go unrecognized until they were already into the valley. To familiarise himself with the area he has subsequently flown with an instructor pilot familiar with it and noted the local terrain in the Talgarth area.

UKAB Note (1): The Hawk shows only intermittently on the recording of the Clee Hill radar and the Jodel does not show at any time. The Hawk tracks 320^{o} and passes 1.1nm to the SW of the centre of Talgarth Airfield.

UKAB Note (2): Talgarth is listed in the UKAIP (Mil) at 1-2-7-6 as a Glider Site and has a mandatory 2nm avoidance.

MoD TESD comments that the pilot has submitted an honest and frank report in which lack of familiarity with the area has resulted in the crew having to take action to resolve a deteriorating situation. They had planned to avoid the glider site but the misidentification of the entry point and the subsequent need to avoid the obscuration by cloud of the mountain tops meant they infringed it.

That said, there still remains the issue of failing to visually acquire the other aircraft and it is conceivable that lookout was degraded during the attempt to correct the navigational error. For whatever reason the crew did not see the Jodel and undoubtedly flew sufficiently close to it to cause the pilot of the Jodel concern.

The Hawk pilot has taken necessary action to ensure that, for future flights in the area, he has familiarised himself with the local terrain but this Airprox is an object lesson in how quickly an uncertainty in position could be sufficient a distraction to cause something far worse.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted the Hawk pilot's open and honest report, appreciating both his candour and the actions taken subsequent to the Airprox..

Bearing in mind the weather with complete cloud cover on the hilltops, having entered the wrong valley the Hawk pilot was faced with a difficult decision: whether to proceed and possibly infringe the glider site or to abort from low level. He decided to proceed, presumably on the assumption that gliding would not be taking place when the weather was so poor: however, the tug was in the circuit area and about to land. It was pointed out to the Board by the Military Low Flying Advisor that for military ac (only) Talgarth is a mandatory avoidance and a better solution would therefore have been to conduct a low level abort when it became clear that an infringement would result if the Hawk continued up the valley. Finally, the importance of proper training/briefing before undertaking flights such as that by the Hawk was highlighted by Members, the Board concluding that following a navigational error, the Hawk flew through the Talgarth glider avoidance area and into conflict with the Jodel. The Board also decided that in the circumstances conscientiously reported here, the Hawk pilot's actions had effectively removed any risk of collision.

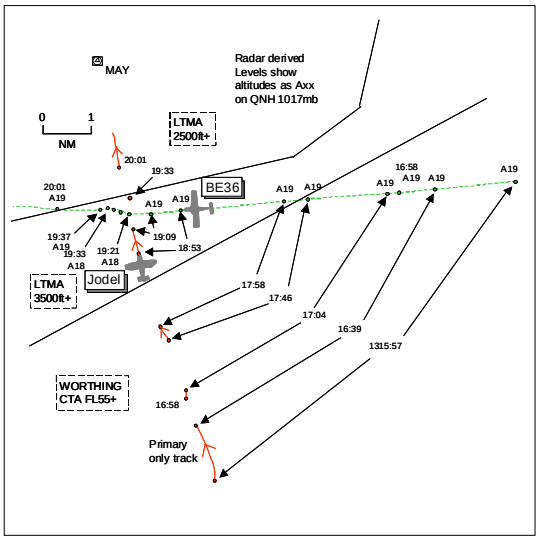
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Following a navigational error, the Hawk flew through the Talgarth glider avoidance area and into conflict with the Jodel.

Degree of Risk: C.

AIRPROX REPORT NO 151/08

Date/Time:	19 Oct 1319 (Sunday)	
Position:	5058N 00008E (3nm S MAY)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reporting Ac*
Type:	Jodel 1050	BE36 Bonanza
Operator:	Civ Pte	Civ Pte
Alt/FL:	1800ft	2000ft
	(QNH 1017mb)	(QNH 1017mb)
Weather	VMC CLBC	VMC CLBC
Visibility:	>20nm	15km
Reported Separation:		
	100ft V/Nil H	1nm
Recorded Separation:		
	NR	



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BE36 PILOT reports flying solo enroute to Fairoaks VFR and squawking 7000 with Mode C. The visibility was 15-20km flying 2000ft below cloud in VMC and the ac was coloured white/red/blue with anti-collision and strobe lights switched on. Heading 265° at 170kt and 2000ft QNH 1017mb, he was tracking towards MID, establishing communication with Farnborough E on 123·225MHz having just changed frequency from Lydd. With it being a clear day with a strong sun from the S, he had turned his sun-visor to prevent the blinding effect. He was unsure but he believed he heard another ac's pilot talking to Farnborough routeing from somewhere to MAY at 1800ft. As this was in the same area as he was, he moved the sun-visor and immediately saw another ac, a low wing single engine type, in his 10 o'clock about 1nm away at almost the same altitude. He elected to turn R instantly, in the same direction as the other ac, as a L turn would have been unsafe. This decision was made as he was sure the other ac was a PA28 type or similar and slow moving so he felt he had the speed to pull away in the same direction thus taking safe avoiding action, estimating he passed 1nm clear of the other ac. When he was confident that he was well clear of the other ac and at no further risk, he continued en-route, establishing contact with Farnborough E and notifying them of the incident.

THE JODEL PILOT reports flying solo VFR to Redhill and in receipt of a FIS from Farnborough E on 123·225MHz; no transponder was fitted. The visibility was >20nm flying >500ft below cloud in VMC and the ac was coloured white/red with lighting switched off. Flying from SFD with 2nm to run to MAY at altitude 1800ft QNH 1017mb and heading 359° at 95kt, another ac, a single engine white coloured monoplane, appeared from underneath his ac in his 10 o'clock position heading WNW about 100ft below flying straight and level or slightly descending. Once seen, there was no risk of collision as the ac was heading away from him but he saw it too late to take any avoiding action. On reaching MAY he reported the Airprox on frequency and heard another ac's pilot call stating he was the other ac.

THE FARNBOROUGH E RADAR CONTROLLER reports the Jodel pilot called on frequency at about 1315 stating 'non-transponder' routeing via SFD, MAY and Sevenoaks to Redhill. He informed the pilot that he was under a FIS and asked him to report at MAY so that he could formally identify the ac and ensure that it remained outside the Gatwick CTA. Before he could do so the pilot called advising that he had had an Airprox and was unsure what to do. The Jodel pilot went on to say he had seen the other ac in his 4 o'clock, he thought, flying E to W and it had passed very close when about 2nm S of MAY. Radar E replied that he was going to file a report but the pilot must also file a report after landing. Shortly after this the BE36 pilot called stating he was routeing Lydd to Fairoaks and he had just taken avoiding action on traffic. He issued a squawk to identify the ac and the radar response appeared approximately 4nm S of Horsham. He therefore believed that the BE36 was the ac reported by the Jodel pilot and he informed the BE36 pilot that the other pilot was filing a report and that he should do so too.

AIRPROX REPORT No 151/08

ATSI comments that the incident took place in Class G airspace, approximately 3nm S of MAY VOR.

At 1315, the Jodel flight established communications with Farnborough LARS E. The pilot reported flying a Jodel from Old Sarum to Redhill, 4 miles N of SFD and routeing via MAY at 2000ft on 1019mb. He requested a Flight Information Service (FIS), adding 'negative squawk'. The controller issued the current LARS E QNH, 1017mb, advised that a FIS was now being provided and requested the pilot to report passing MAY. This was read back correctly. In his written report, the LARS E controller recalled that he had asked for a MAY report so that he could identify the flight and ensure it remained outside the Gatwick CTA.

The RT transcript shows that no relevant transmissions took place until 1321:13, when the Jodel pilot transmitted a message, the first part of which is unintelligible due to simultaneous transmissions, hence the transcript records *"???? ???? ???? ???? want to report an Airprox I'm not quite sure what I'm supposed to do about that and somewhat disconcerting (Jodel c/s)".* Despite the simultaneous transmission, the controller had detected the c/s and requested a repeat of the message. The pilot transmitted *"Er some aircraft came out from er I don't know about my four o'clock erm probably just passed er within I don't know seven hundred yards from me probably closer erm going east to west erm slightly bigger aircraft than me erm didn't get any further details but I was erm somewhat disconcerted."* There followed several exchanges about the process of filing an Airprox and then, at 1323, the BE36 flight established communications with LARS E. The pilot reported on a flight from Lydd to Fairoaks, currently about 15nm S of Gatwick at 2000ft and requesting a FIS. He added *"…and that er was evasive action by myself I just heard I was monitoring the frequency there".* The controller acknowledged the message and issued the QNH (1017) and a discrete squawk, which was read back correctly. The Jodel pilot was then asked for his altitude and position at the time of the occurrence; he replied it was 1800ft and 2nm S of MAY.

The BE36 pilot emphasised again that he had to take evasive action, the controller responding with *"Er he* (the Jodel pilot) *says he was rather concerned the proximity of you to him".* The BE36 pilot replied *"Yeah when I was er putting a bit more speed on I had to turn right I couldn't go behind him I had to go right t-to avoid him".* The controller advised that he would be filing a report and requested the pilot did so also, when on the ground.

A review of the radar recording was undertaken, using Pease Pottage and Gatwick 10cm radar sources. At the time the Jodel pilot established communications with LARS E (1315), a primary only contact, believed to be the ac concerned, can be observed tracking NNE, 6nm from SFD VOR. By 1316, it has turned L towards the NNW, in the direction of MAY. At this time, the BE36 is 9nm NE of the Jodel, tracking W. It is wearing a 7000 squawk and indicating at altitude 1900ft QNH 1017mb. Over the next few minutes the Jodel's primary radar response is intermittent. As it appears briefly at 1317:46 the 2 ac are 4·1nm apart, converging. Three sweeps later it disappears until 1318:53, when the BE36 is in its 2 o'clock position, range 1·3nm. By 1319:09, the last sweep before the Jodel fades again, the range between the 2 ac is 0·5nm, with relative positions unchanged. Thereafter, the Jodel's primary return is not seen until 1319:33 as a pop-up contact, by which time respective tracks have crossed and the BE36 is in the Jodel's 8 o'clock at 0·5nm. The radar recording also shows that at this point the BE36 is just returning to its original track having briefly deviated to the N and descended to 1800ft QNH over the previous 12sec.

The FIS, applicable on the date of the incident, is described in MATS Part 1, Section 1, Chapter 1, Page 2, Paragraph 6, current at the time, where it states:

"A FIS is a service provided without the use of ATS surveillance systems, either separately or in conjunction with other services, for the purpose of supplying information useful for the safe and efficient conduct of flights. Under a FIS the following (relevant) *conditions apply:*

b) A controller may attempt to identify a flight for monitoring and co-ordination purposes only. Such identification does not imply that an ATS surveillance service is being provided or that the controller will continuously monitor the flight. Pilots must be left in no doubt that they are not receiving such a service;

c) Controllers are not responsible for separating or sequencing aircraft.

In addition to the above, controllers will, subject to workload, provide pilots with information concerning collision hazards to aircraft operating in Class C, D, E, F or G airspace when 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."

At the time of the incident, the Jodel was being provided with a FIS by the Farnborough LARS E controller. The BE36, however, only made its presence known to the controller after the incident had occurred. It is therefore considered that there are no implications for ATC in this Airprox.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

This incident occurred in Class G airspace beneath the LTMA where pilots are responsible for their own separation through 'see and avoid'. Both pilots had had the opportunity to see each other's ac approaching for some considerable time prior to the Airprox. The radar recording revealed the subject ac flying on steady tracks, which subtended a line of constant bearing, leading to the conflicting traffic appearing as a stationary object in the other pilot's field of view and making the ac a more difficult target to spot, as there would be no relative movement apparent. Although the BE36 pilot had the right of way under the Rules of the Air, the Jodel pilot reported seeing the BE36 only after it had crossed ahead, in his 10 o'clock and slightly below, and was diverging, an effective non-sighting. Meanwhile the BE36 pilot only saw the Jodel late, after hearing the Jodel pilot's position report to Farnborough and moving his lowered visor, and had executed an immediate R turn to avoid. The BE36 pilot had apparently lost sight of the Jodel during this manoeuvre as he turned 'belly up' to it, estimating he passed about 1nm clear before resuming his original course. The Board agreed that whilst the visual acquisition of the Jodel and subsequent action taken by the BE36 pilot were enough to remove the actual risk of collision, safety had not been assured during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: An effective non-sighting by the Jodel pilot and a late sighting by the BE36 pilot.

Degree of Risk: B.

AIRPROX REPORT No 152/08

AIRPROX REPORT NO 152/08

Date/Time: 29 October 1249

Position: 5428N 00150W (14nm W of Durham Tees Valley Airport)

Reporter: Durham Tees Valley ATC

Airspace: London FIR (Class: G)

	First Ac	*Second Ac*
Type:	Fokker 70	Hawk
Operator:	CAT	HQ Air (Ops)
Alt/FL:	NR	FL80
Weather	NR	VMC CLOC
Visibility:	NR	20nm+

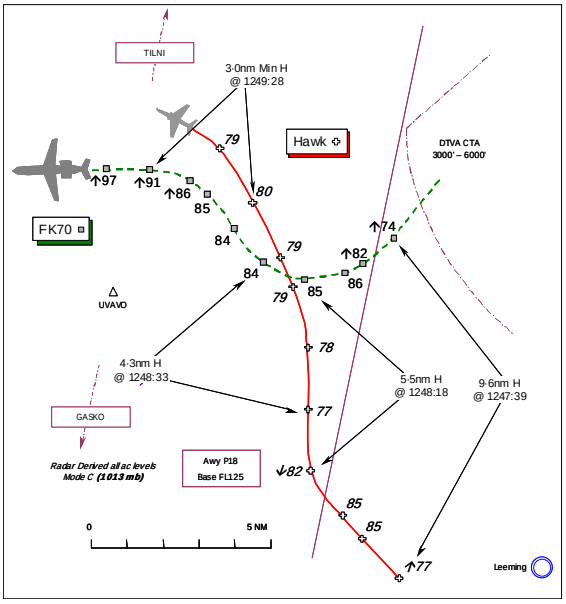
Reported Separation:

DTV ATC: Nil V @ 3nm H

700ft V/3nm H 1000ft V/3nm H

Recorded Separation:

1100ft V @ 3nm Min H; 100ft Min V @ 6·9nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DURHAM TEES VALLEY APPROACH RADAR CONTROLLER (DTVA APR) reports that at 1235UTC [some 14min before the Airprox occurred] the DTVA ATC Assistant (DTVA ATSA) pre-noted the pending departure of the FK70 from DTVA's RW23, squawking A3424, to Leeming APPROACH (APP). Some 10min later at 1245 as the FK70 was getting airborne, Leeming called with traffic information on a departure from their RW16 heading NW climbing to FL85 squawking A0421 – the subject Hawk. When he, the DTVA APR, received this information he called Leeming back for co-ordination, requesting that their Hawk maintain 1000ft on Mode C below his FK70 to which the Leeming controller replied "affirm that should be fine". At 1247 he passed traffic information to the FK70 crew [under the RAS] about the Hawk, which at the time was in the FK70's 11 o'clock - 10nm, accompanied by an instruction to turn R heading 270°. At this point the Hawk [squawking A0421] was observed at FL80 climbing whilst the FK70 was at a similar level. At 1247:48 he observed the Hawk indicating FL85↑ [climbing] on radar so he instructed the FK70 crew to stop climb at FL85, believing [erroneously] that the Hawk was continuing to climb. At 1248:01 the FK70 pilot reported passing FL85 but ascended to FL86 before descending. Avoiding action of a R turn heading N was issued to the FK70 crew at 1248:09. At this point he thought the conflicting traffic was in the FK70's 11 o'clock - 5nm. He then telephoned Leeming to request traffic information and was told the Hawk was turning E to pass 5nm astern of the FK70. On receiving this he instructed the FK70 crew to turn L heading W again and climb to FL130. The Hawk levelled at FL85 on Mode C and passed about 3nm behind the FK70 at the same level, he thought, some 15nm W of the airport. The FK70 was subsequently given a heading of 195° and transferred to Manchester ACC. Prescribed separation was eroded. Before switching frequency the FK70 pilot asked if the DTVA APR would be filing a report which he said he would and would be happy if the FK70 commander did also.

THE FOKKER 70 (FK70) PILOT did not complete an Airprox Report despite requests through his company to do so. He stated in an e-mailed narrative that whilst climbing through FL82, on a radar heading of 265°, the DTVA APR instructed them to level off at FL85. Whilst in a high RoC the AP was disengaged while correcting to FL85 from a maximum of FL87. This was immediately followed by an instruction from Durham to turn R onto a heading of 360° to avoid traffic – which the controller suspected to be a military Hawk jet - approaching from the S. Whilst he maintained a heading of 360°, he thought, and level flight at FL85, the jet passed 3nm behind them from L - R a minimum of 700ft beneath his ac. No TCAS TA or RA was received, only an indication of proximate traffic which was never seen visually. After they were clear of the Hawk they were instructed to turn L again onto a heading of 270° to proceed en-route. The Durham APR told them that he would be filing a report.

THE HAWK PILOT reports that he was departing from Leeming for a solo sortie under VFR in VMC. A RIS was provided by Leeming APP and a squawk of A0421 selected with Mode C; neither Mode S, TCAS nor any other form of CWS is fitted.

Heading 310°(M) passing about FL70, a contact was called in his R 2 o'clock about 6nm away [it was actually reported to be at a range of 8nm] crossing from R to L. He spotted the other ac - a low-wing twin [the FK70] in level flight - at a range of 6nm+ and asked if it was a civilian ac out of DTVA, which it was. He was also advised by APP that the airliner was climbing to level at FL80 some 500ft below his planned cruising level. He called "Tally", turned to pass behind the FK70 and also descended to clear its level whilst transmitting to APP to advise that his intention was to pass behind the FK70, thereby allowing its crew to continue their climb. The FK70 then began a right-hand level turn at about FL80. Remaining about 3nm clear and slightly below the FK70 he turned L onto 300°(M) to maintain clearance from CAS to the N, which has a base level of FL75. Some 30sec later he saw black smoke from the FK70's engines as the crew increased power to climb and then turned L towards POLE HILL.

Minimum separation was 1000ft/3nm and the risk of collision was *"low"*. Visual contact was maintained with the FK70 throughout the encounter and he stressed that he had manoeuvred his jet to increase the eventual separation and to facilitate the FK70 crew's outbound climb (they were originally on crossing tracks and about 500ft of vertical separation would have existed).

He added that he was amazed that this Airprox had been filed after he had spotted the FK70, avoided it and tried to assist the crew with their flight.

THE LEEMING APPROACH CONTROLLER (APP) reports that DTVA prenoted traffic departing RW23 – the FK70 - on track GASKO [S of UVAVU] climbing to join CAS [base level FL125] on a squawk of A3424. Shortly afterwards he was prenoted the Hawk departing from RW16 at Leeming on a track of 310° climbing to FL85; traffic information was immediately passed on to DTVA. The DTVA traffic was observed airborne on a westerly heading climbing through approximately FL50 at about 5nm W of the DTVA overhead. After identifying the Hawk and placing it under a RIS, the DTVA controller called to request co-ordination on this flight. During this conversation he agreed that the Hawk would maintain 1000ft separation below the FK70 on Mode C, which would continue climbing to join at GASKO. At this stage, due to the respective rates of climb, he assessed that by the time the Hawk was within 5nm it would easily achieve 1000ft separation as it was to level at FL85 and the FK70 was continuing in a climb. As the Hawk turned onto a more northerly heading he called the civil traffic – the FK70 - to the Hawk pilot at a range of about 10nm to which he asked him to confirm that it was civil outbound traffic from DTVA. Having confirmed this was so, the Hawk pilot then advised him that he was visual with the FK70 and would turn R and avoid it to the E. He told the Hawk pilot that the FK70 was continuing the climb and he should soon obtain 1000ft separation but the pilot still opted to turn R. The Hawk levelled at FL85 and shortly after this he realised from the Mode C indications that the DTVA controlled FK70 had stopped climbing and had levelled at a similar level. The Hawk was on a northerly track about 7nm SE [actually S] of the FK70. DTVA then called to ask what he was doing with the Hawk to which he informed them the Hawk was turning R to go behind their FK70 and should maintain 5nm to the E. The DTVA controller then informed him the FK70 would continue to climb on track. He then realised that their FK70 had turned onto a more northerly track which was more of a converging heading to the Hawk which at this stage had descended 500ft and turned onto a NNW'ly track but still maintaining about 3nm separation. Controlled airspace to the North of the Hawk [base of FL75 N of TILNI] was called to the pilot and he asked him if he would be descending to get below it. He replied he would remain clear and turned onto a more W'ly heading. The FK70 was in a very slow L turn and was very slow to resume the climb but the Hawk pilot maintained about 3nm away from it to the NE and N before departing to the W.

THE LEEMING ATC SUPERVISOR (SUP) reports that although he did not witness the encounter he spoke with the Leeming APP controller and the pilot of the Hawk. Notwithstanding the fact that requested co-ordination by the Durham Radar controller was agreed by the Leeming controller, the nature of such was not relayed to the pilot of the Hawk. The pilot of the Hawk, whilst visual with the FK70, was allowed to turn to pass clear behind the FK70 thereby affording the civil pilot a clear flightpath to climb and turn on track GASKO. After landing at Leeming he spoke with the pilot of the Hawk who explained that by maintaining visual contact with the Durham departure at all times, keeping 3nm horizontal separation and by positioning to go astern, he was manoeuvring to assist the flightpath of the FK70. However, at some point the pilot of the FK70 apparently turned R onto a heading of approximately 300° towards the Hawk whose pilot then descended to provide vertical, in addition to, horizontal separation.

The flight profile of the Hawk and the FK70 were prenoted to the respective ATSUs by the controllers. Co-ordination was agreed between the controllers but the agreement was not communicated to the Hawk pilot by the Leeming APP controller. The Hawk pilot took his own visual separation from the FK70 whilst operating under the auspices of RIS. However, the FK70 did not follow the expected flight profile in that it did not continue to climb to at least the base level of CAS (FL125) and turned N. Positive control of the Hawk in order to comply with the agreed co-ordination and appropriate information to the Hawk pilot might have prevented this incident.

ATSI reports that at 1234, the DTVA ATSA telephoned Leeming, on the direct landline, to pass traffic information about the departing FK70 from RW23 towards GASKO - approximately 23nm SW of the airport. This was in accordance with the LOA between the two ATSUs. Later, at 1245, Leeming telephoned the DTVA ATSA to pass details about a departure from Leeming squawking A0421 (the subject Hawk) which would be climbing to FL85, tracking NW.

The FK70 crew established communication with the DTVA APR at 1245, reporting passing FL42 for FL60. Once clear of opposite direction traffic at FL70, the FK70, now 5nm WSW of DTVA, was instructed to climb to FL130 and to route direct to GASKO. At the time, the A0421 squawk of the Hawk is shown on the radar recording, just S of Leeming at FL17.

Shortly afterwards, the DTVA APR telephoned Leeming to *"request co-ordination"* on the Hawk squawking A0421 that was 4nm W of Leeming. The Leeming APP controller reported it was climbing to FL85 whereupon the DTVA APR asked if APP could climb their Hawk to a level 1000ft below the FK70's Mode C on A3424, which had been pre-noted to GASKO. Leeming replied *"Affirm that should be fine".*

MATS Part 1, Section 1, Chapter 10, Page 2, states the procedures involved in co-ordination. Of relevance to this incident:

'When requesting co-ordination, a controller shall: make verbal contact with the appropriate controller and, after identifying himself, open the dialogue with the words "Request Co-ordination". Propose a course of action upon which agreement is requested and obtain a clear decision on that proposal. To ensure clarity and avoid misunderstandings, before terminating the call, parties shall explicitly state the action required of their aircraft to achieve the agreed course of action. For example, an appropriate response to a request for an aircraft to maintain FL120 may be, "My traffic maintaining FL120". A response that does not reaffirm the details of the agreement, such as "Roger", is not acceptable. Where both aircraft are climbing, or both are descending, controllers may co-ordinate to use Mode C indications to enable an expeditious step climb/descent, which maintains the required vertical separation/deconfliction minima, e.g "I will maintain 1000ft above/below on Charlie". In such circumstances the criteria for level assessment of Mode C shall be applied.'

On this occasion, only an affirmation to the co-ordination was received by the DTVA APR instead of the readback by Leeming of the action required, as stated above. Despite this, the DTVA APR believed that the requested co-ordination had been agreed with Leeming and they would take the appropriate action to maintain vertical separation between the subject ac.

At 1247:36, the DTVA APR, observing that the two ac were on conflicting flight paths with the Hawk's Mode C indication being higher than the FK70, decided to turn the latter away to the W: "[C/S] *turn right heading 2-7-0 degrees traffic left 11 o'clock range of 1-0 miles northbound climbing Flight Level 8-0"*. Although the DTVA APR understood that Leeming had stated that the Hawk was climbing to FL85 and this was the level he annotated on a piece of paper by his display, for an unknown reason he believed, at the time incorrectly, that it was climbing to FL80. The radar recording shows that when the two ac were 10nm apart the FK70 was passing FL72 and the Hawk FL75. Although the FK70 had left CAS, the pilot was not informed, as required in MATS Part 1, of the radar service being provided. The APR confirmed, in his written report, that he was providing the FK70 with a RAS. Seeing that the radar display indicated that the Hawk was still climbing and had passed the level he was [erroneously] expecting it to maintain at FL80, he instructed the FK70 crew just before 1248:00 to stop its climb at FL85. The radar photograph, timed at 1247:54, shows the FK70 passing FL82 and the Hawk - which is 8nm to the S - indicating FL85 [after just levelling out]. Due to the short notice, the pilot of the FK70 was unable to stop the climb at FL85. [The Great Dun Fell radar recording indicates the aircraft ascended to FL86, at 1248:02 before descending. At this time it was 6·9nm N of the Hawk, which was maintaining FL85.]

When the pilot of the FK70 reported leaving FL86 for FL85, the controller issued an avoiding action turn "[C/S] *roger avoiding action turn right heading north I say again right heading north that traffic is left 11 o'clock 5 miles northbound Flight Level 85 indicated"*. The pilot reported turning north, adding afterwards that the traffic was 4nm behind and 700ft lower. The DTVA APR telephoned Leeming to request traffic information about the Hawk. Leeming said that the Hawk was turning R to go 5nm E of the FK70. The DTVA APR reported he would instruct the FK70 to turn L again. The FK70 was instructed to turn L heading 270° and climb to FL130. When discussing the incident with the FK70 pilot on the frequency, the DTVA APR commented *"I believe it was a Hawk out of Leeming they did know about you and were supposed to maintain Flight Level 85 I believe"*.

The radar recordings show that the Hawk descended to FL77 and at 1248:33, it was 4·3nm SSE of the FK70 which was maintaining FL84. Thereafter, the Hawk and the FK70 climbed. [At the CPA, timed at 1249:28, the Hawk was indicating FL80 at it passed 3nm behind the FK70 that was climbing through FL91.

The DTVA APR did not advise the FK70 pilot when he left CAS or the type of ATS being provided. However, this is not considered to be a causal factor to the Airprox. Despite not receiving a full readback from the Leeming APP controller of the requested co-ordination, the APR believed he had achieved the appropriate agreement to ensure vertical separation between the subject ac. He was surprised when the Hawk did not remain 1000ft below the FK70 as they both climbed. For an inexplicable reason, he thought that Leeming had reported that the Hawk would be climbing to FL80, rather than the notified actual level of FL85. Consequently, when he saw that the Hawk had passed FL80 and the radar display indicated that it was still climbing, he assumed that there had been a change of plan and the Hawk would be climbing above the FK70. On this basis, he instructed the FK70 to maintain FL85. As the Hawk levelled at FL85, he issued the avoiding action turn to the FK70. He then telephoned Leeming to request traffic information about the Hawk. As a result of Leeming reporting that the Hawk would be turning away from the FK70, the DTVA APR was able to re-climb the FK70 to FL130 and turn it back onto its planned routeing.

MIL ACC reports that the Hawk departed RW16 at Leeming VFR to the NW under a RIS for a training exercise in Spadeadam Range. The FK70 departed DTVA to join CAS at GASKO - base of CAS FL125. The aircraft was prenoted to Leeming and the weather was CAVOK.

At 1242:55 Leeming TOWER prenoted Leeming APP regarding the Hawk's climb-out details - *"..heading 310° climbing FL85 for a handover to Spade."* The details were read back by APP and a squawk of A0421 issued. APP immediately prenoted the Spadeadam Assistant and then at 1243:54 passed traffic information to the DTVA ATSA, *"Leeming Approach just about to be getting one airborne out to the NW climbing flight level 85 squawking 0421"*; the DTVA ATSA read back the details. The Hawk, airborne at 1246:01, was identified by APP who provided a RIS and reiterated the level to climb to of FL85. Some 50sec later, the DTVA APR contacted Leeming APP requesting co-ordination against the Hawk that was 4nm W of Leeming. APP stated *"..am climbing not above FL85".* DTVA APR requested at 1246:56, *" can you maintain a thousand below Mode C on the 3424* [FK70] *which was prenoted to you going towards GASKO?"* APP replied *"affirm, you'll be er..that should be fine".* At 1247:25, APP passed traffic information to the Hawk pilot *"..traffic north 8nm tracking south west slow climb FL80 climbing."* The Hawk pilot called visual with the traffic and queried *"is that a civvy out of Durham Tees?"* APP replied *"Affirm."* The Hawk pilot then said at 1247:45, *"Roger I am happy to turn right behind him to let him climb."* APP then said *"Roger, he's continuing in the climb anyway, he's at least, well he'll be a thousand feet above shortly."* However, APP did not inform the Hawk pilot that he was subject to co-ordination and should have been taking 1000ft below the FK70. APP stated in his report that 'due to rates of climb, he assessed that by the time the Hawk was within 5nm I would easily achieve 1000ft separation as I was to level FL85 and he was continuing his climb.' The Hawk pilot maintained a track routeing behind the FK70 by approximately 3nm and reports remaining visual with the FK70. The radar replay shows that just prior to the Hawk initiating a R turn, the ac was indicating FL85 as the FK70 indicated FL86. As the Hawk turned R and descended to FL77 to pass behind the FK70, the latter indicated maintaining FL85. The FK70 then turned R onto a northerly heading at an acute angle of convergence with the Hawk's track. Whilst maintaining visual contact with the FK70, the Hawk pilot climbed slowly back up to FL80. At 1248:09, the DTVA APR called APP requesting traffic information on the Hawk. APP stated *"Roger, he's turning right to er go 5nm to the east of you."* DTVA APR then stated that he would vector the FK70 left again. The FK70 is then seen to reverse into a L turn and resume the climb. APP asked the Hawk pilot at 1249:00, if he would be happy to descend to remain clear of CAS to which the Hawk stated that he was happy and would remain clear. The Hawk then continued en-route and was handed to Spadeadam without further incident.

The flight profile of the Hawk and the FK70 were prenoted to the respective ATC unit. Coordination was agreed between the controllers concerned but the agreement was not communicated to the Hawk pilot. The Hawk took his own visual separation from the FK70 under the auspices of RIS. Moreover, the FK70 did not follow the expected flight profile in that it did not continue to climb towards GASKO to the S at least to the base level of CAS at FL125 and turned North. Positive control of the Hawk in order to comply with the agreed coordination and appropriate information to the Hawk pilot may have prevented this incident.

HQ AIR (OPS) comments that although both controllers seem to have agreed coordination, this agreement was not communicated to the Hawk pilot. Consequently, he took his own lateral separation from the FK70 based on his visual assessment of what the other ac was doing. Without the level co-ordination information the Hawk's continued climb confused the DTVA controller who also had to apply avoiding action 'on the hoof'. The agreement between these two airfields has matured over recent years, but will only work if it is applied fully.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board was briefed by the DARS Advisor, himself a fast-jet pilot, that the Hawk unit conducts a significant number of single-pilot sorties. It was clear to Members that without the benefit of TCAS in his jet to highlight the presence of other ac in conflict, the pilot must rely absolutely on his own visual lookout, supplemented with traffic information from ATC. Here, it was immediately evident to the Board from the comprehensive reports provided by all concerned that the solo Hawk pilot was merely endeavouring to assist the FK70 crew and ensure that their southerly departure profile was not impeded by his own planned track, both of which crossed to the N of Leeming. It was, therefore, very unfortunate that this Airprox had resulted, subsequent upon his well-intentioned actions to remain clear of the FK70. From the Hawk pilot's perspective it was clear that under the RIS he had been passed traffic information by APP about the departure from DTVA and from his account had sighted the civil airliner in excess of 6nm away. However, the Mil ACC report had shown that APP had not passed on the details of the co-ordination that had been agreed with the DTVA APR beforehand. This was evidently significant and a military controller Member pointed out that the agreement between the two controllers involved here was not valid without the concurrence of the Hawk pilot who had not been appraised of the plan to allow 1000ft vertical separation on indicated Mode C levels beneath the departing airliner.

The ATSI report had also revealed the DTVA APR's erroneous belief that he had been told the Hawk was climbing to FL80 and thus when he saw the Hawk jet above this level, he had elected to stop the climb of the FK70 thereby placing both ac at the Hawk's planned and prenoted actual transit level of FL85. An element of confusion had obviously introduced itself here, leading to an assumption that the Hawk pilot was not stopping his climb. However, controller Members recognised that the APR's concerns were justified as it was plain to him that the agreement reached for the Hawk to maintain 1000ft vertical separation on indicated Mode C beneath the departing FK70 was not being observed.

In the FK70 cockpit, the crew had been instructed to climb towards their CAS joining point at GASKO and had merely complied with the DTVA APR's instruction to stop their climb at FL85. When the APR spotted that the Hawk's Mode C indication was above the airliner's, he believed that Leeming APP had changed the plan with their Hawk. Apparently the APP controller was not concerned at this stage as he was naturally anticipating that the FK70 would continue to climb toward GASKO thereby increasing the vertical separation before the tracks crossed in azimuth. Indeed, APP reports that due to the respective rates of climb, he assessed that by the time the Hawk was within 5nm of the FK70 it would easily achieve 1000ft separation as it was to level at FL85 whilst the FK70 was continuing in a climb. Whereas it was evident that the Hawk had initially out-climbed the FK70 for a short period, which some thought contrary to the agreement, APP was aware that the Hawk was still levelling at FL85 - the transit level prenoted to DTVA beforehand. This was achieved at a range of more than 6·9nm but it seemed likely to some Members that even if the FK70 had kept climbing the prescribed horizontal separation of 5nm the APR was seeking to achieve would still have been eroded before the airliner was through FL95 and thus safely above the Hawk. This Airprox therefore illustrated well the pitfalls associated with basing the achievement of separation on expected rates of climb when the other ac does not do as anticipated.

The APR's instruction to the FK70 crew to level their ac at FL85 thus resulted in a conflict with the Hawk which had levelled-off at the notified level of FL85. The Hawk pilot had emphasised in his report that he had been visual with the airliner throughout and had evidently turned to pass astern of the FK70 to increase separation, as indeed the radar recording had shown. However, the FK70's turn NW'ly in response to the APR's avoiding action instruction had the plainly unintentional result of reducing the horizontal separation somewhat: nonetheless 3nm separation was achieved, albeit less than the 5nm the APP controller suggested would obtain. This implied to some Members that this Airprox was no more that a controller perceived conflict between IFR and VFR traffic but controller Members recognised that this was not the fundamental cause. If APP had communicated the essential elements of the plan beforehand and either obtained the concurrence of the Hawk pilot or 'stopped-off' the Hawk at an intermediate level which would have ensured vertical separation of 1000ft was preserved beneath the climbing FK70 for a short while until the tracks had crossed then this situation would not have arisen. As it was, the Hawk pilot was left 'out of the loop' and thus formulated his own plan which did not comply with the co-ordination agreement sensibly proffered by the APR and agreed by APP – but the latter did not obtain the agreement of the Hawk pilot. This resulted in the conflict at FL85 that, the Board decided, had been caused because Leeming APP did not apply the course of action agreed with the DTVA APR following the latter's request for co-ordination. However, with the Hawk pilot in visual contact from an early stage, aiming to pass clear astern of the FK70 at a safe distance and subsequently descending below the airliner, Members agreed unanimously that no risk of a collision had existed whatsoever in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

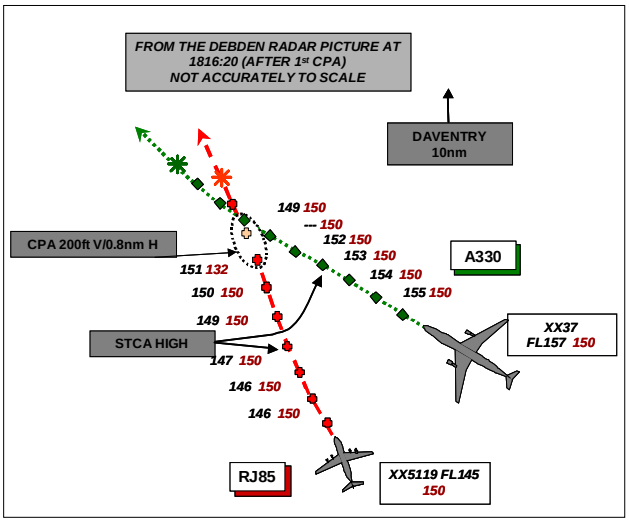
Cause: Leeming APP did not apply the course of action agreed with the DTVA APR.

Degree of Risk: C.

AIRPROX REPORT No 153/08

AIRPROX REPORT NO 153/08

Date/Time:	2 November 1816 (Sunday)	
Position:	5200N 00103W	(10nm S DTY)
Airspace:	Daventry CTA	(Class: A)
	Reporting Ac	*Reported Ac*
Type:	A330	RJ85
Operator:	CAT	CAT
Alt/FL:	FL150	FL150
Weather	VMC CLBL	NR
Visibility:	50km	NR
Reported Separation:		
	0 V/<1nm H	0 V/3nm H
Recorded Separation:		
	200ft V/0.8nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A330 PILOT reports being in receipt of a radar control service from London Control on 130.925MHz. The ac was cleared to descend to FL150 and as they were levelling off at FL150 they received a TCAS TA followed almost immediately by an RA descent. When passing FL143 they received a clear of conflict from the TCAS. Air Traffic Control were advised and they were requested to maintain FL140. They did not see the other ac visually at any time but their TCAS display showed zero ft vertical separation with approx 1nm separation and he assessed the risk as being high.

THE RJ85 PILOT reports the F/O was the pilot flying and they were on a normal departure from London City as instructed by London ATC on 130.925MHz. After the SID and following other instructions, they were instructed to climb to FL150 on a heading of 330°. At FL143 they received a TCAS TA so reduced the rate of climb to 500fpm in the VS autopilot mode. An ac (the A330) was seen on their TCAS display indicating +700ft and they saw it visually high in their 0130 position. ATC passed a message to the A330 to maintain altitude as an ac was levelling below it. A TCAS RA followed and the F/O disconnected the autopilot and started to follow the RA when ATC told them to turn left onto 270°. The green arc required a minimum climb rate of 1500fpm. The conflict was resolved when their ac was at about FL154 and they reported to ATC that they had TCAS RA and were returning to FL150 and a heading of 270°. ATC then instructed them to climb to FL160 and the Captain tried to engage A/P but FL150 and heading 270° were still selected so he disconnected the A/P as the bank angle started to exceed 30°; climbed to FL160 and then re-engaged the A/P and followed ATC instructions. He assessed the risk as being high.

THE LONDON TCC CONTROLLER reports working as the WELIN controller and the traffic level was 'quiet'. An A330 pilot called in the descent to FL220 and he descended the ac initially to FL180 due to an overflight at FL170. The RJ85 pilot then called on frequency so he climbed it to FL150 and turned it right to cross over the [track of the] A330.

He then gave the A330 a descent to FL150 but thought that he had descended it to FL160 even though he had both written FL150 on the strip and actually passed on the RT a descent to FL150. He then saw that STCA had activated and he became confused when he saw the Mode S of both ac indicating a selected level of FL150.

Believing the A330 to have been to the W of the RJ85 he then gave avoiding action to both ac. The labels on both ac were garbled throughout making it unclear to him what was actually happening. The A330 pilot then advised him that he had received a TCAS RA and was going to climb back up to FL150 but he instructed the pilot to descend back down FL140 and turn further left 270° as the RJ85 was at FL150 but by then the conflict was resolved.

UKAB Note (1): NATS provided a copy of their report into this incident. It confirmed that TCAS and STCA functioned correctly. It also contained largely the same factual information as in the ATSI report below.

ATSI reports that the LTC Midlands Sector was split into COWLY/WELIN, the controller operating as the combined WELIN E and W Radar Controller. He had been in position for 30min before the Airprox and described his workload as light.

The A330 established communication with the WELIN Sector, at 1810, reporting passing FL242 descending to FL220, to be level by HEMEL at 290kt or greater. This was in accordance with the Standing Agreement Level between the WELIN Sector and LACC Sector 26. The pilot was instructed to route direct to WELIN at his *"own speed"* and just under 2min later, the flight was instructed to descend to FL180, taking into account an overflight at FL170, which was routeing N to Manchester. The RJ85 pilot contacted the WELIN Sector at 1814, reporting heading 305° and climbing to FL140 (the Standing Agreement Level with TC NW DEPS); he was instructed to turn right heading 330° and climb to FL150.

The controller reported that his plan was to cross-over the tracks of the ac placing the RJ85 to the E of the A330 to allow the latter's descent into Birmingham. After instructing the RJ85 to turn, the next transmission, by the Radar Controller, was to instruct the A330 to descend to FL150 and turn left 10° (radar heading 300°). This resulted in both ac being cleared to the same level, on conflicting tracks. The Radar Controller commented that his intention had been to instruct the A330 to descend to FL160 and that was what he believed he had done. He did not realise his error, either when he transmitted the instruction or when the pilot read back the descent clearance to FL150 correctly. Additionally, he annotated the A330's fps with descent to FL150. He did not register that, shortly afterwards, the Mode S Selected Flight Levels (SFL), for both flights, showed FL150. (The checking of SFL is not mandatory for controllers, although it is encouraged for early identification of possible level busts.) He could not readily explain his error especially as at the time, he had mentally told himself not to descend the A330 to FL150 and then straight away but unknowingly, he had instructed the flight to descend to that level. He thought that he probably did not note the incorrect level during the pilot's readback as the reported descent level matched the level he had annotated on the fps.

In accordance with his plan, to cross-over the tracks of the subject ac, the controller instructed the RJ85 to turn right heading 345°. Shortly afterwards, when the two ac were 2.3nm/1800ft apart, STCA activated with a low level alert. Believing that he had issued clearances which provided standard vertical separation between the two flights, he instructed the A330 to *"maintain Flight Level One Five Zero on reaching there's traffic to cross one thousand feet below your cleared level"*. The pilot confirmed to stop descent at FL150. Immediately afterwards, the Radar Controller instructed the A330 *"Er (callsign) turn right head three six zero degrees avoiding action"* (STCA changed to a high activation alert) and, without waiting for a reply, instructed the RJ85 *"(Callsign) turn left heading er three two seven zero degrees"*. Following the pilot's readback, he transmitted to the A330 *"(Callsign) further right heading zero three five avoiding action"*. Although he had issued de-conflicting turns to both ac, at the back of his mind he still believed that they were cleared at separated vertical levels. Accordingly, he advised the RJ85 *"there's traffic to cross one thousand feet above your cleared level"*. The pilot replied *"Er copied and er we have a TCAS climb (callsign) levelling now at er fifteen hundred and er ????? ?????"*. Thereafter there were part simultaneous transmissions *"C/S er is er descending ????? TCAS"*. From the RJ85 *"????? ????? ????? ????? Flight Level er One Three ?????"*. *"C/S er we had an RA had to descend we're climbing er Flight Level One Five Zero again"*. During this time STCA ceased activating.

The radar recording, timed at 1816:37, shows the A330 1.1nm W of the RJ85. According to Mode S readings, the former is at FL144, heading 320°, and the latter at FL150, heading 326°. Neither ac had completed their avoiding action turns. The Radar Controller, now realising that the A330 was below the RJ85 and, having reported climbing to FL150, was climbing back into confliction, he instructed it to maintain FL140. A high severity STCA alert activated (separation at the time 1nm/500ft). He then instructed the RJ85 to *"climb Flight Level One Six Zero avoiding action"*. In order to resolve the confliction laterally, the controller issued revised heading instructions. As the relative positions of the ac had changed, the RJ85 having crossed to the R of the A330, the former was turned right heading N and the latter turned left heading W. By 1816:57, the A330, which was 0.8nm WSW of the RJ85, was descending through FL143, heading 322° (i.e. 2° right from the radar photograph taken 20sec previously) and the RJ85 was climbing through FL152, heading 311° (i.e. 15° left in 20sec). Vertical separation was provided while the ac turned onto their revised deconflicting headings.

The Airprox occurred because the WELIN Radar Controller inadvertently instructed the A330 to descend to FL150, the same level as the RJ85, rather than the intended level of FL160. Further he did not detect his error, either from the correct pilot readback nor from the Mode S SFL displayed on the radar display. When STCA activated, he issued avoiding action instructions, although he still believed that the subject ac were cleared to correctly

separated levels. Subsequently, as both ac received TCAS RAs, understandably neither pilot fully carried out the avoiding action turns and horizontal separation was not achieved. Thereafter, as the A330 started to climb back to its cleared level, a further confliction arose with the RJ85. This time the controller realised the problem and quickly passed instructions to resolve the situation.

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.

Controller Members observed that the WELIN Controller's plan was sound but, for whatever reason, he did not implement it as conceived. They also discussed why the controller had been so convinced that he had descended the A330 to F160, despite several obvious sources of information indicating that he had actually descended it to FL150 and into conflict with the RJ85. Neither the electronic flight progress strip, the correctly selected and displayed SFLs of the respective ac, the STCA nor the pilots correctly reporting RAs served to prompt him to recheck his action. Only after the ac had crossed and were adjusting to their (re) allocated flight levels did he realise his mistake and issue avoiding action to resolve the conflict. Despite extensive discussion Members could not suggest why this had occurred, ultimately attributing the slip to an undetected human error (although it is understood that it was noted by adjacent controllers and warnings not recorded on the RT tape were passed).

Members also noted that TCAS had given 'crossing' avoidance to the respective pilots who had followed the commands correctly and in a timely manner. Members also observed that, as in this case, when the original clearance is flawed, returning to the originally cleared levels after 'clear of conflict' is received will potentially regenerate the RA.

Since both pilots reacted correctly to their TCAS warnings and since the RJ85 pilot was visual with the A330 slightly ahead of him, the Board decided by a majority of one that there had been no risk of collision.

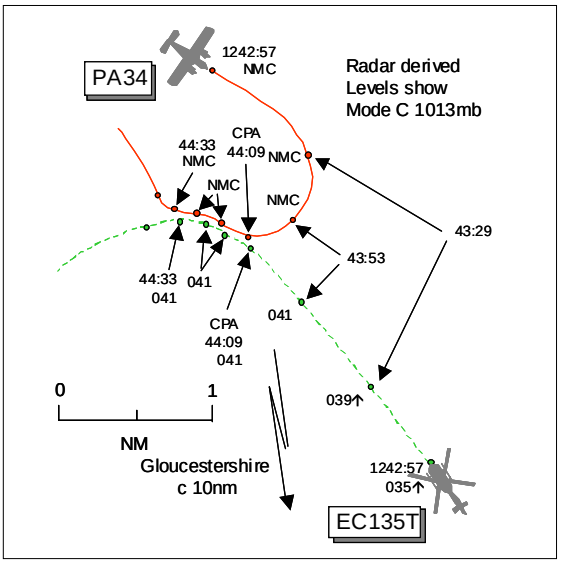
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LTCC WELIN Controller descended the A330 to the level assigned to the RJ85.

Degree of Risk: C.

AIRPROX REPORT NO 155/08

Date/Time:	7 Nov 1244	
Position:	5203N 00212W (10nm N Gloucestershire)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	EC135T	PA34
Operator:	Civ Pte	Civ Trg
Alt/FL:	FL40↑	4000ft (QNH 1005mb)
Weather	VMC CLAC	VMC CLOC
Visibility:	>10km	25km
Reported Separation:	50ft V/100m H	Not seen
Recorded Separation:	0·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EC135T PILOT reports flying a local sortie from Gloucestershire Airport, VFR and in receipt of a FIS from GLOSTER Approach on 128·55MHz; the ac's transponder was thought to be unserviceable. The visibility was >10km flying 1500ft above cloud in VMC and the ac was coloured red; no lighting was mentioned. Whilst climbing to altitude for an air-test passing FL40 heading 270° at 100kt 14nm N of GST NDB, a PA34 overtook him on their RHS. The PA34 remained wings-level when first seen abeam, 50ft above and 100m away. No avoiding action was taken as the ac had already passed; if it was overtaking it was very close. He assessed the risk as medium.

UKAB Note (1): The RAC contacted the EC135T pilot post incident as the radar recording shows the EC135T squawking with Mode C. The pilot believed that the transponder was intermittent but could not recall if it was switched on or off for this flight.

THE PA34 PILOT reports being unaware of being involved in an Airprox. The sortie consisted of a dual initial familiarisation and general handling flight and he was in receipt of a FIS from Gloster Approach on 128·55MHz squawking 7000 with Mode C. The visibility was 25km flying 500ft above cloud in VMC and the ac was coloured white/blue with strobe lights switched on. On departure from Gloucestershire he climbed to altitude 4000ft QNH 1005mb and remained approximately 10nm N of GST in a small area of airspace which was clear of cloud and enabled him to remain in sight of the ground and in VMC. On reaching 4000ft the student carried out some steep turns, both L and R, then commenced a cruise descent to about 2500ft whereby the student configured the ac for an approach to land. The student then commenced a practice go-around and climbed back to 4000ft. After this the student was asked to complete a power-off stall and recovery on his command followed by 2 incipient stall recoveries. The ac was manoeuvred to complete lookouts and remain clear of cloud. On completion the ATIS was obtained and a rejoin to land was executed. He was concerned that both he and the student had no sighting of any other ac.

THE GLOUCESTERSHIRE APP reports that at 1205 the PA34 departed VFR for a local flight to the NW, duration 1hr. On initial contact the pilot was given the Cotswold RPS 1001mb and was asked to report for rejoin. At 1227 the EC135T departed VFR for an air-test to the N and he thought that on initial contact the pilot advised that he would be climbing to FL70. About 15min later the EC135T pilot transmitted that he had an Airprox at FL40 with a W'bound Piper Seneca [PA34] which was acknowledged. Shortly after this the Gloucestershire APP contacted the PA34 flight and asked the pilot if he had been W'bound in that area shortly before which the pilot confirmed. A radar return correlated with the PA34's QDM reading from this last transmission and that radar return had come from the area that the EC135T pilot said the Airprox had occurred. He spoke to the EC135T pilot after landing and asked if the PA34 he had seen was coloured dark blue/white, which the pilot confirmed it was. The APP then

telephoned the pilot of the PA34 to inform him that his ac, which is coloured dark blue/white, was the subject of an Airprox.

UKAB Note (1): The Gloucestershire METARs show EGBJ 1220Z 21009KT 9999 VCSH FEW018 SCT025 11/07 Q1005= and EGBJ 1250Z 21011KT 9999 FEW020 SCT025 12/07 Q1005=

ATSI comments that the PA34 had departed Gloucestershire Airport on a VFR flight to the NW some 40min before the Airprox occurred. The flight was listening out on the Approach frequency and had been requested to report rejoining. The EC135 pilot reported, at 1231, on the Approach frequency, operating between 5-10nm N of the airport between 1500ft and 5000ft. Because of holding traffic at 5000ft, the EC135 pilot agreed to operate up to 4000ft. Approximately 11min later the pilot of the EC135 commented that he required to climb briefly to FL95. Shortly afterwards, he reported an Airprox *"Flight Level Four Zero Seneca aircraft westbound"*. The APP called the PA34 flight requesting if it had recently been operating to the N at about FL40, W'bound. The pilot confirmed that he had.

Although the controller ticked the RIS box on his written report, it would appear he was not providing a radar service to either flight. At all times the RT c/s of the ground station was 'GLOSTER Approach'. Both pilots stated, on their written reports, that they were receiving a FIS from Gloucestershire ATC.

UKAB Note (2): The Clee Hill radar recording shows both ac manoeuvring to the N of Gloucestershire but separated by several miles before the Airprox. The PA34 is seen squawking 7000 with NMC tracking S'bound before turning onto and steadying on a SE'ly heading at 1242:57. Meanwhile the EC135T is seen squawking 7000 with Mode C steady on a NW'ly track in a slow climb and as the PA34 steadies on its SE'ly track the helicopter is climbing through FL35 in its 1 o'clock range 2·9nm. This geometry continues for just under 30sec until 1243:29 when the PA34 is seen to have commenced a R turn 1·5nm from the EC135T, which is climbing through FL39. By 1243:53 the PA34 is turning through a SW'ly heading in the EC135T's 1230 position range 0·5nm, the helicopter now level at FL41. The CPA of 0·1nm occurs 16sec later at 1244:09 as the PA34 is turning through a WNW'ly heading as the EC135T is commencing a slow L turn. As the EC135T turns L the PA34 briefly rolls out on a NW'ly track before also turning L, both ac still separated by 0·1nm. The ac continue on parallel tracks remaining separated by 0·1nm until the ac start to diverge at 1244:41 as the PA34 commences a R turn with separation now 0·2nm. Thereafter rapid divergence is seen as the PA34 steadies on a NW'ly track. The PA34 pilot reported operating at 4000ft QNH 1005mb whilst the EC135T is seen to level at FL41 which equates to 3860ft QNH 1005mb.

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.

This incident occurred in Class G airspace where pilots are responsible for maintaining their own separation from other ac through 'see and avoid'. Of concern to Members was the fact that these ac passed each other in close proximity, effectively unsighted by both pilots. The opportunity to see each other's ac was there immediately prior to the Airprox. The EC135T was on a steady NW'ly track when the PA34 turned from a SE'ly track towards its projected track, onto a converging heading. However, the PA34 was only seen as it 'overtook' the helicopter on the R, 50ft above and 100m clear. Likewise, the PA34 pilot had the opportunity to see the EC135T when he carried out a lookout scan to clear the area into which he was about to turn but he did not see the helicopter at all. In all probability, once the turn was commenced, the EC135T would have been lost from view, as the PA34 was turning 'belly-up' to the helicopter. It was clear that luck had been the major factor in this incident, the ac passing by chance unsighted by both pilots. The Board therefore concluded that an actual risk of collision pertained during this encounter.

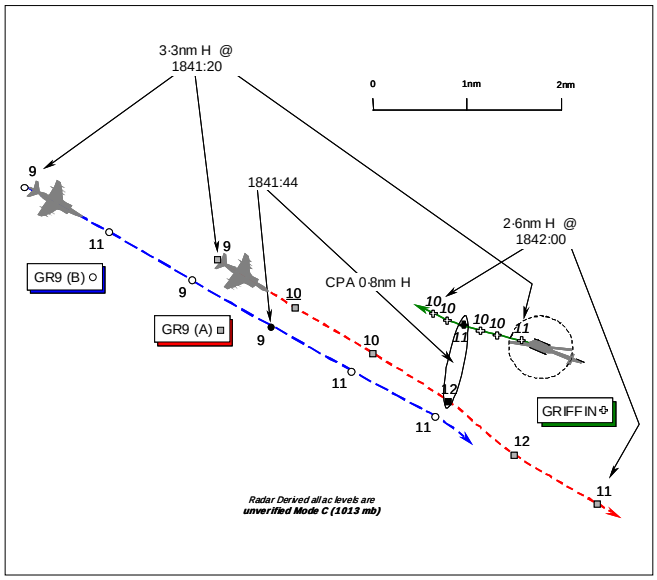
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the PA34 pilot and an effective non-sighting by the EC135T pilot.

Degree of Risk: A.

AIRPROX REPORT NO 156/08

Date/Time:	11 November 1843 NIGHT	
Position:	5237N 00241W (10½nm S of Shawbury AD - elev 249ft)	
Airspace:	UKNLFS	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Griffin HT1	Harrier
Operator:	HQ Air (Trg)	HQ Air (Ops)
Alt/FL:	250ft	300ft
	RPS (996mb)	Rad Alt
Weather	VMC Nil Cloud	VMC Full Moon
Visibility:	30nm	20km
Reported Separation:		
	Nil V/900m H	200-300ft V/2-3nm H
Recorded Separation:		
	v GR9 (A): 100ft V/0·8nm H	
	v GR9 (B): 100ft V/1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GRIFFIN HT1 HELICOPTER PILOT reports that he was conducting a VFR night low-level training sortie in the UKNLFS whilst in receipt of a FIS from Shawbury ATC 'Low-Level' on 376·675MHz. His helicopter has a black & yellow colour-scheme and the HISLs and navigation lights were all on. A squawk of A7000 was selected with Mode C on; neither TCAS nor any other form of CWS is fitted

About 1min before the Airprox occurred, Shawbury ATC reported a pair of fast moving contacts converging on their track approximately 3nm away. Nothing was seen at this point. 'Low-Level' then reported the contact had closed to a range of 1nm. As they could still see nothing, he slowed his helicopter down from 120kt to 60kt. Some 30sec later, approaching a position 10½nm S of Shawbury, heading 278° at 250ft agl, one set of anti-collision lights was spotted in his 12 o'clock at about ½-¾nm crossing from R - L. He then turned his Griffin 30° R as the second ac of the pair had not been identified. He only saw the anti-collision beacon of one ac which, he estimated, passed some 900m ahead at the same height with a "low" risk of a collision. At this point he asked if ATC had a squawk from the other ac, which they had [A7001 from both GR9s], and advised he would be filing an Airprox on the RT.

THE HARRIER GR9 PILOT provided a very frank and comprehensive account reporting that he was leading a pair of Harriers flying a night low-level training sortie [through NLFA5E]. They were listening out on the LFS common frequency of 278·0MHz, squawking A7001 with Mode C, whilst operating VFR, clear of cloud but flying into a full moon (76 mLUX). At the time of the reported Airprox the formation was flying at 420kt in a 1½nm trail heading 115° at 300ft Rad Alt when he saw the lights of a helicopter in his L 10 o'clock at 3-4nm away. He called the traffic to his No2 who was also visual with the helicopter, which was slightly high and appeared to be on a generally reciprocal heading. His formation of Harriers passed well to the S of the helicopter – minimum separation was 200-300ft vertically and about 2-3nm. No avoiding action was required and there was *"absolutely no risk of confliction/collision".*

He considers that this occurrence was the result of his own pre-flight planning error as the formation leader. Whilst planning the route, he checked the list produced by LFBC of stations conducting night flying and noted that Shawbury was not notified as being open at the time of his flight. His squadron had been allocated Night LFA5E which encompasses LFA9. This LFA is not marked on the Low Flying Chart (LFC) as a separate 'Rotary Area' at Night, unlike most others. This led him to believe [erroneously] that if Shawbury was closed, the area of LFA9 was available for low-flying fixed-wing traffic. Consequently, the formation was planned to fly, and subsequently flew, through the SW of LFA9 unaware that Shawbury was in fact open and rotary wing Night flying was taking place.

After the Airprox was raised he rechecked the Night section of the Military Low Flying Handbook (LFH) and noticed the one line entry referring to the Day LFA9 Section where it details the requirement to book into LFA9 at Night regardless of whether Shawbury is open - Day or Night. Although aware of the daytime restrictions and the night restriction if Shawbury is open, he was unaware of the need to book-in when it is not night flying. He reports candidly that he had led his fixed-wing formation into a dedicated rotary-wing area without a booking, which was an honest oversight.

Notwithstanding this omission, he does not believe that there was ever any danger either to his formation or any helicopter. The weather was extremely good with a full moon; all ac were flying with HISLs 'on' and the Griffin helicopter was seen at range by both formation pilots with no avoiding action being taken or indeed necessary.

To avoid any future misconceptions (based on a straw poll, it was not solely his misunderstanding of this aspect of the Night LFS) he believes that two things could be changed relating to the Night status of LFA9. Firstly, in his view the procedures for LFA9 at 'Night' should be in the 'Night' Section of the LFH. Secondly, since it is in fact a dedicated rotary area at Night, it should be bounded and identified as such on the Night LFCs in green.

MIL ACC reports that the Griffin crew was flying a low-level Night training sortie in LFA9 receiving a FIS from Shawbury 'Low-Level' (SLL) on 376·67MHz. The SLL controller was the Shawbury ADC located in the VCR. There is no radar in the VCR but the controller was able to monitor the progress of his ac using the Hi-Brite display [an Aerodrome Traffic Monitor (ATM)].

Prior to the Airprox the No2 GR9 had been working London Mil LJAO Central on 252·87MHz. The No2 GR9 had departed from Wittering to cross CAS via DAVENTRY to join the lead GR9 Pilot who was already flying in the LFS. Once clear of CAS the No2 GR9 pilot was provided with a RIS and at 1816:51, was instructed to continue with his en-route frequency.

At 1830:55, the Griffin crew called SLL "*at Peplow low-level navex to western".* SLL provided a FIS and issued the Barnsley RPS of 995mb. Approximately 10min later at 1840:56, SLL passed traffic information to the Griffin crew *" traffic believed to be you has fast moving traffic north west about 10 miles indicating same height as you, a pair going towards you",* which the Griffin crew acknowledged. At 1841:22, SLL updated the traffic information as "[C/S] *that fast moving traffic now west converging same height 5 miles",* whereupon the Griffin crew reported visual with the traffic. SLL went on to say *"one* [ac] *about 2 miles behind that"* which is believed to refer to the No2 GR9. SLL then contacted LJAO to try and find out what the fast moving traffic was. The LJAO controller stated that he thought it was the GR9 formation operating low-level and offered to confirm the details on behalf of SLL. At 1842:00, the Griffin crew asked SLL to confirm if there was 1 or 2 fast ac to which SLL replied, *" There's a pair, one 2 miles further behind the other one. I think the second one's just come past you now".* The Griffin crew reported that he didn't see the second aircraft and reported that the first ac passed *"..about a mile away".*

[UKAB Note (1): The radar recording shows the Griffin helicopter on a westerly track with 2 fast moving tracks approaching from the NW squawking A7001 [the GR9 formation] tracking SE. The GR9 formation maintained a SE'ly track passing to the S of the Griffin; the lead GR9 (A) was on a reciprocal track at the same indicated level as the Griffin before passing S abeam the helicopter at 1841:44, with a CPA of 0·8nm whilst indicating 100ft Mode C above the helicopter. The No2 GR9 (B) passed by 100ft above the Griffin at the CPA of 1nm just before 1842:00.]

SLL offered to trace the GR9 formation and the Griffin pilot advised SLL that he would be filing an Airprox. After speaking to LJAO again, SLL confirmed the observed fast jet ac was the GR9 formation. SLL also asked LJAO to make a note to advise any other aircraft going low level in the area that Shawbury [LFA9] was active; the LJAO controller acquiesced.

In summary, the Griffin crew was operating low-level in LFA9 at Night receiving a FIS from SLL. The controller passed relevant traffic information to the Griffin crew with regard to the GR9 formation and updated the information when he deemed it necessary for flight safety. SLL also obtained traffic information from London Mil LJAO Central establishing that there was a formation of Harriers operating Low Level in LFA9, who had flown into an active dedicated rotary operating area without prior notification.

MOD LF OPS reports that the following regulations concerning Dedicated User Area (DUA) LFA9 bookings are spread throughout the LFH in the Sections shown below:

Regarding the details of the regulations to booking into DUA LFA9 by Day & Night, whilst the rules and regulations are not highlighted, there are more than enough references throughout the LFH to ensure that aircrew are aware that DUA9 remains an independent block of airspace by Day & Night which must be separately booked; it is not subsumed into the Allocated Regions. The DUAs are included on the night charts but none of them are individually highlighted in Green as the airspace does not change day to night. Those areas that do change - HTAs, SAR boxes etc - are on the night charts in Green - the same as all extra night information. However, LF Ops is considering the inclusion of a "Big and Bold statement" at a suitable point in the LFH.

HQ AIR (TRG) comments that the lead Harrier pilot incorrectly assumed that Shawbury was closed and that a specific clearance was not required to operate in LFA9. Having entered LFA9 the Harrier formation was seen and reported by Shawbury ATC to the Griffin crew. The accurate and timely traffic information helped the Griffin crew adjust their flight profile to reduce the risk of collision. The Harrier formation had seen the Griffin and remained clear.

HQ AIR (OPS) comments that the planning error by the lead Harrier pilot put the formation into an area which the Griffin crew did not expect to find FJ traffic. However, a combination of traffic information and lookout by both sides resulted in a satisfactory outcome. The day rules for the Shawbury RW area are well known but the Harrier team thought they also knew what happens at night; this was not so.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Military LF Ops Advisor explained further that the Night Section LFS regulations contained within the LFH is, effectively, an addendum to the applicable Daytime rules contained within the individual LFA briefs in the LFH. Stressing that procedures contained in the Night Section cannot be read in isolation, the Advisor stated that the main Day LFA Section briefs must also be consulted. Many DUAs exist in the LFS for the exclusive use of helicopter traffic, eg Culdrose and Yeovilton DUAs, in addition to the Shawbury LFA9 DUA that featured here. None of the rules applicable to these DUAs change significantly, by day or night, and in the Advisor's opinion there is sufficient information already contained within the LFH to explain this. Consideration had been given to changing their depiction on the Night LFCs to green as suggested by the reported pilot: this was subsequently rejected however as the increased green overprint could lead to a more cluttered LFC. The Board recognised the difficult choices between adding too much information and depicting essential data clearly on charts, the subject of previous Safety Recommendations made by the Board.

It was explained that individual tracks through LFAs are not actually notified to the LFBC when Units book their sorties in the LFS. Furthermore, it is feasible to transit through Night LFA5E without entering the LFA9 DUA. Hence, when the LFBC accepted the booking from the Unit they were unaware of the leader's intention to transit the DUA. Clearly the Harrier leader was mistaken in believing that Shawbury was not night flying and the Board was advised by the LFBC that at some point sortie details had been changed and the low flying booking amended to reflect this. Clearly the subsequent sortie flown resulted in the formation flying through the area when Shawbury was indeed night flying, but it was unclear from the information available to the Board as to whether the Harrier leader had recognised this from the original notification of Stations conducting night flying that evening. Military pilot Members observed that it seemed plain enough from the regulations that normal FW flying in LFA9 is however prohibited.

The Mil ACC report had shown that, fortunately, the alert ADC had observed the GR9 jets on his 'Hi-Brite' display in the VCR; recognised the potential for a conflict with the Griffin and had conscientiously passed traffic information to the Griffin crew, albeit that only a FIS was being provided at the time. The Board commended the ADC for his prompt action which clearly provided the Griffin pilot with an early warning of the unexpected presence of the Harrier formation within the helicopter DUA such that he was primed to search for them and which subsequently helped him to acquire the lights on one jet visually. It was not completely clear which of the two jets he saw and the timings on the RT transcript suggested to some Members that the Griffin pilot might have seen GR9 (B) – the second ac as the pair flew by. Nevertheless, the radar recording had reflected that fortunately the two jets were passing clear to S of the helicopter on a broadly reciprocal track – the closest about 0·8nm away at the CPA – approximately 1500m distant and somewhat more than the Griffin pilot had estimated.

For his part, the GR9 formation leader's frank and comprehensive account had clearly reflected the catalyst to this Airprox when he inadvertently planned and undertook this flight through the DUA contrary to established protocols. Whilst pilot Members recognised the difficulties of trying to assess distance visually at night, it was clear from his account that both he and his wingman had detected the presence of the Griffin in good time – some 3-4nm away he reports - assessing that no avoiding action was required. The Board agreed unanimously, therefore, that this Airprox had resulted because the Harrier GR9 formation entered the LFA9 DUA and flew into conflict with the Griffin.

Although the reporting Griffin pilot apparently only saw one of the jets, he had wisely turned away anticipating the presence of another and assessed the risk himself as *"low".* Similarly the lead GR9 pilot reported there was *"absolutely no risk of confliction/collision".* The Board agreed with the pilots involved that despite the relatively close proximity of the jets to the helicopter at Night, no risk of a collision had existed in the circumstances conscientiously reported here.

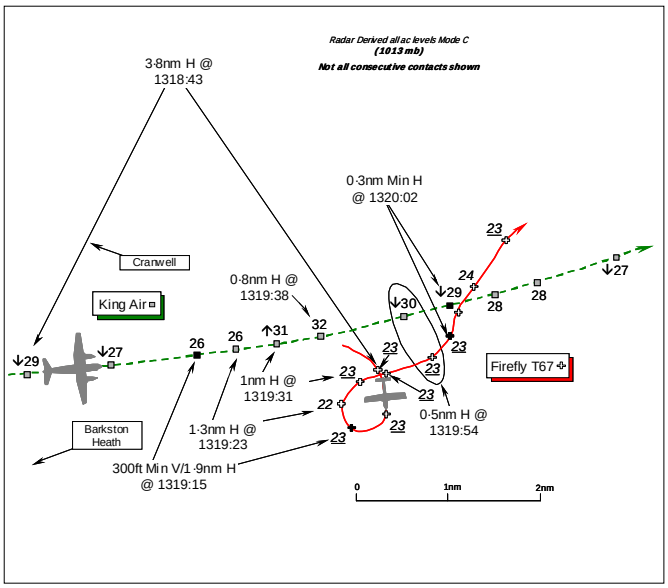
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Harrier GR9 formation entered the LFA9 DUA and flew into conflict with the Griffin.

Degree of Risk: C.

AIRPROX REPORT NO 158/08

Date/Time:	7 Nov 1319	
Position:	5259N 00021W (5nm ESE of Cranwell - elev: 218ft)	
Airspace:	MATZ/FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	B200 King Air	Firefly T67M
Operator:	HQ Air (Trg)	HQ Air (Trg)
Alt/FL:	2000ft	2000ft
	QFE (998mb)	RPS
Weather	IMC KLWD	VMC CLOC
Visibility:	10km	25km+
Reported Separation:		
	300ft V/1nm H	300ft V/500m H
Recorded Separation:		
	300ft Min V @ 1·9nm H	
	0·3nm Min H @ 600ft V	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BEECH 200 KING AIR GT PILOT, a QFI, reports that he was flying under IFR in the radar pattern to RW27 at Cranwell in IMC and in receipt of a RIS from Cranwell APPROACH (APP) on 119·375MHz. A squawk of A2602 was selected with Mode C; TCAS and Mode S are fitted.

Eastbound and now clear of the Barkston Heath visual cct, descent instructions were received from APP to descend to a height of 1800ft QFE (998mb). On the DOWNWIND leg about 5nm SE of Cranwell at 180kt, as his ac approached 2000ft QFE in descent, traffic was noted on TCAS close to their ac about 1nm away, indicating 300ft below them. This was immediately followed by a TCAS CLIMB RA, which demanded a CLIMB at about 2000ft/min. An RT call was made to APP reporting, "[C/S] TCAS CLIMB". The aircraft was climbed in IMC to a height of about 2800ft QFE, whereupon the TCAS RA moderated to "MONITOR VERTICAL SPEED" and allowed a level-off. The conflicting ac – a yellow Firefly - was then observed through a gap in the clouds in their 1o'clock about 0·25nm away heading towards them in level flight, some 800ft below his ac after the TCAS action had been completed.

At the moment the Airprox occurred they were flying about 50ft above cloud; minimum separation between his and the other ac was 300ft vertically and 1nm horizontally. Stressing that TCAS ensured there was *"no"* risk of collision, without this system he felt that there was a *"significant"* risk of collision [his Airprox Report form was annotated *"medium"* Risk]. He added that his ac is only VHF equipped which may have increased the workload of ATC who were working both UHF and VHF traffic. This also reduced their awareness of other traffic on UHF – the main operating frequency. An Airprox was reported by telephone to Cranwell after landing. His ac is coloured Blue & White and the ac's lights, including the HISLs, were on.

THE FIREFLY T67M PILOT, a student pilot, reports 2½weeks after the Airprox occurred that he departed from Barkston Heath at 1315 to carry out a solo 1hr mixed general handling (GH) & VFR navigation sortie. His intention was to navigate from Point OSCAR [UKAB Note (1): At the junction of the A52 & A15 roads, some 4½nm SSW of the location of the Airprox] to Swineshead Bridge [110°(T) CWL 11½nm], before entering the LFS to the N of Spalding after obtaining a FIS from Cottesmore and thence to Borne. Thereafter, his intentions were to climb to height for aerobatics and a PFL before returning to Barkston Heath.

Flying straight and level at an altitude of 2000ft RPS in VMC, heading 070°(M) at 120kt, about 5min after departure and during his preparations for starting the first leg of the navigation phase of the sortie, Cranwell DEPARTURES (DEPS) - from whom he was receiving a FIS on 275·675MHz - made him aware of a King Air ac to the W about 1nm away. He acknowledged this with "looking (C/S)". Shortly afterwards he made visual contact with the King

Air which approached from slightly behind his Firefly, on his L and some 300ft above his ac, on a track of about 040° and thus diverging, he thought from L to R. He manoeuvred his Firefly (turned R) to increase the "rate of separation" and angle of divergence until he was well clear of the twin, advising DEPS that he was visual with the King Air, before he continued with his navigational route. At the closest point the King Air passed 300ft vertically and some 500m horizontally away as it crossed astern.

Reporting his workload as "high" and busy preparing to start his nav leg and switch to the Cottesmore ZONE Frequency, he believes his lookout was adequate. However, if he had not been made aware of the other aircraft by DEPS he may not have seen the King Air until it had passed him, due to its position astern.

THE CRANWELL RADAR APPROACH CONTROLLER (APP) reports that the King Air was 'VHF only', DOWNWIND in the radar pattern descending from 2500ft Cranwell QFE to 1800ft QFE under a RIS. Unknown traffic, he thought squawking A2641 (Lincolnshire AIAA) [but actually displaying A7000 at the time of the Airprox] was observed manoeuvring 2nm S of the King Air tracking S, he thought at 2600ft Mode 'C' [equating to 2150ft QFE (998mb)], but no confliction with the King Air. The unknown traffic then made a tight 180° turn onto N into conflict with the King Air, subsequently triggering a TCAS CLIMB RA in the latter. When clear of the conflicting traffic, which was subsequently found to be a Firefly, the King Air continued descent.

In the APP controller's view, this situation was compounded by three factors. Firstly the sharp turn of the Firefly gave little opportunity to warn the King Air crew of the potential confliction. Secondly, the use of both VHF and UHF frequencies to control traffic recovering to Cranwell led to insufficient division of attention to enable him to recognise the confliction early enough to give adequate warning. Finally, the Firefly was manoeuvring at 1800ft in the vicinity of a known radar pattern.

MIL ACC reports that at the time of the Airprox, Cranwell was operating to RW27 with the Watchman ASR and SSR fully serviceable. APP was operating both UHF and VHF frequencies with one track on each frequency.

APP was aware that a TCAS RA had occurred and immediately made notes in response to the King Air pilot's report. However, ATC was not made aware of an Airprox being filed until a significant period after the event. Consequently, a report was not requested from DEPS and the SUPERVISOR's report was written a considerable time after the event. Therefore, information from Cranwell ATC is based solely on the report made by APP and the tape transcripts of the APP and DEPS frequencies.

The King Air was established in the Cranwell Radar Training Circuit (RTC) on the DOWNWIND leg to the S of the airfield. At 1317:59, APP instructed the King Air crew to descend to 1800ft Cranwell QFE (998mb), which the pilot acknowledged 4sec later. The APP controller reported that traffic was seen manoeuvring S of the King Air tracking S, squawking A2641 indicating 2600ft Mode C and no confliction: however, this track does not appear on the radar replay. [UKAB Note (2): In all probability the APP was referring to the track shown at 1318:43, later identified as the Firefly, shown on the Claxby Radar recording squawking A7000 maintaining 2300ft Mode C (1013mb) - displayed in a wide R turn after previously tracking ESE – some 3·8nm due E of the King Air that itself is descending through 2900ft Mode C (1013mb) in accordance with the instructions issued by APP.] The Firefly appears not to be in confliction with the King Air at this point. Meanwhile, at 1318:24 APP had received a PRACTICE PAN call on UHF and was busy dealing with the call for the next 20secs. At 1319:07 the Firefly can be seen to continue in a hard R turn - 2·5nm away bearing 120° from the King Air which is now descending through 2700ft Mode C (1013mb). At 1319:12, APP issued a positioning left turn instruction onto 070° to the King Air crew which was immediately acknowledged. [The radar recording shows the King Air at 1319:15, indicating 2600ft Mode C approaching the MATZ boundary - two sweeps before the TCAS CLIMB is evident - with the Firefly indicating 2300ft Mode C bearing about 135° from the King Air at a range of 1·9nm - outside the MATZ - some 300ft below the twin at the point of minimum vertical separation.] Some 8sec after acknowledging the turn [1319:20], the King Air crew transmitted *"TCAS climb".* At 1319:31, the King Air crew transmitted "[C/S] *leveling 2800 feet"* which APP acknowledged. Moments later at 1319:38, the King Air crew declared, *"clear* [of] *conflict we're descending back down to cleared altitude* [sic] *1800 feet* [height on QFE]*".* [At 1319:54, vertical separation of 700ft was evident as the King Air descended and passed 0·5nm to port of the Firefly, maintaining 2300ft Mode C. The Claxby Radar recording shows the ac continued to close as the King Air overtook the Firefly to port. The point of minimum horizontal separation of 0·3nm occurred at 1320:02, when 600ft of vertical separation was indicated just as the Firefly starts to draw aft.]

Meanwhile, the Firefly was operating under a FIS with DEPS, who was concerned about the proximity of the King Air and issued traffic information to the Firefly pilot at 1319:11, "[C/S] *traffic west 2 miles tracking east descending to 1800 feet, King Air",* to which the Firefly pilot reported looking. At 1319:25, DEPS updated the traffic information as *"..that King Air is now north-west by 1 mile eastbound. Are you visual?"* The Firefly pilot replied "…negative". Some 19sec later at 1319:54, the Firefly pilot reported visual with the King Air which was within 1sec of the King Air crew reporting visual with the Firefly.

Cranwell APP was operating both UHF and VHF frequencies at the time of the Airprox and distracted by a Practise Pan on UHF immediately prior to the Airprox. That, combined with the sudden alteration in the flight profile of the Firefly - previously on a non-conflicting track - gave APP little time to spot the confliction. Therefore, traffic information was not passed to the King Air crew about the Firefly that was manoeuvring in close proximity to Cranwell's radar training pattern.

UKAB Note (3): Met Office archive data gives the 1318UTC Cranwell SPECI Weather as: 21013kt; 9999; SCT023, BKN250; 11/07 Q1005 WHT TEMPO FEW023 BLU=. The BARNSLEY RPS for this hour was 995mb.

HQ AIR (TRG) comments that there were several elements to this Airprox. Firstly, there is the issue of some Cranwell based King Airs only being VHF equipped. At the time of this Airprox, Cranwell had just taken delivery of several new King Airs that were fitted with VHF radios. These ac have since all been modified and are now fitted with both VHF and UHF radios. Secondly, it is possible that the Firefly pilot (solo student) had misidentified his navigational start point and was inadvertently manoeuvring in the radar pattern. Finally, the unexpected tight turn by the Firefly suddenly changed its status of not being in confliction and flying away into direct confliction with the descending King Air not giving the APP controller much opportunity to issue avoiding action. However, TCAS provided a solution to the King Air that reduced the actual risk of a collision

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It seemed ironic to some Members that the VFR flight in receipt of a FIS here had received comprehensive traffic information whereas conversely the King Air crew, operating IFR in IMC and under a RIS, had received none. Moreover, a controller Member contended that sound ATC teamwork was not entirely evident from this Airprox.

The Mil ACC Advisor to the Board opined that notwithstanding the PRACTICE PAN call to APP, the controller's workload was such that he could and should have passed traffic information to the King Air crew about the Firefly. Whilst Members recognised that the LATCC (Mil) radar recording did not replicate the actual radar picture displayed to APP, the Claxby Radar data clearly showed that the Firefly was squawking unverified Mode C – indeed, APP's report cited that a track was displayed to him. Whilst accepting that the Firefly might have been heading away from the projected track of the twin at one point, it should have been evident to APP that the 'unknown' light ac was in relatively close proximity to the DOWNWIND pattern and in the Advisor's view should have been pointed out to the King Air crew under the RIS that pertained. Controller Members were in no doubt that when the 'unknown' Firefly continued to turn R towards the King Air, the Firefly should have been called in to the King Air crew as a definite confliction. Moreover, the Firefly was maintaining a level equivalent to about 1850ft QFE and it should have been evident to APP from the indicated levels that he had instructed the King Air crew to descend through, or close to, the level indicated by the 'unknown' Firefly. That this was not done denied the King Air crew significant traffic information that would have aided their situational awareness; the Board agreed that the lack of traffic information was a Contributory Factor in this Airprox.

Whilst this Firefly squawking A7000 might have been 'unknown' traffic to APP, DEPS was entirely cognisant of the flight, providing its student pilot with a FIS as revealed by the RT transcript. It was unfortunate that the Unit had not sought a report from the DEPS controller at the time which was puzzling to some Members. The Mil ACC Advisor briefed the Board that both APP and DEPS were seated adjacent in the same ACR and experienced controller Members were disappointed that these two controllers had not sought to co-ordinate the two flights more closely with one another under the prevailing light traffic conditions. However, the recording had reflected that DEPS had passed comprehensive traffic information to the Firefly student on two occasions which accurately reflected that the King Air was descending to 1800ft – presumably a height on QFE although not stated as such –

which suggested that DEPS was aware of APP's intentions either through direct liaison with the controller or from his general appreciation of what APP's traffic was doing. It was clear from the Mil ACC report that DEPS was concerned over the proximity of the descending King Air and had conscientiously issued a warning under the FIS. DEPS therefore ensured that the student pilot was kept appraised with two transmissions of traffic information that ultimately enabled the student to sight the twin as it overtook him above.

Instructor pilot Members recognised that the Firefly student pilot had little experience himself to draw upon here and it seemed unlikely that he would have realised that he was in the vicinity of the radar training circuit, close to the height at which traffic was routinely marshalled in the pattern. Controller Members familiar with ATC procedures in this area expressed the opposite view however, believing that the Firefly pilot would have been briefed about such patterns. After discussion, the consensus was that the student would have had little grasp of the significance of straying into the RTC with all that this entails. From his perspective, he was operating VFR under 'see & avoid' whilst endeavouring to depart on his NAVEX from his chosen departure point - Point OSCAR - but as this was shown to be somewhat SW of his position at the time of the Airprox it appeared that he might have been trying to locate his position - hence the orbit. Thus it seemed plain to the Members that the Firefly student would have been unable to spot the King Air, apparently descending though cloud, any earlier than he did without the assistance of DEPS and the controller was wise to pass traffic information when he did. But for his part the Firefly student pilot had little impact on the outcome other than to spot the King Air as it flew past, 0·5nm away on the port beam, albeit by this time some 700ft above his aeroplane after its crew had responded to their TCAS RA.

As had been shown, the King Air crew could reasonably have expected traffic information about the Firefly but another view was that as they were descending IMC in cloud, it was difficult to imagine what else the King Air crew would have done differently at the time even if they had been armed with traffic information on the Firefly. This Airprox illustrated the difficulties that can ensue when IFR traffic is vectored in the radar pattern, either through or in close proximity to cloud in IMC, under an ATS that ultimately requires the crew to avoid other traffic visually within the principles of 'see & avoid', where the Firefly was operating clear of the MATZ in Class G airspace. Far better to ask for assistance in maintaining separation against other traffic and an upgraded radar service might have precluded the necessity for TCAS to act, which is plainly the penultimate safety net that should not be used to engineer separation for IFR traffic in the first instance. The Cranwell METAR however revealed that the weather was not that dismal and in the CC WHITE; TEMPO BLUE weather conditions that pertained at Cranwell, the King Air crew subsequently saw the other ac beneath them but only after they had complied with the demanded TCAS CLIMB RA. The radar recording revealed that the King Air had descended to a mere 300ft above the indicated level of the Firefly as the range decreased to 1.9nm, but within a further 0·9nm the King Air crew had reversed their descent into a climb and ascended to 3100ft Mode C (1013mb) such that at a range of 1nm they were 800ft above the Firefly, itself indicating 2300ft Mode C, and thus more than that required to ensure that the TCAS equipped King Air remained clear of conflict with the non-TCAS fitted aeroplane. Once again TCAS had worked 'as advertised' but the crew should not have been placed in this predicament. The Board concluded therefore, that this Airprox had resulted from a conflict in the vicinity of the Cranwell radar pattern resolved by the King Air B200 crew following TCAS but that any risk of collision had thereby been removed entirely.

PART C: ASSESSMENT OF CAUSE AND RISK

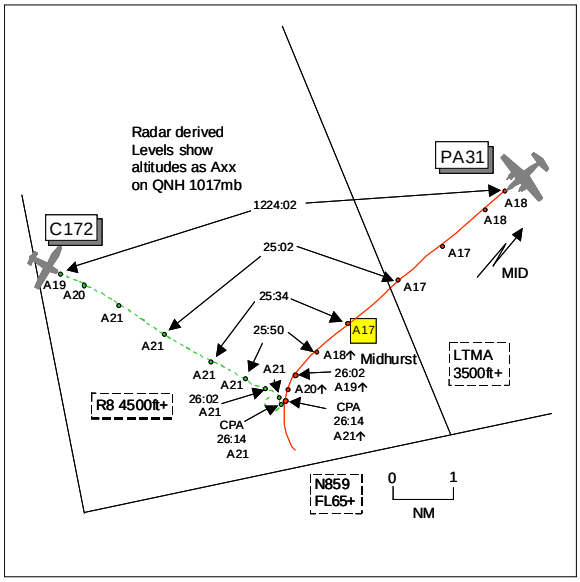
Cause: Conflict in the vicinity of the Cranwell radar pattern resolved by the B200 King Air crew following TCAS.

Degree of Risk: C.

Contributory Factors : Lack of traffic information from APP to the King Air pilot.

AIRPROX REPORT NO 159/08

Date/Time:	12 Nov 1226	
Position:	5058N 00046W (2nm SW Midhurst Town)	
Airspace:	LFIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	C172	PA31
Operator:	Civ Pte	Civ Surv
Alt/FL:	2000ft (QNH 1018mb)	1800-3500ft (QNH)
Weather	VMC CLNC	VMC NR
Visibility:	>10km	NR
Reported Separation:	Nil V/200m H	Not seen
Recorded Separation:	Nil V/0·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C172 PILOT reports en-route to Shoreham VFR and listening out with Goodwood Information on 122·45MHz squawking with Mode C. The visibility was >10km in SKC VMC and the ac was coloured white/beige; no lighting was mentioned. About 2nm S of Midhurst heading 110° at 100kt and 2000ft QNH 1018mb, he first saw a low-wing twin-engine ac coloured white/blue in his 10 o'clock range 0·25nm at the same level. He immediately commenced a descending RH turn into a 360° orbit to avoid the other ac, possibly a C340 or PA34, passing about 200m away at the CPA. Despite his ac having the right of way, the other ac did not appear to take any avoiding action. After resuming course, the other ac was seen to make a lazy LH turn onto a NE'ly track. He did not know why he did not spot the other ac sooner, assessing the risk as high. Later he telephoned Goodwood who had spoken to Farnborough and Swanwick, neither of whom were aware of this ac. Approximately 3min before the Airprox he had been handed-off by Solent to en-route frequency and having been under a FIS he had not been advised of any conflicting traffic. Although he was monitoring Goodwood on Box 1 he was also listening out with Farnborough frequency 125·25MHz on Box 2.

THE PA31 PILOT reports flying a photo-laser survey flight from Cambridge VFR and in receipt of a RIS from Farnborough on 125·25MHz squawking an assigned code with Mode C. The Wx was VMC and the ac was coloured red/white/blue with strobe lights switched on. He was unsure whether he had seen the reporting ac. Operating between 1800 and 3500ft in a busy piece of airspace he is normally very vigilant when it comes to lookout. There were several ac in the vicinity that day but he could not be specific about the reporting ac. He was receiving a RIS at the time and he later spoke to his 2 operators on board but they could not provide any additional information.

ATSI reports that at 1227hrs the C172 flight established communications with Goodwood Information. The pilot reported 5nm to the N of that airfield at 2000ft, routeing to Shoreham and adding that he would like to report an 'airmiss' that occurred at 1225. The FISO asked the pilot to pass the details, *"Okay er height was er altitude two thousand feet heading one one zero er position two miles south of Midhurst er the aircraft type was twin engined er piston with er white upper markings er with a blue…fuselage didn't get the registration".* The FISO acknowledged the details and advised the pilot he would telephone Farnborough to see *"if they've got that on radar".* The C172 pilot responded, *"Roger and er risk of collision was high".* A short time later, the C172 pilot reported transferring to Shoreham.

The other ac was the subject PA31 which, some 15min earlier, had established communications with Farnborough on the LARS W frequency. This occurred at 1210, following the flight's transfer from Farnborough LARS N. The controller issued a LARS W discrete SSR code and informed the flight *"…it's er Radar Information Service limited due to traffic density possible late warning traffic".* It is noted that the flight was not issued with the current

Farnborough QNH, the setting used in LARS W (LARS N use Heathrow QNH). At the time, the Farnborough QNH was 1018mb while the Heathrow QNH was 1017mb.

A **Radar Information Service** is described in the MATS Part 1 (current at the time) 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 aircraft whether or not the controller has passed traffic information."* Also, in relation to **Limiting a Service** *"Outside controlled airspace in circumstances where controllers cannot continue to provide the following* (relevant) *requirement*:

b) traffic information in respect of all conflicting unknown aircraft for a Radar Information Service, controllers may elect to continue to give the service by limiting the extent to which it is provided.

Controllers must inform pilots when they limit the service and ensure that pilots are made fully aware of the implications of any limitation.

The pilot read back the SSR code but not the type of service, as required by MATS Part 1. This went unchallenged by the controller. A request was then made to overfly Farnborough Airport en-route to an area around Midhurst where the survey was to be conducted. The radar recording shows the PA31 approximately 20nm N of Farnborough at this point. Over the next few minutes it flew S, passing close to Farnborough, before setting course for Midhurst. During this time, the controller passed TI to the PA31 flight, as appropriate, and at 1217:30, the pilot reported descending to 1500ft for the survey run. Despite this report, however, the ac's Mode C did not indicate below 1700ft at any stage thereafter.

By 1220:40 the PA31 is passing overhead MID and established on a SW'ly track. Also visible, within the LARS W sector, is traffic in the PA31's 1 o'clock position at 12nm, tracking SE. This traffic is the subject C172 squawking 7000 at altitude 1900ft London QNH 1017mb and 'unknown' to Farnborough. Respective tracks continue to converge on a constant relative bearing and by 1225:34 they are 2·2nm apart, the PA31 at 1700ft and the C172 at 2100ft. At 1226:02, the 2 ac are 0·5nm apart; the PA31's track history indicating it has started a turn to the L. It has also commenced a climb, reaching altitude 1900ft. CPA occurs 3 sweeps later at 1226:14, when the C172, now just starting a R turn, is in the PA31's 1 o'clock range 0·1nm, both ac indicating at the same level - 2100ft. Thereafter, tracks diverge, the C172 entering an orbit to the R and rolling out onto a SE'ly track once more, while the PA31 completes a wide turn to the L onto N. At no stage was the PA31 flight issued with TI on the 'unknown' traffic (the C172) and the pilot of the PA31 made no comment on the frequency about an incident taking place. As a consequence, the controller concerned was not aware of the incident and did not submit a report. It was not until several days later that Farnborough were informed the PA31 had been involved in an Airprox with the C172. By this time, however, the controller had left the employ of the ATS provider (for reasons not connected with the incident) and has not been available to provide an input to the investigation. The RT recording reveals that in the 5min prior to the incident there were up to 9 ac on the frequency, the majority being provided with a FIS. Two of these made their first call within 1min of CPA and were on routes through the middle of the sector. One made its first call at the time of CPA.

Although the PA31 remained on the LARS W frequency for 20min after the incident, its presence was not recognised by Farnborough when enquiries were made by the Goodwood FISO about any 'twins' receiving a service. This apparent omission remains unexplained.

Notwithstanding the 2 ac were operating VFR and responsible for their own separation, the PA31 pilot could reasonably have expected to receive TI on the conflicting unknown ac. Although the LARS W controller had limited the RIS, it was only to the extent that warnings may be late. On this occasion no TI was passed.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

As this incident occurred in Class G airspace beneath the LTMA, both pilots had equal responsibility to 'see and avoid' other traffic in accordance with the Rules of the Air. Even though the PA31 pilot had been under a RIS from Farnborough LARS and could reasonably have expected to receive TI on the C172, he was still ultimately

responsible for maintaining separation from all other traffic. The PA31 pilot was flying into sun and could not recall seeing the C172 which had right of way. The radar recording shows the subject ac converging on a constant relative bearing with the PA31 initially level at about 1700ft QNH before commencing a slow climb and wide L turn back towards MID. It was during this manoeuvre that the Airprox occurred, the C172 going unsighted by the PA31 pilot. The opportunity for the PA31 pilot to see the approaching C172 was there for some time prior to the CPA but the C172 would probably have then disappeared into the PA31 pilot's blind-spot as he climbed and turned belly-up to it. Meanwhile, the C172 pilot had been listening out on the Goodwood and Farnborough frequencies but had not called for a service. Members opined that to enhance flight safety it is better to call an ATSU thereby broadcasting your flight details for other pilots to hear and gain better situational awareness of potential traffic conflictions. Similarly for the C172 pilot, the opportunity for him to see the converging PA31 from his L and below was there but he only saw it very late in his 10 o'clock range 0·25nm at the same level. He had immediately turned R into an orbit and commenced a descent to avoid the PA31 which passed 200m away to his L, a distance verified from the radar recording. Members agreed that this had been a potentially serious incident. The PA31 pilot's L turn away had been purely fortuitous with the C172 pilot only visually acquiring it as it manoeuvred and he then was endeavouring to clear his slow ac out of the way of the faster moving PA31. The Board agreed that the C172 pilot had done enough to remove the actual risk of collision but that safety margins had been eroded during this encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

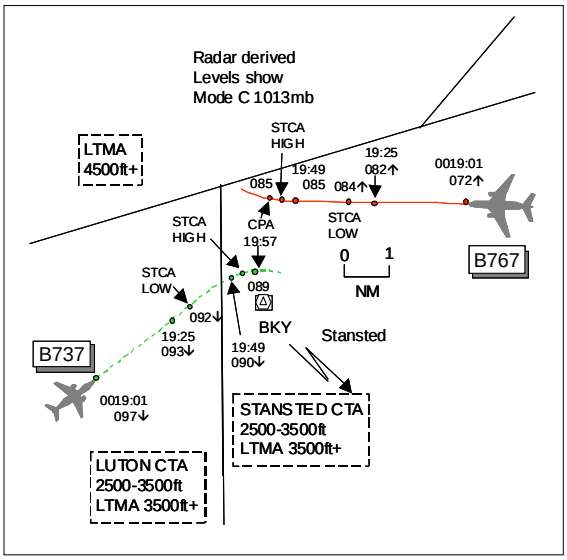
Cause: A non-sighting by the PA31 pilot and a very late sighting by the C172 pilot.

Degree of Risk: B.

AIRPROX REPORT No 160/08

AIRPROX REPORT NO 160/08

Date/Time:	NIGHT 29 Nov 0020 (Saturday)	
Position:	5201N 00004E (1·5nm N BKY)	
Airspace:	LTMA	(Class: A)
	Reporting Ac	*Reported Ac*
Type:	B737-300	B767
Operator:	CAT	CAT
Alt/FL:	FL90	↑FL80
Weather	VMC CLAC	VMC CLNC
Visibility:	>10km	>10km
Reported Separation:	250ft V/1nm H	400ft V/1nm H
Recorded Separation:	400ft V/1·6nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports inbound to Stansted IFR and in receipt of a RCS from Essex Radar on 120·625MHz squawking 7021 with Modes C and S. The visibility was >10km flying 8000ft above fog in VMC and all lighting was switched on. RW05 was in use at Stansted and they were on heading 060° from BKY, level at FL90 and 220kt with opposite direction traffic departing Stansted told to climb to and level-off at FL80. The traffic was seen visually about 20nm away before a TCAS TA 'traffic, traffic' was received and they were given an avoiding heading of 130° by ATC, a hard R turn. During the turn a momentary height loss of 200ft occurred which was soon recovered; no RA was triggered. The B767 was kept in sight at all times, passing 1nm clear on their LHS and 250ft below and the risk was assessed as high.

THE B767 PILOT reports outbound from Stansted IFR and in receipt of a 'departure' service from Stansted Radar squawking with Modes C and S. The visibility was >10km in SKC VMC and all lighting was switched on. Initially they were following the CPT 2S SID with an altitude restriction of 5000ft to BKY and a speed limit of 180kt 'until above 4000ft and established on the desired radial'. The controller took them off the SID and gave a heading of 330° then 275° and although the SID states that ATC may delete the speed restriction, the controller did not. Climb was then given to FL80, the FMC still had 180kt and the hard altitude of 5000ft for BKY set. When the crew realised the ac was levelling-off the PM (Pilot Monitoring) selected 'Climb Direct' and the PF inquired whether the speed restriction still applied. The flaps were still at pos. 5 and the PF wanted to raise the flaps. When passing the Transition Altitude of 6000ft, which was briefed, they were still trying to clean-up the ac whilst climbing, turning, accelerating, talking to ATC and the crew; they all missed the altimeter setting to 1013mb. Passing through FL75 TCAS annunciated a TA at 10 o'clock and the ac levelled-off at FL80, or so they thought. The controller became very busy and ordered them to maintain FL80 before instructing another flight to make a hard R turn onto 130°. At this point the PF set the altimeter (Capt side) to 1013mb and disconnected the A/P to get back down from FL84 to FL80. By now the flaps had been retracted to 0. There was confusion as to whether the hard turn was for them or the other flight. The PM re-confirmed the heading and verified that they were level at FL80 before ATC handed them over to London whilst back on the heading 275°. During this phase of flight there were many transmissions along with many ATC-ordered turns and altitude changes. Those were spoken in a strong British accent which complicated the understanding of the clearances. All of the crew became focussed on finding the alerted traffic. Lastly, they could not understand why the controller took the flight off the SID when the vectors given placed the ac right along the lines of the SID.

THE STANSTED FIN DIR reports the B767 was placed on a radar heading and was given climb to FL80. The crew read back '80' not 8 thousand or any variation on that theme whilst the B737 flight was on a radar heading through BKY at FL90. When the B767's height readout showed 081 then 082 he challenged the crew with 'maintain flight level 80 on standard setting' or words to that effect and TI was passed. The B737 flight was given a hard R turn as avoiding action. The ac's labels flashed 'white' then 'red', the B767 showing at least 084, possibly

085. Eventually the B767 crew responded that they were turning onto the heading assigned to the B737. The B767 flight was later transferred to the next sector and the B737 was vectored for an uneventful approach.

ATSI comments that the incident took place 10·5nm NW of Stansted Airport in Class A CAS of the London TMA. The B767 had recently departed from Stansted enroute to Louisville (USA), while the B737 was inbound to Stansted from Exeter. At the time of the incident both flights were in receipt of a RCS from Stansted Radar. The RW in use was 05 and the 00:20 METAR was: 34002KT 0900 R05/P1500 R23/0800 FG SCT001 BKN002 02/02 Q0994=. The Transition Altitude is 6000ft.

The B767 flight had been issued a CPT 2S SID from RW05. This requires ac to:

"Climb straight ahead. At I-SED D2 (BKY VOR R119) turn left on to BKY VOR R102 by BKY D7 to BKY VOR. Crossing BKY VOR R102 D5 at 3000 or above. At BKY VOR turn left onto BKY VOR R260 to WCO NDB. Crossing BKY VOR at 5000. At WCO NDB turn left onto CPT VOR R026 to CPT VOR."

Following departure from RW05 at 0016, the B767 flight established communications with Stansted Radar, reporting passing 2200ft for 5000ft. It was requested to squawk 'ident' and to confirm it was flying a CPT 2S SID. Once the pilot had acknowledged this correctly, the flight was instructed to *"…roll out of the left turn onto a heading initially of 330 degrees".* Then, at 0017:11, the B767 flight was issued with a clearance to *"…climb Flight Level eight zero"*, the pilot reading back *"(c/s) continuing eight zero".* The B767 had been stopped on the heading to facilitate the descent of inbound traffic (not involved in the incident) from the NW.

At 0017:20, the B737 flight made its first call to Stansted, reporting *"…with Information Oscar nine nine four descending Flight Level one hundred passing Flight Level eleven hundred direct to Barkway".* The controller responded by placing the flight on a radar heading of 050°, instructing it to reduce to 220kt and advising there would be no delay and that Low Visibility Procedures were in force. The radar recording at this time shows the B737 to the W of Stansted airport, tracking NE. At 0018, the B737 flight was issued descent clearance to FL90. After a read back was received, the B767 flight was instructed to turn L onto a heading of 275°. This was followed by a heading adjustment of 10° R for the B737, onto 060°.

By 0019, the two ac were established on their respective new headings, which, evident from the radar recording, placed them now on converging tracks 8·7nm apart. The B737 was passing FL97 Mode C for its cleared level of FL90 while the B767 was climbing through FL72 Mode C for FL80. In his written report the controller recalled observing the B767's Mode C indicate a climb through FL80, noting *"081, 082"*. This prompted him, at 0019:28, to transmit to the B767 *"(c/s) maintain Flight Level eight zero on a standard setting there is traffic opposite direction eleven o'clock five miles one thousand feet above break (B737's c/s) avoiding action turn hard right heading one three zero degrees"* (STCA activated at low severity during this transmission). Once the B737 pilot had read back the instruction, the controller returned to the B767, transmitting *"(c/s) acknowledge the level cleared Flight Level eight zero on a standard setting"* (STCA was now at high severity). The B767 pilot responded *" Okay er standard set er eight zero and we're turning to a heading of er one three zero",* the controller immediately replying *"The heading was not for you ma'am the heading was for the conflicting traffic",* which was acknowledged. The controller then reiterated both the assigned heading and cleared level to the B767 but its pilot read back the heading as *'two five zero'.* Once again, the controller transmitted the assigned heading of 275°.

A review of the radar recording was conducted. It shows that when the controller commenced his transmission at 0019:25, the B737 is passing FL93 with the B767, at FL82, in its 1230 position, range 5·1nm (all levels Mode C). By 0019:49, the B767 is at FL85 and now in the B737's 1130 position, the latter having reached FL90. In the next sweep, the B737 commences its turn to the R, the other ac now in its 1030 position. The CPA is reached at 0019:57, when the two ac are 1·6nm apart and just before they pass abeam each other. At this point the B737 is at FL89 with the B767 400ft below, still at FL85. Thereafter, the range between them increases quickly, partly a factor of the B767 commencing a R turn, while erroneously acting upon the heading instruction intended for the B737. Neither crew made any TCAS activity reports on the RT during the encounter.

The Stansted Radar controller was prompt in recognising the developing conflict and took action without delay. There are no ATC implications in the cause of this Airprox.

UKAB Note (1): The UK AIP at AD 2-EGSS-1-14 Flight Procedures Para 2 Speed Limitations states *i) A Speed Limit of 250kt IAS applies to all departures from London Stansted whilst flying below FL100 unless previously*

removed by ATC. ii) ATC will endeavour to remove the speed limitation as soon as possible and will use the phrase 'No ATC Speed Restriction'. This phrase must not be interpreted as relieving the pilot of his responsibility for the observance of any noise abatement procedures which may include a speed-power reduction. iii) In certain weather conditions and perhaps for reasons of safety, pilots may not be able to comply with the speed limit of 250kt IAS. When such conditions are anticipated, the pilot should inform ATC when requesting start up clearance and state the minimum speed acceptable. Pilots should be informed before take-off of any higher speed limitations required. Similarly should such circumstances arise in flight, the pilot should immediately advise ATC and state the minimum speed acceptable.

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.

Airline pilot Members believed that the 180kt speed mentioned by the B767 crew was an FMC limitation input by the operator to enable the ac to follow the NPR profile before the 250kt limitation came into play in accordance with the SID requirements. The crew had become focussed on the ac's configuration whilst trying to comply with the 180kt limit and assimilate the required flight profile and had thereby missed setting Standard Altimeter Setting (SAS) when climbing through the Transition Altitude of 6000ft. This had then led to the crew climbing above their cleared level which had caused the Airprox.

The FIN DIR had very quickly noticed the B767 climbing above FL80 and told the crew to maintain FL80 on the SAS; given TI on the B737 and then passed an avoiding action turn to the B737 crew. After re-iterating the need for the B767 crew to set the SAS, there followed an exchange of transmissions to clarify that the heading read back by the B767 crew, 130°, had been issued to the B737 flight and that the B767 flight was required to fly its previously assigned heading of 275°. Fortunately the B737 crew had good situational awareness and were cognisant of the potential confliction. The B767 was seen both on TCAS and visually before the B767's climb above FL80 generated a TCAS TA before ATC gave them the R turn to avoid. The B737 crew immediately commenced the R turn whilst maintaining visual contact with the B767 which passed to their L and below; no RA warnings were generated on either flightdeck. Taking all of these elements into account, the combined actions taken by all parties were enough to allow the Board to conclude that any risk of collision had been quickly and effectively removed.

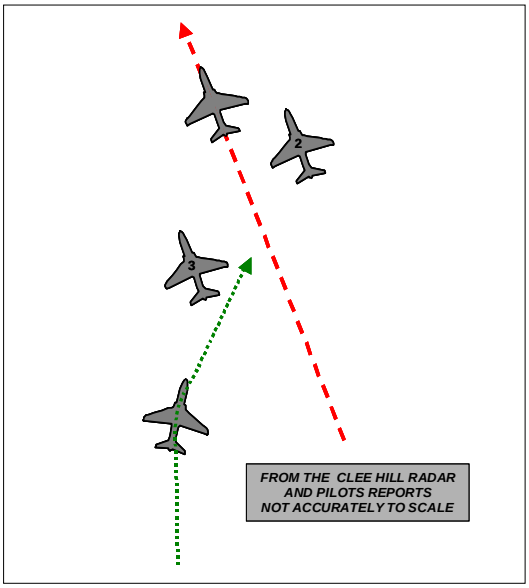
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The B767 crew did not set SAS and climbed above their cleared level.

Degree of Risk: C.

AIRPROX REPORT NO 161/08

Date/Time:	3 December 1532	
Position:	5303N 00413W (16nm SE RAF Valley)	
Airspace:	Valley ATA	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Hawk TMK1	Hawk TMK1
Operator:	HQ Air (Trg)	HQ Air (Trg)
Alt/FL:	7600ft	5000ft
	(RPS 998mb)	(QFE 1001mb)
Weather	VMC CAVOK	VMC CAVOK
Visibility:	25km	>10km
Reported Separation:		
	30ft V/0m H	30ft V/30-50m H
Recorded Separation:		
	Est <100ft/<100m (See Note 5)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK TMK1 PILOT (the singleton) reports recovering from a training flight with a student pilot squawking 3737 [he thought, actually 7000] with Mode C and in receipt of a FIS from Valley APP. They were 16nm SE of Valley, heading 355°, descending through 7600ft on the RPS [UKAB Note (1): They had previously climbed to that level from FL55] and were positioning from near Llanbedr for a VMC recovery to RAF Mona. Just after selecting the Valley APP frequency, another Hawk appeared over the top of the front cockpit from the 5 o'clock position at high speed and in a descent. The separation was estimated to be about 30ft. After the ac were well separated, he called Valley and reported the incident and they passed the other ac's callsign. He assessed the risk as being high. The recovery to RAF Mona was continued without further incident.

THE HAWK TMK1 PILOT reports flying as No2 in a three-ship of Hawks squawking 3737 with Mode C, recovering to Valley VFR from ATA East and in receipt of a FIS from Valley APP. They were flying in arrow formation, descending through 5000ft on the Valley QFE and were heading 310° when he saw another Hawk in very close proximity to the formation's No3 [on his left] so he immediately instructed No3 pilot to pull up in order to avoid a collision. The call was transmitted on Valley APP, their operating frequency at the time. No3 immediately initiated a hard, wings level, pull-up to avoid the singleton Hawk. The formation then reformed into arrow formation and recovered to RAF Valley without any further incident.

From his perspective it appeared that both ac were at the same level and that there was a high risk of collision.

UKAB Note (2): The Hawk TMk1 is not TCAS equipped.

UKAB Note (3): RAF Valley conducted a full internal Flight Safety investigation into this incident and provided a the UKAB with a copy. The Command Comments are based on this investigation.

MIL ACC reports that RAF Valley was operating on RW13 in good weather. The Approach control team consisted of a trainee supervised by a screen controller. Hawk No2 was part of a formation of 3 Hawks that had been operating in VATA East and were recovering visually to Valley while a single Hawk that had been manoeuvring autonomously at medium level near Llanbedr was recovering visually to RAF Mona [a Valley RLG controlled by Valley].

At 1529:54 [while near Llanbedr at FL144] the Hawk formation leader called APP on 379.95MHz for a visual recovery from the E. He was informed that RW13 was in use; the QFE was 1001mb and was placed on a FIS; he correctly read back the details. There were no further transmissions addressed to or given by APP to/from either

ac involved until after the Airprox took place at 1531:50. The transcript of the APP frequency however reveals some of the R/T exchanges between the formation leader and the singleton pilot who had just come on frequency. Evidently, the pilot of the No2 Hawk spotted the singleton and called Hawk 3 to 'pull up' on their tactical frequency. At 1531:50, a transmission was then made on the APP frequency, possibly using a pilot's nickname, the singleton pilot replying *" Tally, we are a stranger, your 6, 100yds".* The crews then continued to maneuver and passed their intentions until clear of each other. All ac then continued to Valley and Mona respectively without further incident.

[UKAB Note (4): Mil ACC conducted a full analysis of the radar recording. For brevity it has not been included herein as it was essentially the same as at UKAB Note (5) below.]

Neither the formation nor the singleton knew of the presence of the other ac prior to the Airprox. Both ac concerned altered course to the NNW at about the same time and after the respective turns the formation was positioned almost directly above the singleton for their approaches to Valley and Mona respectively. Valley APP did not pass TI to the formation with respect to the singleton ac [not yet on frequency]. Although it is acknowledged that under a FIS controllers are not responsible for separating or sequencing ac, information that may be useful for the safe and efficient conduct of flight should be passed; therefore, cognisant of the formation's intention to recover to Valley and that that would necessarily require a turn onto a reciprocal track and a descent, TI regarding the unknown [at that time] ac at Llanbedr would have enhanced the formation crews' situational awareness. Consequently, the formation might have gained visual contact with the singleton earlier or planned to track well clear of its reported position.

UKAB Note (5): The recording of the Clee Hill radar at 1529:30 shows 3 ac at FL140, 10nm N of Llanbedr reforming into loose arrow formation on a roughly S'ly track while squawking 5121/2/3. At 1529:30, about 2min before the Airprox, the single Hawk is seen squawking 7000, manoeuvring at about FL60 in the vicinity of Llanbedr. When the formation, now rejoined at FL142, initiates a right turn 5nm NE of Llanbedr to position for its approach to RW13 at Valley, the singleton is initially 10nm SW of it, tracking N before turning left onto 330° overhead Llanbedr. The formation also rolls out of its right turn on a track of 330°, about 1nm E of the singleton and initially about 6000ft above it but descending quite quickly on a gradually converging track. The singleton then indicates a rapid climb from FL55 to FL073 - while the formation continues its descent - and it crosses the formation L to R from the No3's 9'clock, passing very close behind that ac as the formation continues to descend. Although the update rate of the radar replay is insufficient to clearly show the vertical CPA and in addition the No3's Mode C data is incomplete, by interpolation it can be deduced that the vertical separation was less than 100ft when the ac crossed. It can also be seen that the singleton alters course slightly to the right to pass just behind the No3 ac.

HQ AIR (TRG) comments that RAF Valley conducted a formal Flight Safety Investigation into this incident from which these Command comments are taken. As a result of the inquiry several follow-up actions have been initiated.

The Command Aviation Safety Officer (CASO) observed that the ac were so close that only chance had affected the outcome. The 'big sky theory' and the 'see and avoid' principle are sound concepts but in this case neither had assured safety. The investigation identified that in some areas there was a reluctance to talk about incidents that involve lookout because of a perception that criticism or blame might be levelled at individuals. However, if they are to achieve the safest possible operating environment, everybody associated with flying must become engaged in voicing their concerns, whether real or perceived, so full engagement can take place to address the issues. Criticism or blame does not achieve a safer operating environment.

The CASO agreed with comments made by the respective Squadron Commanders, in particular that a careful internal examination of procedures should be conducted. The fitment of a collision warning system to the Hawk would undoubtedly help crews' Situational Awareness and would help prevent similar occurrences. In the meantime, aircrew and ATC staff must remain alert to circumstances that could lead to similar occurrences and react accordingly.

THE AOC directed that a review of Valley departure/recovery procedures and the use of appropriate ATC facilities, in particular the provision of RIS/RAS, should be concluded as a matter of urgency. He also requested that the viability of fitting a collision warning system to the Hawk should be revisited by the appropriate MoD staffs.

Notwithstanding the importance of the procedural concerns identified, he expressed concern at the cultural issues highlighted in the investigation, crucially that the Airprox nearly went unreported. "The concept of a 'just culture'

must be championed by us all and no effort should be spared in ensuring that individuals, especially those students under our charge, are both willing and confident to speak up. It is our duty and moral obligation to highlight failings in the way that we conduct our operations in order that others may benefit."

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 Hawk operating authorities.

The Board noted that both the singleton Hawk and the formation had been operating legitimately in their respective, well separated locations albeit in the same general area. Having completed their exercises, the ac were recovering visually to Mona and Valley respectively at the same time (as is often the case with the 'wave' system operated at Valley). Both the singleton and the formation correctly called Valley to obtain the recovery information and, in accordance with the extant Valley visual recovery procedures, both accepted a FIS from Valley APP.

Notwithstanding that the formation was in receipt of a FIS and at the time of their initial call the singleton - squawking 7000 - had not yet come on frequency, it was the view of several ATC Members that Valley APP should have passed TI to the formation regarding the '7000' contact, subsequently identified as the singleton. The Mil ACC Advisor explained that there is no requirement to do this and that on standardisation visits to some units, controllers had been counselled regarding over-controlling. Nevertheless, he considered that in these circumstances a warning would have been prudent despite the significant displayed altitude difference between the ac. The Mil ACC Advisor said that he had come to this view largely because it should have been evident to the controller that the 7000 squawk was also a Valley (Mona) recovery which at some time would probably become a confliction with the formation, on a similar track and eventually at a similar alt.

A pilot instructor Member pointed out that flying instruction often does not end when the exercise is complete and can continue until the ac has shut down; therefore, many QFIs prefer a minimum RT environment when instructing. This should however, be tempered with the need to receive safety critical information in a timely manner.

The Board noted the AOC's comments and his concern over the reporting culture that could have crept in at Valley, commending the actions taken and his openness in providing a copy of the full investigation report. Members also welcomed the review of procedures at Valley and shared the concern over the fitment of TCAS to the Hawk T Mk1 and T Mk2.

Despite the cultural and procedural aspects of this incident, since it took place in a VFR environment, Members agreed that the underlying cause related to lookout. They accepted that in a 'stacked' situation lookout can be very difficult as, depending on the precise circumstances, the opposing ac may be totally obscured to the respective pilots. In the circumstances prevailing in this incident however, specialist Members agreed that this had most likely not been the case; the singleton Hawk had a relatively unobstructed view upwards and the formation was above it thus probably giving them a much better downward view than the singleton crew would have had. That being the case, the Board agreed that both the singleton and the formation should theoretically have been visible to each other's pilots, albeit significantly above or below, for a reasonable period of time. Therefore, Members determined that even in these difficult circumstances and with no outside prompts, the pilots could have seen and avoided the other ac earlier.

It was observed that this incident should serve as a good example to all pilots flying under VFR, not only military, that however difficult, lookout must be 3 dimensional, particularly in well known busy areas.

The Board noted that the formation No2 pilot had seen the singleton approaching the No3 ac and had promptly and, possibly just in time to prevent a collision, given the latter's pilot a correct avoiding action instruction. Further, Members were aware of the exceptional manoeuvrability of the Hawk and, somewhat unusually, that both pilots had agreed the miss-distance. Since the ac had been very close, the Board concluded that there had been a risk that the ac would have collided.

AIRPROX REPORT No 161/08

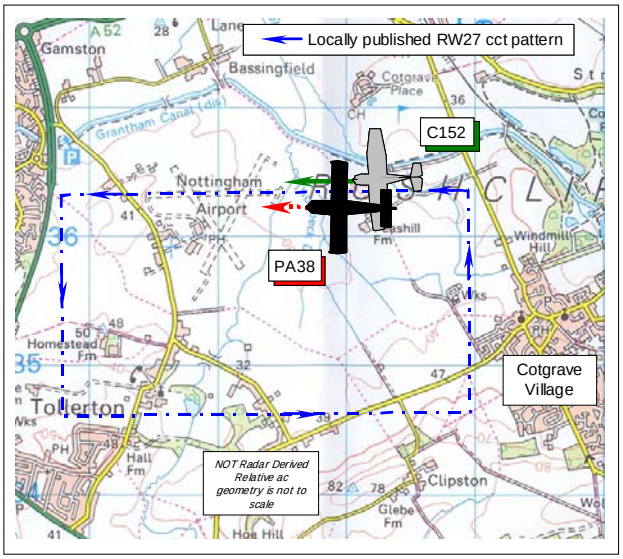
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: An effective non-sighting by the singleton crew and late sightings by the Hawk formation crews.

Degree of Risk: A.

AIRPROX REPORT NO 162/08

Date/Time:	5 Dec 1333	
Position:	5255N 00105W (½nm FINALS to RW27 at Nottingham)	
Airspace:	Nottingham ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	C152	PA38
Operator:	Civ Trg	Civ Trg
Alt/FL:	300ft↓	FINALS↓
	QFE	QFE
Weather	VMC CLOC	VMC CLOC
Visibility:	>10km	10km
Reported Separation:		
	6ft V/1m H	Not seen
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C152 PILOT, a student pilot, provided a very frank and comprehensive account reporting that he was inbound to Nottingham under VFR in VMC as part of his qualifying cross-country flight for his Private Pilot's Licence. A squawk of A7000 was selected but no Mode C is fitted. The anti-collision beacon was on.

Contacting Nottingham RADIO A/G Station on 134·875MHz at approximately 13:25, he reported inbound using the 'student' prefix and was told the circuit for RW27 was active with 'one in'. Approaching from the S at 1200ft amsl below the base of the East Midlands CTA, he subsequently joined DOWNWIND L for RW27 at 800ft QFE and called "LATE DOWNWIND". He was aware of the instruction given in Nottingham's AIP entry to "avoid overflying adjacent built up areas" and he kept clear of Cotgrave by routeing his circuit outside of the village. Whilst he was on BASE LEG to the E of the village, the A/G Operator called him to request he "report FINALS", to which he replied "wilco". He saw a helicopter almost stationary above Cotgrave, slightly higher than he was. After intercepting the RW centreline abeam the Eastern edge of Cotgrave village heading 270° at 67kt, he called "FINAL 27". Another pilot was then heard to call "DOWNWIND". When approximately 1nm from the threshold, the A/G operator transmitted to him "[C152 C/S] Nottingham". He was not immediately sure how to respond to such a call, and due to the workload on final approach was unable to formulate a reply.

At approximately ½nm FINALS, descending through 300ft agl, he heard the pilot of another ac call "FINAL". About 5sec later, the other ac – a white/yellow low-wing single engine monoplane [the PA38] - came into view as it passed him on his port side overtaking from astern "centred approximately 1m to his left and 5ft above" his aeroplane with the wings "overlapping" and a *"very high"* risk of a collision.

Around that time, the A/G Operator said something about traffic reported on FINAL, but he does not remember the exact message. A few seconds after the PA38 overtook his ac - now about 10m ahead and slightly below - the PA38 pilot replied to indicate she did not have visual contact with the traffic. Calling Nottingham RADIO to say he was now visual with the PA38, which was now significantly below him and close to the threshold, he called "going around" and moved to his R in order to do so, maintaining visual contact with the PA38 that was now at the threshold. The PA38 pilot then said to the A/G Operator "advice please", to which Nottingham RADIO replied "land".

After a subsequent uneventful landing, he visited the Tower to pay his fees, obtain a signature on his cross-country certificate (QXC) and discuss the occurrence. He found the A/G Operator somewhat defensive. Opining that his cct had been far too big, she said that when he called FINALs she had been unable to see him as he was so far out. In her view, he should have called "LONG FINAL" from that position, but this was incorrect as he was definitely less than 4nm away. The A/G Operator said she had tried to call him but he did not reply: he did not recall this at

that time and said he had not heard her but he now realizes she was referring to the message "[C152 C/S] Nottingham". With hindsight he should either have replied regardless of correct RT procedure or reported his position as a precaution. He commented that perhaps the fact the other ac was a low-wing type, whilst his was high-wing, had contributed to them not seeing each other. The A/G Operator had stated that his C152 was lower than her PA38: however, when he was being overtaken this was definitely not the case. On signing his QXC form, the A/G Operator said she had marked his airmanship as "good" because he "did the right thing by going around". He does not think this was a fair comment considering he had 'right-of-way' under Rule 13 paragraphs 1, 2 and 6 and was forced to go around by the other aircraft overtaking him.

[UKAB Note (1): Rule 13 to The Rules of the Air Regulations 2007 - Order of landing - requires that:

(1) An aircraft landing or on its final approach to land shall have the right-of-way over other aircraft in flight or on the ground….

(2) An aircraft shall not overtake or cut in front of another aircraft on its final approach to land.

(6) …..if two or more flying machines…are approaching any place for the purpose of landing, the aircraft at the lower altitude shall have the right-of-way.]

After leaving the Control Tower, he found a noticeboard showing diagrams of the local cct pattern together with copies to take away. These show the circuit for RW27 passing to the inside of Cotgrave, with the turn onto FINAL 0·8nm from the threshold. He had turned final approximately 1·8nm from the threshold.

An instructor from the club came to speak to him. They discussed the events and local circuit procedures. The instructor informed him that the PA38 pilot was a student flying solo consolidation circuits who believed his call of "FINAL" came from the helicopter above Cotgrave. He also checked that he was not too shaken to fly back home.

He believes the main cause of this occurrence was that he was unaware of the local procedure and flew a larger circuit than expected. Consequently his position report of "FINAL" was misinterpreted by both the PA38 pilot and the A/G Operator. At his home airfield he is used to flying a circuit that occupies most of the ATZ - also for noise abatement reasons. In the absence of other information, flying outside Cotgrave and turning FINAL near the eastern boundary of the ATZ seemed the most appropriate thing to do. He was not aware that this was incompatible with local procedures, despite having made every effort to plan his visit to the airfield and obtain all available information.

The AIP entry for Nottingham simply states "avoid overflying adjacent built up areas whenever possible". This wording is completely inadequate to describe the local procedures. For example, a substantial portion of the RW03 circuit does cross a built up area, so following the AIP instruction would result in a very different circuit. He also consulted their web site, but unlike some other airfields it contains no pilot information. He suggested to the Instructor that the maps should be made available on the web site and was told that this was already being looked into. He also took a copy to give to his own flying club.

He had previously flown to the airfield with his instructor, and flown exactly the same route for RW27 outside Cotgrave without incident or comment from the Nottingham A/G Operator. He discussed his intention to fly around the village with his instructor at the time, and he agreed. No mention of circuit procedures was made when he phoned in for PPR on either occasion.

This Airprox would have been avoided if maps of any noise abatement circuits were routinely available from the AIP. None of the airfields he has visited so far have had such maps in their AIP entries and the only ones he has seen have come from unofficial sources published on the initiative of the airfield.

THE PA38-112 TOMAHAWK PILOT reports she is a student pilot with 22 hours total experience, including 2hr 30min solo. On this flight she was undertaking solo cct consolidation training in the RW27 cct at Nottingham, her base aerodrome, and in communication with Nottingham RADIO on 134·875MHz. Her ac is coloured white with yellow stripes and the HISLs were on.

Whilst flying in the circuit she heard details of a Cessna joining the RW27 cct so she looked out for the other ac. As she executed a 'touch and go', the C152 pilot reported he was DOWNWIND. Later when she reported

DOWNWIND the C152 pilot reported he was on FINAL. A few minutes later when she turned onto BASE-LEG she observed a helicopter overhead Cotgrave village but no visual contact was made with the C152 when she turned onto FINALs. Heading 270° at 70kt whilst descending and looking over the RW surface to check it was clear, she was concerned that the C152 pilot had not reported 'runway vacated'. The A/G Operator called the C152 pilot but there was no reply so she asked Nottingham RADIO for information as she could not see the other ac. The C152 pilot then reported that he was 'GOING-AROUND'. Asking the A/G Operator for advice as to whether she should LAND or GO-AROUND, she was advised to LAND and did so. After landing she went straight to the Control Tower to find out what had happened. She was debriefed by her instructor about 10min after the event and did not learn of the Airprox report until a few days later. She suggested that a significant factor was the inexperience of the two pilots involved. The Risk was not assessed.

UKAB Note (2): A copy of her flying training provider's FOB detailing the cct pattern for RW27 was helpfully provided – as shown on the diagram. The PA38 pilot reports she has been trained to fly this pattern.

UKAB Note (3): This Airprox occurred outwith the coverage of recorded radar.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac.

It was evident from the C152 student pilot's very frank and comprehensive account that despite his best endeavours he was not aware at the time that the normal cct flown to RW27 at Nottingham was somewhat shorter than either he expected or, from his limited experience, was used to flying. The C152 student reported that he had previously visited and flown a cct at Nottingham with his Instructor with whom he had discussed, before this solo land-away, the cct pattern and his intention to fly around the village. However, it was unclear why, having flown to Nottingham with his Instructor beforehand, that the latter was unaware of the locally published pattern that took a route inside the village of Cotgrave. Thus it seemed to the Board that the C152 student's Instructor had apparently dispatched his student to Nottingham to conduct this solo land-away without being completely familiar with all necessary details of the locally stipulated cct pattern.

Members understood entirely the C152 student's expressed concern regarding the lack of published detail available to visiting pilots beforehand about specific visual cct patterns. The C152 student had made a valid point here and the constraints placed on GA aerodromes to avoid noise sensitive areas sometimes resulted in an unusually short or longer cct pattern. Here the locally published cct pattern for RW27 at Nottingham did appear to pilot Members to be slightly shorter than the norm. Without the benefit of such information, the C152 student had interpreted the information he had as best he could which resulted in a lengthened cct outwith the village of Cotgrave. This cct was, therefore, somewhat longer than that flown by the locally based PA38 student who was familiar with the local pattern and would have flown a cct inside the village, more closely aligned with that she had been shown during her training. The C152 student was correct in his assertion that neither the UK AIP nor other published pilots' guides gave any further data on the Nottingham visual cct or indeed many other GA training aerodromes. This Airprox had highlighted the desirability of such detail being promulgated for the benefit of visiting pilots and the Board encouraged aerodrome managers to include such detail in the respective entries within flight information publications, but clearly this was entirely the responsibility of the individual aerodrome operators concerned. A very experienced GA pilot Member explained that varying cct sizes do create a significant hurdle for the unwary and doubly so for inexperienced tyros leading to increasingly wide successive ccts by those following in the pattern so formed. Here the exact tracks made good in the cct by both ac involved was not shown by recorded radar data, which did not illustrate the encounter at all. Neither were the exact timings of the student pilots' RT transmissions available to the Board as A/G Stations are not required - as a matter of course - to record the frequency in use.

Whereas the reporting C152 student had opined that as he was unaware of the local procedure, in his view this larger cct was the main cause of the Airprox, the Board took a slightly different tack. From the PA38 student's account, having heard the C152 pilot report DOWNWIND as she executed her 'touch and go', she should have been looking for the other ac as she flew DOWNWIND herself. When she turned onto BASE-LEG moments later, it was evident that she had no visual contact with the C152, whose student, she reports, had called FINALS ahead of her in the cct. Neither had she spotted the other ac when she herself turned onto FINALs with the C152 closing along the FAT unseen all along in very close proximity beneath her ac. The importance of locating other ac in the cct and checking carefully up the approach was emphasised by pilot instructor Members but understandably the

stress imposed on students at this stage of training is high when flying solo and their overall situational awareness can be somewhat blinkered whilst focused on landing their aeroplane. Nevertheless they should each have been capable of dealing with one other ac in the cct. Members recognised that the PA38 student would have been concentrating on the RW to her L as she circuited without, it would seem, paying enough attention to the danger which lurked unseen to the R. Here was a salutary lesson for both students of the importance of an all-round scan when within the cct and the potential dangers of runway fixation. It was clear to Members that the PA38 student would not have turned in when she did if she had identified the position of other cct traffic beforehand. But this also relies on other pilots reporting their cct position accurately: whereas the C152 student was probably giving his reports conscientiously, unbeknown to the student in the other ac these were based on his longer pattern outside Cotgrave village, thereby giving the PA38 pilot a misleading impression. Thus she expected to see the C152 on the RW when she herself was established on FINALs. A military pilot Member – himself a highly experienced elementary flying training instructor – stressed the importance of reporting circuit positions accurately and of the difficulties for pilots in forming an accurate mental picture of their position within the sequence when confronted with ccts of different sizes. It seemed clear from both pilots' accounts that the C152 student was established on FINALs before the PA38 student had reported FINALs herself. Whereas the C152 student might have right of way in this situation it was stressed that this is a visual cct and he also had a duty to look out for the other circuiting PA38, which evidently he did not see until overtaken on FINALS. Although others might contend that he had not integrated his ac correctly into the pattern, in the Board's view it was the PA38 student who was required to search for and fit in with the C152. Thus the Members agreed that the Cause of this Airprox was that the PA38 student pilot flew into conflict with the C152 on final approach which she did not see.

Turning to the inherent Risk, the Board recognised that the relative inexperience of the two students involved had played a large part in this close quarters encounter. Plainly the C152 was there to be seen, albeit not in the place expected by both the A/G Operator and the PA38 student. The reporting C152 student pilot had commented that perhaps the fact the other ac was a low-wing type, whilst his was high-wing, had contributed to them not seeing each other: Board Members agreed that this would have been a significant factor here which added to the complexity of the situation. Once the PA38 student turned onto FINALs she would have been belly-up to the C152 unseen beneath, the latter steady on the FAT, with the PA38 itself possibly masked from the C152 student by his own mainplane until she flew forward of the beam and into his field of view. Then, it seemed, finally realising that the C152 was not where she expected it to be, the PA38 pilot had wisely asked for help of the A/G operator. Some might contend that the operator had overstepped the mark here in advising the PA38 student pilot to LAND. However, it was clear to controller & pilot Members alike that this was a wise decision and the Board commended the A/G operator for her awareness and prompt advice that prevented the situation from becoming more complicated than it already was and undoubtedly A/G's advice was appropriate in these circumstances. The C152 student also did exactly the right thing by 'going around' at this point, but if the PA38 student had also commenced a 'go around' then it could have placed the C152 student in an even worse predicament. Whilst the Board could only assess an Airprox on the basis of what actually occurred not what might have happened if circumstances had been slightly different, this was undoubtedly a very close quarter's situation indeed where, fortuitously, 'chance' had also played its part. Although there was no radar data to support the C152 student's estimate of the separation that pertained here, there was no reason to doubt the veracity of his report of the overlapping wings and in the order of 6ft of vertical separation. In the circumstances conscientiously reported here, Members agreed unanimously that an actual risk of a collision had indeed existed.

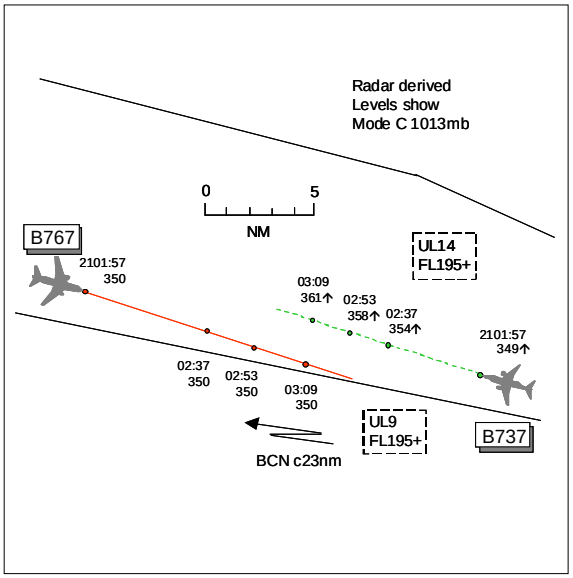
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA38 student pilot flew into conflict with the C152 on final approach which she did not see.

Degree of Risk: A.

AIRPROX REPORT NO 163/08

Date/Time:	NIGHT 5 Dec 2103	
Position:	5146N 00238W (23nm E BCN)	
Airspace:	UAR UL14/UL9	(Class: C)
	Reporting Ac	*Reported Ac*
Type:	B737-800	B767-300
Operator:	CAT	CAT
Alt/FL:	FL352↑	FL350
Weather	VMC CLAC	VMC
Visibility:	50nm	Unltd
Reported Separation:	600ft V/3nm H	700ft V/>5nm H
Recorded Separation:	800ft V/4·4nm H OR 1100ft V/2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports outbound from Stansted IFR and in receipt of a RCS from London on 134·75MHz squawking with Modes C and S. Locked on radar heading 283° by ATC and cleared to FL360 at 480kt, when climbing through FL352 a TCAS TA was received on traffic in their 11 o'clock range 5nm indicating 300ft below. A TCAS RA 'climb' was then received and followed, ATC were informed and the other ac passed 600ft below 3nm away on their LHS. He assessed the risk as high.

THE B767 PILOT reports en route to Germany IFR and in receipt of a RCS from London squawking with Mode C. Cruising at FL330, he thought [actually FL350], they received a TCAS TA on traffic at 6nm range and immediately saw the other ac's nav lights before an RA 'monitor v/s' was then generated at range 4nm. The A/P was not disengaged as they were in level cruise and they never felt that there was a serious risk as the other ac was in a cruise climb when the TA occurred. The other ac was a low wing twin-engine ac which passed 700ft above and >5nm away to their L. Nothing was said on the RT before, during or after this event and they did not make a report to ATC as they were on the correct course at the correct altitude. He assessed the risk as low.

THE LAC S5/6/8/9/23/35/36T reports that the B737 flight called on frequency climbing to FL210 as per standing agreement and heading 250°. The ac was turned onto heading 295° and climbed to FL320. The Planner had already agreed Release For Climb (RFC) up to FL340 from LMS and LUS. Having put other traffic at FL330 on a heading to avoid the B737, S23T continued the B737 flight's climb to FL340 within LUS airspace. As soon as the B737 was within the confines of S23 airspace, the flight was climbed to FL360. Approximately 15nm after giving the B737 its final climb instruction, the B737 crew announced a TCAS RA as the ac was passing FL355 with opposite direction B767 maintaining FL350. There was no loss of separation and the B767 crew did not call an RA.

ATSI reports that the controller was operating as the Tactical Controller for the Brecon (BCN) and Berry Head (BHD) Sectors in a bandboxed configuration i.e. S5/8/23/35 and S6/9/36 respectively. She described her workload as, initially, moderate but it increased in the period leading up to the Airprox. She had discussed the possibility of splitting the sectors with the Planner but both agreed it was not considered necessary. However, with hindsight, she thought it would have been prudent to have carried out the action. She explained that, previous to the day of the Airprox, she had worked 2 days of the current cycle. Before this, she had been on a period of leave. This had been the first period of significant leave since she had achieved her Certificate of Competence some 8 months earlier. Although not recognising it at the time, she thought that returning to work after the leave break, together with her relative lack of experience, might have affected her performing up to her usual standard during a busy period.

AIRPROX REPORT No 163/08

The B767 flight established communication with the BCN/BHD Sector at 2046, reporting at FL350, and was instructed to *"route Compton KOKSY"*, resulting in it tracking about 10nm N of its planned routeing. At the time, the flight was approaching the E coast of Ireland and thereafter no further communication was made with the flight until it was transferred to the next frequency at 2104 which was after the Airprox had occurred.

At 2052, the B737 flight made its initial call to the sector. The pilot reported approaching FL210 on a radar heading of 250°. He was instructed to continue the heading and climb to FL320. When questioned, the pilot reported his requested level as FL360. At the time, the subject ac were approximately 170nm apart. Shortly after this, another flight - AC3 - reported its intention to make an operational diversion from Paris to Luton. This unexpected task, resulting in having to vector and descend the flight through other traffic towards its new destination, increased the workload of the sector. This, together with an increase in other flights, resulted in the S5/6/8/9/23/35/36T not being able to position the flight strips as she normally would and, consequently, later overlooking the confliction between the subject ac. The B737 was issued a heading adjustment to 295°, at 2054:50, and just over 1min later was instructed to climb to FL340. This level had been coordinated by the Planner with the Central Sector and provided separation from an eastbound flight at FL350 which was approaching BCN (not the subject B767, which was near STU).

The subject ac were now 110nm apart. The controller's next transmission to the B737 flight was at 2058:58, as it entered her airspace. She initially cleared the flight to FL340 but immediately corrected that to instruct it to climb to FL360 i.e. through the level of the B767 which was now 67nm away on a reciprocal track. She was more concerned about climbing the B737 through the level of N'bound traffic approaching BCN and had overlooked the presence of the B767 at FL350. The controller then turned her attention to dealing with other traffic in the sector. She was not aware of the confliction, between the subject ac until the pilot of the B737 reported, at 2102:39, a *"TCAS RA"*, to which she correctly acknowledged *"Roger"*. Almost straightaway, the B737 pilot reported *"clear of conflict"*. The pilot of the B767 made no comment on the frequency. STCA did not activate. The radar recordings of the incident show that, at 2102:37, the 2 ac were 8·4nm apart. The B767 was still maintaining FL350, as it did throughout, and the B737 was passing FL354. The minimum separation, 4·4nm and 800ft, occurred at 2102:53. By now, the B737, passing FL358, was on a track to pass N of the B767. This continued and, at 2103:09, the B737 passed 2nm N of the B767 and 1100ft above it.

NATS SYSTEMS SAFETY carried out a review of STCA performance at the request of the Safety Investigations Dept owing to the lack of STCA warnings. The encounter took place in a combined alerting region type of 'En-route RVSM' where basic separation threshold parameters for the Linear Prediction (LP) filter are 3nm and 501ft with a look ahead time for the LP filter of 115sec; the cycle interval period is 6sec. The LP filter extrapolates the current velocity of the ac tracks to determine their relative positions in the future. If a predicted lateral violation time coincides with a predicted vertical violation then a 'hit' will be registered in the LP filter 'sliding window'. Unless the conflict is deemed imminent, 3 successive 'hits' will be required to generate a conflict alert. On cycle 3 at 2101:05, a lateral violation was predicted to occur between 110·9 and 125·7sec into the future whilst the vertical violation was predicted to occur between 27·6 and 66·6sec. As there was no overlap between times, no 'hit' was registered by the LP filter on this cycle. By cycle 5, 12sec later, the time between the predicted lateral and vertical violation times reduced to 12sec. However, from 2101:35 it increased to over 34sec. For the remainder of the encounter the time difference between the predicted violation times did not drop below 20sec. At 2102:53 the Current Proximity (CP) filter registered a hit through the 'predicted proximity' part of the logic which is based on the lateral closing rate; the current separation-to-relative speed ratio and the predicted lateral miss distance. The alert was not confirmed on the subsequent cycle as the ac were identified as 'vertically fast diverging' and so none of the fine filters were called to process the encounter on that or the subsequent cycles. Altering the LP filter vertical parameter to 901ft from 501ft generates a conflict alert for this encounter on cycle 17 timed at 2102:29. Two hits were registered on cycles 5 and 6 (2101:17 and 2101:23) although this was insufficient to generate an alert. When this parameter change was tested on 2 weeks of historical data with additional serious encounters, it generated an extra 65 wanted alerts. However this was overshadowed by an additional 587 unwanted nuisance alerts.

In summary, STCA performed as expected in this encounter based on the LAC parameters. STCA is not a separation assurance tool and therefore is not expected to alert to all losses of separation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

ATCO Members initially discussed the issue of Sector manning. One Member opined that from his experience, when in-situ controllers broach the subject of splitting a sector it normally is close to the time to carry out the split. Having said that, further advice could have been sought from the Local Area Supervisor/Traffic Manager who would have been aware of the impending traffic flow and sector complexity and would have been able to assist the incumbent controllers in making their decision. In this case, the Tactical's workload had increased and she was unable to move the fpss around the display board to assist in detecting ac conflictions. Also, after the B767 flight had called on frequency and been given a more direct routeing, no further communications were made with the flight until after the Airprox, 18min later. These factors go someway to explain why the B767 was not taken into account when the Tactical climbed the B737 which had resulted in the Airprox.

The direct routeing given to the B767 had resulted in the ac flying 10nm N of its flight planned route, in the opposite direction to the normally W'bound traffic flow. The Tactical had concentrated on ensuring that the B737's climb would provide separation against other traffic N'bound ahead, forgetting about the B767. The first time she became aware of the confliction was the B737 flight's TCAS RA call. The B737 crew had received a TCAS TA then RA 'climb' and had followed the guidance whilst the B767 crew had received a TA then a passive RA 'monitor v/s' which allowed the crew to see the B737 as it passed clear to their L and well above. The radar recording shows the subject ac approaching each other and separation being eroded briefly during the encounter as the B737 crew reacted to the TCAS warning. The prompt actions taken by both crews and the visual sighting by the B767 crew allowed the Board to conclude that any risk of collision had been quickly and effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

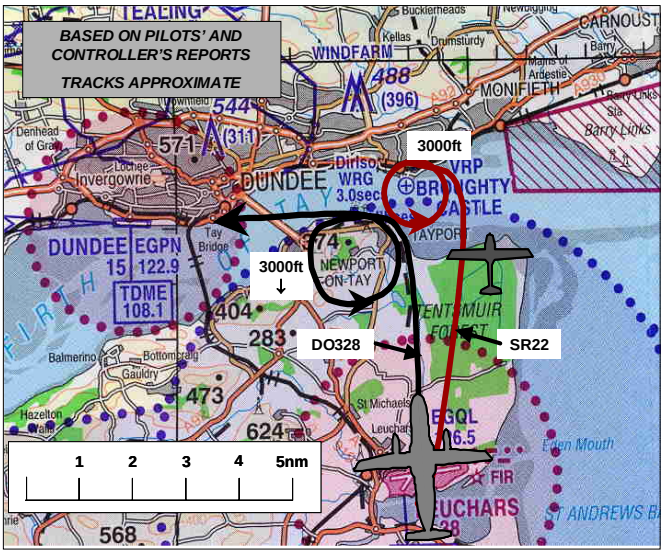
Cause: The LAC S5/6/8/9/23/35/36T did not take the B767 into account when climbing the B737.

Degree of Risk: C.

AIRPROX REPORT No 164/08

AIRPROX REPORT NO 164/08

Date/Time:	3 Dec 1522	
Position:	5627N 00252W	(4.5nm E Dundee)
Airspace:	Scottish FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Dornier 328-100	Cirrus SR22
Operator:	CAT	Civ Pte
Alt/FL:	1400ft	3000ft
	(QNH 1002 mb)	(QNH NR mb)
Weather	VMC CAVOK	N/R
Visibility:	CAVOK	10 km
Reported Separation:		
	<500ft V/<1nm H	500ft V/1-1.5nm H
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DORNIER 328 PILOT reports flying a scheduled passenger flight IFR inbound to Dundee. On handover from Leuchars APR to Dundee ATC, descending from 4000ft to 2500ft, they were left very high at 6nm East of the field. They were told about traffic on a missed approach from Dundee at 3000ft tracking E; once visual with that traffic they were cleared for a visual approach to RW28. In order to lose height they elected to orbit left. During the descending orbit they had a TCAS RA 'descend'. After responding to the RA, they then became visual with another low winged light ac [the SR22]. Once visually clear of the ac they recommenced the visual approach. Although they were warned about the first traffic, the Tucano, and became visual with it, they were not aware of a second ac in the vicinity as they had not been passed any warning by Dundee ATC. He reported the incident to Dundee on landing, saying that he thought that better communication between Leuchars Radar and Dundee ATC may have prevented this incident.

THE CIRRUS SR22 PILOT reports flying VFR inbound to Dundee. He was handed over from Leuchars APP, not below 3000ft, to Dundee very late at about 8nm E of Dundee on the centre line. He made contact with Dundee TWR, who had a very high work load at the time, requesting long finals but was told to orbit left till further instructions; this was at about 6nm. He could hear the Dornier also in an orbit and the TWR also warned him of a C152 orbiting on the downwind leg. He carried out 2 full left hand orbits level at 3000ft and 90 knots. On the 3rd orbit they had clear visual contact with the Do328 in his 2 o'clock descending from his left to right and shortly after it was cleared to land. At the end of their 3rd orbit they were also cleared to land. He did not at any time consider it to be anything else other than a minor conflict in the circuit and certainly not an Airprox. He did however think that they should have been handed over to Dundee TWR a lot sooner than crossing the runway centre line.

THE TUCANO PILOT also provided a report that following a navigation sortie a pre-booked Practise Diversion was flown from the Leuchars overhead to Dundee. A visual approach was flown to RW28 and he stated his intention to depart to the E along the Tay, to transit VFR to RAF Leuchars via initials for their RW27.

Having overshot at Dundee they were cleared QSY en-route but he remained on Tower frequency and advised that he would climb to 1500ft whilst turning downwind to deconflict with a light ac downwind and another one joining downwind; he was visual with both. Approaching the Tay Estuary he was advised of an ac 1000ft above, descending towards him, and he replied that he was visual: he initiated a descent to stay well clear. Once the ac had passed behind him he changed frequency to Leuchars APP. At no point did he consider that there was any risk of collision as he was visual with the Do328 throughout and had a corresponding TCAS contact and also descended in order to maintain a comfortable separation.

UKAB Note (1): The incident occurred outside recorded radar cover.

ATSI reports that Dundee is not a radar unit and that the Aerodrome and Approach control duties were being provided by a mentor and trainee; all the ATC transmissions during the period were made by the trainee who was shortly to take a Certificate of Competence for these duties. The mentor described the workload as high, approaching the time of the Airprox. There is no ATSA position in the VCR. RW28 was in use and all circuits at Dundee are to the S. The 1520 Dundee weather was:

290/01kt; 20km; SCT 040; M02/M04; Q 0998.

At 1513, Dundee received a call from Leuchars on the direct line, initially concerning the Do328 inbound IFR. The flight was estimating the airport at 1527 and Dundee agreed to take it at 3000ft QNH 999mb to the Dundee (DND) NDB. This agreement was read back by Leuchars ATC. (The relevant part of the LoA between Leuchars and Dundee is stated below). The telephone call then continued with information about the SR22, expected in 10min, which was inbound to Dundee from the S VFR. Dundee cleared it to join, requesting that its pilot report lefthand downwind RW28: Leuchars read back *"downwind lefthand"*. Leuchars then wished to pass a pre-note about a VFR flight from "aerodrome to aerodrome". The trainee asked the mentor to take the message and he then continued the telephone call. The traffic was the Tucano which was inbound to Dundee VFR from the S, estimating in five minutes for a go-around. This flight would be transferred from TWR to TWR and Dundee asked for it to be made aware that the circuit was active and that they would like it to be transferred as soon as possible; Leuchars said they would relay the information.

The Tucano established communication with Dundee at 1517, the pilot requesting a visual join from Leuchars and reporting *"one mile south of the water approaching the field"*. He was cleared to *"make a straight in approach runway Two Eight you're just becoming number one to a Grob touch and go"*. Subsequently, after it was cleared for the low approach and go around, the pilot advised that he would like *"to depart visually along the Tay"*, adding in a repeated message to *"track to the East"*.; the controller replied *"roger be advised I do have circuit traffic downwind leg and one joining from the West"* and the pilot reported *"looking"*. Neither of these was the subject Do328. After its go-around, the Tucano pilot was informed about - and reported sighting - a C152 at the S bank of the Tay to join downwind. Although transferred to Leuchars, the pilot elected to remain on the Dundee frequency, reporting *"turning wide downwind outside the traffic visual with that traffic"* and added that he would transfer when clear of the circuit area. Thirty seconds later, at 1521:10, Leuchars telephoned to see if Dundee would accept the Do328 for a visual recovery. A visual approach to left base RW28 was agreed and Dundee added that the circuit was active with *"three in"* but the current position of the Do328 was neither mentioned nor requested.

The Tucano transferred to Leuchars at 1521:47, just before the Do328 made its initial call on the Dundee frequency reporting at 4000ft about 5nm E of the airport. After being passed the pressures, he was *"cleared for a visual approach are you able to lose the height traffic information correction Tucano transiting to the east VFR not working this frequency"*. The mentor explained that, during this transmission, he prompted his trainee to issue the TI first as he considered it more significant than the visual approach clearance. The Do328 pilot stated that it should be possible to lose the height and confirmed that he was visual with the Tucano, the controller responding *"roger with that traffic in sight cleared visual approach report final runway Two Eight you are number two"*. However, shortly afterwards, the pilot of the Do328 commented *"we'll do an orbit here we're currently at three thousand feet four miles to the east of the field for rejoin on finals"* and he was requested to report turning final. An ac downwind was instructed to orbit as it was number two to the Do328. At this time, the SR22 pilot contacted the frequency and was asked to standby.

At 1523:50 the Do328 pilot reported *"just turning round about Broughty ferry"* (a VRP 5nm E of the airport.) In view of this position report, the controller changed the sequence order *"you will now be number two to a Cessna One Five Two crosswind this time correction base leg"* but the pilot responded *"We've gone into a TCAS traffic"*. (Later the traffic was confirmed as the subject SR22). No response to this message was made by ATC. After transmissions to and from two other ac, and one minute after his initial call, the SR22 pilot transmitted his callsign and after being told to pass his message, reported *"from Blackpool inbound to you currently on an eight mile final at two and a half thousand feet can orbit and go behind the Dornier currently on Niner Niner Five"*. He confirmed he was visual with the Do328 and was instructed to *"maintain your present position until advised you will be number three to that traffic the QNH QFE Niner Niner Eight millibars"*. He asked whether he should orbit or keep visual with the Do328 and was requested to do both. Subsequently, after the C152 ahead had been instructed to go-around, the Do328 was given a late clearance to land on RW28. The SR22 continued to orbit then proceeded to final behind further circuit traffic.

The mentor commented that both the Do328 and the SR22 did not route as expected in accordance with the information provided by Leuchars and additionally, the Do328 arrived earlier than the estimate passed by Leuchars.

The Dundee MATS Part 2 states the procedures for the 'Integration of East Bound VFR Traffic and IFR Traffic from the East Carrying Out Visual Approaches'. For RW28:

'Whenever an inbound IFR ac is making, or is expected to make, a visual approach via the Tay estuary mouth i.e. via Broughty Castle, VFR departures are not to be permitted east of the Tay road bridge. Ac wishing to depart VFR to the east or north-east are to be directed to depart either: a) by routing out to the west of the City via Longforgan, or b) by turning left after departure and climbing to 2000 ft QNH/QFE (minimum) in the overhead before setting course'.

On this occasion, the Tucano was allowed to route outbound to the E along the River Tay because at the time, the visual approach of the Do328 had neither been notified by Leuchars nor agreed. Also, the mentor believed that in view of its ETA i.e. some 8min away, the Do328 would not be in a position to conflict with the Tucano's departure. The mentor said that he was surprised when the Do328 reported 5nm E of the airport on its initial call, rather than on base leg as he expected. Had he realised its position, he would not have allowed the Tucano to change frequency until TI had been passed. All he could ensure was that TI was passed to the Do328 as soon as possible and when this was passed the pilot reported sighting the Tucano.

When the pilot of the SR22 contacted the frequency, due to the level of traffic he was instructed to standby. Dundee is not equipped with DF so the mentor/trainee did not realise that the ac was not to the S or SW of the airport, to join lefthand downwind, as expected. It was only **after** the Do328 pilot had reported a TCAS alert that the SR22 pilot was able to pass his message, indicating he was 8nm E of the airport with the Do328 in sight. Thereafter, ATC were able to redirect the traffic, taking both the Do328 and the SR22 into account.

Since neither of the inbound ac were in the positions expected by the mentor/trainee, they were not able to provide TI before any potential conflictions.

The LoA between Leuchars and Dundee states the procedures for 'IFR flights Inbound to Dundee Airport':

'Whenever an ac receiving an ATC service, including Flight Information Service, from Leuchars requests to make an IFR approach to Dundee, the Leuchars/LARS controller will:

Obtain an approach altitude/flight level for the NDB(L) "DND" from Dundee ATC as soon as possible.

Ensure that the IFR traffic is transferred to Dundee control as soon as it is clear of known traffic, but not later than the NDB(L) "DND".'

MIL ACC reported that Leuchars APP and Deps were manned by the same controller when the Do328 called them at FL80 requesting a RIS. The ac was identified and a limited RIS was provided due to poor radar performance. The Do328 was then given a descent to 4000ft on the Leuchars QFE of 998mb; all calls were acknowledged and read back correctly by the pilot. Some 35sec later a Tutor ac [not involved in the Airprox but a factor in the Do328's approach] called Leuchars Deps requesting a FIS for VFR departure to the S. A FIS was provided and the Tyne RPS of 995mb passed. TI was passed to the Do328 on another ac [although believed to be the SR22, this cannot be verified from the RTF transcript] *'east 5nm tracking north coordinated below'*. The pilot reported looking and this was immediately followed by TI on the Tutor *'traffic 12 o'clock 3nm climbing out of Leuchars, Tutor 3000ft below'* and the pilot reported visual. Further TI was then passed to the Do328 on multiple radar contacts thought to be in Dundee visual cct.

The Do328's visual recovery was then negotiated with Dundee ATC and the ac handed to Dundee with all appropriate information and instructions.

In summary, Leuchars ATC applied the appropriate ATS to the Do328 iaw regulations; accurate and timely TI was passed in a busy situation.

UKAB Note (2): Although there is no radar recording, it is assumed that the TCAS RA received by the Do328 was in respect of the SR22.

UKAB Note (3): A report from the Leuchars Controller was not requested at the outset of the investigation as it was believed that he played no part in the incident. However, since both the pilots involved commented that the handovers from Leuchars to Dundee had been a contributory factor, the RT transcript was rechecked. It is believed that the traffic co-ordinated below the Do328 was the SR22 at 3000ft approaching Leuchars ahead of and below it; below the SR22 was the Tutor on its VFR departure to the S. This would explain why the Leuchars Controller did not clear the Do328 to descend earlier.

UKAB Note (4): The sequence of events regarding the Do328 and the SR22 was as follows:

TIME	EVENT
1512:15	SR22 Initial call to Leuchars ZONE on VHF requesting MATZ penetration through overhead and straight in at Dundee
1512:26	ZONE replies standby
1512:45	SR22 report casting in (South Coast of Fife)
1513:13	ZONE prenote Do328 to Dundee and pass estimate of 1527 and given 3000ft on 999.
1513:27	ZONE also prenote VFR traffic (SR22) and pass estimate of 10min (3½ min before the Do328. (*ZONE do not pass request for straight in 28)*
1513:47	After some conversation about SR22's callsign and position ZONE told by Dundee that SR22 is to join downwind for 28 and ZONE correctly read-back.
1514:07-1514:22	ZONE take call from Scot MIL re D&D
1514:22	ZONE warned by TWR of VFR inbound from S
1515:42	SR22 calls coasting in (*not acknowledged due further land line calls ref D&D)*
1516:42	SR22 repeats coasting in call and passes his height as 2000ft
1516:57	SR22 told to climb to 3000ft on QFE998 and reads back
1517:39	SR22 told MATZ crossing approved
1517:42	SR22 told that it would be a downwind left hand join at Dundee
1517:49	SR22 reads back correctly downwind left.
1518:26	Do328 makes initial call on Leuchars DEPS (UHF) requesting RIS and track through overhead
1518:40	Do328 cleared to descend to 4000ft *(due SR22 at 3000ft ahead)*
1519:30	Tutor requests VFR departure to S
1519:52	Do328 passed TI on traffic coordinated 1000ft below *(presumed SR22)*
1520:45	SR22 requests descent to 2000ft
1520:52	Request declined
1520:59	Do328 warned on multiple traffic at Dundee
1521:19	DEPS request visual recovery for Do328 from Dundee – granted
1521:22	Dundee agree visual join left base
1521:34	DEPS pass joining instructions to Do328 *(replied copied but not read-back)*
1521:57	Tucano (at 1000ft) requests visual join on Leuchars APP - granted
1522:51	Do328 told to free call Dundee
1523:03	SR22 told to free call Dundee
1524:30	SR22 calls Dundee saying orbiting [at VRP Broughty] and visual with Do328 *(frequency continuously busy from 1517)*

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 in the absence of any radar information, this had been a very difficult incident to analyse with any degree of certainty. Also, since the diagram (above) was based only on the various reports, rather than on radar-verified data, a Member of the Secretariat briefed the probable sequence of events pointing out that both ac had been handed over to Dundee relatively late (probably coasting out on Northerly tracks) and high. He also explained why the Leuchars transcripts had not been requested until well after the incident and noted their cooperation when it emerged later that transcripts would greatly assist the investigation.

Controller Members noted the late and high handovers. They also noted that the Do328, possibly because of its change to a visual straight-in approach, was several minutes earlier on the approach than expected by Dundee and apparently was by then ahead of rather than, as Dundee ATC expected, behind the SR22. The situation was further complicated by the Do328 pilot initially accepting a visual straight in approach and then electing to orbit on the approach to lose height. Also, the SR22 had not joined downwind as expected and when its pilot made his first call, it emerged that it was in the same area as the Do328 which by that time was taking TCAS avoidance. Controller Members agreed that in these circumstances the non-radar equipped Dundee APP Controller was poorly placed to implement his, apparently well considered, sequencing plan for the arriving ac, requesting his mentor to assist by making some RT calls.

Members accepted that there had been good reasons (namely lower traffic) why the Do328 had been held higher than optimum through the Leuchars overhead and the SR22 had had to be climbed to 3000ft (1000ft below the Do328's cleared descent altitude). That being the case and taking account of other Leuchars traffic, since the SR22 had been ahead of, but was being overtaken by, the Do328, it was always going to be difficult to sequence the ac for their approaches to Dundee. The SR22 pilot asked for a straight-in to Dundee but this was not acknowledged by Leuchars nor relayed to Dundee and the pilot was, apparently to his surprise, instructed to join downwind. It was unclear to Members why, having acknowledged this instruction the SR22 pilot continued routeing to position for a long finals. One Controller Member suggested that he might have been under the false impression that his MATZ crossing was on a radar heading of N when in fact he had been climbed above the MATZ and could have routed to the W towards the downwind join position. It was thought likely however, that the SR22 pilot had been trying to afford the Do328 priority while still attempting to get permission from Dundee for a straight-in approach behind it.

Although TI regarding the SR22 was passed by Leuchars APP to the Do328 pilot, it did not appear to identify the SR22 to him. It seemed to some Members that, despite being fairly clear on the transcript, the Do328 pilot thought that the TI had referred to the Tucano crossing from W to E which he saw rather than the SR22 paralleling him below, which he did not. This however had little bearing on the incident which took place a short time later after both ac had transferred to Dundee APP and entered their respective orbits. It was also noted that Leuchars APP warned the Do328 pilot about the busy visual circuit at Dundee by means of generic TI. One controller Member observed that Leuchars APP seemed almost to opt out of assisting with the positioning and sequencing of the inbound ac, passing the rather tricky task to Dundee.

Focussing on the essentials of this Airprox event, Members agreed that the incident actually took place in the open FIR, well removed from the area of the published IFR approach to Dundee and that being the case 'see and avoid' was the principal method of collision avoidance. Although, after transfer from Leuchars to Dundee ATC, a radar service was not available to assist either pilot with this responsibility, the Do328 was TCAS equipped and the SR22 pilot wisely had his transponder switched on, thus enabling the Do328 pilot to receive a warning of his presence. The Do328 pilot reacted correctly to this warning thus removing any risk of collision. Further, the SR22 pilot saw the Do328 from an early stage, probably just after it had overtaken him in the descent, and maintained visual contact with it for as much time as was possible in their respective orbits. Members therefore agreed unanimously that in this incident the 'see and avoid' principle had worked as intended and there had been no risk of collision.

Notwithstanding the cause, Members agreed that had the SR22 routed towards the downwind join position, as instructed, it is probable that the incident would not have occurred. That the SR22 was not in the position expected by Dundee ATC had therefore been a contributory factor.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Whilst orbiting on final approach in a busy traffic situation, the Do328 experienced a TCAS RA against the SR22.

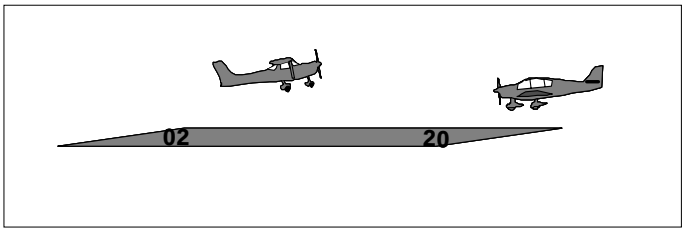
Degree of Risk: C.

Contributory Factor: The SR22 was not in the position expected by Dundee ATC.

AIRPROX REPORT No 165/08

AIRPROX REPORT NO 165/08

Date/Time:	6 Dec 1215 (Saturday)	
Position:	5050N 00018W (RW02 Shoreham - elev 7ft)	
Airspace:	Shoreham ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	C152	Robin DR400
Operator:	Civ Trg	Civ Pte
Alt/FL:	0ft	50ft (QFE N/R mb)
Weather	VMC CLBC	VMC
Visibility:	>10km	10km
Reported Separation:	50ft V/100m H	300ft V/150m H
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C152 PILOT reports flying a white and brown ac on a training flight with a student pilot at the controls. They were given clearance to line up on RWY02 and then lined up for takeoff. The student applied full power and the ac accelerated just as he noticed an ac landing on the opposite RW. He took control of the ac from the student, rotated and climbed at 50kt turning left in the climb to keep the other ac visible on his (RH) side. He reported the ac landing on the opposite RW to the ADC as it landed beneath him. At 500ft on the climbout, after concluding that the other ac had not landed on RW20 due to an emergency, he requested ATC to file an 'airmiss' against the ac involved. Although he accepts that we all make mistakes, the commander of the DR400 made no attempt to discuss the incident with him and after paying his landing fee went straight back to his ac. He questioned the airmanship of the pilot and considered that corrective training was warranted on how to join a busy airfield.

He considered the risk to be very high.

THE ROBIN DR400 PILOT gave a very full report some time after the incident where he noted that he was flying VFR from Biggin Hill to Shoreham in a red and white ac with all lights switched on and with another pilot in the RHS. On arrival at Shoreham he mistakenly made his approach to RW20 rather than 02 and the other pilot did not realise the mistake. On the approach to RW20, he twice received calls from ATC requesting his position: on the first instance he replied that he was on final and on the second that he was on short final. He was alarmed by these calls but he only realised that he was landing against the traffic pattern when he was on short final and he saw a C152 about 300yd away avoiding him. At that stage, it seemed best to continue as both he and his passenger could see that there was no other traffic approaching RW02. The C152 was climbing away to his right as he was about to land.

He did not initially submit a report as the other pilot did not inform him that he would be filing an Airprox when they spoke on the ground after the incident; thereafter he was overseas for some time.

He gave a full and frank 2-page written report, summarised below, regarding this incident that shocked and disturbed him. He is an experienced GA pilot with over 2800 hours but he thought that he must have lost concentration at a critical point in the flight.

He has now had time to consider the factors that might have had a bearing on the incident.

Shoreham has an 02/20 RW orientation and they are easily confused. Although he had another pilot who is a frequent flyer on board and he attributes no responsibility whatsoever to him, he thought it interesting that he too did not notice his misidentification of the landing RW. The other pilot has accompanied him on well over a hundred

flights, often difficult and lengthy, but he must have felt it unnecessary to monitor this particular, straightforward flight.

When carrying passengers, he asks them not to talk when within 5min of the landing airfield so that he can monitor the position of other ac and ensure that he understands fully any instructions from ATC. However, on this flight he relaxed this rule as his passenger might be able to contribute and assist with look out; nonetheless he does not believe the incident would have occurred had he been flying solo.

He intends to write a CHIRP report about the incident and an article about cockpit resource management in private flying. Having 2 pilots in a light ac should reduce the possibility of a serious error. Sometimes, however, it can induce complacency as witnessed by 2 past fatal accidents involving very experienced GA pilots flying with co-pilots.

As a result of this incident he has decided that in future he will fly with a kneeboard and will note all the relevant details with particular regard to the landing airfield. Further, when he has a second pilot on board he will have a sterile cockpit in the vicinity of the landing airport, as he would with non-flying passengers. However, he will ask him/her to monitor his flying. Finally he will ask an examiner to fly with him at four monthly intervals. If he finds that any of his performance again falls below his personal standards then he will give up flying.

ATSI reports that the Shoreham ADC reported his workload as moderate to high and the APP controller considered that he was very busy. He commented that as a result of the high number of inbound ac, he was having to delay them by holding several away from the airport.

The Shoreham RW in use was 02 and the 1150 METAR was:

34008kt; 9999; FEW 025; 07/01 Q1014.

The DR400 established communication with Shoreham APP at 1206, the pilot reporting inbound from Biggin Hill, about 15nm NE of the airport. He was cleared to join overhead at 2000ft for RW02, left-hand circuit and issued with the QFE 1014mb. The pilot read back the pressure and the instruction to join overhead at 2000ft and then queried *"is it for Zero Two".* No confirmation of the RW was made by the controller and consequently, no read back of the RW in use was made by the pilot. MATS Part 1, Appendix E, lists messages which pilots are required to read back, which includes the 'Runway in use' and it also states that 'Controllers are to prompt a pilot if a read-back is not immediately forthcoming'.

APP continued by requesting how many minutes the ac was from the airport and the pilot responded that he had 14nm to run to the overhead and was estimating in about 7min. A re-clearance was issued to join overhead at 2400ft, although this was changed less than two minutes later back to 2000ft. At the time (1209), the pilot reported at 11nm and was passed TI about two joining ac, one from Brighton and one from the W.

Meanwhile, the C152 was holding at 'B1' for RW02, the pilot having reported ready for take off. At 1210, the pilot confirmed that he could take an immediate departure but the ADC instructed him to hold his position due to landing traffic; about 3min later the pilot was instructed to line up after a landing ac.

Shortly after this the DR400, still with APP, reported 2.5nm from the overhead. The pilot was informed about another ac (an RV6, but type not mentioned at the time) which was descending from overhead and he was then transferred to the Tower frequency. The APP Controller commented that, as he was busy, he was not visually monitoring the circuit and consequently, did not see the Airprox.

At 1214, the RV6 contacted the Tower frequency and was instructed to descend dead side to report downwind for RW02. Shortly thereafter the DR400 pilot made his initial call on the Tower frequency and was instructed *"report visual with an R V Six descending dead side*" to which he replied that he was looking for the traffic, the controller responded *"descend dead side and you're following that R V Six he should be quicker than you"* and the pilot read back *"Roger descend dead side"*. The controller then received a downwind call from a PA32 which was number two in traffic.

The pilot of the DR400 then transmitted *"descending from eighteen hundred feet and joining on the downwind leg"*. He was cleared to *"descend to circuit height one thousand one hundred and report downwind"* and he read back

"Descend to eleven hundred and report downwind". The ADC commented that he understood the calls to mean that the DR400 was commencing its downwind leg and that he could see an ac approaching the downwind position which he believed to be the DR400. However, this was later discovered (after the Airprox) to be the PA32.

The ADC dealt with other circuit traffic and once the landing ac had vacated the RW, the C152 was cleared for take off, into a left-hand circuit. Following a transmission to and from other circuit traffic, the DR400 reported *"short final"* and was instructed to continue approach. The ADC said that he looked towards the 02 approach and saw an ac on final which he assumed to be the DR400, although shortly afterwards, the PA32 reported *"just turning finals to land"*. He explained that he could only see one ac on approach and not two as he now expected i.e. the DR400 and the PA32 so he asked the DR400 *"confirm you're on final"*. When the pilot of the DR400 confirmed he was on short final the controller, again wrongly, assumed this was the ac he could see, believing that possibly the PA32 was further out, which could explain why it was not yet visible. Consequently, as the C152 was now airborne from RW02, he issued the DR400 with a landing clearance *"C/S clear to land runway Zero Two surface wind northerly nine knots"* and the pilot acknowledged, just using the last two letters of the registration.

The next transmission was from the C152 pilot, who reported *"Er Shoreham Airport er there's an ac landed on the wrong runway there"* and the DR400 pilot then apologised for landing *"the wrong way"*. After the previously mentioned RV6 reported downwind and the PA32 was cleared to land, the pilot of the C152 stated his intention to *"file an Airmiss on that"*. The ADC confirmed that he had not seen the DR400 until after the warning from the C152. All he could assume was that the DR400 pilot had positioned downwind left hand RW20 i.e. in the 02 dead side. Because of this he would not easily have seen the ac from the VCR, located on the S side of the airport, as it would have been obscured above the roof.

The pilot of the DR400 did not read back the RW in use and the APP Controller did not challenge this omission as required by MATS Part 1. However, the RW in use was passed clearly and it was mentioned by both the APP and the ADC to several other ac, whilst the DR400 was on their respective frequencies; it was also included in the DR400's landing clearance. The ADC wrongly identified a PA32 as the DR400 from the time it positioned downwind and did not, therefore, query the latter ac's joining procedure. Undoubtedly, the busy traffic situation affecting both controllers, was a contributory factor to the incident.

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 the open and honest report provided by the DR400 pilot describing the events that lead to his error. Several Members also observed and commented that 02/20 (and 13/31) RW confusion is a well known problem that has been extensively publicised: extra vigilance is required, primarily by pilots but also controllers, at airfields with these RW directions. 'Forewarned is forearmed' - if the possibility of confusion is anticipated it can often be avoided.

The GA Member noted that after its overhead join at 2000ft the DR400 would have descended to cct height on the live side yet the pilot did not see any other opposing ac nor did the controller see the DR400. Another Member familiar with Shoreham observed that there is an ATIS service there and had it been used then that would have provided an additional notification of the in-use RW well before the DR400 arrived at the aerodrome. Another pilot Member observed that in the circumstances where the DR400 continued to land, the C152 instructor did well to avoid it at very low airspeed. The Member also observed that had the DR400 gone-around on what its pilot considered to be the dead side, the two ac would have come into even closer proximity.

Accepting that the provision of the ATS was not as good as it might have been, specifically as the ATSI report outlined, by the omission of some readbacks, Members considered that the prime cause of the incident had been the DR400 pilot joining for RW20 despite several indications that RW02 was in use. Although understanding some of the human factors outlined in the DR400 pilot's report and that the human brain will often make a mental picture fit what it expects to see rather than what it actually sees, Members agreed that that all pilots should be most vigilant with continual cross-checking in such circumstances and be alert to the possibility, even probability, of error.

Members agreed that the C152 instructor had done very well to spot the confliction, take control of the ac from his student and initiate considerable avoidance when the ac was at low speed immediately after take off. They also agreed that by doing so he had removed any risk of collision but that normal safety standards had nevertheless been eroded.

PART C: ASSESSMENT OF CAUSE AND RISK

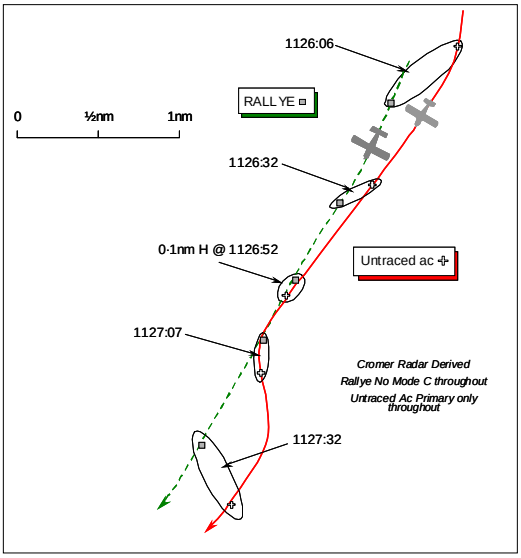
Cause: Having selected the wrong RW for landing, the DR400 pilot flew into conflict with the departing C152.

Degree of Risk: B.

AIRPROX REPORT No 166/08

AIRPROX REPORT NO 166/08

Date/Time:	6 Dec 1126 (Saturday)	
Position:	5221N 00106E (1½nm SSW of Diss)	
Airspace:	London FIR	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Rallye 893	Untraced Ac
Operator:	Civ Pte	N/K
Alt/FL:	1500ft	NR
	QNH (1014mb)	NR
Weather	VMC CAVOK	NR
Visibility:	>10km	NR
Reported Separation:	25-50ft V/150m H	
Recorded Separation:	~0·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE RALLYE 893 PILOT reports that he was en-route from Felthorpe to Wattisham under VFR in CAVOK conditions and in receipt of a FIS from Norwich APPROACH on 119·35MHz. A squawk of A7000 was selected with Mode C on.

Approaching a position about 2nm S of Diss flying straight and level at 1500ft QNH (1014mb) heading 190° at 100kt, he first became aware of another ac in his peripheral vision on the port side about 150m away, overtaking his ac at the same altitude. The other ac – a white single engine mid-wing fixed u/c type similar to an Extra 300 - then moved slightly ahead in level flight before climbing and turning away to port. Minimum horizontal separation was about 150yd and some 25-50ft vertically. The pilot of the other ac then commenced aerobatic manoeuvres. Both ac were flying straight and level on similar headings as the other ac overtook him; no avoiding action was taken because the other ac climbed and turned away. He assessed the Risk as *"Medium".*

Concerned as to whether or not the other pilot had seen him before drawing alongside and then climbing away, he reported the Airprox to Norwich ATC – both on RT and by telephone after landing.

THE RADAR ANALYSIS CELL (RAC) AT LATCC (MIL) reports that despite exhaustive enquiries, including contacting aerodromes/clubs and known farm strips in the locality, they have been unable to trace the reported aeroplane, the identity of which remains unknown.

THE NORWICH APPROACH RADAR CONTROLLER (APR) reports that the Rallye pilot was in receipt of a FIS en-route from Felthorpe to Wattisham, originally squawking A7374. The Rallye pilot was subsequently instructed to squawk A7000 and to free-call Wattisham APPROACH. Shortly afterwards, during a period of particularly busy RT with 3 IFR flights in receipt of RAS inbound to Norwich, the Rallye pilot called an Airprox, passing his details immediately and without warning. Instructing the pilot to call via landline, the duty ATSA subsequently took the details of the Airprox which involved an unknown aeroplane - possibly an Extra 300 – which passed within 100ft vertically and 500yd horizontally of the Rallye before climbing steeply away.

ATSI had nothing further to add.

UKAB Note (1): The Rallye 893, initially identified from its allocated Mode A squawk, is shown on the Cromer Radar recording, approaching the reported location of the Airprox and now squawking A7000, apparently following the railway line with no Mode C evident throughout. The recording does not illustrate this Airprox clearly but does show the untraced ac as a primary-only contact somewhat below the base of the Cromer's theoretical primary radar coverage. However, considerable track jitter does not engender sufficient confidence in the full track history

– the Cromer shows the untraced ac better than the Debden recording – to be certain of the minimum separation that pertained. The untraced ac approaches from the Rallye 893's port quarter before overhauling the reporting pilot's aeroplane. Some primary contacts are lost on the untraced ac as it overtakes the Rallye, with some others suggesting that the untraced aeroplane might have crossed astern to the Rallye's starboard side. The untraced aeroplane is shown in the Rallye's 11 o'clock - 0·1nm at 1126:52, at a point some 1½nm SSW of Diss Railway station before it then opens to port of the Rallye and accelerates away ahead.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report solely from the pilot of the Rallye 893, transcripts of the relevant RT frequency, radar video recordings and a report from the tracing authority, together with a report from the air traffic controller.

It was unfortunate that the RAC at LATCC (Mil) had been unable to ascertain the identity of the reported ac: without a report from its pilot, it was difficult for Members to come to meaningful conclusions as to Cause and Risk. With only the Rallye pilot's report and the radar recording upon which to base the Board's assessment it was not possible to answer the reporting pilot's query and not at all evident if the Rallye had been spotted at all. Nonetheless, it seemed highly unlikely that the pilot of the untraced ac would have deliberately flown towards and within 200m the Rallye. Therefore, somewhat unsatisfactorily from the limited information available, the Board could only conclude that the Cause of this Airprox was an apparent non-sighting by the pilot of the untraced ac whilst overtaking the Rallye.

There appeared to be an anomaly between the horizontal separation of 500yd - reported by the Rallye pilot to the Norwich ATSA on the telephone after the event, as reflected in the Norwich APR's report - compared to that contained within the Rallye pilot's account in his written submission. Notwithstanding the apparent 'track jitter' on the Cromer Radar recording, the Rallye pilot's assessment of 150m horizontal separation as the untraced ac passed by did not seem far off the mark. The Cromer recording suggested this was about 0·1nm, albeit that the quality of the recorded data was not that high. Thus with the Rallye pilot naturally unsighted on any ac closing rapidly from astern until it approached abeam, plainly he would have been unable to spot the other ac any earlier than he did. Therefore, with the pilot of the untraced ac apparently unsighted also, it was indeed fortunate that such separation existed. Whilst clearly there could have been a very different outcome if circumstances had been slightly different, the Board could only base its assessment on what had actually transpired. The Members agreed unanimously that the safety of the ac involved here had certainly been compromised.

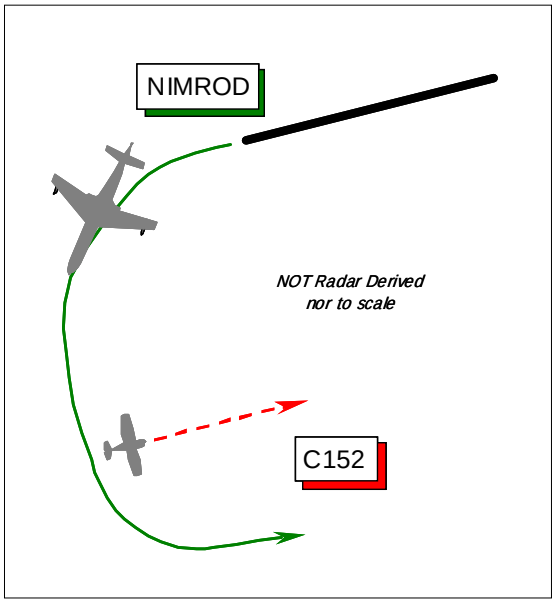
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: An apparent non-sighting by the pilot of the untraced ac whilst overtaking the Rallye.

Degree of Risk: B.

AIRPROX REPORT NO 167/08

Date/Time:	8 December 1449	
Position:	5739N 00334W (RW26 cct Kinloss - elev 22ft)	
Airspace:	Kinloss ATZ/MATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	Nimrod MR2	Cessna 152
Operator:	HQ Air (Ops)	Civ Trg
Alt/FL:	750ft↑	800ft
	QFE (1012mb)	QFE (1012mb)
Weather	VMC CLOC	VMC COCISS
Visibility:	30nm	>10km
Reported Separation:		
	Nil V/500m H	Nil V/500m H
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE NIMROD MR2 PILOT reports that he was operating in VMC in the visual cct to RW26 at Kinloss and in communication with TOWER on VHF; SSR Mode A/C was selected 'on' but TCAS is not fitted. The Flight Deck crew comprised two pilots including himself as the PF seated in the right-hand seat and an air engineer.

After rolling into the visual cct, he was aware that the pilot of a light aircraft (LA) was requesting a visual join to RW26 from the W. Climbing through 500ft QFE and with the speed increasing to 160kt, he began a left hand turn in the normal place to position DOWNWIND. Halfway through the left hand turn in the CROSSWIND section of the cct climbing through 750ft Clutch QFE, he became visual with a high-wing Cessna 152 very slightly above and just "through the nose in the 11:30 position" about ¼nm away crossing from R - L. Assessing that there was a risk of a collision with the LA he rolled 'wings-level' to stop the left hand turn and "pop up" behind the other aircraft to 1000ft – the normal cct height for MR2 ac. He then positioned his DOWNWIND leg much wider than normal as he wanted to keep the C152 visual, it being only 200ft below his ac. He assessed the risk to be "high" and upon landing informed the SFSO and ATC that he was filing an Airprox.

Opining that the C152 pilot had been cleared by Kinloss TOWER to join DOWNWIND for the RW26 visual cct, he added that the Club who operate the C152 and military users of the airfield are bound by the same rules contained in the Kinloss Flying Order Book. The ac has a hemp colour-scheme and the HISLs were on.

THE CESSNA C152 STUDENT PILOT, a qualified navigator, reports that on arrival back at Kinloss after a solo PPL training sortie in the local area, she conducted the standard VFR rejoin for RW26. This was via 'The Bridges' [UKAB Note (1): The A61 road bridge over the River Findhorn, some 4½nm SW of the Kinloss ARP and used as a geographical reference for visual cct joins] at 1500ft Clutch QFE under a FIS from Kinloss TOWER on VHF 122·1MHz.

Flying in VMC, clear of cloud and in sight of the surface, when cleared to rejoin she followed the procedures and descended to 800ft QFE for the DOWNWIND join. On the run in to the DOWNWIND point heading 080°, level at 800ft, she was informed by TOWER of another ac - the Nimrod - that was rolling into the cct. Whilst continuing inbound at 80kt it became apparent that the Nimrod pilot, whose ac was first sighted rolling from the runway, did not appear to be visual with her C152. Informing TOWER that she was "just short of DOWNWIND" in order to aid the Nimrod crew acquire her ac visually, the jet then turned after rolling and climbed through her level passing some 500m behind her ac at the closest point.

She did not consider there to be a risk of collision and no avoiding action was taken – she annotated her report as *"low".* The procedures stipulated for the Flying Club and the local FOB were followed. The ac is coloured white and the lights were on, including the landing lamp and strobes.

THE KINLOSS AERODROME CONTROLLER (ADC) reports that at the time of the Airprox, the airfield colour code was BLUE and the weather was "fit" for visual circuits. He assessed his workload as *"low"* with 3ac under control.

When the C152 student pilot called to join via "The Bridges", there was another Flying Club ac departing and a Nimrod in the visual circuit. The C152 student pilot was informed on RT that there was "one 'in' [the cct] and one departing" and he instructed her to report when visual with the traffic. She said she was visual with the one departing. Watching the Nimrod during the ROLL, he then turned to look towards the joining point to search for the C152. After spotting the C152 approaching the beginning of the DOWNWIND leg, he asked again if the pilot was visual with the Nimrod, whereupon she said she was. Asking the Nimrod pilot if he was visual with the C152, he replied negative, so as the Nimrod turned onto the DOWNWIND leg he tried to pass the position of the C152 to the Nimrod pilot but he still could not see the C152. The Nimrod overtook the C152 during the first half of the DOWNWIND leg.

From his perspective it seemed as though the C152 pilot was not particularly aware of where the Nimrod was nor its expected flight profile. It looked as though they were flying very close to each other so he continued to pass traffic information to the Nimrod crew.

UKAB Note (2): This Airprox is not shown on radar recordings.

UKAB Note (3): The Extant UK Mil AIP Vol 2 at AD 2 - EGQK - 1 – 13 Special Procedures (1) specifies that Lossiemouth and Kinloss operate on a single Clutch QFE pressure setting for all operations within the CMATZ and for associated instrument procedures and radar patterns iaw Mil AIP ENR 2-1-5-3.7. When Lossiemouth (higher aerodrome) is open the Clutch QFE will be observed barometric pressure for the TDZE of the Lossiemouth Rwy in use. When Lossiemouth is closed the Kinloss airfield QFE will be used.

MIL ACC reports that the Nimrod MR2 crew was conducting visual ccts to RW26 at Kinloss on the common TOWER VHF frequency of 122·1MHz. The C152 flown by a flying club student on a solo sortie was returning, also on the same TOWER VHF frequency, using a standard visual re-join procedure. For RW26 the procedure laid down in the Kinloss FOB is to report to Kinloss ATC "..at 'The Bridges' for rejoin", join at 800ft [Clutch QFE], or as cleared by ATC, left-hand DOWNWIND.

The Nimrod crew had been cleared to ROLL on RW26 when at 1447:05, the C152 student pilot called TOWER reporting "[Student pilot C/S] *approaching the Bridges descending 1500ft ready for rejoin on runway 2-6."* TOWER replied "[Student pilot C/S] *join runway 2-6 Clutch QFE 1-0-1-2 one in* [the cct – the Nimrod] *one departing to the LTA."* The C152 student pilot read back the QFE correctly and reported visual with the one departing at 1500ft that was another Flying Club Cessna ac. TOWER then requested that the C152 student pilot repeat the last message, the pilot stating *"we are at the bridges 1500 feet* [C/S]*",* which TOWER acknowledged with "[C/S] *roger"*. In her account the C152 student pilot states that she followed the procedures and descended to 800ft QFE for the DOWNWIND join. [UKAB Note (4): The Flying Club Orders/FOB require that a descent to 800ft be initiated and completed by the 'Distillery' a point 3nm SW of the Kinloss ARP before reaching the circuit.] At 1447:55, the Nimrod pilot asked TOWER to confirm that he was cleared to ROLL to which TOWER replied *"Affirm."* One minute later, TOWER instructed the C152 student pilot to *"..report visual with the one in"* - the Nimrod. The C152 student pilot replied that she was *"visual with the one in and one taking off [C/S]".* The C152 student pilot wrote in her report that at this point she was visual with the Nimrod rolling. At 1449:02 the Nimrod pilot requested a low-level circuit to which TOWER replied "[C/S] *negative, got 1 light aircraft joining not sure where he is yet",* which the Nimrod pilot acknowledged. Upon hearing this RT exchange, the C152 student pilot reported that it had become apparent that the Nimrod was not visual with her ac and so in order to assist the Nimrod crew to gain visual contact, she transmitted at 1449:15, "[Student pilot C/S] *is just DOWNWIND."* Some 15 sec later TOWER asked the Nimrod pilot if he was visual with the C152, to which he immediately replied *"looking."* TOWER passed further traffic information at 1449:43, as *"..should be in your left 10 o'clock",* whereupon the Nimrod reported visual with the C152 and reported that he took-up a wider DOWNWIND leg to remain visual with the C152. Both ac then continued their sorties as planned without further incident. The CPA based on all reports was 500m horizontally.

In summary, the Cessna pilot maintained visual contact with the Nimrod throughout. The pilot of the Nimrod did not gain visual contact with the Cessna until the CPA when it turned onto the DOWNWIND. Standard instructions were passed by ATC and, notwithstanding a missed call with respect to the Cessna being at 'The Bridges', traffic information was passed to both pilots about each other's ac.

HQ AIR (OPS) comments that it would seem that the C152 Student pilot joined the cct in accordance with current procedures and was visual with the Nimrod throughout. Furthermore, the Student pilot attempted to make her position more clear to the Nimrod pilot by transmitting her position in the cct. However, it appears that the Nimrod pilot, looking across the cockpit, took some time to acquire the C152 and avoid it.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The integration of disparate ac types in visual aerodrome ccts is always challenging. Of all military aerodromes it seemed to the Board that Kinloss had an enviable advantage here, normally populated as it was almost exclusively with the large Nimrod multi-jet. Nonetheless, it was also evident that the widely differing flying characteristics of this large military jet and perhaps the rarely encountered single engined civilian C152 were about as far apart as might be commonly expected at military aerodromes.

However, it was clear to the Board that the ADC was mistaken when he observed in his account that the C152 pilot was not particularly aware of where the Nimrod was nor its expected flight profile. It was evident that the crux of this Airprox actually stemmed from the Nimrod pilot's inability to spot the small C152; cross-cockpit out of the small 'letterbox-like' flight deck windows. Indeed the ADC had reported that he wisely continued to pass traffic information to the Nimrod pilot on the small aeroplane established at the light ac cct height of 800ft QFE when the controller belatedly acquired the C152 himself. It was clear to pilot Members that the C152 pilot, although a PPL student, had exhibited sound airmanship throughout this encounter - gleaned it would appear from service as a qualified navigator. From her candid account it was plain that she was entirely cognisant of both the position of the Nimrod and the difficulties experienced by its crew in acquiring her small aeroplane visually. Moreover, from the Mil ACC report it was evident that the C152 pilot had indeed complied precisely with the established procedures for joining the cct. Members commended the C152 pilot for her sound appreciation of the situation and good airmanship in making the DOWNWIND call at the earliest opportunity to assist visual acquisition of her aeroplane by both the ADC and the Nimrod crew. The RT transcript had revealed that appropriate cct joining calls had been made by the student pilot which, with both ac operating on the same frequency, should have assisted the Nimrod crew's situational awareness.

Undoubtedly the small size of the C152 had played a part here in masking its presence from the Nimrod crew who, in this high-workload scenario as they cleaned up the ac and climbed away from the 'roller', had the added task of establishing where the C152 was before they turned L cross-wind and climbed to their cct height of 1000ft, and thus through the LA cct height of 800ft. The absence of recorded radar data to illustrate this encounter did not allow the exact geometry to be ascertained independently but it seemed that the Nimrod's turn was just as the light ac commenced the DOWNWIND leg. Some might contend that there was a built-in confliction within the cct but this means of separating LA from jets was used at many military aerodromes and pilots could reasonably be expected to deal with such a situation routinely. Indeed it seemed the C152 was already established in the cct when the Nimrod crew executed the ROLL into the cct: therefore it was the jet pilot's responsibility to integrate his ac safely at his cct height, taking due account of the presence of the C152 which he had been warned about by TOWER. The Air Command pilot training Member opined that the Nimrod crew should have identified the location of other cct traffic before the pilot turned CROSSWIND. Alternatively, it was a simple case of maintaining runway track until the cct height of 1000ft was achieved and thus above the LA cct. As it was the Nimrod pilot reports he had turned L in the normal place but he should have been taking account of the slower C152 before he turned. Nevertheless, according to the Nimrod pilot's candid account the C152 was sighted ¼nm away – about 500yd - crossing from R - L so he wisely straightened-up and promptly achieved cct height. That the Nimrod pilot flew a slightly wider cct than normal to maintain visual contact on the C152 flown by the inexperienced student was entirely sensible and sound airmanship in the circumstances. It was evident to the Board that he had not seen the other aeroplane until he had turned CROSSWIND which was somewhat late and in the Board's view the Cause of the Airprox. Nonetheless, as the Nimrod pilot had spotted the C152 ¼nm away following the ADC's traffic

information and manoeuvred to avoid it whilst integrating his jet into the cct, Members agreed unanimously that no Risk of a collision had existed in the circumstances conscientiously reported here.

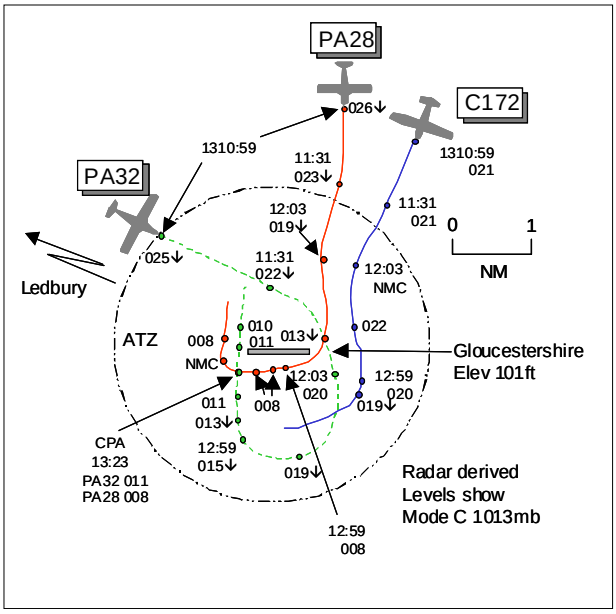
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by the Nimrod crew.

Degree of Risk: C.

AIRPROX REPORT NO 168/08

Date/Time:	17 Dec 1313	
Position:	5153N 00211W (0·5nm WSW Gloucestershire - elev 101ft)	
Airspace:	ATZ	(Class: G)
Reporter:	Gloucestershire ADC	
	First Ac	*Second Ac*
Type:	PA32	PA28
Operator:	Civ Club	Civ Trg
Alt/FL:	1150ft↓	1000ft
	(QFE 1013mb)	(QFE)
Weather	VMC CLNC	VMC NR
Visibility:	>10km	10km
Reported Separation:		
	200-250ft V	Not seen
Recorded Separation:		
	300ft V	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GLOUCESTERSHIRE ADC reports that at about 1310 he had 3 ac descending to join RW27 RH from the O/H, including a student on a qualifying cross-country in the subject PA28. He tried to establish RT contact with the PA28 pilot several times without success and APP confirmed the flight had left their frequency. At 1313 he observed the PA28 passing close below the subject PA32 with both turning crosswind, the PA32 pilot confirming he had the PA28 in sight. During this period he had made several transmissions to all traffic about the 'non-radio' ac, the PA28. The PA28 pilot finally made 2-way contact when on about 0·5nm final RW27. The PA28 made a bouncy landing and go-around followed by a further go-around and a subsequent landing.

Gloucestershire METAR EGBJ 1250Z 23002KT CAVOK 08/04 Q1016=

THE PA32 PILOT reports flying a solo local sortie from Gloucestershire VFR and in communication with Gloster Tower on 122·9MHz squawking 7000 with Mode C. The visibility was >10km in SKC VMC and the ac was coloured white/burgundy with anti-collision and strobe lights switched on. At 1302 he reported a slow Attitude Indicator (AI) failure to Approach on frequency 128·55MHz with his intention to return to Gloucestershire. Eight minutes later, at 1310, heading 120° at 150kt he reported his position as 2D NW of the aerodrome to Approach and he was instructed to contact Tower on 122·9 which he did. He then was told by Tower to make a standard O/H join for RW27 and to report downwind so he set the QFE of 1013mb and complied with the request. Two minutes later he commenced descent crossing the RW27 threshold at 1950ft QFE heading 170° at 130kt. He heard Tower repeatedly trying to contact a student pilot who was not answering any radio calls whilst ATC were very busy as there were many ac in the cct and local area. One minute later at 1310 when 1D S of RW09 threshold at 1450ft QFE descending and turning R through 355° at 120kt, Tower warned him of possible conflict with a silent student on RW27 climb-out. This TI was timely and accurate for he could immediately report 'copied' and also 'visual'. The traffic was a white and blue coloured PA28 about 0·5nm away in his 2 o'clock crossing R to L ahead, below and climbing, he thought, so he arrested his descent to fly straight and level at 1150ft QFE at 110kt. He watched the PA28 disappear from view under the leading edge of his R wingtip about 250ft below and then turned to look out of the L window to see the same ac emerging from beneath the trailing edge of his L wing about 200ft below and 50m to his L. Shortly after this, satisfied that the collision risk had subsided, he turned downwind for RW27 whilst descending to 1000ft. He added that he was checking the AI more often than normal during the recovery to see if the instrument would right itself which it did on final approach to land.

THE PA28 PILOT reports flying solo on the second leg of a triangular qualifying cross-country from Peterborough/ Connington to Gloucestershire, VFR and in communication with Gloster Approach and Tower squawking with Mode C. The visibility was 10km in VMC and flying conditions were appropriate throughout although the visibility

towards Gloucestershire was modestly impaired by haze into sun. On this leg he was briefly in contact with Northampton/Sywell for FIS but he became uncertain of his position 20min into the flight, estimating he was N of his intended track. He contacted Coventry Radar and was given headings to steer for Gloucestershire and, as suggested by the Coventry Radar controller, he re-contacted Coventry after calling Wellesbourne to fly through the Wellesbourne O/H. Coventry then suggested that he contact Gloster Approach which he duly did and received instructions for a standard O/H join for RW27. Approaching the O/H he contacted Gloster Tower on frequency 122·9MHz, as instructed. Unfortunately, as he later worked out, he had dialled the incorrect frequency of 129·9MHz. He was conscious of speaking to Gloster (accepting that this could definitely not have happened) and heard an instruction to 'report descending deadside'. He continued onto the deadside and descended into the cct at 1000ft and reported. He did not hear any communication but flew the standard cct making the standard downwind and final calls. It was not until he had not received a reply to the 'final' call that he realised his error with the radio frequency. He redialled the correct frequency (noted from his kneepad) and reported 'final' and received the instruction 'cleared to land, we have been trying to contact you for some time'. At this late stage he felt he could not explain the situation. During touchdown the ac bounced twice and he elected to go-around, moving onto the deadside. On the next cct he was following 2 other ac and felt it was inappropriate to continue so 'went around' before rejoining the cct and landing. He felt that causal to the incident was that he had become distracted from being off heading and dialling up the wrong frequency but not noticing this error until late in the cct. Furthermore, it may have been further compounded by the fact that Connington was only an A/G service and instructions were less didactic.

THE PA28 COMPANY'S MANAGING DIRECTOR comments that there were issues concerning the signing-off by ATC of the student's cross country qualifying form and the release of the student pilot to return to Oxford after this flight leg. The student was unaware of his apparent close proximity to another ac in the cct. The student will be undertaking further training including a dual flight to Gloucestershire and a reminder of radio technique and radio failure procedures prior to the next solo navigation exercise.

ATSI comments that at 1305, the PA32 pilot reported overhead Ledbury Airstrip [13nm WNW Gloucestershire], requesting to return to Gloucestershire Airport. The flight was cleared to join O/H at height 2000ft for a RH cct to RW27, to report 2nm NW. Approximately 3min later, the PA28 flight established communication with Gloucestershire Approach. The pilot reported on a student solo flight, requesting a standard O/H join. He requested help with his track due to poor visibility and also reported heading 230° at 2700ft. He was cleared for a standard O/H join at height 2000ft, for a RH cct to RW27. He was requested to report 2nm N of Gloucester and advised his steer for the airport was 200°. The pilot was advised of 2 other flights (not the subject PA32, a C172 joining and a N'bound R44 passing E of Gloucestershire), which he acknowledged and reported the airport in sight. When the pilot of the PA32 reported at 2nm from the airport, he was informed about 2 ac approaching from the N (the subject PA28 and joining C172) and transferred to the Tower frequency. Shortly afterwards, the pilot of the PA28 reported he was changing to the Tower frequency which was approved by the Approach Controller.

At 1311:30, the PA32 pilot reported, on the Tower frequency, descending on the deadside for RW27 and was requested to report downwind. He was asked if he could see a Cessna: the pilot acknowledged the TI and reported looking. At 1313, as no call had been received on the Tower frequency from the subject PA28, the controller tried to contact the flight without success. He then informed the joining C172 pilot about *"one P A Twentyeight not yet working me but believed to have made an early descent on the deadside right hand side do you have the traffic in sight"*. The pilot replied *"affirm"*. The pilot of the PA32 then reported visual and was informed the traffic was a student pilot not in contact. *"No problem he's passing just beneath me we're at a thousand foot QFE just heading downwind"*. The controller made 3 more unsuccessful attempts to contact the PA28. Thereafter, he warned the PA32 pilot *"caution the aircraft is still not in contact with me is turning base leg and you'll be number two against that traffic"*. The pilot confirmed he was visual and would make a wide cct.

At 1315:24, the controller transmitted to the PA28 *"PA28 c/s this is Gloster Tower transmitting blind clear to land runway Two Seven surface wind at Two Three Zero degrees four knots"*. The PA28 pilot read back the landing clearance. The PA32 pilot reported making 1 LH orbit on the deadside and the C172 flight was informed about the PA32's orbit. Subsequently, the PA28 pilot reported going around.

The Tower Controller had informed the other cct traffic about the presence of the PA28 and a visual sighting was made by both the joining C172 and PA32 pilots.

UKAB Note (2): The Clee Hill radar recording clearly captures the Airprox. At 1310:59 the PA32 is seen entering the ATZ 2nm NW of Gloucestershire tracking 120° squawking 7000 indicating unverified FL025 (2600ft QNH 1016mb) descending. At the same time the PA28 is seen 3nm N of Gloucestershire tracking S'ly squawking 0264 (Coventry Radar allocated code) indicating unverified FL026 (2700ft QNH) descending. Another ac, a joining C172, is seen 1nm ESE of the PA28 tracking SSW'ly indicating level at FL021 (2200ft QNH). Owing to its faster GS, the PA32 passes through the O/H just E of the RW27 threshold turning onto S at 1312:03 at FL020 (2100ft QNH) whilst the PA28 is 1·3nm to the NNE of the RW27 threshold descending through FL019 (2000ft QNH). Whilst the PA32 descends on the deadside, the PA28 is seen to continue its descent towards the RW27 threshold passing FL013 (1400ft QNH) before turning R on the deadside onto a heading parallel to, and just S of, the RW before levelling at FL008 (900ft QNH) at 1312:59. By now the PA32 is just rolling out onto a N'ly track towards the RW09 threshold descending through FL015 (1600ft QNH) 1nm to the SW of the PA28. The subject ac continue on these tracks, the PA32 is seen levelling at FL011 (1200ft QNH) on the radar sweep immediately prior (8sec) to the CPA, which occurs at 1313:23, as the radar returns merge with the PA28 crossing at 90° to the PA32 from R to L and 300ft below. The PA32 continues onto the crosswind leg and descends to FL010 (1100ft QNH) whilst the PA28 turns R onto crosswind behind and slightly wider than the PA32.

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 agreed that the Gloucestershire ADC had handled the situation well. When he recognised that the PA28 student had not called on his frequency after transferring from APP, he had tried to contact the flight without success. The ADC had then kept the cct traffic, including the PA32 flight, informed of the PA28's 'silent' arrival by passing TI, stating that it had descended early onto the deadside which allowed the PA32 pilot to acquire it visually. The PA32 pilot had resolved the potential confliction by arresting his descent to ensure the PA28 passed below by 200-250ft as it crossed from R to L near the upwind threshold. Although the PA32 went unnoticed to the PA28 student pilot, the timely TI and actions taken by the PA32 pilot had removed any risk of collision, ultimately leaving the Board to classify this incident to be a controller perceived confliction.

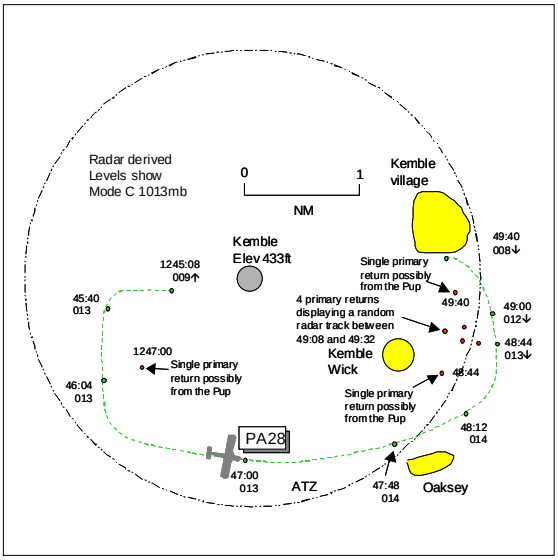
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Controller perceived conflict.

Degree of Risk: C.

AIRPROX REPORT NO 170/08

Date/Time:	17 Dec 1250	
Position:	5140N 00203W (0·25nm FIN APP RW26 Kemble - elev 433ft)	
Airspace:	ATZ	(Class: G)
	Reporting Ac	*Reported Ac*
Type:	PA28	Beagle Pup
Operator:	Civ Trg	Civ Trg
Alt/FL:	200ft	200ft↓
	(QFE 1000mb)	(QFE)
Weather	VMC CLNC	VMC CLBC
Visibility:	>10km	>10km
Reported Separation:		
	50ft V	Not seen
Recorded Separation:		
	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA28 PILOT reports flying a solo student cct detail at Kemble and in receipt of a FIS from Kemble Information on 118·9MHz squawking 7000 with Mode C. The visibility was >10km on a clear sunny day and the ac was coloured white/blue with anti-collision light switched on. On his 5th cct he called downwind at 1000ft QFE 1000mb and the Tower replied there was 1 ac in front. He turned onto final heading 260° at 75kt and informed the Tower who acknowledged his call, stating there was an ac on the RW. He acknowledged this stating that he had it in sight. He continued his landing approach and the ac on the RW was vacating. He then heard another ac's pilot declaring 'on final'. After other radio transmissions, the Tower stated that they did not know which ac was ahead for landing so he called stating that as far as he was concerned he was No 1 to land as he was about 200m from the threshold at 200ft QFE: he could not see any other ac, either above or below. He heard the Tower call the ac behind him and suggest a go-around. Tower passed this suggestion to go-around 3 times before the other pilot acknowledged and confirmed that he was going around. As he touched down he saw the other ac fly over the top of him at 50ft so he continued his roll down the RW allowing the other ac more space before he took off. After taking off he moved to the starboard side keeping the other ac in sight. He assessed the risk as very high.

THE BEAGLE PUP PILOT reports being unaware of this Airprox, only being informed after he had landed. Nothing was seen or heard whilst airborne. He was instructed to go-around by ATC but was never advised that an incident had occurred or the reason for the go-around. He was flying a dual training sortie of 'touch and goes' and 'go-arounds' and was in communication with Kemble on 118·9MHz. His transponder was switched off. The visibility was >10km in VMC and the ac was coloured silver/blue/white and the anti-collision, nav and landing lights were all switched on. He had completed his first sortie at 1205. During the early stages of this first sortie prior to take-off, he reduced volume on the radio for a short moment whilst at the B1 hold to speak to his student and reset the volume at a clear and audible level but it was not overly loud. The volume was adequate and remained set until all training was completed at 1300. After carrying out a debrief he recommenced with a second cct session at 1220. They flew a series of ccts and the incident appears to have occurred on the penultimate cct. On this cct they flew the downwind leg a little wide but parallel to the RW at 1000ft QFE but had not seen any other ac during the take-off, climbout and commencement of downwind. Normal calls and drills were carried out correctly. The Eastern end of the downwind track passed approximately midway between Kemble Wick and Oaksey village and the base leg turn commenced slightly before the railway line, describing a curve close to Poole Keynes and turning back onto a splay NNW'ly towards the RW26 C/L to miss Kemble village. Their height remained at 1000ft agl until base leg splay commenced at which point the descent began at 80kt. At no time was any ac seen by himself or his student but he recalled that there was RT traffic at the time, as there had been in some considerable volume throughout the flight. He did not notice any RT calls specifically for them and their descent continued normally with their 'final' call being made when on final approach. All appeared normal: the student was flying well with the ac correctly set up; full flap was selected and the speed was close to the 70kt required when they were on the RW

approach axis. He believed that by now they were about 500ft agl on a steady approach angle heading 260°. After this was established he heard a call from ATC requesting them to 'go-around'. He was unsure why this was, as he could see no reason ahead or elsewhere which could be the cause for this instruction. Nevertheless he told his student to go-around immediately and this was handled very well by levelling-off with full power and then, with adequate airspeed, climbing back to cct height. He raised the flaps to 10° and believed this go-around was commenced just before the aerodrome perimeter, estimating their height was in excess of 200ft. They landed after the next cct and were subsequently informed, after parking, of the incident. He was dumbfounded as to how this had occurred for had he had any appreciation that an Airprox situation was developing he would have taken immediate action to prevent confliction. Not withstanding that they may have missed an ATC call, as they had flown at the correct heights and made slightly generous but well disciplined ccts he could not understand how they were never aware of the other ac's close proximity. Also, he questioned why the other pilot did not see their ac because if the other ac had been to their side or ahead they would have seen it so he assumed that it must have been to their rear as the situation developed.

THE KEMBLE AFISO reports the incident occurred during a very busy period with RW26 in use with constant RT on 118·9MHz. At approximately 1245 there were 5 ac in the LH cct including the 2 subject ac as well as 3 ac moving on the aerodrome. Although previously positioned No 2 to the subject PA28 in the cct, a Bulldog pilot reported final, after flying a tight cct and therefore becoming No 1, and was given '...land at your discretion' with the surface wind and a landing was accomplished. Another student pilot was carrying out an orbit for separation at the end of the downwind leg on a fairly wide cct and another ac was downwind. The subject PA28 student pilot reported 'on finals', now positioned No 2 to the Bulldog, and was told 'RW occupied' and the student reported 'Student ac c/s has him in sight'. The Bulldog landed and its pilot was told to '...vacate first right R (via B1) to Woodside'' which was acknowledged. The Pup pilot then reported 'final' which meant that there were still 2 ac on final approach about 1nm from touchdown, the PA28 and Pup. The 2 ac appeared to be one on top of the other and he was unable to distinguish which was which owing to the ac being of similar size, colours and a significant distance away. The pilot of an ac at the A1 hold [adjacent to RW26 end, before the displaced threshold] had a relatively good view of the situation and reported 'the two ac on final are one on top of the other'. He acknowledged this before the PA28 student pilot reported 'finals for first land'. The pilot of the ac at the hold then transmitted 'the Pup's on top' which he could now assimilate. As the PA28 was at the lower altitude he assigned priority to the PA28 in accordance with the Rules of the Air Regulations and transmitted 'Pup c/s believe you're above one, I suggest you go-around'. Three seconds elapsed with no reply from the Pup pilot so he repeated 'Pup c/s suggest go-around'. A further couple of seconds passed with no acknowledgement and the pilot of the ac at the hold reported 'getting awfully close'. At this point the 2 ac were critically close so he transmitted 'Pup c/s suggest go-around' and this third go-around call was acknowledged by the Pup pilot who went around seemingly flying directly O/H the PA28. Once the Pup appeared settled in the climb-out he transmitted 'Pup c/s I had to call you three times there, that was very close. You were probably no more than twenty feet above that landing traffic' to which there was no reply. The Pup flew into the LH cct and the PA28 completed a 'touch and go' and climbed back into the cct. He later discussed the incident with both operators and this will be discussed at the next Kemble Airside Safety meeting.

ATSI comments that the RW in use at Kemble was 26 LH cct with flights being provided with a Flight Information Service. CAP427 Flight Information Service and the FISO Licence describe the service: *'This is provided at an aerodrome to give information for the safe and efficient conduct of flights in the Aerodrome Traffic Zone. From the information received, pilots decide the appropriate course of action to be taken to ensure the safety of flight'*. The publication also states the responsibilities of a FISO at an aerodrome, including: *'Issuing information to aircraft flying in the Aerodrome Traffic Zone (ATZ) to assist pilots in preventing collisions'*. The same information is published in CAP410, Manual of Flight Information Services.

In the period leading up to the Airprox, there were 5 ac in the cct. The subject ac were carrying out ccts, the PA28 being flown by a student and the Pup by a student and instructor. The Airprox occurred on final approach to RW26.

Just after the PA28 pilot reported on final, on its approach prior to the Airprox, the Pup pilot reported late downwind. By the time the latter reported on final for a touch and go, the PA28 had completed its touch and go. The PA28 pilot, subsequently, reported downwind for another touch and go and was requested to report on final. The RT recordings reveal that, about 90sec later, there were part simultaneous transmissions, one of which is thought to have been from the pilot of the Pup (a downwind call?). A further 90sec later, the pilot of the PA28 reported on final approach. Because, at the time, there was another ac, a Bulldog, landing ahead, the pilot was informed the RW was occupied. Approximately 30sec later the Pup pilot reported on final, coinciding again with a part

simultaneous transmission. The FISO responded *"I've got two aircraft on final now"*. The pilot of a departing ac, waiting at Holding Point A1, transmitted *"er the two aircraft on final are one above the other"*. The FISO responded *"Affirm two aircraft on final and I don't know which is which"*. The following transmissions were then made, with all calls, apart from the Pup pilot's going around report, when only the last 2 letters were used, using the approved abbreviated c/ss:

PA28: *"Student (ac c/s) on finals for er first land"*.

A1 holding ac: *"The Pup's on the top"*.

FISO: *"Thanks for that er (Pup c/s) believe you're above one I suggest going around"*.

FISO: *"(Pup c/s) suggest go around"*.

A1 holding ac: *"Getting awfully close"*.

FISO: *"(Pup c/s) suggest go around".*

Pup: *"(Pup c/s) going around".*

FISO: *"(Pup c/s) I had to call you three times there that was very close you were probably no more than twenty feet above that landing traffic"*.

No reply was received from the Pup. The pilot of the waiting ac at the holding point was thanked for his help.

The following are extracts from CAP410 about FISO procedures:

'FISOs may not allocate a landing order, e.g. 'Report final number 3'. The pilot must be told that there are two aircraft ahead in the circuit and it is up to the pilot to position himself accordingly. Although there is a legal requirement for pilots to report entering and leaving the ATZ (Rule 45 of the Rules of the Air Regulations), this is not the case for other reports in the circuit. Any requests for position reports downwind, final etc., for the purposes of passing traffic information, only have the status of a request although it is expected that most pilots will comply. When a pilot reports on final approach the FISO should respond with either 'Land at your discretion….', if they are number one, or 'The runway is occupied with….'. FISOs are not to advise pilots to 'Continue' or invite them to land after traffic already on the runway'.

In accordance with FISO procedures, it was not possible for instructions to be issued to the Pup pilot. However, with the assistance of the information provided by the pilot of the ac on the ground at the holding point, the situation was resolved when the FISO suggested that the Pup should go around. It would appear that the Pup pilot had not sighted the PA28 on approach.

UKAB Note (1): The recorded radar does not capture this Airprox which occurs with the subject ac below recorded radar coverage on final approach. A 7000 squawk is seen at 1245:08, believed to be the PA28, 0·7nm W ofBB Kemble tracking 270° indicating unverified FL009 (510ft QFE 1000mb) climbing. The PA28 then executes a L turn onto the crosswind leg and levels at FL013 (910ft QFE) before turning downwind. When the PA28 is 1·6nm S abeam Kemble at 1247:00 a pop-up primary only return appears, possibly from the Pup, 1·25nm SW of Kemble. The PA28 commences a L turn onto base leg and when tracking N'ly at 1248:44 descending through FL013 (910ft QFE) a further single pop-up primary response is seen, possibly from the Pup, 0·5nm WSW of the PA28. As the PA28 continues its cct with a L turn onto final approach, 4 further primary returns are displayed between 1249:08 and 1249:32 to the E of Kemble Wick and S of Kemble village but showing random track positions. The PA28 is last seen at 1249:40 S abeam Kemble village on final approach descending through FL008 (410ft QFE) with a final pop-up radar return 0·3nm 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 aerodrome FISO involved and reports from the appropriate ATC authorities.

When several ac are flying within a visual cct pattern it is essential that good situational awareness be maintained at all times. A pilot's primary method of achieving this is through 'see and avoid' and the pilot's mental picture of the traffic pattern can be further enhanced by information gathered from RT exchanges between other ac's pilots and, in this case, the FISO. The Pup instructor had reported that the ac's radio volume had been set at an adequate level yet it was apparent that several RT calls from the FISO to the Pup flight went unanswered. This led Members to wonder whether the Pup pilot and/or instructor had heard other RT transmissions/exchanges on the frequency. On the cct prior to that of the incident, the Pup pilot had called late downwind after the PA28 student pilot had reported final so the PA28's relative position was available to the Pup flight as it followed the PA28 in an established cct pattern. The PA28 had then completed its touch and go before the next ac in the traffic sequence, the Pup, was on - and whose pilot reported - final. On the next cct the PA28 student had established his ac - and reported - downwind, a further reinforcement of the PA28's position to the Pup flight. Hereafter, it appears that the Pup flight turned downwind and then onto base leg without ensuring that the final approach path was clear of traffic as shortly after the PA28 student pilot reported on final, the Pup pilot also reported on final, apparently having caught up the PA28. For this to have happened, the PA28 student pilot must have flown a slightly larger cct than that flown by the Pup, ending up on final with the Pup converging from his L. From his written report, the Pup instructor reported that he was unaware of the PA28 during his climbout and commencement of the downwind which led Members to agree that the Pup flight had not maintained situational awareness of the cct traffic and had descended on top of the PA28 whilst on final, and this had caused the Airprox.

Members commended the actions taken by both the pilot of the ac at the hold and the FISO. Good judgement was shown by the FISO in deciding to pass TI and this information was well supplemented by the holding pilot. This had identified the Pup ac as being above the PA28 and whose pilots could not see each other's ac. However, it had taken 3 calls from the FISO, suggesting a go-around, to elicit a response from the Pup pilot by which time the subject ac were still flying very close to each other, still unsighted by their pilots. By all accounts it appeared that luck had also played a major part as the incident came to a climax on final approach. Eventually the Pup pilot executed a go-around and despite being told that he was about 20ft above another ac, the instructor had reported that he was unaware of his close proximity to the PA28 or why he had been told to go-around. These factors left the Board in no doubt that this had been a very serious incident and that during the final stages an actual risk of collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Pup pilot did not maintain situational awareness and descended on top of the PA28 whilst on final.

Degree of Risk: A.

AIRPROX REPORT NO 147/06

INVESTIGATED BY THE IRISH AVIATION AUTHORITY (IAA)

AIRPROX PANEL REPORT NO. 04/08

Date: 29th September 2006
Time: 19:52
Aircraft: KC135R / unidentified aircraft
Position: Northern Oceanic Transition Area (NOTA)
Reported by: Shannon ATC (Ref. MOR SA 227/2006)

DESCRIPTION OF OCCURRENCE

This incident was reported as a 'near miss' by the captain of the KC135R. This flight was en route from the UK to the USA, and flying as General Air Traffic in the Northern Oceanic Transition Area. Air traffic control (area radar service) was provided by Shannon Control (high level sector) using MSSR.

The event occurred in the vicinity of PIKIL (56N 015W). The KC135R reported that an aircraft had crossed the nose of his aircraft heading in a northbound direction, passing a quarter of a mile in front at the same level, which was FL340. The crew of the KC135R briefly acquired the aircraft visually and reported it as whitish in colour and subsequently suggested that it may have been a B1. It was also stated that wake turbulence from this aircraft was encountered. The aircraft had not generated a TCAS (Traffic Alert and Collision Avoidance System) traffic advisory or resolution advisory in the KC135R system which was functioning normally.

Shannon ATC had not received a flight plan or other information which would correspond with the flight of the unidentified aircraft and review of the Shannon radar tapes showed no record of the aircraft in the position reported or any other position within radar coverage. It is therefore concluded that the aircraft's transponder was either switched off or out of service. The required minimum radar separation in the NOTA is 10nm lateral or 1000ft vertical. Subsequent attempts by the chairman of the Panel to identify the intruder aircraft were unsuccessful.

ANALYSIS OF OCCURRENCE

The Panel considered the available information and documentation in its analysis of this event. This included the Shannon occurrence report: the report of the pilot of the reporting aircraft and information provided by military authorities and states' representatives, and a report of an investigation conducted by a foreign military authority. The panel having established that the radar recordings held no information which could assist its analysis, did not view a recording or the Shannon radar tape.

The absence or radar data and the inability to obtain information on or from the second aircraft limited the Panel's ability to conduct its analysis to the desired level of detail.

The Panel was satisfied from information obtained that the unidentified aircraft was not a B1 but was more likely a military aircraft on manoeuvres in high seas airspace.

CLASSIFICATION OF OCCURRENCE

Cause: There was insufficient information available to the Panel to enable the identification of causal factors.

Degree of Risk: D.