



UK AIRPROX BOARD

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Analysis of Airprox in UK Airspace

**Report Number 13
July 2004 - December 2004**

Thirteenth Report by the UK Airprox Board:

‘Analysis of Airprox in UK Airspace’

(July 2004 to December 2004)

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 thirteenth Report from the UK Airprox Board, is to promote air safety awareness and understanding of Airprox. "Book 13" covers the second half of 2004 in detail, containing findings on the 98 Airprox which were reported as occurring within UK airspace in that period and which were fully investigated. In addition, this book contains a range of graphs and tables highlighting many of the key statistics from UK Airprox throughout the whole of 2004.

The count of 98 incidents during the last six months of 2004 is nine less than the average of comparable figures in each of the previous five years. The proportion of Risk Category A events is down by over a third on the previous-five-year average whilst the proportion of 'risk bearing' incidents is down by one sixth. These two statistics apply substantially to 2004 as a whole.

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). The one Risk Category 'A' Airprox involving a CAT aircraft in the latter part of 2004, although serious, needs to be kept in proportion. Analysis of CAT data covering the two periods 1995-1999 and 2000-2004 shows that:

- The number of 'risk bearing' Airprox, those assessed as Risk A or B, in which one or both aircraft were CAT has more than halved; and
- The 'risk bearing rate' of Airprox in which one or both aircraft were CAT has dropped by 60%.

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 allows others to learn valuable lessons by reading about the unhappy situations in which people have found themselves. As my first year 'in office' comes to a close, I would like publicly to thank all who are involved in the UK's Airprox system. Tribute is particularly paid to those who report their experiences honestly and openly. My sincere thanks too to those who work so hard 'behind the scenes' to investigate the different aspects of Airprox incidents; to those who present the investigations fairly and accurately and in an unbiased way to the Airprox Board and to those who prepare for and attend the 11 – intensive - Board meetings every year.

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

Peter Hunt

Director, UKAB

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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 gliders; and
- Military flying, both fixed and rotary wing, by the RN, Army and the RAF.

UKAB's ROLE

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

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

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.

On pages 6 to 15, 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.

To begin this review, Figure 1 overleaf shows the distribution of Airprox that were reported in 2004 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:

In previous Reports, certain Tables included figures for 'Unknown' aircraft. In this Report, numbers of 'Unknown' aircraft are added to 'Untraced' aircraft and weather balloons to produce a new category, 'Other'. All figures in the relevant Tables have been adjusted accordingly, including those for prior years.

In 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 based on aircraft with less than 5,700Kg maximum take-off weight authorised. Gliders and microlights are included; gyroplanes, balloons and airships are excluded.*
- (3) *Military flying hours are supplied by the Ministry of Defence and by US Air Forces Europe.*

AIRPROX RESULTS FOR 2004

Monthly Distribution - 2004

Figure 1 shows the distribution of Airprox during 2004. After above average numbers in March-May, the number of events was – excluding November – on or below the five-year average. The annual total was 207 compared with the preceding-five-year average of 201.

During the year, 28 reports were initially made but then subsequently withdrawn (by the reporter) after reflection and in the light of fuller information.

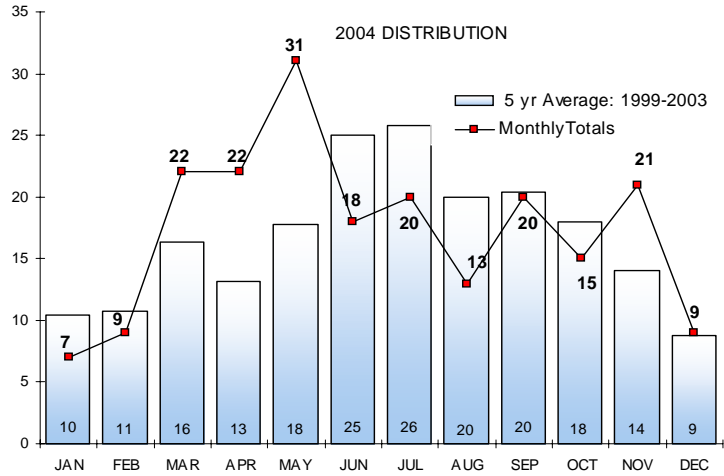


Figure 1: Monthly distribution during 2004

Trends by User Groups

User Group Mix since 1995

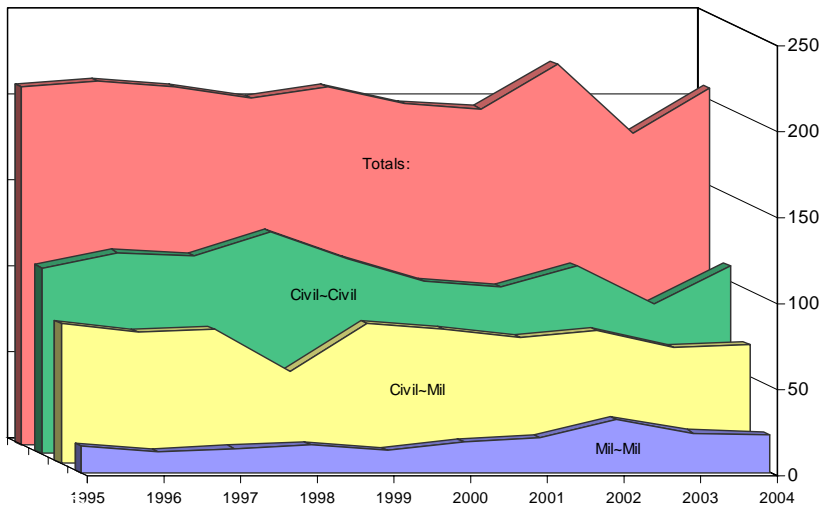


Figure 2: Airprox totals by user groups

Airprox totals by user group over the last ten years are shown in Figure 2, the underlying data being in Table 1 below.

The fluctuations in total number of Airprox in recent years substantially mirror those in 'Civil-Civil' encounters, both continuing on a downward trend.

Encounters involving military aircraft are virtually unchanged, 2003-2004, be they Civil-Mil or Mil-Mil. The rise in the total number of Airprox, 2003-2004, is thus due to a rise in Civil-Civil events, analysis of which is overleaf in Figure 3.

Table 1: Airprox totals by user groups

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Civil-Civil	108	117	115	129	113	100	97	109	87	109
Civil-Mil	81	76	78	53	81	78	73	77	67	69
Mil-Mil	15	12	14	16	13	18	20	31	23	22
Unknown	4	6	1	3	1	2	5	4	4	7
Totals:	208	211	208	201	208	198	195	221	181	207

Analysis of the Civil~Civil figures for years 1997-2004 (Figure 3) shows that two of the three main components are on long-term, downward trends. Numbers of Airprox involving at least one CAT aircraft are falling whilst those involving solely GA aircraft are continuing up the 2000-2003 trend line. The trends for all combinations of user groups are shown later in this Report (page 15). Later sections also take the basic numbers of Airprox and compute rates from aircraft utilisation data.

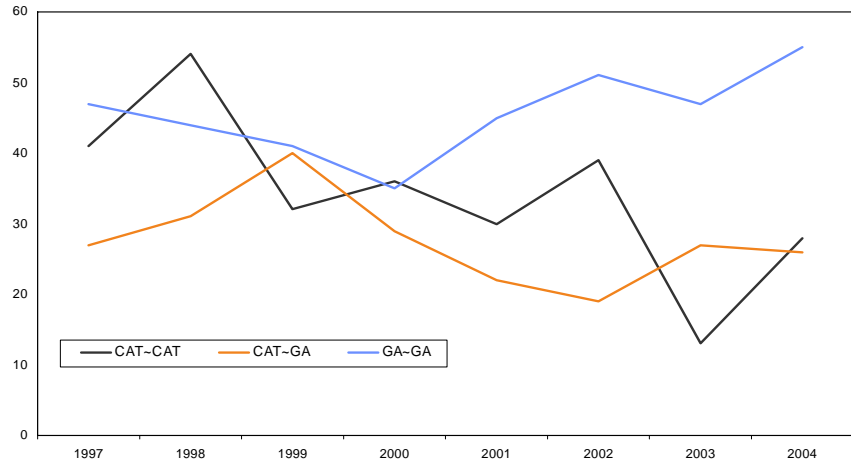


Figure 3: Analysis of Civil~Civil figures

'Who met with whom' during 2004

The grid at Figure 4 shows which groups conflicted and how often. The yellow column shows the pilot group (or their air traffic controllers) that filed Airprox while those in the green row represent the other party. Positioning in either grouping does not imply being 'right' or 'wrong' – it is just how they met. For example, 'GA Helicopter' pilots met 'GA Private or Club' pilots on five occasions, the latter group meeting each other 20 times. The largest change on results from 2003 was experienced by pilots of scheduled passenger airliners who filed on 10 more occasions. Whilst this is an increase over the preceding year, the 2004 total of 64 is 12 less than the 2002 figure, illustrating the variability of such data.

Figure 4: A breakdown of Airprox participants in 2004

All Airprox 2004	CAT Cargo	CAT Helicopter	CAT Psgr (sched)	CAT Psgr (non-sched)	CAT Trng / posning	GA (Hire & Reward)	GA Company Ac	GA Glider	GA Helicopter	GA Private or Club	GA Training	Military Fixed Wing	Model aircraft	Military Glider	Other	Totals	Change on 2003
CAT Cargo											1					1	0
CAT Helicopter						1										1	0
CAT Passenger (sched)	2		23	1		3	3	2		8	2	16			4	64	10
CAT Passenger (non-sched)			1								1					2	1
CAT Training/positioning			1													1	1
GA (Hire & Reward)						2				2	1	7				12	4
GA Company Ac			1							1	1	2				5	2
GA Glider						1				7		1				9	2
GA Helicopter			1						1	5		3	1		1	12	-3
GA Private or Club			2				1	1	1	20	2	9			1	37	6
GA Training									1	3	2	3			2	11	-3
Military Fixed Wing		1	4					1		6	2	19	1		3	37	0
Military Glider									2	2						4	1
Military helicopter			1				1	1		4	1	3				11	5
Totals	2	1	34	1	0	7	5	5	5	58	13	63	2	0	11	207	26

Airspace in which conflicts took place

Figure 5 shows the airspace types in which the various encounters took place. As in the past, most Airprox in 2004 occurred in Class G airspace: 71%, to be precise.

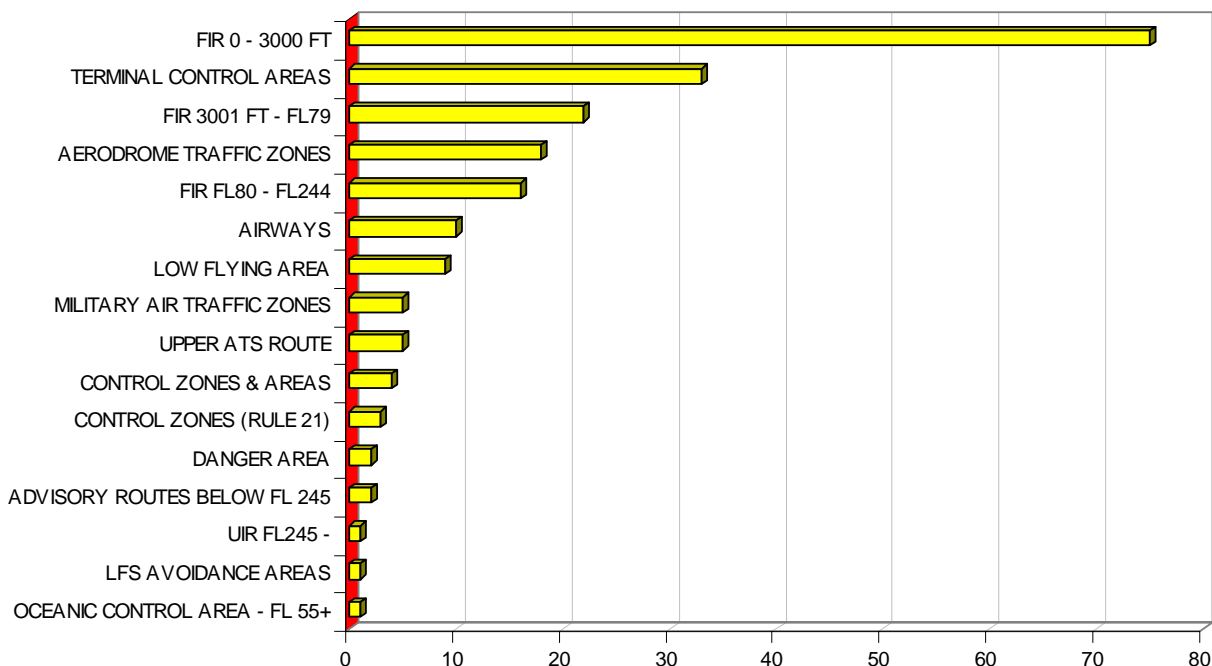


Figure 5: types of airspace - all Airprox in 2004

FIR 0 - 3000 feet: numbers of Airprox vs altitude

Those Airprox which occurred in the top band in Figure 5, "FIR 0 - 3000 FT", were reviewed from a number of angles. Perhaps of most interest is the graph of 'numbers of Airprox by altitude (measured in feet)'. Figure 6 below gives the result.

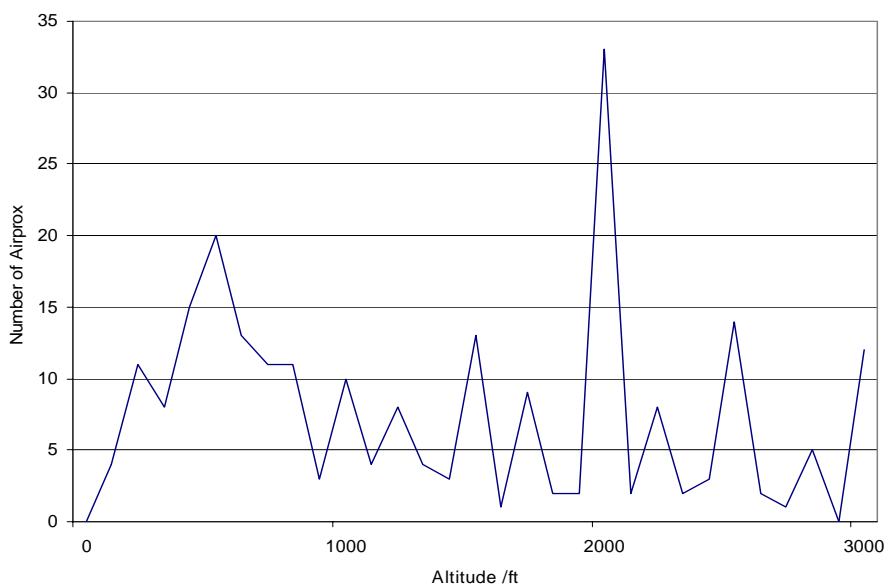


Figure 6: 'FIR 0 - 3000 feet' - Numbers of Airprox vs altitude

COMMERCIAL AIR TRANSPORT (CAT) SECTION

CAT Risk Results

The plot in Figure 7 below - and the associated data in Table 2, also below - show the trends in Risk ratings for Airprox involving at least one CAT aircraft over the decade 1995-2004 inclusive. Also shown is data relating to CAT 'hours flown' in UK airspace from which it is evident that the rising trend in the first part of the decade is now re-established.

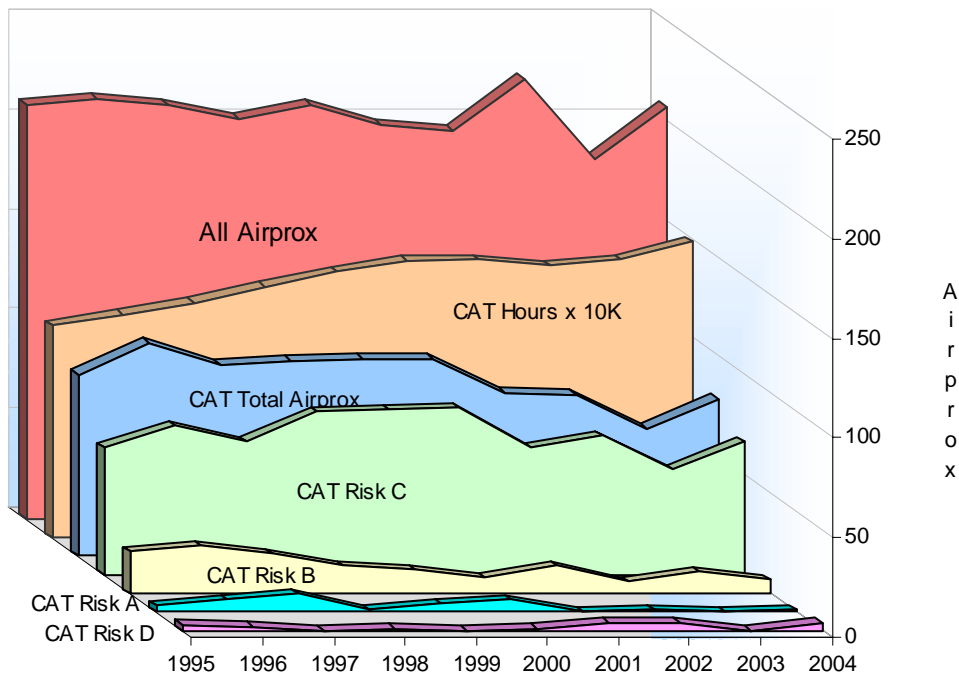


Figure 7: CAT Risk distribution 1995 - 2004

As regards conclusions from the data, the overall story is one of continuous improvement. CAT Airprox now account for less than four in ten of All Airprox whilst the proportion of CAT Risk Bearing events has fallen by two-thirds from earlier levels. Whilst 2004 data bears a remarkable similarity to that for 2002, these results make no allowance for changes in flying hours, to which we turn overleaf.

Table 2: CAT Risk data 1995 - 2004

CAT Data	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
CAT Risk A	3	6	9	1	4	6	0	1	0	1
CAT Risk B	21	24	20	14	12	8	14	6	11	7
CAT Risk C	64	75	67	82	83	84	64	70	53	67
CAT Risk D	3	2	0	1	0	1	4	4	0	4
CAT Total Airprox	91	107	96	98	99	99	82	81	64	79
Hours x 10K	106.1	111.8	117.9	125.9	133.2	138.9	139.5	136.6	139.7	148.5
All Airprox	208	211	208	201	208	198	195	221	181	207

CAT Airprox Rates

Table 3 shows rate information: taking the 'raw numbers' on the previous page and dividing them by flying hours to obtain rates. This information is plotted in Figure 8 with (logarithmic) trend lines added. Whilst a general increase in the number of Airprox reports can be for no other reason than increased awareness amongst pilots and controllers, this is not likely to be the case in risk bearing events. The continuing downward trend in the CAT Rate (A+B) is thus to be welcomed.

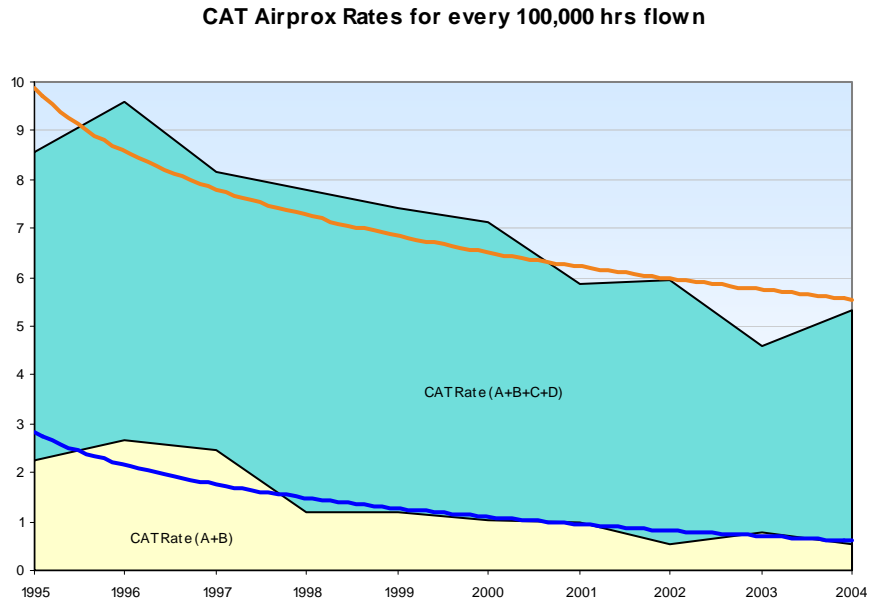


Figure 8: CAT Risk rates 1995 - 2004

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

CAT Rates	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
CAT Rate (A+B)	2.26	2.68	2.46	1.19	1.20	1.01	1.00	0.51	0.79	0.54
CAT Rate (A+B+C+D)	8.58	9.57	8.14	7.78	7.43	7.13	5.88	5.93	4.58	5.32
Hours x K	1,061	1,118	1,179	1,259	1,332	1,389	1,395	1,366	1,397	1,485

CAT Causal Factors

Table 4 below lists the predominant reasons behind the 79 Airprox involving at least one CAT aircraft. One Airprox can have more than one causal factor: 139 causal factors were allocated in toto. All but one of the Airprox with 'Did not separate/poor judgement' as a causal factor were assessed by the Board as Risk category C, the exception being the 'B' mentioned in Book 12. It is particularly noteworthy that whereas in 2003 top place was taken by pilots with "Penetration of CAS/SRZ/ATZ without clearance", this is now number 10 on the list.

Table 4: Most common causal factors for CAT aircraft involvement in Airprox during 2004

Ser.	Cause	Totals	Attributed to
1	DID NOT SEPARATE/POOR JUDGEMENT	40	CONTROLLER
2	CONFUSION OR POOR COORDINATION INCLUDING AT HANDOVER	9	CONTROLLER
3	DID NOT SEE CONFLICTING TRAFFIC	7	PILOT
4	LATE SIGHTING OF CONFLICTING TRAFFIC	6	PILOT
5	COLLAPSED-SECTOR WORKING(BANDBOXING)/HIGH WORKLOAD	5	CONTROLLER
6	DISTRACTION	5	CONTROLLER
7	DID NOT ADHERE TO PRESC'D PROCED'S/OPERAT INSTR'S	5	CONTROLLER
8	SIGHTING REPORT	5	OTHER
9	PENETRATION OF CAS/SRZ/ATZ WITHOUT CLEARANCE	5	PILOT
10	UNDETECTED READBACK ERROR	4	CONTROLLER
11	DID NOT ADHERE TO PRESCRIBED PROCEDURES	3	PILOT

GENERAL AVIATION (GA) SECTION

GA Risk Results

More often than not flying outside controlled airspace; in aircraft from the size of microlights through to sophisticated aeroplanes and helicopters; piloted by those 'just out of flight school' through to the very experienced professional pilots, this range of activities and experience levels makes it unsurprising that the largest proportion of Airprox in UK airspace involve GA pilots. As Figure 9 illustrates, whilst the 'All Airprox' trend is essentially downwards, the 'GA Totals' trendline is flat with about 60% of all Airprox having a GA involvement.

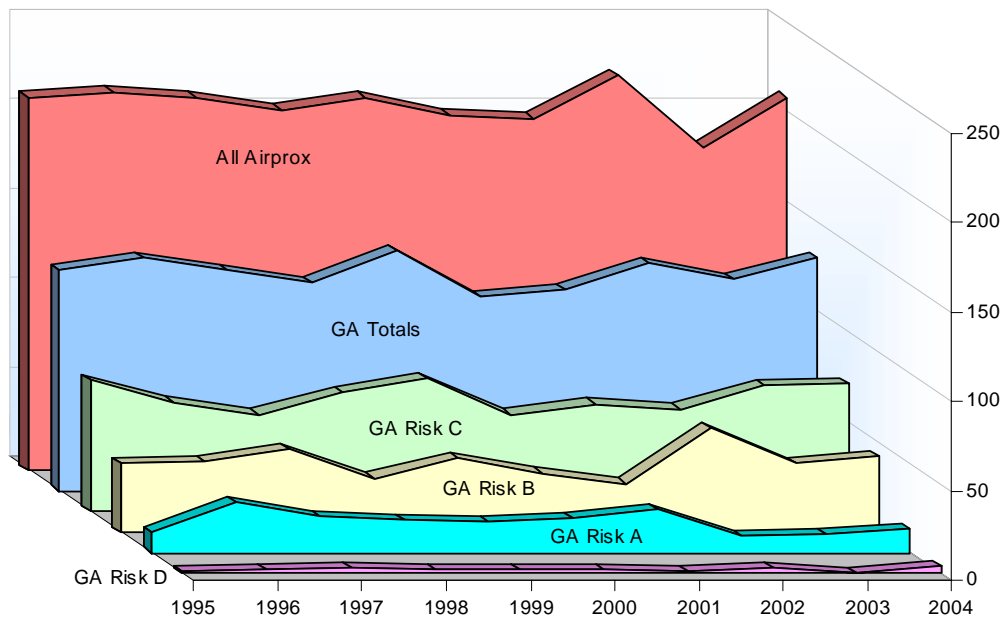


Figure 9: GA Risk distribution 1995 - 2004

Figure 9 is based on the data in Table 5 below. A few calculations on the numbers therein show that 'GA Risk A' Airprox as a proportion of the 'GA Totals' figure averages 14% over the decade, the three most recent years being below average (at 7, 8 and 10% respectively). On average 46% of Airprox involving GA pilots are risk-bearing: virtually one in two. That this figure remains substantially constant is possibly explained by the point often made by the Board's GA Member: whereas professional pilots tend to stay in aviation, the GA community is constantly welcoming new members whilst others move to different interests. For this reason, the same safety messages are repeated regularly in the UKAB 'GA Books':

Table 5: GA Risk data 1995 - 2004

GA Data	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
GA Risk A	11	28	20	18	17	19	24	9	10	13
GA Risk B	38	39	46	30	41	33	27	58	38	42
GA Risk C	73	61	54	66	74	54	60	57	70	71
GA Risk D	1	2	3	2	2	2	1	3	0	4
GA Totals	123	130	123	116	134	108	112	127	118	130
All Airprox	208	211	208	201	208	198	195	221	181	207

GA Airprox Rates

The chart at Figure 10 and Table 6 on this page give more information regarding GA Airprox, this time from the perspective of rates rather than absolute numbers. The best available estimate of hours flown in 2004 by the UK GA fleet is 1,347,000 hours, some 50,000 hours up on the previous year. Using this and the numbers of Airprox (Table 5), rates are calculated for Risk Bearing (i.e. Risk A plus Risk B) and for all GA Airprox. These rates are in Table 6 from which Figure 10 is plotted. Trend lines have been added from which it can be seen that the 10-year trend in rate per 100k hours flown is sloping gently downwards for the two groups of events. Also note, as was observed on the previous page, that the risk bearing rate is roughly half of that for all GA Airprox.

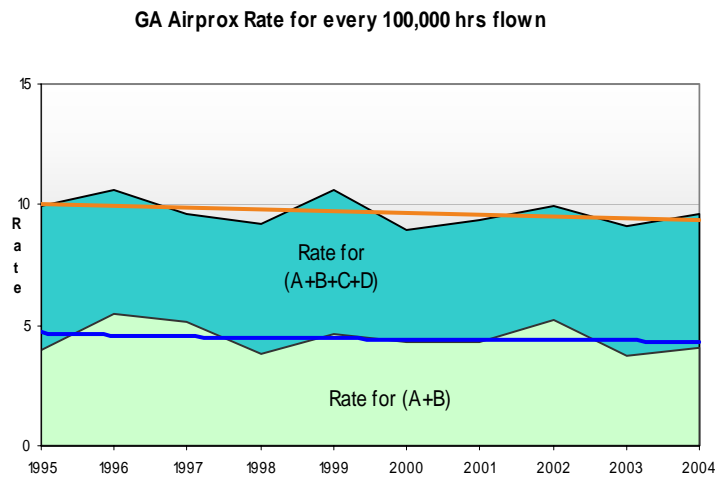


Figure 10: GA Risk rates 1995 - 2004

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

GA Rates	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Rate for (A+B)	3.96	5.45	5.17	3.82	4.60	4.30	4.28	5.24	3.70	4.08
Rate for (A+B+C+D)	9.94	10.57	9.64	9.23	10.64	8.93	9.40	9.93	9.10	9.65
Hours flown in K	1,238	1,229	1,276	1,257	1,260	1,210	1,191	1,279	1,296	1,347

GA Causal Factors

Table 7 below gives the most common causal factors assigned to Airprox involving GA pilots. By far the largest numbers involve sighting issues as would be expected when so much GA flying is in the 'see and avoid' environment of Class G airspace. Late sighting or non-sighting of the other aircraft was assigned 72 times in 2004, compared with the next Cause on the list which was assigned 15 times. This serves to emphasise the importance of good lookout. Further down the list, it can be seen that flying close to or over a glider or paradrop site was given as a causal factor in seven Airprox. Six of these occurred at weekends and one was sufficiently serious to warrant a risk rating of A, there was a risk of collision.

Table 7: Most common causal factors for GA aircraft involvement in Airprox during 2004

Ser.	Cause	Totals:
1	LATE SIGHTING OF CONFLICTING TRAFFIC	36
2	DID NOT SEE CONFLICTING TRAFFIC	36
3	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	15
4	DID NOT TO SEPARATE/POOR JUDGEMENT	14
5	PENETRATION OF CAS/SRZ/ATZ WITHOUT CLEARANCE	10
6	FLYING CLOSE TO/OVER GLIDER OR PARADROP SITE	7
7	NOT OBEYING ORDERS/ FOLLOWING ADVICE/ FROM ATC	7
8	CLIMBED/DESCENDED THROUGH ASSIGNED LEVEL	6

MILITARY (MIL) SECTION

Military Risk Results

The immediate conclusion from Figure 11 below (and Table 8, on which the Figure is based) is that whilst the total number of Airprox in 2004 involving Military pilots has remained substantially constant, the number of risk bearing Airprox has dropped significantly. The military Risk A number peaked at 27 in 2001, fell to 14 in 2002, to 8 in 2003 and now, in 2004, has dropped still further to 5. The number of military Risk B events rose to a high of 35 in 2003 but this has now reversed, recording 26 such events in 2004. Thus, military risk bearing Airprox numbers are down from 43 to 31 - by more than 25%.

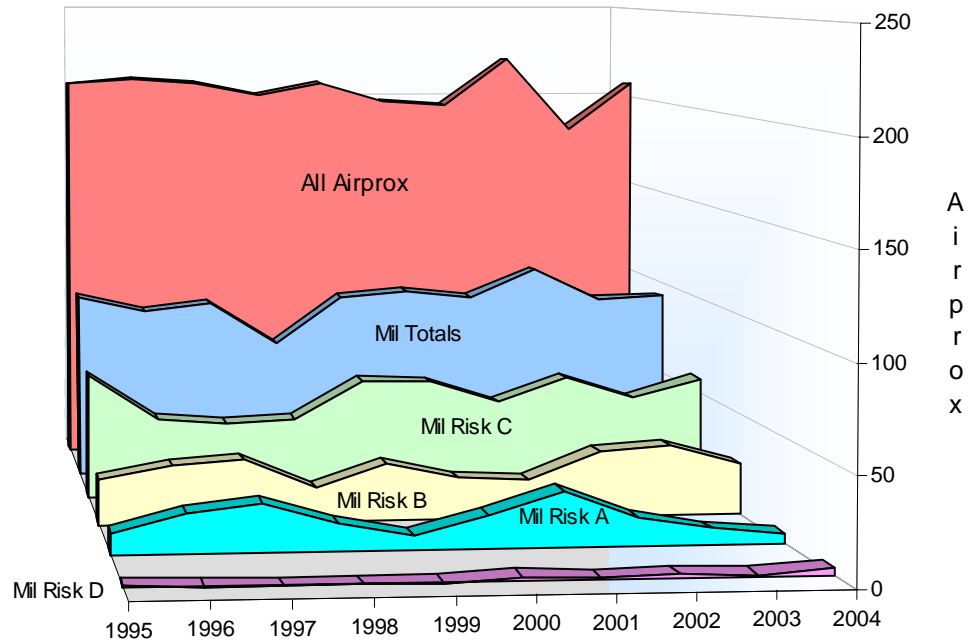


Figure 11: Military Risk distribution 1995 - 2004

A look at the main causal factors assigned to the set of risk bearing Airprox in 2004 shows that sighting issues predominate: late sighting or non-sighting of the other aircraft is assigned to 50% of the risk bearing military Airprox. Whilst this is an improvement on figures around the late 1990's - when two-thirds was more the order of the day - the statistics illustrate just how much of a challenge it is for a military pilot to complete the task whilst continuing to 'see and avoid'. It is understood that considerable efforts are being made to find a technological solution in the same way as ACAS/TCAS has benefitted primarily the civil world.

Table 8: Military Risk data 1995 - 2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Mil Risk A	10	19	23	13	7	16	27	14	8	5
Mil Risk B	22	29	31	17	28	21	19	33	35	26
Mil Risk C	63	40	38	39	59	58	47	59	48	58
Mil Risk D	1	0	0	0	0	2	1	2	1	4
Mil Totals	96	88	92	69	94	97	94	108	92	93
All Airprox	208	211	208	201	208	198	195	221	181	207

MIL Airprox Rates

The improvements described on the preceding page would perhaps be explained if flying hours had dropped by a similar percentage to the fall in risk bearing Airprox numbers: rates would then have stayed the same. Hours flown have indeed dropped, but by approximately 7%, so the overall improvement is thus real. Using hours flown data, Table 9 gives the rates calculated both for risk bearing and all Airprox involving military pilots. The calculated rates are then plotted in Figure 12, (logarithmic) trend lines being added. The trend for Risk (A+B) has yet to turn down to reflect the underlying reduction since 2002: it is to be hoped that this will happen as ever more effort is made by our military colleagues to make changes which improve safety in the Airprox arena.

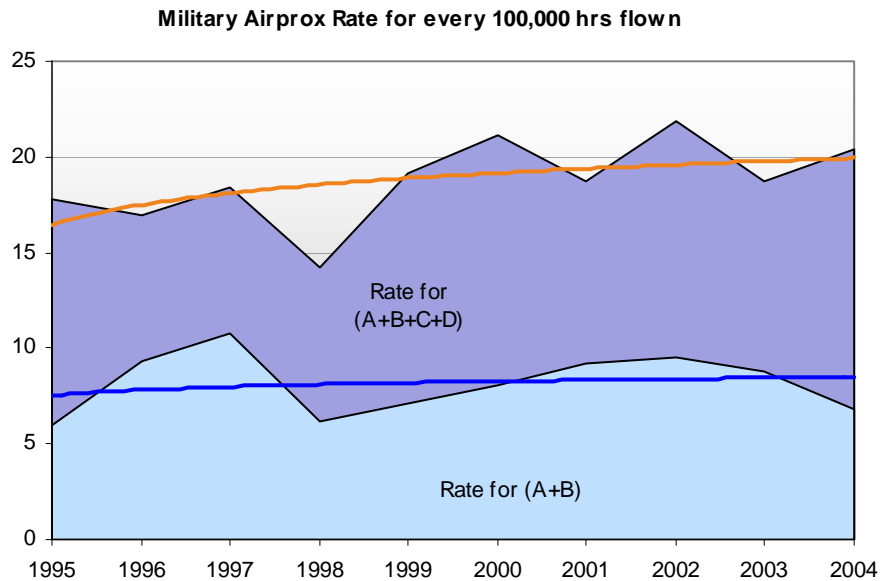


Figure 12: MIL Risk rates 1995 - 2004

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

Military Rates	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Rate for (A+B)	5.94	9.27	10.78	6.17	7.13	8.08	9.16	9.50	8.74	6.80
Rate for (A+B+C+D)	17.81	16.99	18.36	14.20	19.14	21.18	18.73	21.83	18.69	20.41
Hours flown in K	539	518	501	486	491	458	502	495	492	456

MIL Causal Factors

Table 10 lists the predominant causal factors assigned to Airprox having a military involvement. As mentioned previously, sighting issues remain at the top of the list.

Table 10: Most common causal factors for MIL aircraft involvement in Airprox during 2004

Ser.	Cause	Totals:
1	DID NOT SEE CONFLICTING TRAFFIC	23
2	LATE SIGHTING OF CONFLICTING TRAFFIC	17
3	DID NOT SEPARATE/POOR JUDGEMENT	13
4	DID NOT ADHERE TO PRESCRIBED PROCEDURES	7
5	LACK OF CO-ORDINATION BETWEEN CONTROLLERS	7
6	DID NOT PASS OR LATE PASSING OF TRAFFIC INFO	5
7	CONFUSION OR POOR COORDINATION INCLUDING AT HANDOVER	4
8	PENETRATION OF CAS/SRZ/ATZ WITHOUT CLEARANCE	3
9	INADEQUATE AVOIDING ACTION / FLEW TOO CLOSE	3
10	CLIMBED/DESCENDED THROUGH ASSIGNED LEVEL	3

Airprox Trends

Airprox trends by Flight Classification

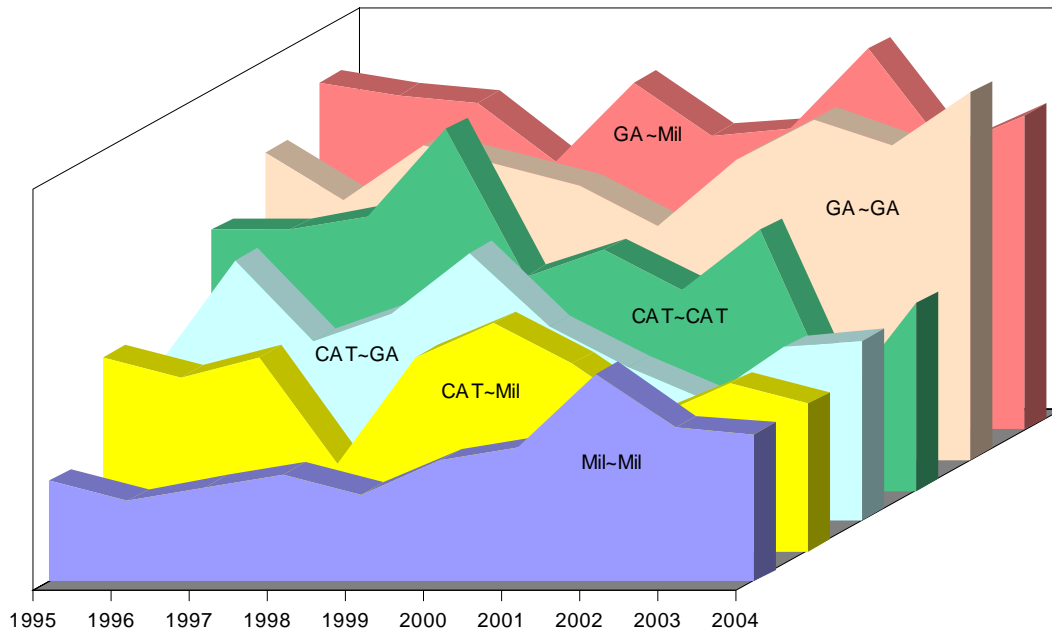


Figure 13: Airprox trends by Flight Classification

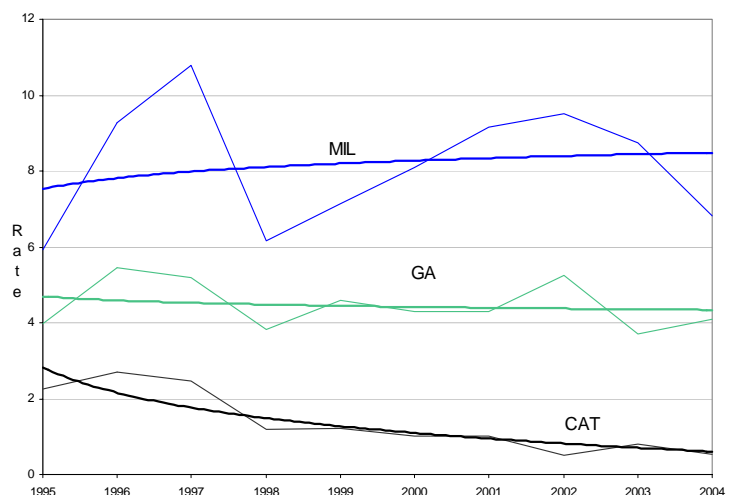
In seven of the ten years from 1995 to 2004, encounters between GA and Military aircraft were the most prolific: in a different seven years, Military ~ Military produced the lowest numbers. Given the relative numbers of aircraft 'in the system', this is probably not surprising. Because all of the numbers are relatively small, it is unrealistic to expect to be able to draw statistically sound conclusions from the data. Where the table and figure score, however, is in the ease with which overall trends can be assessed. In this regard, data in the years from 2000 show that GA~GA encounters are on a steadily rising trend; the GA~MIL and MIL~MIL trends are now substantially flat whilst the three trends involving CAT aircraft are downwards, CAT~CAT and CAT~MIL especially so.

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

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
GA~Mil	52	50	49	40	52	44	45	57	42	47
GA~GA	46	39	47	44	41	35	45	51	47	55
CAT~CAT	39	39	41	54	32	36	30	39	13	28
CAT~GA	23	39	27	31	40	29	23	18	26	27
CAT~Mil	29	26	29	13	29	34	28	20	25	22
Mil~Mil	15	12	14	16	13	18	20	31	23	22

One final figure to conclude this part of the Report: Figure 14 shows on one plot the 'risk bearing' rates per 100,000hours flown for each of the three main user groups. Trend lines have been included.

Figure 14: Trends in Risk bearing rates 1995 - 2004



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 Report Number 12. Also listed are Safety Recommendations made more recently together with Responses where available. Updates will continue to be published until action is complete, indicated by 'CLOSED' in the 'STATUS' sections below.

Airprox 047/02: 22 Apr 02 involving a DHC8 and a SHAR Risk C

RECOMMENDATIONS: The MOD considers a review of the rules for Visual identification by military air defence ac in UK airspace.

ACTION: The MOD accepts this Recommendation. HQ 1Gp issued written guidance on 15 May 03 to all Air Defence aircraft crews on Targets of Opportunity (TOO) that states 'if the target cannot be identified by 5nms, crews are to ensure that a minimum of 3000ft vertical separation is maintained. Wherever possible, crews conducting TOO intercepts are to be in receipt of a radar service and are to avoid traffic that is not in Class G airspace'.

The above guidance was issued in advance of a planned re-write of Training Instruction 4 of 1984 (TI4/84), an updated version of which was released on 28 February 2005. The relevant parts of TI4/84 pertaining to TOO are firstly that only military fast-jet (FJ) aircraft, excepting Hawk, flying day VMC in Class G airspace may act as, and be intercepted as, TOO. Secondly, TOO is not to be conducted in Advisory Air Routes and thirdly if the TOO target cannot be positively identified as a military FJ aircraft by 3nm it should be presumed that it is a civil ac. In this event crews are to break off the interception and ensure that a minimum of 1000 ft vertical and 2nm horizontal separation is maintained.

STATUS - ACCEPTED – CLOSED

Airprox 156/03: 29 Aug 03 involving an A320 and a SHAR Risk B

RECOMMENDATION: That the CAA and the MOD reviews jointly the safety issues associated with ac that climb or descend in controlled airspace at such high rates that their Mode C indication cannot be interpreted by TCAS or ground based ATC equipment, thereby inhibiting any warning to pilots and/or controllers.

ACTION: The CAA and the MOD accept this Recommendation. A review team, comprising members from DAP and SRG, has examined the relevant issues concerning this incident and initiated a study into the effect of high rates of climb/descent on surveillance infrastructure and safety nets, such as TCAS and STCA. This work, conducted in cooperation with the MOD, will aim to quantify the problem and allow policy guidance to be issued to adequately manage the issue. This work is expected to be completed by Summer 2005.

STATUS – ACCEPTED - OPEN

Airprox 004/04: 21 Jan 04 involving a PA31 and a PA28 Risk C

RECOMMENDATION: That the MOD, MOD (DPA), and CAA should jointly review the applicable Boscombe Down, Thrupton and Middle Wallop aerodrome/approach procedures to ensure that these conform to the requirements of Rule 39 of the Rules of the Air so as to ensure the safe integration of air traffic at these closely located aerodromes.

ACTION: The CAA accepts this Recommendation. The joint review involving CAA (SRG, DAP), MOD and MOD (DPA), of the Boscombe Down, Thrupton and Middle Wallop ADC/APC procedures with respect to compliance with Rule 39 of the Rules of the Air is now complete. The CAA will issue a general exemption from Rule 39 for civil registered aircraft inbound/outbound to Boscombe Down and Thrupton airfields. This will permit pilots to remain on the appropriate Boscombe Down frequency whilst in the Thrupton ATZ and for civil aircraft departing Thrupton to adhere to the LOA, contacting Boscombe when airborne. This will enable Boscombe controllers to be aware of conflicting Thrupton traffic and pass pertinent traffic information as and when necessary.

A condition to the Thrupton Civil Aerodrome Licence will be added requiring the licence holder to take all reasonable steps to ensure that departing aircraft observe the provisions of the LOA. The text in the UK AIP,

Pooley's guide, Military AIP and other relevant documents should be amplified to reflect the importance of the contents of the LOA and the history of the effects of non-compliance.

A revised LOA is being finalised by Boscombe and Thrupton to give effect to the substantive changes. This Response remains 'open' pending completion of the LOA.

STATUS – ACCEPTED - OPEN

Airprox 018/04: 4 Mar 04 involving a Gulfstream 41 and an F16 Risk C

RECOMMENDATION: The MOD should review the safety arrangements in respect of major air exercises with a view to establishing an Air Safety Cell for each such exercise in order to minimise the risk of participating aircraft infringing Controlled Airspace.

ACTION: The MOD accepts this Recommendation. The MOD has established the need to conduct a Safety Review on the potential requirement for air safety cells for major exercises. Initial work has identified that there were nine AIRPROX and 18 Mandatory Occurrence Reports submitted during the period 2000-2004 that appear to have involved exercise aircraft. However, three incidents were reported under both schemes which means that there were twenty-four incidents reported within a five-year period.

STATUS – ACCEPTED - OPEN

Airprox 059/04: 28 Apr 04 involving an Embraer 145 and a Tornado F3 Risk B

RECOMMENDATION: The MOD and CAA should jointly the terminology used by Air Defence and Air Traffic controllers when effecting co-ordination with other military and/or civilian ATSUs, the aim being usage of a standardised form of phraseology which minimises the potential for any misunderstanding.

ACTION: The MOD accepts this Recommendation. As a result, an agreement has been reached that the CAA and MOD will form a Working Group to jointly review the coordination process and terminology used by military Air Traffic or Air Defence controllers and civilian controllers when providing traffic information or effecting coordination with other military and/or civilian ATSUs. Where considered appropriate, terminology will then be amended accordingly.

STATUS – ACCEPTED - OPEN

Airprox 097/04: 25 May 04 involving an MD80 and a CRJ Risk C

RECOMMENDATION: The CAA revise the UK AIP clearly to promulgate the requirement for flight crews to report inter alia their cleared level and, if appropriate, passing level, on initial contact with a controller subsequent to an RT frequency change.

ACTION: The CAA accepts this Recommendation. The work to produce the necessary amendments to both the UK AIP and CAP 413 'Radiotelephony Manual' has been completed. Aeronautical Information Publication (AIP) Amendment AL8/05, effective date 04 August 2005, will promulgate a revision which introduces a new section on Initial Call and Level Reporting. Consequential changes to the CAP 413 will be issued at the next amendment to the CAP.

STATUS – ACCEPTED – OPEN

Airprox 124/04: 01 Jul 04 involving a Gulfstream 4 and a Falcon 20 Risk C

RECOMMENDATION: That the MOD review the use of the traffic information phraseology promulgated at JSP552 915 Serial 5, with a view to including a more comprehensive caution as to its use, highlighting again to military controllers the potential for confusion when traffic information is transmitted to civilian/foreign aircrews.

ACTION: The MOD accepts this Recommendation. In the light of this Airprox, the existing JSP instructions and the rationale behind them have been re-emphasised to all Military air traffic controllers and a review of the subject JSP has been included as part of the action following acceptance of UKAB SRs 039/04 and 059/04.

STATUS – ACCEPTED – CLOSED

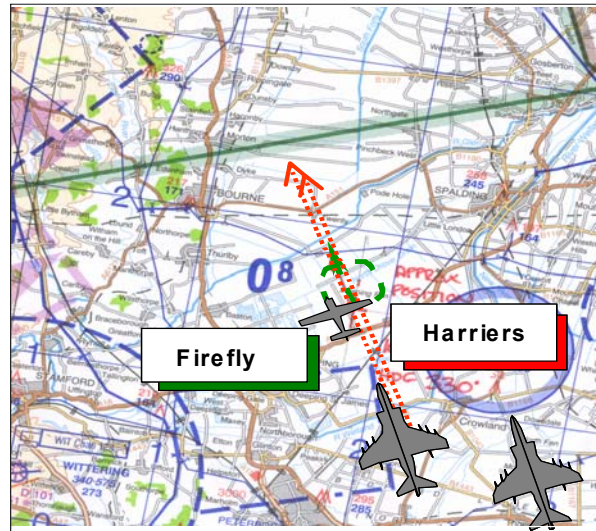
Glossary of Abbreviations

AAI	Angle of Approach Indicator	CLBL	Clear Between Layers
aal	Above aerodrome level	CLOC	Clear of Cloud
ac	Aircraft	CMATZ	Combined MATZ
ACAS	Airborne Collision Avoidance System	CPA	Closest Point of Approach
ACC	Area Control Centre	C/S	Callsign
ACN	Airspace Co-ordination Notice	CTA	Control Area
ACR	Aerodrome Control Radar	CTR/CTZ	Control Zone
A/D	Aerodrome	CWS	Collision Warning System
ADC	Aerodrome Control(ler)	DA	Decision Altitude
ADF	Automatic Direction Finding Equipment	DAAvn	Director Army Aviation
ADR	Advisory Route	D & D	Distress & Diversion Cell
AEF	Air Experience Flight	DF	Direction Finding (Finder)
AEW	Airborne Early Warning	DFTI	Distance from Touchdown Indicator
AFIS(O)	Aerodrome Flight Information Service (Officer)	DH	Decision Height
agl	Above Ground Level	DME	Distance Measuring Equipment
AIAA	Area of Intense Aerial Activity	DUA	Dedicated User Area
AIC	Aeronautical Information Circular	E	East
AIP	Aeronautical Information Publication	EAT	Expected Approach Time
AIS	Aeronautical Information Services	elev	Elevation
alt	Altitude	ERS	En Route Supplement
amsl	Above mean sea level	est	estimated
AOB	Angle of Bank	FAT	Final Approach Track
A/P	Autopilot	FIC	Flight Information Centre
APP	Approach Control(ler)	FIR	Flight Information Region
APR	Approach Radar Control(ler)	FIS	Flight Information Service
ARP	Aerodrome Reference Point	FISO	Flight Information Service Officer
ASACS SSU	Air Surveillance and Control System Standards and Safety Unit	FMS	Flight Management System
ASR	Airfield Surveillance Radar	FO	First Officer
ATC	Air Traffic Control	fpm	Feet Per Minute
ATCC	Air Traffic Control Centre	fps	Flight Progress Strip
ATCO	Air Traffic Control Officer	GAT	General Air Traffic
ATCRU	Air Traffic Control Radar Unit	GCA	Ground Controlled Approach
ATIS	Automatic Terminal Information Service	GCI	Ground Controlled Interception
ATM	Aerodrome Traffic Monitor	GMC	Ground Movement Controller
ATS (U)	Air Traffic Service (Unit)	GP	Glide Path
ATSA	Air Traffic Service Assistant	GS	Groundspeed
ATSOCAS	ATSs Outside Controlled Airspace	H	Horizontal
ATSI	Air Traffic Services Investigations	HISL	High Intensity Strobe Light
ATZ	Aerodrome Traffic Zone	HLS	Helicopter Landing Site
AWACS	Airborne Warning and Control System	HMR	Helicopter Main Route
AWR	Air Weapons Range	HPZ	Helicopter Protected Zone
BGA	British Gliding Association	HTZ	Helicopter Traffic Zone
BHAB	British Helicopter Advisory Board	HUD	Head Up Display
BHPA	British Hang Gliding and Paragliding Association	IAS	Indicated Air Speed
BINA ERS	British Isles/N Atlantic En Route Supplement	iaw	In accordance with
BMAA	British Microlight Aircraft Association	ICF	Initial Contact Frequency
c	circa	IFF	Identification Friend or Foe
CAA	Civil Aviation Authority	IFR	Instrument Flight Rules
CALF	Chart Amendment - Low Flying	ILS	Instrument Landing System
CANP	Civil Air Notification Procedure	IMC	Instrument Meteorological Conditions
CAS	Controlled Airspace	JOI	Joint Operating Instruction
CAT	Clear Air Turbulence	JSP	Joint Services Publication
CAVOK	Visibility, cloud and present weather better than prescribed values or conditions	KHz	Kilohertz
Cct	Circuit	kt	Knots
CFI	Chief Flying Instructor	km	Kilometres
CinC Fleet	Commander in Chief Fleet, Royal Navy	L	Left
CLAC	Clear Above Cloud	LACC	London Area Control Centre (Swanwick)
CLAH	Clear Above Haze	LARS	Lower Airspace Radar Service
CLBC	Clear Below Cloud	LATCC(Mil)	London Air Traffic Control Centre (Military) (West Drayton)
		LFA	Low Flying Area
		LFC	Low Flying Chart
		LH	Left Hand

LLZ	Localizer	SMF	Separation Monitoring Function
LJAO	London Joint Area Organisation (Swanwick (Mil))	SOP	Standard Operating Procedures
LoA	Letter of Agreement	SRA	Surveillance Radar Approach
LTMA	London TMA	SRA	Special Rules Area
MACC	Manchester Area Control Centre	SRE	Surveillance Radar Element of precision approach radar system
MATS	Manual of Air Traffic Services	SSR	Secondary Surveillance Radar
MATZ	Military Aerodrome Traffic Zone	STAR	Standard Instrument Arrival Route
mb	Millibars	STC	Strike Command
MHz	Megahertz	STCA	Short Term Conflict Alert
MoD	Ministry of Defence	SVFR	Special VFR
MRSA	Mandatory Radar Service Area	TA	Traffic Advisory (TCAS)
MSD	Minimum Separation Distance	TAS	True Air Speed
MTRA	Military Temporary Reserved Airspace	TBC	Tactical Booking Cell
N	North	TC	Terminal Control
NATS	National Air Traffic Services	TCAS	Traffic Alert & Collision Avoidance System
NDB	Non-Directional Beacon	TDA/TRA	Temporary Danger or Restricted Area
nm	Nautical Miles	TFR	Terrain Following Radar
NMC	No Mode C	TI	Traffic Information
NK	Not Known	TMA	Terminal Control Area
NR	Not Recorded	TRUCE	Training in Unusual Circumstances and Emergencies
NVG	Night Vision Goggles	UAR	Upper Air Route
OAC	Oceanic Area Control	UHF	Ultra High Frequency
OACC	Oceanic Area Control Centre	UIR	Upper Flight Information Region
OAT	Operational Air Traffic	UKDLFS	United Kingdom Day Low Flying System
OJTI	On-the-Job Training Instructor	UKNLFS	United Kingdom Night Low Flying System
OLDI	On-Line Data Interchange	UNL	Unlimited
PAR	Precision Approach Radar	USAF(E)	United States Air Force (Europe)
PFL	Practice Forced Landing	UT	Under Training
PF	Pilot Flying	UTA	Upper Control Area
PI	Practice Interception	UTC	Co-ordinated Universal Time
PINS	Pipeline Inspection Notification System	V	Vertical
PNF	Pilot Non-flying	VCR	Visual Control Room
PTC	Personnel & Training Command	VDF	Very High Frequency Direction Finder
QDM	Magnetic heading (zero wind)	VFR	Visual Flight Rules
QFE	Atmospheric pressure at aerodrome airport elevation (or at runway threshold)	VHF	Very High Frequency
QFI	Qualified Flying Instructor	VMC	Visual Meteorological Conditions
QHI	Qualified Helicopter Instructor	VOR	Very High Frequency Omni Range
QNH	Altimeter sub-scale setting to obtain elevation when on the ground	VRP	Visual Reporting Point
R	Right	W	West
RA	Resolution Advisory (TCAS)		
RAS	Radar Advisory Service		
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		
R/W	Runway		
RVR	Runway Visual Range		
S	South		
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		
SID	Standard Instrument Departure		

AIRPROX REPORT NO 120/04

Date/Time: 5 Jul 1005
Position: 5243N 00015W (5nm SE Bourne)
Airspace: UKDLFS LFA6 (Class: G)
Reporting Ac Reported Ac
Type: Firefly T67M Harrier
Operator: HQ PTC HQ STC
Alt/FL: 200ft agl 2000ft
RPS 1013 (QFE)
Weather VMC CLBC VMC HAZE
Visibility: >10km 6km
Reported Separation:
50-100f tv/O H Not seen
Recorded Separation:
400ft V/O H

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

THE SLINGSBY FIREFLY T67M PILOT reports flying a high visibility yellow and black ac with the HISLs selected on, on a dual instructional sortie in receipt of a FIS from Cottesmore APR and Squawking 4640. While heading 330° at 80kt climbing out from overshoot from a PFL 5nm SE of Bourne, and passing 200ft agl, both QFI and student saw 2 Harriers pass directly overhead. They were in close echelon right heading in the same direction and were approximately 50-100ft above. The sighting was too late to enable the student pilot who was flying the ac to take any avoiding action or for the QFI to take control.

Maintenance of lookout during PFLs is emphasised to students and the instructor had cleared the area visually in the descent, although for much of the final turn they would have been belly-up to the direction of the Harriers' approach.

THE HARRIER PILOT reports leading a pair of Harriers recovering from low level to the SE of Cottesmore VMC in poor visibility, that was in places down to 5km. They were heading 270° at 360kt at 2000ft (he thought) in a L turn at the E edge of Cottesmore MATZ Stub. All their attention was directed towards looking for other approaching traffic that would have been at a similar height or above and trying to pick out the runway from the background. Both ac had head-down FLIR pictures. Although he accepted that this was Class G airspace, it was also the extended centre-line of busy Fast Jet Stn (he thought). A light ac climbing out of 200ft would have been almost impossible to see in the visibility conditions, even if it had been pre-warned.

UKAB Note (1): The Wittering METAR for 0950Z was:

EGXT 050950Z 30008KT 9999 SCT028 16/08 Q1018 BLU NOSIG=.

UKAB Note (2): The radar shows the Airprox as taking place in the position and altitude reported by the Firefly pilot. This was some 11nm SE of the Cottesmore extended centreline and 4nm N of the Wittering extended centreline.

THE FIREFLY STATION comments that the Firefly pilot had taken every reasonable precaution: he was keeping a good lookout; he had checked for known transit routes and was operating clear of them in open airspace. He was under a FIS from Cottesmore, and was keeping them informed of his actions. It was unfortunate that the Harriers were not on the same frequency and that their direction of approach was from his blind spot: however, this was due to chance not poor practice and is difficult to avert. Unalerted encounters in the open FIR are always a risk and even though the Firefly is brightly coloured (yellow), this incident highlights the difficulty in seeing small ac and should serve to remind all aviators of the need for constant vigilance, especially at low level.

AIRPROX REPORT No 120/04

THE HARRIER STATION comments that this Airprox has raised concerns in that several ac are all legitimately using a fairly small area of airspace. Although operating in Class G airspace, the Units involved (Cottesmore and Barkston) have made preliminary plans to discuss an operating procedure that will accommodate the needs of all parties and should prevent similar recurrences.

MIL ATC OPS reports that a Firefly was carrying out PFLs 10 nm ENE of Wittering from 100-2500ft on the Barnsley RPS of 1013mb and in receipt of a FIS from Cottesmore APR. At 1008:20, the Firefly reported "*climbing away from PFL...got an Airprox to report...currently 5...(transmission interrupted)...2 Harriers who were heading north...height 250 ft whilst climbing away from PFL VMC*". APP was not able to copy the details and after a repeat transmission the details "*Airprox...time minute 05 with 2 Harriers 5 miles south east of Bourne and 2 Harriers were heading north in tight formation and VMC*" were acknowledged. The Firefly immediately transferred to Cranwell APP. The 2 Harriers called APP for a service at 1006:05, after the Airprox had occurred, reporting their estimated position as "*10 miles south east of the field at 1000ft*" and duly commenced their recovery to Cottesmore.

Analysis of the Claxby Radar recording clearly shows both ac operating to the NE of Wittering. However, neither ac was showing on Cottesmore Radar, due to their height at the time of the incident, giving APR no opportunity to pass TI to the Firefly. The Harriers did not contact APR until after the Airprox had occurred. There are no military ATC causal factors in this Airprox.

UKAB Note (3): The recording of the Claxby radar shows at 1004 2 fast moving ac 11nm SE of the Airprox position heading NNW at FL02. At the same time the Firefly is seen operating 2nm WNW of the Airprox position at FL16. The Airprox occurs at 1005:20 with the Harriers in close formation at FL07 heading NNW crossing directly over the track of the Firefly which is at FL03.

HQ PTC comments that this seems to be an instance of the 2 participants carrying out their tasks perfectly legitimately but unfortunately, at the same place and time. That the Harriers were unaware of the event is worrying but it seems to have occurred some time earlier than the impression they give – certainly clear of both airfields' extended centrelines and probably before they came into Cottesmore radar cover. Nevertheless, neither was in a position to significantly affect the outcome. Had the Harriers climbed out of low-level earlier and been in contact with their base (to which the Firefly had been talking) then some TI might have been possible. We are encouraged that both Units are talking together to avoid a repetition.

HQ STC comments that the chosen area for PFLs by the Slingsby pilot was very close to the Wittering MATZ. He had made the effort to get a FIS from Cottesmore APP (the LARS provider for the area) to highlight his position. However, the FIS would not guarantee that the Harriers would be reported to the Firefly and in this case the Harriers were below radar cover. Therefore, the Firefly probably placed undue reliance on an ATS that would probably not have helped him.

Furthermore, the tardiness of the Harriers in calling Cottesmore APP, seemingly after the Airprox, had meant that the controller had no chance of calling in the non-radar contact Harriers to the non-radar contact Firefly. The Harriers would appear to have left their RT call until too late being some 8nm from the MATZ boundary when the BINA En-Route Supplement states "If not under ATCRU control contact Cottesmore APP at least 10nm from the MATZ boundary". When this is coupled with the reported visibility minima (5km) for low-flying then the Harrier's decision, in hindsight, was not a very wise one.

HQ STC is encouraged that Cottesmore and Barkston Heath are planning to come to a local agreement to reduce the chances of recurrence. It is suggested that the final plan is published to other regular users of that airspace at a forum such as the Lincolnshire Airspace Users' Group (LAUG), which is chaired by HQ 3Gp ATC.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted that not having seen the Firefly or apparently been aware of its position, the Harrier pilot's report related to the position of the pair a few minutes after the actual incident. The Board commented that this might account for the substantially differing perceptions of the weather by the pilots involved. While accepting that

observed visibilities can differ depending on the view point, had it been as low as the 5km reported by the Harrier pilot then perhaps calling Cottesmore APR earlier would have been a wise precaution. His actions would then have been in accord with the requirements of the Cottesmore Flying Order Book and would have revealed the presence of the Firefly thus allowing the Harrier pair to avoid it. Notwithstanding, Members felt that neither the weather nor the position of the Sun were factors in this incident.

The Board welcomed the action by HQ STC and HQ PTC to attempt to co-operate in this busy airspace but were informed that a LoA had been in existence some years previously. The HQ PTC Member agreed to report the results back to the Director, which action will be recorded.

Members agreed that the Firefly instructor had taken appropriate precautions before conducting his PFL. While accepting that his chosen location was close (5nm) to both Cottesmore and Wittering MATZs, it was not on either's approach path and Members considered that his selection was reasonable. Since the Harriers had approached from the Firefly's 6 o'clock, its pilots could not reasonably have been expected to see the pair. Since the Harriers had elected to fly below the Cottesmore radar cover, APR could not have provided the Firefly pilots with any advance warning of the other ac's approach.

Members discussed why the Harrier pilots, particularly the wingman, had not seen the Firefly. It was suggested that they may have just commenced their pull up from low level and the Firefly may have been below their noses. Also, it was tail on and would therefore have presented a very small target, perhaps blending in with the agricultural background. However, they did not see it and flew almost directly above it, separated by a few hundred feet. Fortunately there had been no actual risk of collision due to the existing vertical separation that was increasing because of the differing climb rates of the respective ac. Members however, determined that since the Harrier pilots had not been aware of the presence or proximity of the Firefly, the safety of the respective ac had not been assured

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting of the Firefly by the pilots of the overtaking Harriers.

Degree of Risk: B.

AIRPROX REPORT No 121/04

AIRPROX REPORT NO 121/04

Date/Time: 8 Jul 1422

Position: 5726N 00413W
(9nm SW Inverness - elev 31ft)

Airspace: FIR (Class: G)

Reporting Ac Reported Ac

Type: JS32 Jetstream PA38

Operator: CAT Civ Pte

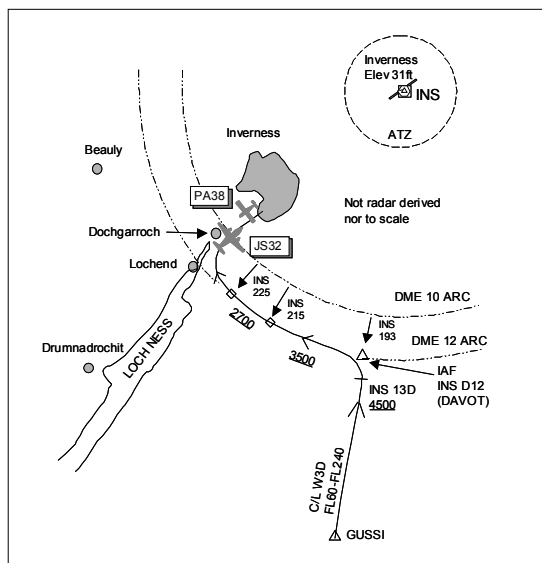
Alt/FL: 2700ft 2600ft
(QNH 1019mb) (QNH 1018mb)

Weather VMC CLOC VMC CLBC

Visibility: 30km 40km

Reported Separation:
<300ft V/200m H 50ft V/300m H

Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JS32 PILOT reports inbound to Inverness IFR via W3D having been cleared by Lossiemouth RADAR for an ILS approach onto RW05 squawking an assigned code with Mode C. The visibility was 30km in VMC and the ac's nav, strobe and landing lights were all switched on. About 20nm from Inverness he was transferred to Inverness TOWER on 122.6MHz and although 'visual' decided to carry out the new ILS procedure for training. The only traffic reported by ATC, he thought, was "a fast moving jet to the south" which was not affecting their flight (Inverness has no radar). Established on the ILS LLZ at 9nm heading 055° at 150kt and 2700ft QNH, the platform altitude, a blue/white PA38 was visually acquired moments before it passed down their LHS about 200m away and above, at between 2700-3000ft. This placed the PA38 on the extended C/L of RW23 and within 300ft vertically. He assessed the risk as high. They had not heard the PA38 pilot call on the radio during the time that they were on the same frequency prior to the Airprox. As far as they are aware, there are no VFR departure/arrival procedures at Inverness, something that in his view could be looked at owing to the increase in commercial traffic using the airport. The PA38 was then found to be on the frequency as the Tower controller asked its pilot "did you see the Jetstream" to which he replied "yes".

THE PA38 PILOT reports flying a local solo sortie from Inverness and in receipt of a FIS from Inverness TOWER on 122.6MHz. The visibility was 40km, flying 2500ft below cloud in VMC. The ac's lower fuselage was coloured blue with white upper half and wings and the anti-collision beacon was on. Previously he had booked out with ATC and told them that his planned route was Inverness – Loch Ness – Drumnadrochit – Beauty – Inverness. He departed RW05 and followed a RH cct before setting course towards Inverness City, telling ATC that his maximum altitude would be 3000ft. The controller informed him of a Jetstream approaching by way of the 'arc approach' from the DAVOT direction so he climbed to 2500ft. He heard the Jetstream pilot call "turning onto the arc" as he approached Inverness so he kept a good look out. After passing the City close to Dochgarroch heading 215° at 100kt the Jetstream pilot called "10 DME" which put the subject ac in the same area. Ten to 15sec later the Jetstream was seen in his 1030 position, about 600m away, and it was clear that it was not close enough to pose a risk and avoiding action was not necessary. The JS32 passed down his LHS by 300m at a slightly lower altitude (-50ft) in a shallow descent; his altitude was 2600ft. Although he was told about the direction from which the JS32 was approaching, he had not been informed of its altitude or position at any time. He did not have detailed knowledge of the approach path flown by the Jetstream but, from his previous experience and warnings given by instructors, he had come to expect instrument approaches to be flown not further out than the city below 3000ft. Later he found out that the day of the Airprox was the first day of the new IAPs at Inverness which lengthened the Jetstream's track by 4nm, he thought, which took the flight out to Lochend. He believed that when he had reached the edge of the city he was past the Jetstream.

THE INVERNESS ADC/APP reports the JS32 was inbound on W3D from the SW and subsequently undertook the 12 DME VOR ARC to ILS procedure for RW05. Meanwhile, the PA38 had departed VFR to Loch Ness 14nm SW of the airport. TI was passed to both acs' pilots with respective intentions. At 1422 the pilot of the JS32 reported an Airprox against the PA38 which passed approximately 300ft above at a distance of about 500ft, heading SW. The PA38 pilot later reported seeing the JS32 at the same time.

UKAB Note (1): The Inverness METAR was EGPE1420Z 05009KT 9999 FEW020TCU SCT050 16/08 Q1018=

ATSI reports that owing to a problem with the recording of Inverness RT a CD of the frequency was produced but the quality was such that no transcript could be completed.

The PA38 pilot requested departure for a local flight to Loch Ness, at 1412, reporting a maximum operating altitude of 3000ft. Lossiemouth were informed of the flight's details and issued a squawk 3727. This was passed to the pilot and he was cleared for take off RW05 with a R turn out maintaining VFR at 1413. Shortly afterwards the Jetstream crew contacted Inverness, reporting at 17 DME, descending to 4000ft and were cleared for the arc procedure 05, with further descent on the procedure. At 1415 the PA38 pilot was informed about the Jetstream 32 shortly undertaking the 12 mile arc procedure RW05 from the vicinity of DAVOT. This was followed by TI to the Jetstream crew on a VFR PA38, not above 3000ft, routeing from the airfield to Loch Ness; the crew responded 'looking'. It is considered that the controller fulfilled his responsibilities in passing appropriate TI to both flights.

Apparently, according to the Manager ATC, the Airprox occurred on the first day of the introduction of the 'new' ILS procedure. The basic change was a 12nm arc rather than 10nm. The UK AIP shows implementation date for this as 01/05/2003. The MATC commented that its introduction had been delayed owing to not gaining approval for a road closure until 2004. During this period, a number of N

UKAB Note (2): The UK AIP AD2-EGPE-8-7 promulgates the Inverness Direct Arrivals (ARC) procedure for RW05 from W3D routeing inbound to the INS on the R193 descending to not below 4500ft. From INS DME 13nm turn L to establish on the INS DME 12nm arc clockwise and when established descend along the arc not below 3500ft. After crossing step down VOR INS R215 continue descent to 2700ft then from lead VOR INS R225 turn R onto ILS LLZ. The IAF at INS R193 12nm used to be named DAVOT when associated with the previous Direct Arrivals procedure where a L turn was commenced to establish on the DME 10nm arc.

UKAB Note (3): The Airprox occurs below recorded radar coverage.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members agreed that there were some interesting lessons to be learnt from this Airprox. Although the PA38 was a locally based ac and its pilot was aware of the IAP, would or should he be expected to know the exact details of an IFR procedure if he was a PPL holder flying VFR. From his report the PA38 pilot had shown good situational awareness, following the JS32's progress from its crew's reports, but he had not appreciated the vertical profile that would be flown during the Direct Arrivals procedure. The JS32 crew were in receipt of an Approach Control (procedural) service from Inverness and, although flying in VMC and being visual with the airport, they had elected to fly the IFR procedure which was in Class G airspace where the onus was on them to 'see and avoid'. This IAP does not have CAS protection and lookout for other traffic, which may be flying in the area VFR and not working any ATSU, is at all times paramount. Contrary to their recollections, the JS32 crew were passed TI by the Inverness ADC/APP on the PA38 flying VFR in the opposite direction not above 3000ft. The crew were then somewhat 'surprised' to see the PA38, very late, just before it passed on their LHS by 200m, slightly above, as they were established inbound on the ILS. Members agreed that this very late sighting had been a part-cause of the Airprox. The PA38 pilot had been given TI and had monitored the JS32's progress and realised, commendably, that when its crew reported at 10 DME the ac was in the immediate vicinity. He then saw the JS32 as it appeared in his 1030 position 600m away and slightly below, not above as expected, which Members agreed had been a late sighting and a second part-cause of the Airprox. The PA38 pilot's expectations of not encountering IAP traffic flying inbound from the SW of the city below 3000ft were incorrect as both the 'old' and 'new' IAP's promulgate 'platform levels' below that altitude in the Airprox area. However, when the PA38 pilot saw the JS32, he had quickly realised that the subject ac were not on conflicting flight paths with no avoiding action necessary, being content to

AIRPROX REPORT No 121/04

watch it pass 300m to his L slightly below. The PA38 pilot was always in a position to manoeuvre his ac, if required, had the situation deteriorated, which was enough to persuade the Board that safety had been assured during the encounter.

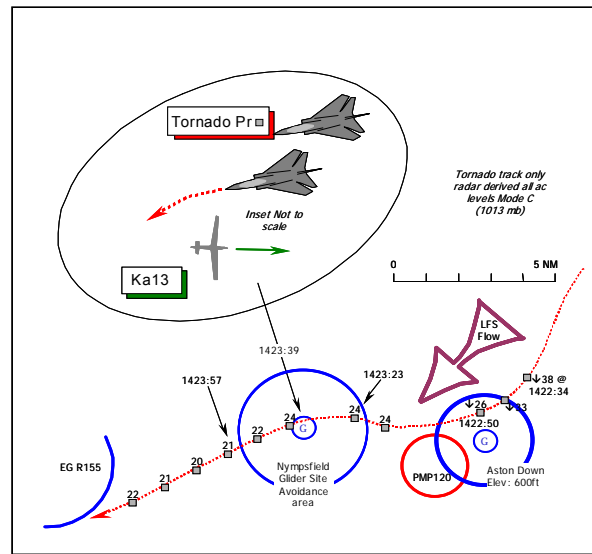
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A very late sighting by the JS32 crew and a late sighting by the PA38 pilot.

Degree of Risk: C.

AIRPROX REPORT NO 122/04

Date/Time: 12 Jul 1423
Position: 5142N 00217W
 (Nympsfield Glider site - elev 700ft)
Airspace: FIR/UKDLFS - LFA 2 (Class: G)
Reporting Ac **Reported Ac**
Type: Ka13 Glider Tornado GR4 pr
Operator: Civ Club HQ STC
Alt/FL: 1700ft 2260ft
 (aal) RPS (1012mb)
Weather VMC CLBC VMC CLBC
Visibility: 20nm 20km
Reported Separation:
 200ft V/100ft H 500ft V/200m H
Recorded Separation:
 Not recorded

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

THE KA13 GLIDER PILOT reports he was instructing a student in this red and white trainer whilst conducting general handling within the circuit area of Nympsfield glider site. The glider was one of several gliders (no more than 6) using the ridge lift and operating typically between 1200-2000ft amsl. Heading E at 50kt, flying level at 1700ft above the site elevation of 700ft amsl he spotted two Tornado jets 500ft away approaching from ahead and to the left. No avoidance was required as the pair of jets passed to port - the closest about 100ft away horizontally and 200ft above his glider - but it was *“far too close (and fast) for comfort”*. He assessed the risk as *“high”*.

THE TORNADO GR4 PILOT provided a comprehensive and frank account reporting that he was leading a pair of grey Tornado GR4 ac in formation on a ‘Hi-Lo’ ‘Convex Attack 2’ sortie as part of his conversion course. The sortie commenced with a medium level transit followed by a descent into LFA2 to low-fly in the SW of England and a range detail in Wales. Following the initial descent with LATCC (Mil) he was handed over to Brize Norton ATC and descended to 2500ft ALT with Brize RADAR, clear of any known traffic where they achieved visual contact with the ground, whereupon he called his wingman over to another ATSU’s frequency for the transit down the Bristol Channel. He was also monitoring the low-flying frequency of 300.8MHz and a squawk of A7001 was selected with Mode C. Whilst heading 245° flying level at 2260ft Cotswold RPS (1012mb) at 469kt switching between ATSUs, he spotted a glider – possibly white and red in colour – about 1km away to port, heading away from his intended track and below his ac. He called the glider into his No2 who at this stage was in loose arrow formation off his starboard quarter. The glider passed about 200m away to port and 500ft below the pair but no avoiding action was taken. The incident followed a descent with Brize Norton ATC who had informed them that the formation was clear of all known traffic about 1min beforehand. After the sortie, on closer inspection of the route he realised that the Nympsfield glider site has a *“non-standard upper limit”* that he had flown the formation through. However, he added that the glider was sighted and called well below the formation and assessed that there was *“no”* risk of a collision.

UKAB Note (1): The UK AIP at ENR 5-5-1-4, promulgates that Nympsfield Glider launching site is active during daylight hours for winch and aerotow launches which may attain a height of 3000ft above the site elevation of 700ft amsl.

UKAB Note (2): The UK Mil AIP at Vol 3 UKDLFS Pt 1-2-2-5 stipulates that Nympsfield Glider Site - GS08 - is to be avoided by 2nm [below 2000ft msd] and notes that gliders operate up to 3000ft agl.

THE TORNADO GR4 PILOT’S STATION comments that although the sortie was correctly briefed and authorised it would appear that the crew did infringe the Nympsfield Glider Site. However, a descent into the LFS in the area of the Bristol Channel is fraught with hazards: airways, glider sites and nuclear power stations, to name but a few.

AIRPROX REPORT No 122/04

The GR4 pilot was on a high workload sortie, leading a pair for his second attack conversion sortie and was keen to get the formation in good shape for entry into low level. Nevertheless, the lead GR4 crew did see the glider below and to the L in good time and it posed no risk.

In normal circumstances this would have been a 'see & avoid' incident. Unfortunately the crew were not aware that the glider site they planned to overfly within normal limits (above 2000ft agl) did in fact have a 'top limit' of 3000ft. Whilst the old adage of "don't assume, check" applies, the use of computerised planning equipment such as the Tornado Advanced Mission Planning Aid (TAMPA) increases the chances of not spotting the obvious. This is by no means an excuse and steps have been taken to highlight the anomaly of the two glider sites having higher than "normal" limits to all the flying units on the Station and advice has also been given about overflight of such sites.

UKAB Note (3): This Airprox is not shown on recorded radar: the Clee Hill Primary was out of service when the Airprox occurred. However, the Clee Hill SSR recording does show the Tornado GR4 (presumed to be the lead ac) identified from its Brize RADAR squawk switching to A7001 just after the pair pass 1nm N abeam Aston Down indicating 2600ft Mode C (1013mb). The jets turn westbound and are shown maintaining 2400ft Mode C - about 1820ft QNH (1017mb - the nearest actual QNH for this period) - and some 1670ft above Nympsfield's elevation of 700ft as they enter the UKDLFS mandatory avoidance area. After passing marginally to the N of the Glider site at 1423:39 level at about 1670ft aal, the jets turn SW and descend clearing the stipulated 2nm avoidance area boundary at 1423:57.

HQ STC comments that the Tornado GR4 crew should have noted the 3000ft marking on the UK Low Flying Chart, which denoted that in addition to the standard glider-site avoid, Nympsfield was promulgated for winch launching and aerotows to 3000ft agl. This would have been apparent in the planning stage. The fact that they had not allowed for the elevation of the field and had even encroached the standard glider site avoid margin of 2000ft agl was indicative of their poor preparation. Fortunately, they were aware of the glider's presence from a reported distance of 1km, and were in a position to avoid it if required, however, their chosen flightpath was too close and obviously caused the glider pilot concern.

It is unfortunate that the glider was not capable of transponding as this would have aided in the assessment of both pilot's estimation of separation; which would appear to be different. In addition, it would have made the glider more visible to Brize Radar, who may well have reported it to the Tornado prior to them going en-route and would have ultimately helped in assessing the level of risk.

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 glider pilot reports he was flying within the Cct area at Nympsfield which, although his glider was not shown on the SSR recording from the Clee Hill Radar, would normally be well within the confines of the applicable LFS avoidance area. A gliding advisor stressed, however, that the 3000ft warning promulgated in the UK AIP refers to the winch launch activity not to aerotows, which could potentially be much higher. Moreover, pilots should be in no doubt that glider pilots are not constrained to operate within these limits in the close vicinity of these sites, gliders will frequently be encountered above these heights off the winch and in his view locations such as this should be given as wide a berth as is practicable. For his part the glider pilot had spotted the two jets as they passed 100ft port and 200ft above his glider and had reported that no avoiding action was required. Indeed, there was probably very little he could have done either to manoeuvre out of the way of the formation when confronted with ac flying at a near head-on aspect at these speeds.

The GR4 pilot had reported that Brize Norton ATC had informed them that the formation was clear of known traffic about 1min beforehand. A civilian controller Member thought that the GR4 pilot's report suggested a somewhat unrealistic expectation of what ATC could do for him. Gliders are notoriously difficult to detect by primary radar and would probably not have been displayed to the Brize Norton controller: hence, the 'known' traffic would generally refer to that which was displayed or might be under the control of Brize ATC at the time. Moreover, the jets would have flown some 8nm in the intervening 1min period after switching frequencies. The Board noted the Command's comments about transponders: although this topic has been raised before, the advent of a light-weight transponder with adequate battery life seemed to be a little way off yet. Some Members also asked if the

glider site was marked on the Brize Norton SRE video map, but the Mil ATC Ops advisor was unsure on this point and undertook to check up on this issue outwith the meeting.

The Board recognised that the catalyst to this Airprox was the intended route of the Tornado GR4 formation through this vicinity that was established at the flight planning stage. The Board's low-flying advisor briefed the Members that the notified elevation of Nympsfield resulted in this unusual, but not unique, upper limit of the winch launch warning at 3700ft amsl. He emphasised that only that portion from the ground to 2000ft agl was a mandatory avoidance area (AA) for military aircrew: the upper 1000ft having the status of a warning only. Nevertheless, Members recognised the inherent danger to ac if pilots flew below the promulgated maximum winch-launch height warning. The radar recording showed that the lead GR4 had also penetrated this lower 2000ft band as the formation followed their planned route – flying just marginally to the NW around Nympsfield - which Members attributed to inadequate situational awareness by the formation leader, his navigator and also the crew of the No2. It was not clear from the reports provided if the No2 Tornado was crewed by instructional staff monitoring the progress of this 'Convex' sortie, but if they were then their omission was also potentially contributory to the cause. The mandatory AAs associated with the two glider sites at Aston Down and Nympsfield were promulgated in the UK Mil AIP for the benefit the lead GR4 crew and his No2, moreover they were also marked on the applicable military LFC. That the GR4 formation leader had planned his route to pass marginally to the NW of the Nympsfield site within the AA and then chosen to fly through at low-level was an entirely needless planning error, which should have been picked up before the crews even walked to their ac. Some Members queried why the sophisticated planning aids now available to crews had not 'flagged' this up, but the Board was informed that devices such as the TAMPA were not able to highlight the potential for problems such as occurred here. The Tornado pilot's station had commented that the sortie had been "correctly briefed and authorised", but military Members were surprised that the supervisory chain at the unit had not detected this basic planning error. The pre-flight brief should have revealed to the crews flying this sortie the dimensions of the AAs encompassing these sites and the 3000ft agl upper 'height' of the warning. That the crews were unaware of this danger beforehand suggested to the Board that this formation's outbrief was not as comprehensive as it should have been. Moreover, notwithstanding any applicable delegated self-authorisation for training flights, the planned route should have been checked by instructional/supervisory staff and the squadron duty authorising officer, who should have detected that the planned route went straight over Nympsfield. Thus they should have either suggested an alteration to the planned track, or cautioned the crews to maintain a higher transit altitude in this vicinity thereby giving this glider site a wider berth. In the Board's view this was a significant contributory factor. The STC fast-jet Member agreed that this was an important lesson that needed to be broadcast widely. Consequently, he undertook to highlight this Airprox, through DASC, as a salutary lesson for inclusion in the syllabus of the Flying Authorisers Course. It was fortunate that the formation leader spotted the glider when he did from about 1000m away and he might well have been able to have afforded greater separation if needs be: that he did not do so ultimately gave cause for concern to the glider pilot. The Board concurred with the Command's view and the Members agreed unanimously that the cause of this Airprox was that the Tornado GR4 formation flew through the Nympsfield Glider Site Avoidance Area and close enough to cause concern to the glider pilot.

Turning to the inherent risk: neither the glider pilot nor the Tornado pilots took any avoiding action when they spotted each other's ac. The Tornado GR4 formation leader reports that he flew 500ft above the red & white glider some 200m away, whereas the latter's pilot commented that the jets passed closer at 200ft above his ac and 100ft to port. This was probably not a particularly comfortable distance, but as the glider did not show on the recording this anomaly could not be resolved with certainty. Furthermore, without the benefit of Mode C from the glider it was impossible to determine the actual vertical separation that pertained independently as each pilot's account differed markedly. Weighing all these factors carefully, therefore, Members concluded that in the circumstances reported here no risk of a collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Tornado GR4 formation flew through the Nympsfield Glider Site Avoidance Area and close enough to cause concern to the glider pilot.

Degree of Risk: C.

Contributory Factors: The 'supervisory chain' at the unit did not detect the GR4 formation leader's flight planning error.

AIRPROX REPORT No 123/04

AIRPROX REPORT NO 123/04

Date/Time: 7 Jul 0931

Position: 5413N 00014W (2nm E Filey)

Airspace: London FIR/UKDLFS LFA 11
(Class: G)

Reporting Ac Reported Ac

Type: Cessna F406 Tornado F3

Operator: Civ Com HQ STC

Alt/FL: 400ft ↑ NR
(Rad Alt) NR

Weather VMC CAVOK VMC

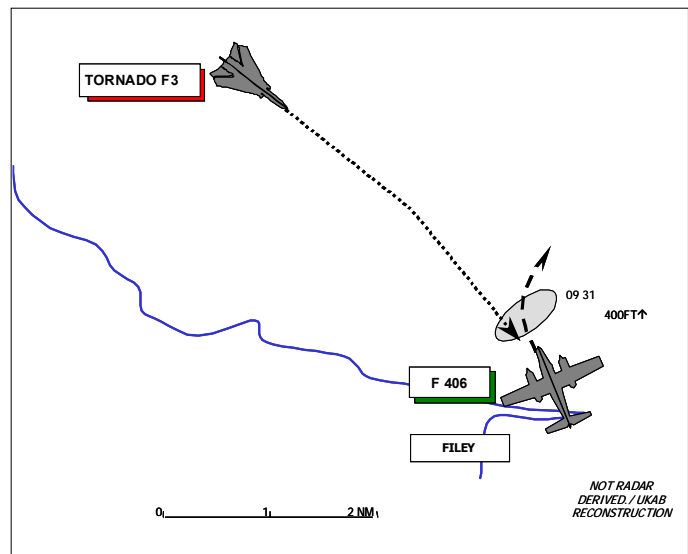
Visibility: 20km >10km

Reported Separation:

300ft V ¼nm H NR

Recorded Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE F406 PILOT reports flying a Fishery Patrol Flight from Humberside in a blue and white ac with no TCAS but with HISLs selected on, squawking 4100 (on the date of the incident, a Fishery Patrol code) in receipt of a FIS from Humberside. While heading 340° at 140kt following a 100ft pass of a fishing vessel which was operating close inshore and on passing the vessel he initiated a climb to their cruising altitude. When passing 400ft he sighted an ac ¾nm away heading in the opposite direction. He believed the pilot saw them as the other ac climbed and turned R. His major concern was that the other ac was heading S with a cliff face on its right hand side which had limited its ability to turn R when the pilot saw another ac heading in the opposite direction. After passing down his port side he lost sight of the ac however, both his First Officer and Systems Operator saw the ac climbing to approximately 1000ft in the vicinity of Flamborough Head before heading off in a Northerly direction. He commenced a R turn to avoid it and assessed the risk of collision as being medium.

THE TORNADO F3 PILOT reports flying a grey ac with HISLs selected on conducting GH prior to conducting air-to-air refuelling for subsequent task. He was in the area where the Airprox was reported but did not see any other ac at that time.

THE TORNADO F3 STATION reported that since the crew of the F3 did not see the other ac, nor were they made aware of any in their vicinity, they could not add any meaningful comment.

ATSI reports that there are no apparent ATC causal factors in this incident. The F406 was receiving a FIS from Anglia Radar and was flying below radar cover. For information, Anglia had warned that D323B/C were active with further descent below the base to 1000ft. The pilot commented that they had been informed that operations were being carried out only down to 5000ft.

UKAB Note (1): The recording of the Claxby Radar shows the Tornado operating in the area off the E coast, to the N of Flamborough Head, prior to the incident; 2½ min before the event it descends below the base of radar cover heading SE along the coast. It reappears to the SE of the incident position 1 min after the event having reversed onto a NNW heading and commenced a climb, passing the F406 again, but 2000ft above it as they cross. The F406 can be seen before and after the incident, operating in the Filey area. Before the incident it descends below radar cover and it reappears climbing through 500ft heading NNW immediately after the reported time of the incident. Although the actual Airprox is not shown on the recording, there is little doubt that the ac involved was the subject F3. By deduction from its positions before and after the incident it was heading SSE and was below radar cover. Further since the F406 starts to paint with Mode C indicating FL005 and the QNH at the time of the incident was 1020mb, it can be calculated that the base of radar cover at that point is 280ft; the F3 was therefore below that height, but probably above 250ft which was its minimum authorised altitude.

UKAB Note (2): The height of the cliffs to the W of the incident area (from OS Sheet 101) is up to a maximum of 288ft.

HQ STC comments that attempts were first made to contact the crew involved in this incident 5 days after AIS (Mil) tracing action; unfortunately, they were not made aware of this and only became involved 6 weeks later. That said, they remembered the sortie as their leader had had an engine failure on take-off that had enabled them to re-call the sortie in question. At the time of the Airprox the crew (2 very experienced aviators) were conducting GH, including max-rate turns, down to a minimum of 250ft Rad Alt whilst awaiting their AAR slot time. They were not using D323B/C and were flying in Class G airspace. The ac was fully serviceable with a working air-to-air radar that would undoubtedly have detected the F406 with the head-to-head aspect of the encounter. Unfortunately, the videotape recording, the radar and HUD pictures had not been saved.

Without the aid of a radar trace there would appear to be insufficient information to comment on this Airprox. However, it is likely that one of 2 events occurred; either the Tornado passed close to the F406 without seeing it, or they saw it but was far enough away not to concern the Tornado crew but close enough to cause the F406 pilots concern. Thus the Tornado crew could not recollect the encounter after the passage of several weeks.

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 Tornado F3 operating authority.

The Board determined that the F406 and the Tornado had both been operating in Class G airspace. Members were reminded by a specialist that military ac operating below 2000ft and within 3nm of the coast should be booked into the UKLFS. Since the F406 pilot had not issued a CANP or other warning of his flight, probably for justifiable operational reasons, his presence would not have been revealed to the Tornado crew during their pre-flight planning. This being the case, both pilots were relying solely on the 'see and avoid' principle. The F406 pilot saw the Tornado and thought, erroneously it transpired, that its pilot had seen his ac, surmising that the Tornado pilot may have been unable to take effective avoiding action because of the cliffs. Expert advice was that this would not have been the case; had the Tornado pilot seen the F406 the performance of the jet would easily have allowed a climbing avoidance manoeuvre. The manoeuvring actually carried out by the Tornado pilot was done with no knowledge of the presence of the F406 either before or after the incident.

Unfortunately due to a breakdown in communication at the station the Tornado pilot did not compile his report until well after the event with consequent memory fade. He did however, state that he did not see any other ac and Members determined that this had probably been the case. That being so, they were surprised that the fighter crew were not aware of the F406 either on radar or visually. It may have been that their arousal state was low since the first planned part of their training was cancelled and, in effect, they were using up time before being able to join the tanker.

In the event however, the F406 pilot saw the Tornado and was able to take avoiding action. This combined with the fortuitous turn by the Tornado increased the separation to an extent that there was no risk that the ac would have collided. In addition, although the actual separation could not be determined, the Board accepted that the figure of ¼ nm and 300ft reported by the F406 pilot was the best estimate, further reinforcing this assesment.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the Tornado F3 crew and a late sighting by the F406 pilot.

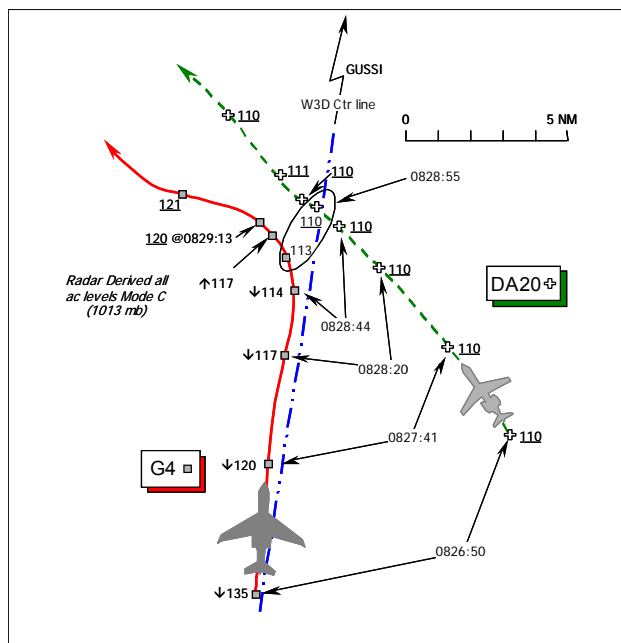
Degree of Risk: C.

AIRPROX REPORT No 124/04

AIRPROX REPORT NO 124/04

Date/Time: 1 Jul 0829
Position: 5701N 00414W (12nm S by W of GUSSI)
Airspace: ADR W3D (Class: F)
Reporter: ScACC W Coast SC

	<u>First Ac</u>	<u>Second Ac</u>
<u>Type</u>	Gulfstream 4	Falcon 20
<u>Operator:</u>	Civ Comm	Civ Comm
<u>Alt/FL:</u>	FL120	NK
<u>Weather</u>	VMC CLBL	NK
<u>Visibility:</u>	20nm	NR
<u>Reported Separation:</u>		
ScACC:	Not reported	
	6-700ft V	NK
<u>Recorded Separation:</u>		
	300ft min V/1.9nm @ 0828:55	
	1.7nm min H/700ft V	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ScACC WEST COAST COMBINED TACTICAL & PLANNER CONTROLLER (W COAST SC) reports that the Gulfstream 4 was inbound to Inverness routeing ADR W3D. Just before he transferred the flight to Lossiemouth RADAR he had co-ordinated this ac with ScATCC (Mil) Console 4 (CON 4), to be not below FL120 against their traffic at FL110 tracking northwest – the Falcon 20. This co-ordination was duly passed on to Lossiemouth RADAR and accepted by the controller. The Gulfstream crew was then transferred to Lossiemouth ATC for an ATS approaching GUSSI, after which the Gulfstream's Mode C was observed to descend below FL120 into conflict with ScATCC (Mil)'s Falcon before making an avoiding action turn and climbing back up. STCA was triggered and prescribed separation was eroded, but he did not specify to what degree.

THE GULFSTREAM 4 (G4) PILOT provided a comprehensive report about his flight from Londonderry/Eglinton to Inverness for which an IFR FPL had been filed. The ac has a white/crimson livery and the HISLs were on whilst flying at 250-270kt in VMC, some 3000ft above cloud, between layers, with an in flight visibility of 20nm. TCAS is fitted, but neither a TA nor RA was enunciated during the period of the Airprox.

Whilst in transit on the heading assigned at FL190, about 5min before the Airprox occurred, Scottish CONTROL cleared them for descent to FL120 in preparation for their descent into Inverness. At about the same time the flight attendant came up front and made an enquiry about ground transport for their passengers and he informed her they would check it out. His co-pilot then made an RT call and resolved the administrative query. ScACC switched them over to Lossiemouth RADAR who cleared them "direct" to the INS VOR, with additionally a garbled message about "...traffic off your right side...garbled...then an audible FL110", which his co-pilot interpreted as a clearance to descend to FL110. At about 22nm from the INS, the co-pilot quickly selected FL110 on the altitude select panel, but he explained to his co-pilot that it was the other traffic that was at FL110 and quickly reselected it back to FL120 himself. The other ac was spotted about 1nm away but the altitude hold was momentarily deselected thereby allowing the ac to drift down to FL117. [UKAB Note1: Mode C shows the G4's descent was arrested at FL113]. However, he quickly realised what had happened and promptly initiated a return to FL120. Shortly thereafter, they were instructed to head W and to maintain FL120, which required a 45° L turn off their heading. At no time did they lose sight of the converging traffic out to starboard, which was 6-700ft below them. Lossiemouth ATC then "releared" them direct to the INS VOR. Upon landing at Inverness they were asked by the TOWER controller to call ScACC by phone. He spoke briefly with both ScACC and Lossiemouth controllers and acknowledged that he had deviated from his assigned level by 300ft. Nevertheless, the ScACC controller informed him a report would be filed. The risk was assessed as "minimal".

THE FALCON 20 (DA20) PILOT provided a brief report saying that he was inbound to Kinloss and in receipt of a RIS he thought from Lossiemouth RADAR [actually ScATCC (Mil)] TCAS is not fitted. He was operating VFR, no other traffic was seen, nor was any avoiding action requested by ATC. The risk was *"not known"*.

MIL ATC OPS reports that the timings of the RT tape recordings at Lossiemouth were found to be inaccurate by about 6mins; the times in this report have been adjusted to UTC accordingly. Steps have also been taken to ensure that the timing reference at RAF Lossiemouth remains accurate.

The G4 was inbound to Inverness under the control of the Lossiemouth LARS Controller having been handed over from ScACC W COAST Sector at 0827. At 0827:26 the G4 crew contacted LARS and reported *"...out of 13,5 descending to level 120"*. LARS identified the G4, placed it under a RAS and called traffic at about 0827:33, *"...right 1 o'clock, 5 miles, right-left co-ordinated at FL110."* The G4 pilot asked for the transmission to be repeated so LARS reiterated the traffic information passing the details slowly and clearly. The G4 pilot responded with *"Alright, we're looking for the traffic, we're descending to level 110 [C/S]"* LARS immediately reacted with *"[C/S] negative descend FL120"*, which the G4 crew acknowledged 5sec later with *"...roger we're maintaining flight level 120...[C/S]"* before at about 0828:21, reporting visual with the conflicting traffic. Some 21 sec later at 0828:42, LARS transmitted avoiding action to the G4 crew *"[C/S] avoiding action, turn left heading 270, you were descending to FL120"*. The G4 crew acknowledged the turn at 0828:48 and LARS passed traffic information on the conflicting track again [at about 0829:03], *"[C/S], previously reported traffic right 1 o'clock. 1 mile, right - left now indicating 500[ft] below"*. The G4 crew, again, reported visual with the conflicting traffic. The G4 crew was instructed to resume a heading for Inverness when the ac levelled at FL120 [at 0829:13].

Simultaneously, ScATCC (Mil) Controller 4 (CON 4) was working the DA20, which had departed from Leuchars and was routeing NW maintaining FL110 under a RIS. W COAST SC had previously called to co-ordinate the G4 descending above the DA20, to agree that the G4 would not fly below FL120 against the DA20 that was maintaining FL110. Traffic information was passed to the DA20 crew regarding the descending G4.

The Lowther Hill Radar recording shows the G4 21nm S by W of GUSSI, tracking 010° just to the W of the W3D centreline, indicating FL129 Mode C (1013mb) descending at 0827:14, with the DA20 17 nm SSE of GUSSI tracking NW indicating FL110. The lateral separation between the 2 ac's tracks at this point is 8½nm. The respective ac continue on converging tracks and the G4 continues a descent on Mode C. At 0827:52, STCA [which is available to the ScATCC (Mil) controller] was activated when horizontal separation is 6nm, the G4 indicating FL119 Mode C whilst the DA20 maintains FL110. The Mode C indication on the G4 continues to descend through FL117 and at 0828:21, with 700 ft vertical separation evident, the horizontal separation is 5nm. In response to LARS's avoiding action instruction, the G4 is seen in a L turn at 0828:44 as it continues to descend until the ac's Mode C 'bottoms out' at FL113 at 0828:55, with 300ft minimum vertical separation evident when the ac are 1.9nm apart. Minimum horizontal separation of 1.7nm occurs moments later on the next radar sweep, as the G4 climbed through FL117 Mode C.

The G4 had previously been co-ordinated, whilst under the control of W COAST SC, to fly not below FL120 against the DA20, under the control of CON 4, which was maintaining FL110. The co-ordination was passed on from W COAST SC to LARS. Subsequently, when LARS identified the G4 and placed the flight under a RAS, details of the co-ordinated DA20 was transmitted to the crew as *"traffic right 1 o'clock, 5 miles, right-left, co-ordinated at FL110"*. The G4 crew responded by stating that they were *"descending to FL110"*. LARS immediately passed a corrective instruction that the G4 crew should have only descended to FL120, which the G4 crew acknowledged and subsequently reported visual with the co-ordinated traffic at 0828:21. Nevertheless, the G4 continued to descend and at 0828:42 LARS observed the G4's Mode C passing through FL120 and passed horizontal avoiding action as well as reiterating that the G4 should not be below FL120. The G4 crew acknowledged the turn and immediately started a climb to FL120 and reported visual with the DA20. LARS demonstrated excellent situational awareness and reacted quickly to the G4 crew descending below their assigned level. The traffic information passed to the G4 crew was in accord with that stipulated at JSP 552 915-3-5.

ATSI reports that the G4 crew contacted the W COAST SC [combined Tactical and Planner controller] at 0804:10, and reported climbing to FL190 on track for 'GOW'. The flight was correctly identified and placed under a RIS. The pilot was informed that the routeing would be GOW and then W3D for Inverness. At 0821:25, the service was changed to a RAS, as the ac routed direct to RANOK.

AIRPROX REPORT No 124/04

Having noted the presence of the DA20 at FL110, at 0825:30, the W COAST SC coordinated with SCOTTISH MILITARY in respect of the G4 down to FL120, with the DA20 not above FL110. The W COAST SC then telephoned Lossiemouth and passed on the coordination. The Lossiemouth controller could see both of the subject ac on his radar. The W COAST SC reiterated that the agreed coordination with SCOTTISH MILITARY was not to descend the G4 below FL120 until clear of the DA20. The Lossiemouth controller replied "*Okay, that's co-ordination agreed and you can send him across to me now*". The telephone conversation ended at 0826:20, and immediately the W COAST SC transmitted "[C/S] *maintain flight level 120 on reaching contact Lossie Radar 119 decimal 35*". This was promptly read back by the crew as "*we'll maintain twelve and now to nineteen thirtyfive ...(sic)*". A short time later, the W COAST SC observed the Mode C readout of the G4 descending below the assigned level of FL120 and consequently, into conflict with the DA20. On telephoning Lossiemouth to confirm the G4 crew was maintaining FL120, he was told that the controller concerned with the flight was also talking to Scottish Military. Later, W COAST SC was advised that the G4 crew had "*just carried on descending...*".

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 was an unusual report insofar as the controller who filed the Airprox, the ScACC W COAST SC, was not actually providing an ATS to these two ac at the time the Airprox occurred. However, it was accepted for assessment because it was the SC who had completed the co-ordination in the first instance to ensure separation existed between these two ac.

It was evident that the W COAST SC had initially instructed the G4 crew to descend to FL120, which although the G4 crew had duly acknowledged this level, was subsequently breached and was the origin of the Airprox. However, a CAT pilot Member noted from the G4 pilot's laudably frank report the distraction caused by the administrative calls about the ground transport for the G4 pilot's passengers. He opined that the crew's RT calls on another frequency to resolve administrative arrangements, whilst in a dynamic scenario such as this, were not sound professional practise. Apparently dealing with non-essential tasks had distracted the co-pilot sufficiently that he had misheard the traffic information about the Falcon that the Mil ATC Ops report had shown was actually passed twice. The G4 pilot had reported that his co-pilot had erroneously reset the selected level on the altitude hold to FL110 after confusing the level of the Falcon given in the traffic information as their own newly assigned level. Civilian controller Members commented that traffic information is not given in this form by civilian controllers - by indicating the actual level of the other traffic - to avert any potential for such confusion as indeed occurred here. Notwithstanding that the Mil ATC Ops report had said that the traffic information message format was in accord with that stipulated at JSP 552 pg 915-3-5, some military controller Members contended that the Lossiemouth LARS controller could, preferably, have given the traffic information in another form: eg by reporting the Falcon as being 1000ft below the G4's assigned level without actually specifying the level of the other ac at FL110. This was another of the three methods that are specified for use at the controller's discretion. There were possibly circumstances where passing an actual level was appropriate, but it was evident that this form of passing traffic information had indeed confused at least one pilot in the G4 and it might not, with hindsight, have been the best method here. After considering all these factors the military controller Members suggested that the use of this specific phraseology should be reviewed with a view to including a more comprehensive caution as to its use, highlighting again to military controllers the potential for confusion when traffic information is transmitted to civilian/foreign aircrews, which the Board agreed should be recommended to the MOD. Fortunately the alert LARS controller had picked up the co-pilot's first error thereby illustrating the value of the read-back mechanism. But though the G4 pilot had said in his report that he had recognised his colleague's error at this point and reset the altitude hold to FL120, it did not appear to the CAT pilot Members that either he or his co-pilot were cross-checking the ac's 'automatics' closely enough. After the actual level of FL120 had been correctly read back a second time, the radar recording had revealed that the G4 had descended further than its pilot had thought, as apparently the altitude hold system had not captured the ac at FL120. A CAT pilot Member said this was a known problem that the G4 crew should have guarded against more closely and resulted in the significant excursion of 700ft below their assigned level that occurred over 30sec after the crew had been reminded that they should level at FL120. The Board concluded therefore that this Airprox had resulted because the G4 crew descended below their cleared and co-ordinated level into conflict with the Falcon DA20.

The Board commended the Lossiemouth LARS controller for his alertness and sound appreciation of what was happening, as it was clear that the controller had to step in again with avoiding action instructions when he

detected that the G4 crew had descended below their assigned level in the vicinity of the Falcon. For their part, the Falcon pilot's brief report was probably indicative of the seriousness with which they viewed the situation, but generally no avoiding action would normally have been proffered by ScATCC (Mil) under a RIS. The G4 crew was aware of the Falcon from the traffic information given, had the other ac in sight at least 30sec before the CPA and throughout the incident. Moreover they reacted promptly to the avoiding action passed by the LARS controller such that TCAS, which was 'standing by' if needed, was not according to the G4 pilot's report called upon to help resolve the situation. This, coupled with the minimum horizontal separation recorded of 1.7nm convinced the Board that no risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Gulfstream 4 crew descended below their cleared and co-ordinated level into conflict with the Falcon DA20.

Degree of Risk: C.

Recommendation: That the MOD review the use of the traffic information phraseology promulgated at JSP552 915 Serial 5, with a view to including a more comprehensive caution as to its use, highlighting again to military controllers the potential for confusion when traffic information is transmitted to civilian/foreign aircrews.

AIRPROX REPORT No 125/04

AIRPROX REPORT NO 125/04

Date/Time: 6 Jul 1448

Position: 5134N 00040E (1nm W Southend - elev 48ft)

Airspace: ATZ (Class: G)

Reporter: Southend APR (+ADC)

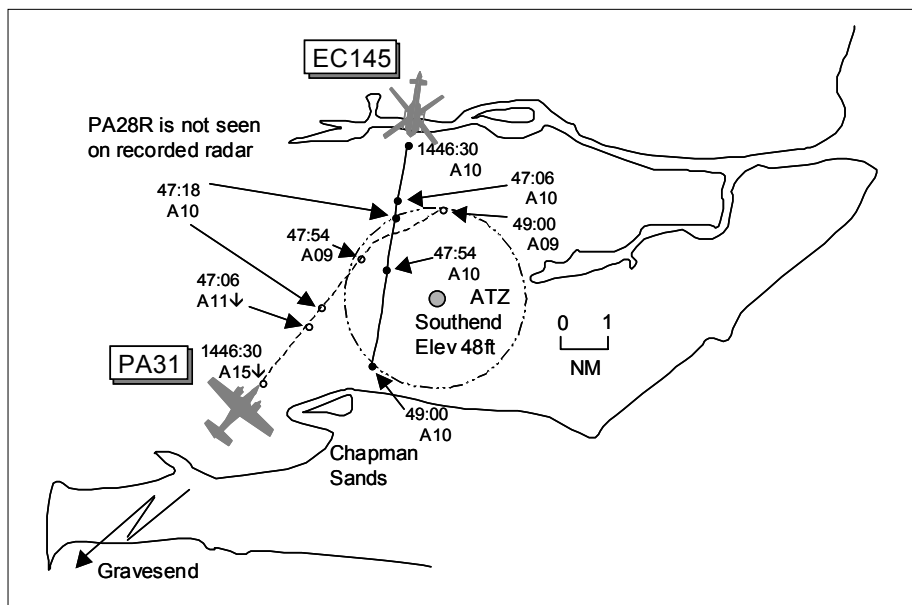
	<u>First Ac</u>	<u>Second Ac</u>	<u>Third Ac</u>
<u>:Type</u>	PA31	PA28R	EC145
<u>Operator:</u>	Civ Pte	Civ Pte	Civ Pte
<u>Alt/FL:</u>	1000ft (QNH)	NR (aal)	1000ft (QNH)
<u>Weather</u>	VMC CLBC	VMC NR	HAZE
<u>Visibility:</u>	>10km	>10km	NR

Reported Separation:

500ft V/0.5nm H NR NR

Reported Separation:

PA31vEC145 100ftV/0.6nm H PA28RvEC145 NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SOUTHEND APR reports that unknown traffic was observed on radar approaching the ATZ from the N. One of the 2 contacts was believed to be a PA28 (not the subject ac) on the frequency at 2400ft, but it was not positively identified. The other contact was tracking to pass about 1nm W of the overhead and was about 3nm NNW of the aerodrome when the PA28 pilot reported overhead. He asked the ADC to look out for this unknown traffic. At 1447, coincident with the traffic crossing the ATZ boundary, a call was received from an EC145 pilot, on handover from Stansted routing to Le Touquet at 1000ft. The unknown traffic was seen by the ADC as an EC145 inside the ATZ and in conflict with 2 ac in the visual cct, a PA31 and a PA28R. The PA31 pilot initiated his own avoiding action and the ADC gave avoiding action to the PA28R pilot. When he asked the EC145 pilot to confirm his position, he replied Gravesend although the Direction Finding (DF) trace did correspond with the contact on radar and the helicopter observed from the VCR. He passed TI to the EC145 pilot on the cct traffic and also informed him that he had possibly infringed the ATZ but no response was received and no further RT communication was established, despite trying several times.

UKAB Note (1): The Southend METAR shows EGMC 1420Z 13006KT CAVOK 21/06 Q1022=

THE PA31 PILOT reports flying solo inbound to Southend VFR heading 060° at 120kt and following instructions from APP to join downwind RH for RW24. He was informed that a helicopter was approaching him from the N not on frequency. He was transferred to TOWER and proceeded to enter the downwind leg. The ADC told him that the helicopter was passing him L to R which he saw in his 11 o'clock range 1nm 500ft above. It was apparent that the helicopter was going to pass in front and above which it did by 0.5nm and 500ft; no avoiding action was needed nor taken.

THE PA28R PILOT reports heading 240° at 70kt on initial climb-out from RW24 at Southend and in communication with Southend TOWER on 127.72MHz. ATC told him about a conflicting helicopter and instructed him to turn R to avoid it. He saw it, a dark coloured type flying straight and level, in his 1 o'clock crossing R to L and he immediately turned R, passing behind and below it.

THE EC145 PILOT reports outbound from Stansted to Le Touquet VFR and being handed over from Approach Control to Essex RADAR on the London INFORMATION frequency 124.6MHz, he thought. He was on a SSE'y heading turning onto S when he gave the Essex controller his previously assigned code from APPROACH with Mode S on. At this time he was having problems getting the Navigation Management System (NMS) to display what he needed for his position report so, whilst he was working on this, he had placed the helicopter on a S'y heading at 1000ft on the A/P. He gave a position report, based on where he thought he was, after he checked with a VFR map. All the while he assumed that Essex RADAR had him in radar contact as he had been handed over and had not been asked to squawk ident or given a new squawk code. Upon reaching the coastline near Chapman Sands, he realised that he had reported at a position further to the S than he actually was and that he had been close to Southend Airport on their western perimeter. After landing at Le Touquet, he telephoned Southend ATC to explain why he had not been on their frequency and he was informed that he had infringed the ATZ and crossed the extended C/L of an active RW. He apologised, as there had been no excuse for it, but told them that the radar controller had not notified him of anything. Apparently Southend ATC had attempted to contact him but he had not heard anything.

ATSI reports that there are no apparent ATC causal factors. Southend has only primary radar. At 1446:30, the ADC, following information from the APR, warned the PA31 pilot, which was RH downwind RW24, of "...unknown contact on radar that's presently three miles north but appears to be heading towards the field". This information was updated about 30sec later "...observed from the tower there's an unknown helicopter appears to be entering the zone just two miles north of the field". The PA31 pilot sighted the helicopter. The ADC then transmitted to the PA28R pilot, which was carrying out a touch and go, "...make an early right turn if possible into the circuit there's unknown traffic that's just infringed the ATZ, helicopter low level in your twelve o'clock." The PA28R pilot reported traffic in sight and said he would be making an early R turn. Meanwhile, at 1447, the helicopter had contacted Southend Approach and, although N of the airport, reported at Gravesend, some 15nm SW. The pilot was given a FIS, which he acknowledged, warned about cct traffic, but no further transmissions were heard from the pilot on the frequency. The ADC/APR team did well to notice the helicopter and pass appropriate information/advice to the pilots involved.

UKAB Note (2): The Southend APR RT transcript reveals the following exchange:-

1447 EC145 - "Southend this is helicopter EC145 c/s with you ????? handover from Stansted squawking seven thousand" (????? One word unintelligible)

APR - "EC145 c/s Southend radar pass your message"

EC145 - "We are on er er according to our flight plan to Le Touquet we are now er ????? ????? er one thousand feet" (????? ????? Two or three words unintelligible).

1447:30 APR- "EC145 c/s roger what type of helicopter are you and report your position".

EC145 - "Standby".

EC145 - "Yeah we are er echo charlie one er four five and we are Gravesend position above Gravesend".

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APR – “EC145 c/s roger flight information service QNH one zero two two”.

EC145 – “Roger information one zero two two thank you”.

1448 APR – “EC145 c/s I believe you have entered Southend aerodrome traffic zone there is traffic in the Southend circuit at one thousand feet believed to be directly in front of you”. No reply received.

1449 APR – “EC145 c/s are you just crossing the coastline to the righthand side is there an island on your righthand side”. (part word-si). No reply received.

APR – “EC145 c/s Southend radar do you read me”. No reply received.

1450:30 APR – “EC145 c/s Southend radar”. No reply received.

UKAB Note (3): The UK AIP at AD 2-EGMC-1-5 Para 2.17 promulgates Southend ATZ as a circle radius 2nm centred on longest notified RW (06/24) 513417N 0004144E from the sfc to 2000ft aal, aerodrome elevation 48ft amsl.

UKAB Note (4): Analysis of the Debden radar recording reveals only the encounter between the PA31 and EC145. At 1446:30 the EC145 is seen 3.5nm N of Southend steady tracking 190° squawking 0210 (Stansted/TC assigned code) indicating altitude 1000ft (London QNH 1020mb) which is maintained throughout. At the same time, a 7000 code is seen, believed to be the PA31, 4.25nm WSW of Southend tracking 040° indicating 1500ft QNH descending. Just over 30sec later (1447:06) the EC145 squawk changes to 7000 before it enters the ATZ 12sec later crossing through the PA31's 12 o'clock range 2.5nm, both ac indicating altitude 1000ft. The ac continue to close as the EC145 slowly diverges until the CPA occurs at 1447:54, the PA31 now at 900ft with the EC145 in its 3 o'clock range 0.6nm, 100ft above it. The EC145 then passes 1.15nm W of Southend before exiting the ATZ at 1449:00 2nm SW of the aerodrome.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear that the Airprox was caused by the unauthorised penetration of the Southend ATZ by the EC145 pilot who flew into conflict with cct traffic. Members concurred with the EC145 pilot's comments that there was no excuse for infringing an ATZ which is clearly shown on 1:250,000 and 1:500,000 topographical charts. Moreover, the pilot should not have been relying on the NMS which should have been used as an aid to VFR navigation (map reading), not the primary method of navigation. ATCO members were critical of the EC145 pilot for not informing ATC if he was unsure of his position as this would have alerted the ATSU that he might need assistance. Also, contrary to his report, the radar and RT transcript had shown the ATS with Stansted/Essex had been terminated, a change of squawk to 7000 conspicuity code was seen and the EC145 pilot had then called on the Southend frequency and been given a FIS, not a radar service. He had, erroneously, reported at Gravesend and after the APR had established that the helicopter was entering the ATZ, it was of concern that when TI on conflicting cct traffic had been given and he had been informed of the ATZ infringement, he did not reply to any of the transmissions or report leaving the frequency.

Turning to risk, the ATC team at Southend had done well to spot the potential confliction. The ADC and APR had passed timely and accurate TI to the PA31 pilot who had seen the crossing EC145 and assessed that it posed no risk. The ADC had then told the PA28R pilot of the crossing helicopter and issued an early R turn out, after its touch and go, as avoiding action. The PA28R pilot saw the EC145 crossing R to L and turned R, passing behind and below it. Taking into account all of these elements, the Board were able to conclude that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Unauthorised penetration of the Southend ATZ by the EC145 pilot who flew into conflict with cct traffic.

Degree of Risk: C.

AIRPROX REPORT No 126/04

AIRPROX REPORT NO 126/04

Date/Time: 14 Jul 1515

Position: 5144N 00008E (Departure from
RW20 North Weald - elev 32 ft)

Airspace: North Weald ATZ (Class: G)

	<u>Reporting Ac</u>	<u>Reported Ac</u>
<u>Type:</u>	C172	B25 Mitchell

<u>Operator:</u>	Civ Pte	Civ Pte
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<u>Alt/FL:</u>	200ft (QNH 1014 mb)	510ft (QFE 1003)
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<u>Weather</u>	VMC CLBC	VMC CLBC
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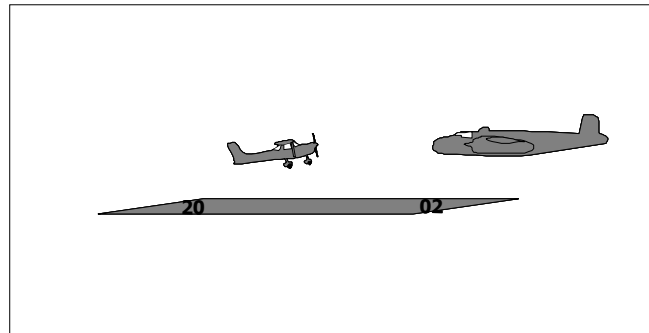
<u>Visibility:</u>	>10km	10km
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Reported Separation:

0 V/300yd H	500ft V/200m H
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Reported Separation:

NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C172 PILOT reports flying a dark blue and white ac with strobes selected on from North Weald to a farm strip. Shortly before take off while she was in contact with North Weald Radio, she heard another ac call for joining instructions and call 'Base Leg'. She called ready for departure from RW 20 and shortly after called '*lining up for immediate departure*' and requested a L turn out onto track. As the RW in use was 20, she assumed the other ac was behind her. On take off she saw a twin engined Mitchell Bomber with its landing lights on coming towards her at the far threshold of the opposing RW and the same height. She made a L turn to avoid it, as a R turn would have taken her ac further across the Mitchell's path. It passed down her right side 300yd away, just above, and she assessed the risk of collision as being high.

THE B25 MITCHELL PILOT reports heading 020° at 180kt positioning the Mitchell bomber from Duxford to North Weald. The flight was carried out in VMC below a solid cloud layer at 2000ft. They had routed to the West of the Stansted Control Zone via BKY and BPK. On approaching North Weald they requested joining instructions and they were advised of the QFE and that RW 20RH was in use. They requested any traffic and were told there was no known circuit traffic but that one ac was taxiing for departure. They then stated that they would join base for 02 [he thought] to make a fly by and circle to land RW 20: again they were informed there was no known traffic to affect. They joined base and called, with no response they then called final, again no reply. They had all available lights on the ac switched on. On crossing the threshold at 500ft they saw a C172 coming the other way and making a climbing L turn to avoid them. They immediately turned L and climbed away. At this point the North Weald Radio Operator told them to climb to circuit height and join for RW 20RH, which they were already doing. They did not at any time hear any radio calls from the C172. Having later spoken with the Cessna pilot they said that she was not aware of what the Mitchell was doing and had made RT calls lining up and taking off. The incident was brought about by their non standard join to the circuit; however this was only carried out as they had been informed that there was no traffic and they were not aware of the presence of the Cessna. If they had been aware of, or informed of the traffic they would have carried out a normal circuit join. He understood that this was not the first time such an incident had occurred at North Weald and thought that an Air Ground Service was not sufficient for an airfield housing such a diverse collection of high performance ac.

UKAB Note (1): The transcript of the North Weald reveals the following:

TO	FROM	TRANSMISSION	TIME
North Weald	NXXXXX	<i>'Er Callsign B Twenty Five Mitchell inbound to yourselves from Duxford er we're just passing Ware twelve hundred feet one zero one four for joining'</i>	1408
NXXXXX	North Weald	<i>Callsign runway two zero righthand QFE one zero zero three'</i>	
North Weald	NXXXXX	<i>'Two zero right one zero zero Callsign</i>	
North Weald	NXXXXX	<i>'Er callsign you any circuit traffic'</i>	1409
NXXXXX	North Weald	<i>'One for er taxiing for a departure nothing else known'</i>	
North Weald	NXXXXX	<i>'Roger I'd like to join then left base for two zero for a fly by circuit height'</i>	
NXXXXX	North Weald	<i>'Roger'</i>	
North Weald	G-YYYY	<i>'Callsign is ready to line up for immediate departure'</i>	1409
G-YYYY	North Weald	<i>Callsign roger current wind two four zero seven knots'</i>	

UKAB Note (2): The North Weald management believes that the times on the transcript may be up to 4min slow.

UKAB Note (3): A primary contact matching the track for an approach to North Weald RW 02, as described by the Mitchell pilot, can be seen on the recording of the Debden radar before and after the event. Although the 7000 with Mode C squawk of the C172 can also be seen shortly after the event, neither ac painted at the time of the incident.

ATSI reports that no report was received from A/G operator; he confirmed only that he was providing an A/G service at the time and that it was from the VCR. The RTF recording reveals that the B25 pilot was informed that the RW in use was 20 with a right hand circuit, which was read back correctly by the pilot and thereafter he stated his intention of joining left base for RW 20, followed by a fly by at circuit height, neither of which he apparently carried out. It is unfortunate that the B25 pilot did not state for which RW when reporting on base leg and later on final approach.

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 radar video recording.

The Board regarded this as a very straightforward, although potentially serious incident. Despite transmitting his intentions very clearly the Mitchell pilot, possibly due to his confusing RWs 02 and 20 in his mind, did not then follow that flight profile. This resulted in his ac flying into conflict with, and hazarding, the C172 that was departing in accordance with the procedures in force at the time. Fortunately the sequence of events was such that the C172 pilot saw the Mitchell at a time when circumstances allowed her to take effective avoiding action.

PART C: ASSESSMENT OF CAUSE AND RISK

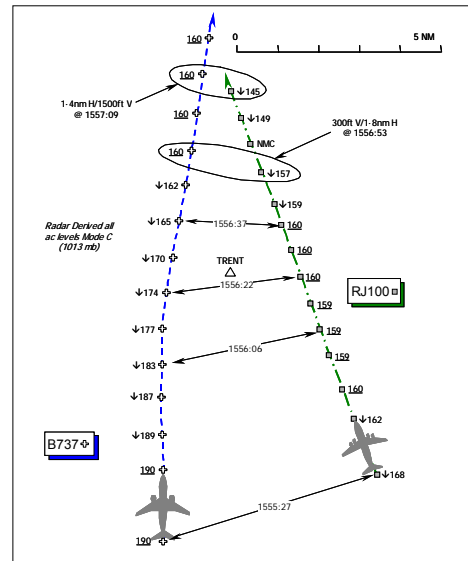
Cause: The Mitchell pilot did not follow his stated intentions, joined for the incorrect RW below circuit height and flew into conflict with the departing C172.

Degree of Risk: B.

AIRPROX REPORT NO 127/04

Date/Time: 16 Jul 1556
Position: 5306N 00140W (3nm N of TRENT VOR)
Airspace: Daventry CTA (Class: A)
Reporting Ac Reported Ac
Type: RJ 100 B737
Operator: CAT CAT
Alt/FL: FL150↓ FL160

Weather VMC CLAC NR CLBL
Visibility: 50km >10km
Reported Separation:
 300ft V/1.5nm H NR
Recorded Separation:
 300ft V @ 1.8nm H
 1.4nm H @ 1500ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE RJ100 PILOT reports that he was in descent into Manchester, NNW bound and in receipt of an ATC service from MACC. He was flying in VMC, with scattered cloud at 11,000ft and an in-flight visibility of 50km. In the vicinity of the TNT [TRENT] VOR in a stepped descent at 250kt from FL160 to FL140, a TCAS TA was enunciated on traffic at 10 o'clock - 5nm away, some 500ft above his ac and descending towards them. Upon passing FL150, ATC requested that they increase their rate of descent, whereupon a B737 was acquired visually at 10 o'clock at a range of 3nm. The autopilot & auto throttle was disconnected and the descent rate increased to 3500ft/min; the B737 passed through their 12 o'clock at 1½nm some 300ft above his ac. TCAS did not enunciate an RA. On arrival he discussed the occurrence with the MACC Watch manager. He did not assess the risk.

THE B737 PILOT did not complete an Airprox report form but provided a thorough account of this occurrence after consulting with the 1st Officer, who was the PF. Whilst inbound to Leeds/Bradford the weather conditions were good with a visibility of >10km, although there were thin layers of scattered cloud at varying levels through which they were descending. They were being stepped down by MACC in their descent towards Leeds and were in the vicinity of the TNT VOR. The speed was approximately 300kt maintaining a reasonable RoD (about 1000ft/min) in a stepped descent which they assumed was necessitated because of an ac descending below them. He could not remember the specific flight level they were cleared to. 'Proximate' traffic was shown on TCAS descending beneath them and slightly behind, which he reported to ATC. The Controller instructed the other ac [the RJ100] to increase his RoD. Soon thereafter the 'proximate' indication became a TA and his 1st Officer saw the other ac in their 4 o'clock about 1nm away and below their level. Cloud had previously obscured the other ac: however, the RJ100 was now visibly clear of their flight path and posed no threat and the TA cancelled itself after only a brief period. He did not assess the risk.

THE MACC TRENT SECTOR CONTROLLER (TRENT SC) reports that the Sector had been opened about 10min before the occurrence as it had become busy very quickly with traffic presented by LACC DAVENTRY Sector. The B737 was flying parallel to and to the W of the RJ100. His first priority was to descend the RJ100 and then to descend the B737 in turn, whilst repositioning both ac appropriately. He descended the RJ100 to FL160 and when it was below FL166, descended the B737 to FL170, with the ac on converging headings, to achieve the crossover. As they approached each other, in plan, he descended the RJ100 to FL140 and observed the Mode C passing, he thought, FL159 so assumed [erroneously] that it was descending whereupon he instructed the B737 to descend to FL160. However, as the labels garbled, he quickly realised that the rate of descent of the B737 was far greater than that of the RJ100. Therefore, he immediately instructed the RJ100 to expedite descent through FL150, but did not issue any avoiding action as the B737 was already ahead, and faster than the RJ100. Traffic information

AIRPROX REPORT No 127/04

was not issued but prescribed separation was eroded; he assessed that minimum horizontal separation was 2nm and the minimum vertical separation 300ft.

ATSI reports that at the time of the Airprox, both ac were in receipt of an Area Control Service from the TRENT SC located at MACC and both the workload and traffic loading were described as 'very high'. The relevant ATC equipment was all reported to have been serviceable and no other factors, which may have adversely affected the controller's performance, were identified during the course of the investigation.

Up until some 10min before the Airprox, the STAFA/TRENT Sector had been operating in a 'bandboxed' mode as traffic levels were light. It became apparent, by the arrival of numerous fpps that this situation would change shortly. The controller was summoned back from a break to open the TRENT sector, which he did. He advised that there was little traffic at first and then numerous flights started to call. The Sector CO-ORDINATOR had alerted him to the fact that the RJ100 and B737 would not be in optimal positions when they came onto his frequency. Normally, Leeds traffic is positioned onto the E side of the airways system and Manchester inbounds further W, closer to the centre of CAS. The RJ100 established communication with the controller at 1551:10, and reported descending to FL200, heading 335° and maintaining a speed of "...two ninety or less". The ac was positioned on the E side of the airways complex and passing abeam Birmingham. The controller instructed the crew to continue on the heading with the speed restriction. Approximately 2min later, the B737 crew established communication with the TRENT SC and reported descending to FL200 "...with a good rate". At that time, the B737 was in the RJ100's 8 o'clock - 6.5nm heading 330°. The B737 was W of the RJ100, on a slightly diverging heading, and, due to their respective destinations of Leeds and Manchester, the SC realised that he would have to reposition the ac so that the B737 was east of the RJ100. His task was to cross the tracks over and comply with the Standing Agreement for the B737, which was to be level at FL120 by the northern Sector boundary, as well as descending the RJ100 to its allocated stack level of FL90. The controller descended the RJ100, initially to FL180 and then to FL160. He then instructed the crew of the B737 to turn R onto 360° and descend to FL190. Up to that point, the two ac had been flying almost parallel with each other, 6-8nm apart. At 1555:25, the controller instructed the RJ100 crew to reduce speed to 250kt. He subsequently explained that this was to stream the ac behind another Manchester inbound. By that stage, the RJ100 was passing FL168 whilst the B737 was in its 9 o'clock position at 5.6nm. The controller then instructed the B737 to descend to FL170. At 1556:00, when the 2 ac were 4.3nm apart, with the Mode C of the RJ100 indicating FL159, although in fact the ac was maintaining its cleared level of FL160, the controller transmitted to the B737 crew "[C/S] turn further right onto 010 degrees and just...say maintain in fact descend now to flight level 160". At the conclusion of this transmission, the radar recording shows that the RJ100's Mode C was still indicating that the ac was maintaining FL160, whilst that of the B737 was passing FL177 in the descent to FL160. The ac were now only 3.7nm apart and converging. The controller reported that the SSR labels of the 2 ac were overlapping and so the Mode C indications were not clear.

At 1556:15, the controller instructed the RJ100 crew to descend to FL140 and whilst the pilot was reading this back STCA activated at 1556:24. The controller reacted to this by transmitting at 1556:30, "And [RJ100 C/S] can you give me a good rate now through 150". The ac were still virtually abeam each other, but converging at a range of 2.9nm. The Mode C of the RJ100 indicated FL160 and that of the B737 FL174, still reducing fairly rapidly. Shortly afterwards, at 1556:40, the crew of the B737 transmitted "[C/S] we have traffic 300 feet below". The radar recording shows the RJ100, still indicating FL160, heading 335° with the B737 in its 9 o'clock position at 2.6nm passing FL165. The two ac continued to converge and the controller transmitted "[RJ100 C/S] expedite through one five zero for me". Recorded vertical separation reduced to a minimum, at 1556:53, when the RJ100 was passing FL157 with the B737 in its 10 o'clock at 1.8nm and 300ft above.

The controller stated that it was his normal practice, when using Mode C readouts to climb and descend ac to levels previously occupied, to wait until the ac had passed through the level by some 200ft. By the time the clearance was issued and read back he would have expected the ac vacating the level to be 500ft or more through it. MATS Part 1, Section 1, Chapter 5, Page 10 para 9.3.1 c) states:

"An aircraft climbing or descending may be considered to have passed through a level when the Mode C readout indicates that the level has been passed by 400 feet or more and continuing in the required direction".

At the time the descent clearance to FL160 was issued to the B737, the Mode C of the RJ100 indicated FL159↓. The Mode C readout of the RJ100 remains at FL159 for several sweeps of the radar and then changes to FL160. Furthermore, the ground speed readout reduces from 370kt to 320kt in compliance with the controller's instruction to reduce to 250kt (IAS). It seems probable, therefore, that the controller mistakenly interpreted the Mode C

readout of the RJ100 as descending through FL159 and on this basis wrongly cleared the B737 to FL160. The controller said that, in his opinion, the frequency was extremely busy, and the RTF recording supports this. He commented that the ATIS message at Manchester requires ac to report their ac type and the code letter of the message received on first contact with Manchester. Some crews provide these details when they first call MACC, rather than Manchester APPROACH, which is the intention of this requirement but it can increase the Sector RTF loading. He went on to say that at the time he was giving the descent clearances to the subject ac, as they progressed northwards, their SSR labels were overlapping. However, both the STAFA controller, who was sitting adjacent to the subject controller, and the CO-ORDINATOR drew his attention to the developing problem. His recollection was that, having been alerted to the problem, he could not get in on the frequency due to RTF congestion. This is not substantiated by the RTF recording, which shows that between 1556:00, when the clearance to descend to FL160 was issued to the B737, and 1556:40, when the pilot of the B737 reported traffic 300ft below, the only communications on the frequency were three short RTF exchanges between the controller and the subject ac.

MATS Part 1 lays down criteria for assessing level occupancy, and also when controller may allocate a vacated level to another ac, using Mode C readouts. Had these requirements been followed then it is unlikely that this Airprox would have occurred.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The commendably frank report from the MACC TRENT SC and the comprehensive analysis provided by ATSI had set out for the Board the essential factors within this Airprox. It had been revealed that in attempting to crossover the B737 and RJ100 and descend the two ac to the levels required, standard separation had not been maintained. Members concurred with the view expressed in the ATSI report that when the TRENT SC had observed the RJ100 at FL159, he had erroneously perceived at that moment that the RJ100 was descending. In fact, the RJ100 crew were actually levelling their ac at the assigned level in accordance with the TRENT SC's own instructions to descend to FL160. Whilst recognising that the radar recording did not replicate what was actually displayed to the SC, it did illustrate this Airprox quite clearly and showed three concurrent indications from the RJ100 at FL159 just before the ac settled at the assigned level. Although the SC had issued a speed reduction to 250kt, evidently he had not descended the RJ100 further from FL160 before he had instructed the crew of the B737 to descend to that same level. In this situation with the ac on converging tracks and the B737 overtaking the slower RJ100 it was clear that horizontal separation could not be maintained. Here the prescribed horizontal separation, below FL195 and N of a line through TRENT – STAFA, was 3nm. Consequently, although he had instructed the RJ100 crew to descend to FL140 15sec later and subsequently asked for a good rate of descent, Members agreed that the vertical separation between these two ac had not been assured. The ATSI report had pointed out that the criteria for assessing level occupancy and also when a controller may allocate a vacated level to another ac using Mode C readouts are clearly laid out in the applicable MATS Part1 entry. Controller Members agreed that had these requirements been complied with, then this Airprox would not have occurred. Thus the Board determined that this Airprox had resulted because the MACC TRENT SC had descended the B737 to the level already occupied by the RJ100.

Having been alerted to the situation firstly by STCA and also by the transmission from the B737 crew, the TRENT SC had asked the RJ100 crew to “...*give me a good rate now through 150*” thereby attempting to restore separation more quickly. Although the SC had not prefixed his next transmission with the words ‘avoiding action’ it was clear that the RJ100 crew had responded appropriately to the second request to “...*expedite through one five zero for me*” by deselecting the ‘automatics’ and descending the ac at a good rate. Whereas the B737 had been a mere 300ft above the RJ100 at a range of 1.8nm, the latter's crew had achieved some 1500ft below the B737 by the time that horizontal separation had reached a minimum of 1.4nm. Furthermore, the RJ100 crew were flying in VMC and the B737 had been spotted out at ten-o'clock as it drew ahead. The B737 crew was also aware of the other ac visually and also from TCAS, which was ready to act if needed but as it was only a TA had resulted. Therefore, the Board agreed unanimously that no risk of a collision had existed in these circumstances.

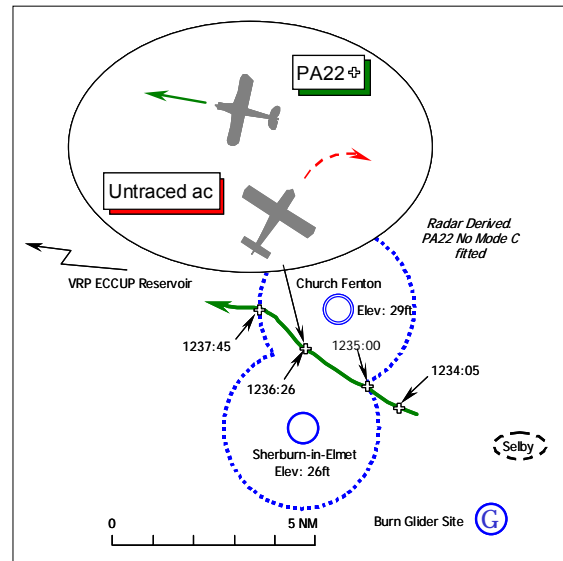
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The MACC TRENT SC descended the B737 to the level already occupied by the RJ100.

Degree of Risk: C.

AIRPROX REPORT NO 128/04

Date/Time: 18 Jul 1236 (Sunday)
Position: 5349N 00113W
 (2nm N of Sherburn-in-Elmet)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: PA22 Untraced
Operator: Civ Pte NK
Alt/FL: 2200ft NR
 (1013mb)
Weather VMC CLBC NR
Visibility: 30km NR
Reported Separation:
 nil V/50-100m H NR
Recorded Separation:
 Not recorded

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

THE PIPER PA22 PILOT reports he was flying from Sandtoft to Leeds Bradford Airport in his red & white ac, in level cruise at an altitude of 2200ft Leeds QNH (1013mb), some 1500ft clear below cloud with an in-flight visibility of 30km. Whilst contacting Leeds APPROACH (APP) overhead Selby, North Yorkshire he had taken up a track from North Selby to Eccup Reservoir (VRP) whilst in receipt of a FIS from APP, squawking the code assigned: the ac was not fitted with Mode C at the time of the Airprox. His planned track had consciously bisected the airspace between Sherburn and Church Fenton and he was approaching a position 2nm N of Sherburn Aerodrome at 1230UTC, he thought, heading 285° at 87kt. He opined that this is a busy section of airspace and during his lookout scan he saw a movement in his L peripheral vision. Upon turning his head to the 7o'clock he saw a white low-wing single engined ac – possibly a RANS RV6 or a Europa – passing behind him in a “max rate” turn to starboard with about 75° AOB. The minimum separation was about 50-75m at the same altitude: he added that it was hard to judge but the other ac was at most 100m away. He took no action to avoid the other ac himself as its pilot was turning away: moreover there was no time to do so. He assessed the risk as “very high”.

AIS MIL reports that the other ac is not shown on radar recordings. The Claxby radar was used to track the PA22 from a position 9nm SE of the reported Airprox position, but no other ac is shown in its vicinity which might possibly be the reported ac. Despite extensive enquiries they have been unable to identify the other ac which therefore remains untraced.

UKAB Note (1): Mil ATC Ops advises that Church Fenton ATC was closed on this particular Sunday. The UK AIP at ENR 2-2-2-1 notifies the Church Fenton ATZ as a radius of 2nm centred on RW06/24, extending from the surface to 2000ft above the aerodrome elevation of 29ft amsl, Fri-Sun 0600-2259UTC in summer.

UKAB Note (2): The UK AIP at ENR 2-2-2-1 notifies the Sherburn-in-Elmet ATZ as a radius of 2nm centred on RW11/29, extending from the surface to 2000ft above the aerodrome elevation of 26ft amsl, 0830-Sunset in summer. An A/G Station operates on 122.6MHz, callsign SHERBURN RADIO, during these hours.

UKAB Note (3): This Airprox is not shown on recorded radar, nor is another ac shown in the immediate vicinity of the PA22 either before, during or after its transit between Church Fenton and Sherburn-in-Elmet aerodromes above the respective ATZs. The PA22 is shown NW bound from Selby following the pilot's reported track (NMC fitted), but the ac passes the reported Airprox location of 2nm N of Sherburn-in-Elmet some 6min 26 sec after the reported timing given by the PA22 pilot, whilst still tracking NW. Furthermore, the PA22 pilot reports that the Airprox occurred whilst heading 285°, but the ac is not shown on this heading until it is 2nm W of Church Fenton after 1237:45.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the pilot of the PA22, radar video recordings, and a report from the appropriate tracing agency.

It was unfortunate that AIS (Mil) had been unable to identify the reported ac and so it was immediately apparent to the Board that with only the PA22 pilot's view of this Airprox it would be difficult to arrive at any meaningful conclusions and virtually impossible to draw any safety lessons. The Board was briefed that the PA22 did not show clearly on primary radar and was probably at the outer limits of recorded primary radar coverage, but the Claxby SSR did show the PA22 very clearly. Although the reported position, timing and heading given by the reporting pilot did not quite gel with the radar recording, the pilot had subsequently confirmed in a telephone call that the Airprox occurred in the reported position of 2nm N of Sherborn-in-Elmet. From the PA22 pilot's perspective he had reported sighting the other ac in his 7 o'clock - no more than 1000m away - as the other pilot was making what appeared to be a robust avoiding action turn. As the other ac was at the same altitude it appeared it was also above the Sherburn ATZ in the 'Open FIR', but without a report the Board was unable to determine whether the other pilot had seen the PA22 and was taking avoiding action or not. Therefore, the Board could only conclude, rather unsatisfactorily, that this report had stemmed from a conflict with an untraced ac. Furthermore, with only one pilot's view and no conclusive radar data, the Members concluded there was insufficient information available to assess the risk.

As a general airmanship point, it was evident to Members that the PA22 pilot was flying just above the upper limit of the respective ATZs as he transited between Church Fenton and Sherburn-in-Elmet under a FIS from Leeds APP. Leeds would not have any knowledge of the cct traffic at Sherburn so whilst recognising the PA22 pilot's legitimate right to be where he was, it might have been more appropriate to communicate with SHERBURN RADIO at this stage of the flight whilst passing this close to another aerodrome. This was not meant as a criticism of the PA22 pilot: some thought that a better understanding of the local traffic scenario in the immediate vicinity might have been acquired from contact with Sherburn, before switching to Leeds APP just W of the lateral ATZ boundary.

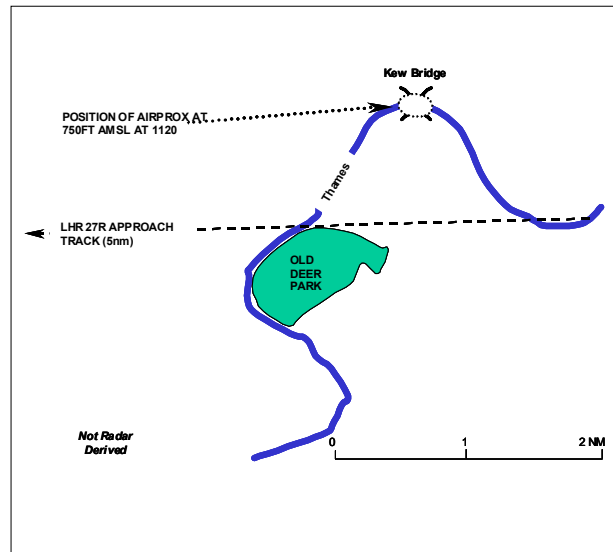
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the FIR with an untraced ac.

Degree of Risk: D.

AIRPROX REPORT NO 129/04

Date/Time: 18 Jul 1120 (Sunday)
Position: 5125N 00024W
 (Kew Bridge London)
Airspace: London CTR (Class: A)
Reporting Ac *Reported Ac*
Type: AS 355 F2 Model ac
Operator: Civ Comm NK
Alt/FL: 750ft NK
 (QNH 1014)
Weather VMC CLBC NK
Visibility: >10km NK
Reported Separation:
 0 H 10-20ft V NK
Recorded Separation:
 NR

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

THE AS 355 PILOT reports flying a white, blue and gold ac on a non-scheduled passenger sightseeing flight over London in contact with the Heathrow SVFR Controller and squawking as directed. He was flying at 750ft amsl at 125kt and heading 285° approaching Kew Bridge on route H10 when he saw what appeared to be a light fixed wing ac flying on the approach path for LHR 27R. He then realised that it was a radio controlled model ac and that it was very close (100ft away at about the same height) so he initiated a hard L turn to avoid it and tracked it visually as it passed from the front R windscreen past the R chin bubble window. It was close enough for him to make out the engine and sprung nose leg. As soon as it had passed, he turned hard R to avoid conflict with LHR inbounds and to maintain the Helicopter Route. He saw the model descending towards the central point of the river between Kew and Richmond Bridges. Neither he nor any of his 5 passengers, all of whom saw the model, could see any evidence on the ground of radio control activity.

UKAB Note (1): Despite extensive attempts, including help from the British Model Flying Association, the operator of the model ac could not be traced. A ground witness of the incident reported people operating model ac from Old Deer Park at the time of the Airprox.

THE LTCC LL SVFR Controller He was working an AS 355 helicopter on a pleasure flight. At the time of the incident the helicopter was Westbound on H10 when the pilot reported that he had had an Airprox with a radio-controlled ac and that he would be taking reporting action. No contacts were observed on radar on either of the LHR radar heads.

UKAB Note (2): Although the AS 355 can be seen on the recording of the Heathrow radar, the model cannot be seen at any time.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included only the report from the AS355 pilot and a radar video recording.

Members found it difficult to comprehend how a model ac came to be operating at such a high altitude in a busy part of Class A CAS not far from Central London. If the model ac was being flown from Old Deer Park, as had been suggested, it had probably strayed out of radio range and was therefore not under control at the time and could have gone anywhere. In the absence of any other information the Board determined that this was the most likely cause of the Airprox. If this were the case, and since the AS355 pilot was close enough to describe the model in such detail while conducting an evasive manoeuvre, then it was clear that due to the proximity of the model, the

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safety of the helicopter had not been assured. No data was available on the effect that the helicopter would have had on the model and whether they would have collided or whether the airflow round the helicopter would have deflected the model to such an extent that they would have missed each other.

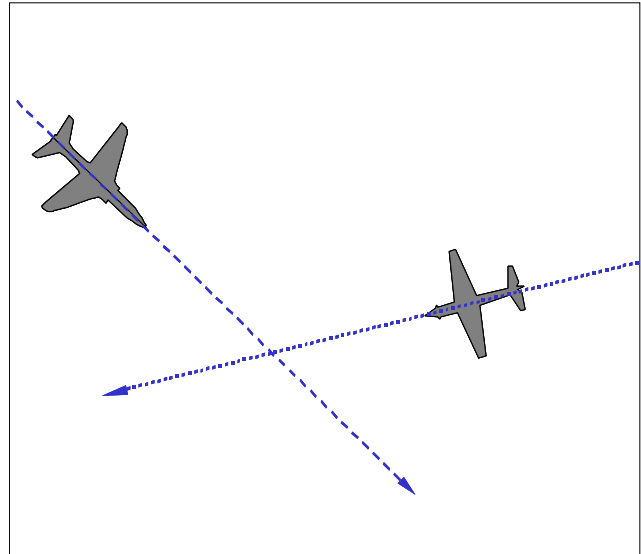
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class A Airspace with an untraced model ac.

Degree of Risk: B.

AIRPROX REPORT NO 131/04

Date/Time: 22 Jul 1040
Position: 5422N 00101W
 (5nm E Billsdale Mast)
Airspace: UKDLFS (Class: G)
Reporting Ac *Reported Ac*
Type: Tucano Hawk
Operator: HQ PTC HQ STC
Alt/FL: 250ft agl 250ft agl
 (RPS 1013mb) (RPS)
Weather VMC CAVOK VMC CAVOK
Visibility: >10km >10km
Reported Separation:
 100ft V/50m H Not seen
Recorded Separation:
 Not recorded

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

THE TUCANO PILOT reports flying a black ac with HISLS and landing lights selected on squawking 7001 on a QFI instructional sortie in the UKDLFS. He was heading 255° at 240kt and as he levelled off at 250ft, having pulled up to cross a ridgeline, he spotted a Hawk in his 2 o'clock 1nm away on a converging heading, and slightly above his level. Because he was already beneath the Hawk and the valley was opening up in front of him, he bunted and the Hawk passed above and behind him. The Hawk appeared to be on a heading of ~140° and remained straight and level throughout the encounter.

THE HAWK PILOT reports that he was informed of the Airprox by telephone a few days after the event. He had been on a low level Navigator instructional sortie in the North Yorkshire Moors flying at 420kt. He saw a Tucano 2min before the reported event, but it transpires that this was not the reporting ac. The Airprox was about 1min later and less than 2min to an Initial Point (IP) for a target run and he then entered a busy period of pre-target checks with the Weapon System Operator. He did not see the reporting ac. They were 5nm NE of Billsdale mast at the reported time of the Airprox and at that time had been heading 130° and at about 300ft agl. The terrain was hilly in the area concerned and he could quite possibly have been in a nose up attitude in rising terrain.

THE TUCANO STATION comments that this would appear to be a relatively routine encounter at low level. Fortunately, the Tucano pilot became visual soon enough to assess his options although, given the terrain, they were limited. The introduction of TCAS 1 in 2005 will provide Tucano pilots with a vital aid to resolve conflicts of this nature more effectively resulting in greatly enhanced safety margins.

THE HAWK STATION comments that as the Hawk crew did not see the ac that is believed to have originated the Airprox signal, they are unable to comment on the risk of this Airprox. What is apparent, however, from both the originating signal from the Tucano, and from the Hawk pilot, is that the undulating terrain might have been a factor in a late tally. In the case of the Hawk, it is possible that increased workload approaching a target run may have reduced lookout time and that this may have also been a contributory factor. The lesson remains unchanged – in the busy airspace that surrounds the Vale of York airfields, lookout must remain at the top of the priority list.

HQ PTC comments that although the Tucano pilot saw the Hawk at 1nm, he was restricted from taking more radical action to achieve greater separation by the rising terrain. However, being already slightly below the other ac, we are content that he was able to maintain a constant tally on him and to take the optimum avoidance (bunt) once the terrain opened up beneath him, without any significant risk.

HQ STC comments that the Tucano's black colour scheme, and the fact that it was below the Hawk, was almost certainly the main reason why the crew failed to spot the Tucano. The adopted black colour scheme works well

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when highlighted against cloud or blue sky but less well against the dark ground of the North Yorkshire Moors. It is unlikely that the Tucano's wing mounted landing lights were visible to the Hawk. The Tucano pilot made a good decision to avoid the Hawk, which was in keeping with the spirit of the Rules of the Air. We echo the Hawk Station's comments regarding the Hawk's lookout and expect the proposed fit of TCAS to the Tucano will reduce the risk in the future.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted that this incident had occurred in the North Yorkshire Moors, a very busy low flying area both for training and operational ac where the rolling and hilly terrain limits acquisition time available for ac flying at 250ft agl. In this case however, both ac needed to be at that height in order to accomplish their respective training tasks. Experts advised, however, that good practise and teaching in 2-seat ac is always to have one crewmember specifically nominated to conduct lookout duties; this is even more important in situations where the crew workload is high as lapses are more frequent.

Ac colour schemes are always a matter of compromise and 'high visibility' differs not only from high to low altitude but also on ambient light conditions. In this case, the black colour and wing mounted landing lamps had not helped the Hawk pilot to acquire the Tucano and may even have had the opposite effect.

Members determined that the appropriate and timely action of the Tucano pilot had prevented there being any risk of the ac colliding in this incident. The Board noted and welcomed the fitment of ACAS to Tucano, and other military ac, as Members considered that this would provide a marked enhancement to flight safety of military and civil ac alike.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the FIR (UKDLFS) resolved by the Tucano pilot.

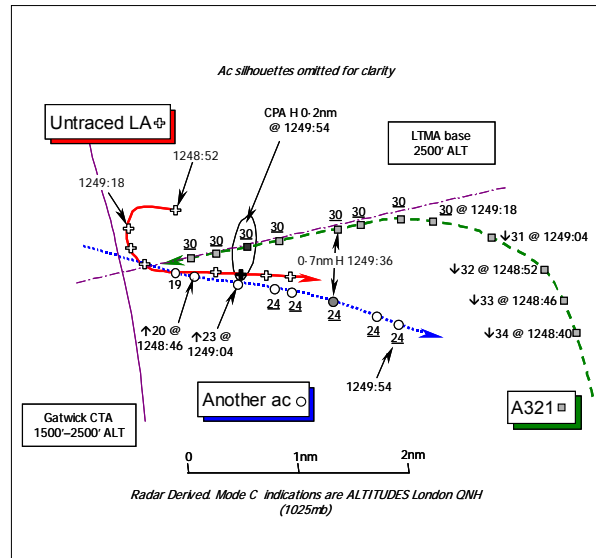
Degree of Risk: C.

AIRPROX REPORT NO 132/04Date/Time: 24 Jul 1249 (Saturday)Position: 5112N 00011E (14nm finals RW26L
London Gatwick - elev 196ft)Airspace: LTMA (Class: A)Reporting Ac Reported AcType: A321 Untraced Light acOperator: CAT NKAlt/FL: 3000ft NK
(QNH 1025mb) -Weather VMC CLOC NKVisibility: NR NKReported Separation:

100ft V/1/2nm H NK

Recorded Separation:

0.2nm H

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

THE A321 PILOT reports he was inbound to London Gatwick IFR and in receipt of radar vectors under a RCS from GATWICK APPROACH on 126.82MHz. The assigned squawk of A1017 was selected with Mode C. HISLs and landing lights were selected 'on'.

Flying level at 3000ft QNH (1025mb) in VMC, approaching 15nm finals to RW26L heading 260° prior to descent at 160kt, a contact was first seen on TCAS at 12 o'clock about 1/2nm away and 100ft below his ac. He looked up and both he and his 1st Officer saw a single engine low wing light ac (LA) – it had a dark coloured fuselage with white wings – similar to a Piper Warrior in their 1230-1 o'clock position executing a stall turn/wingover some 100ft below his ac's altitude. Recognising immediately that the LA did not have sufficient energy to climb up to his airliner's altitude, he did not deem it necessary to take any avoiding action. The LA then dived down gaining airspeed and crossing from R – L about 400m ahead to about 4-800ft below his ac, before passing down his ac's port side and clearing astern. During this period, TCAS enunciated an RA – MONITOR VERTICAL SPEED – so the autopilot was disconnected and he was prepared to manoeuvre if need be, but none was required. He assessed the risk as "medium" and stressed that the LA only appeared on TCAS at a range of 1/2nm despite the 10nm scale being selected. He believed that the RA was generated by the light ac that he had seen.

THE LONDON GATWICK AIRPORT AIR CONTROLLER (TOWER), reports that at 1249UTC, whilst passing 10nm from touchdown for RW26L, the A321 crew reported sighting a light ac performing aerobatics some 400ft below their ac. TOWER informed the A321 crew that the traffic was unknown and asked if the pilot was happy to continue his approach, which he was. Gatwick RADAR was contacted and he informed them of the A321 pilot's report. The LA was not known to them nor was its pilot in contact with Gatwick RADAR, but the A321 crew was told about them. However, the crew reported that the unknown LA – a "warrior type" ac – was now behind them.

AIS (MIL) reports that despite extensive enquiries around the vicinity of this Airprox, they have been unable to identify the primary contact that is believed to be the reported LA. The pilot of another ac squawking A7000 was traced and was eliminated as the reported LA. Unfortunately, although this pilot remembers seeing an airliner in the distance he did not spot the unidentified LA himself.

UKAB Note (1): Tracing action was terminated on 23 Nov 2004. The identity of the reported LA remains unknown.

ATSI commented that there are no apparent ATC causal factors within this Airprox which occurred when the A321 was flying level at 3000ft London QNH – some 500ft above the base of the LTMA, which is 2500ft amsl. Because the unknown LA was only displayed to RADAR as a primary return, there was no reason for ATC to believe it had

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penetrated CAS. In this case RADAR had complied with the requirement of MATS Part 1, Section 1, Chapter 6, Page 4, para 9, which states that:

“...controllers should not normally allocate a level to an ac which provides less than 500ft vertical separation above the base of the Control Area...”

UKAB Note (2): MATS Part 1, Section 1, Chapter 5, Page 13, also states that: within Class A airspace,

“Neither avoiding action nor traffic information shall be passed unless radar derived or other information indicates that an ac is lost, has experienced a radio failure, or has made an unauthorised penetration of the airspace.”

UKAB Note (3): The A321 is shown on the Pease Pottage radar recording at 1248:40, descending through 3400ft ALT (1025mb) on a left base leg and closing on the RW centreline from the S. At the same time an A7000 squawk is displayed by ‘Another ac’ at 1900ft ALT Mode C tracking generally ESE. On the radar sweep timed at 1248:46, the ‘other ac’ indicates it is in a climb and is shown passing 2000ft as the A321 is descending through 3300ft ALT, some 1300ft above it. The Untraced LA – shown only as a primary contact – is first displayed westbound on the next radar return at 1248:52, before turning L about. The ‘other ac’ levels at 2400ft whilst maintaining its ESE’ly course as at 1249:18, the A321 levels at 3000ft ALT and eases out of the L turn inbound, closing the centreline gently from the L as the Untraced LA turned through S. The LA then crossed through the RW centre-line and steadies eastbound as it also passes through the A321’s 12 o’clock at a range of 2nm, before the latter passes abeam the ‘other ac’ ‘port to port’ at a range of 0.7nm at 1249:36. At this point the ‘other ac’ indicates 2400ft ALT with some 600ft of vertical separation evident. The A321 achieves the final approach track and passed abeam the Untraced LA just after 1249:54; the minimum horizontal separation at this point was 0.2nm, before the horizontal separation starts to increase between these two ac. No SSR is evident from the untraced LA at all. Thus if no SSR transponder was operative it could not generate the reported TCAS RA indication in the A321. This was more probably the combined result of the climb initiated by the ‘other ac’ whilst below the A321 that was passing through its 12 o’clock descending through 3300ft Mode C.

PART B: SUMMARY OF THE BOARD’S DISCUSSIONS

Information available included a report solely from the pilot of the A321, transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and a report from the appropriate ATC authority.

It was clearly unfortunate that despite the conscientious efforts of AIS (Mil) to trace the LA involved its identity remained unknown. Pilot Members opined that this was a very difficult incident to assess with, effectively, only one side of the story, but the Board agreed that the A321 pilot should not have received a TCAS RA from the non-squawking untraced LA. (Members could not remotely conceive that the LA could have been transponding on Mode A/C and that the squawk had not been recorded.) Without an SSR response, TCAS was effectively rendered blind to non-transponding ac, so Members agreed that it seemed certain that the TCAS RA had been triggered by the other transponding ac when it legitimately commenced its stepped climb beneath the LTMA in Class G airspace. Civilian controller Members stressed that this was one of the inherent problems of TCAS equipped ac operating close to the vertical boundary of CAS with transponding VFR traffic legitimately operating below in the Open FIR. The ATSI report had shown that the A321 was at 3000ft - correctly 500ft above the base of CAS - but airspace boundaries are invisible to TCAS which would not have ‘known’ that the other ac would be levelling off below the LTMA. TCAS had faithfully reacted to the potential conflict with the other ac when its pilot initiated a climb. This RA of “MONITOR VERTICAL SPEED” was essentially passive in nature and did not require any additional action by the A321 crew. CAT pilot Members thought it feasible that the A321 pilot might have misinterpreted the TCAS display and inadvertently misread the separation against the other ac as 100ft when it might have been 1000ft at that point. Certainly over 1000ft of separation was evident when the A321 passed through the other ac’s 12 o’clock and the radar recording evinced no less than 600ft against this contact and 0.7nm at the CPA. Once TCAS assessed the respective acs’ trajectories were no longer in conflict the RA would have cleared.

Noting the potential for nuisance RA’s from transponding traffic below the LTMA, the HQ STC Member observed that the guidance quoted within the MATS Pt 1 might need to be reviewed before the carriage of transponders is mandated throughout UK airspace. But it was evidently this initial warning from TCAS that had moved the A321 pilots’ eyes out of the cockpit at a critical moment whence they acquired the untraced LA visually. The reporting

pilot's assessment of the range – 400m - as the LA crossed ahead was less than that evinced by the radar recording at 2nm but without any Mode C indication from the untraced LA it was impossible to verify the A321 pilot's assessment of the vertical separation. That was not to say that the Board questioned the veracity of the A321 pilot's report in any way, but it was feasible that the untraced LA was manoeuvring legitimately only just below the base of CAS and had appeared closer vertically than it actually was. Members noted that the A321 pilot did not consider that any avoiding action was warranted. Nevertheless, without any independent data to show that the untraced LA had actually penetrated inside CAS the Board could only conclude, rather unsatisfactorily, that this Airprox had stemmed from a perceived conflict with an untraced LA close to the base of the LTMA. Furthermore, the dearth of factual information about the untraced LA precluded any cogent determination of the inherent risk here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Perceived conflict with an untraced LA close to the base of the LTMA.

Degree of Risk: D.

AIRPROX REPORT No 133/04

AIRPROX REPORT NO 133/04

Date/Time: 23 Jul 0647

Position: 5123N 00312E (5nm NW COA)

Airspace: Brussels/Amsterdam UIR/UTA
(Class: B)

Reporter: LACC

First Ac Second Ac

Type: Dornier 328

B757

Operator: CAT

CAT

Alt/FL: FL270

FL270

Weather: VMC

VMC

Visibility: >10km

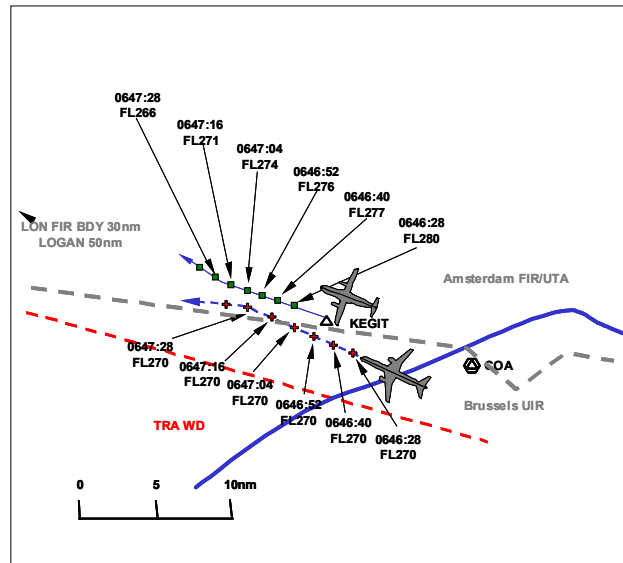
>10km

Reported Separation:

NR ~3nm (ACAS)

Recorded Separation:

100ft V/Min 2.1nm H. (0 V at 2.5nm)



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LACC TACTICAL CONTROLLER (TAC) reports that sectors 12,13 and 14 were operating in a banded configuration and the traffic complexity was increasing considerably as ac were stepping on each other. After consulting with the Planner they called for the sector to be split: however this did not occur until after the incident. The B757 had been co-ordinated in at FL270 (as opposed to the usual level of FL280) beneath the much slower Do328 which was at FL280 but in front. With this in mind, he decided to descend the Do328 to FL250 to sit beneath the B757 to enable him to make its 30 DME LOGAN restriction. He then realised that he had given an unsafe clearance and promptly gave avoiding action to both ac. At no time did either ac report that they had received a TCAS warning. Satisfied that the avoiding action had resolved the conflict he continued controlling the other ac on frequency until the sector was split.

THE LACC CLACTON PLANNER reports that he was working as the planner for the banded Clacton sector and the workload was fairly high. He was alerted by TAC to the conflict between the 2 ac involved. He had not noticed that TAC had descended the Do328 due to his high workload. TAC and he had just decided to split the sector before TAC noticed the unsafe clearance. TAC issued 'avoiding action' to both ac and when he (the planner) was satisfied the action had been successful he returned to planning duties.

THE DORNIER 328 PILOT reports flying a scheduled passenger flight from Munich to London City. He had just passed COA and was handed to London Control while heading 290° inbound LOGAN as cleared at 300kt and FL280 and cleared to descend to FL250. He saw another ac on TCAS overtaking from behind but did not receive any alert or any information from the controller. Shortly afterwards he was given an avoiding action right turn of 20°. The potential conflict was seen by London Control in time to take appropriate action and he assessed the risk of collision as being minor.

THE B757 PILOT reports flying a scheduled freight flight from Frankfurt to Luton heading about 300° inbound LOGAN, as cleared, at FL270 and 420kt. He saw another ac on TCAS at 3nm ahead of him and was surprised that the controller reported that it was descending to FL250 because their initial descent had been to FL270 and at that time they were on a similar heading and overtaking the other ac. However, they did not get any explanation from the controller but he gave an immediate change of heading on to 245°. They did not get any TCAS warning and he did not assess the risk.

UKAB NOTE (1): The incident took place on the boundary of the Brussels/Amsterdam FIR/UIRs on UL179/608 with about 35nm to run to the London FIR/UIR. This is outside the area of airspace delegated to London Control (Clacton S13/14). The respective authorities considered it most appropriate that UKAB investigated the incident.

ATSI reports that the Clacton Sector TAC described his workload as high at the time of the Airprox. This, he thought, was partly because of poor presentation of eastbound traffic from LTCC. As a result of the increase in workload and after consultation with the Planner, a request was made to the Local Area Supervisor (E) to split the sector; however, it remained banded when the incident occurred, the additional controller arriving just afterwards.

The B757 pilot established communication with the Clacton Sector at 0645, reporting: “*Radar good morning (callsign) two seven zero*”. Despite this report, the PFS being annotated with the correct level, and the ac being clearly visible on the radar display, the controller did not register that the flight was at FL270 and assumed that it was at FL280. This level would have been in accordance with the Flight Level Allocation Scheme (FLAS): the agreement is for traffic routeing via COSTA on UL179/UL608 to be level at FL280 at KEGIT. Additionally, however, the LACC MATS Part 2, Page CLN-29, states:

“In circumstances where two or more ac are inbound at the same time, Maastricht may utilise the levels below the normal data transfer level (*FL280*) down to FL260. In this case the ACT message will contain the revised level or telephone co-ordination will take place between Maastricht and S14”.

TAC commented that this co-ordination must have taken place as a copy of the FPS showed that the standard printed level of FL280 had been crossed through and replaced by a hand written FL270. He added that although in the circumstances it is not a specific requirement as both ac were procedurally separated, he would have expected the Planner to have ‘cocked out’ the PFS or otherwise drawn his attention to the revised level. He said that he had no recollection that either had occurred.

The Do328 pilot made his initial call shortly after the B757 pilot. Although the Do328 pilot did not report his level he was, at the time, level at FL280. The radar recording shows that both ac were on similar tracks with the slower Do328, at FL280, 6.4nm ahead of the B757 at FL270. TAC stated that he had believed that both ac had been transferred from Maastricht at the same level (FL280) but agreed that the PFS display would have shown the true situation. He commented that the PFSs for both ac were displayed under the same designator but not directly adjacent to each other. He realised that the Do328 would need to be given an early descent clearance to ensure that it made the Standing Agreement Level of FL220, 30nm before LOGAN. Consequently, at 0646, he instructed the Do328 to descend to FL250. He explained that, due to conflicting traffic at FL240, he was unable to issue descent straight to FL220. He was aware that the B757 was faster than the Do328 (163 knots on filed TAS) but was confident that separation would be maintained. He estimated that the Do328 would pass FL270 on the descent i.e. 1000 feet below the believed level of the B757, before horizontal separation was lost. He, therefore, turned his attention to the traffic situation elsewhere on the sector. The radar photograph, timed at 0646:00, shows the subject ac on similar tracks. The Do328, at FL280, is 5.6nm ahead of the B757, at FL270. The radar recording reveals that the Do328 vacated FL280 about thirty seconds later, by which time the lateral distance had reduced to 4.3nm.

TAC stated that he first became aware of the potential conflict just before the STCA activated. As soon as he was able (another ac was transmitting at the time), at 0647 he issued an ‘avoiding action’ right turn heading 310° to the Do328. This was followed by an ‘avoiding action’ left turn heading 240° to the B757. By this time, the ac were 2.8nm apart. As the conflict was not being resolved, the controller took further action by instructing the Do328 to climb to FL280 and the B757 to turn further left heading 210°. With hindsight, he thought that it would have been more appropriate to allow the Do328 to continue its descent to FL250, as it was just about to pass through the level of the B757, when he instructed it to climb. Separation reduced to 2.3nm/200 feet (the minimum recorded) [UKAB Note: 2.1nm and 100ft on the Pease Pottage radar recording] before the respective turns, given to both flights, began to take effect. In the event, the Do328 descended to FL265 before arresting its descent but by then the tracks were diverging. Neither pilot reported receiving a TCAS warning.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members commended the controller concerned for his frankness in reporting this incident, thereby allowing a full appraisal of the circumstances by the UKAB and lessons to be passed to others.

AIRPROX REPORT No 133/04

The ATSI advisor explained to the Board that, in accordance with the LACC MATS Part 2, traffic on UL179 between KEGIT and SASKI is released for descent to FL220 within Brussels airspace, subject to known traffic.

Board Members pointed out that the Local Area Supervisor had the responsibility for forecasting traffic density and allocating manpower to meet forecast demand. It follows, that (s)he would have the necessary information to inform any decision to split combined sectors in a timely manner, before controller loading becomes a problem, as it did in this case. However, following considerable discussion, ATC specialist Members considered that, in this case, controller loading had not contributed directly to the incident.

The Board considered that the S12/13/14 Tactical Controller had made an error by descending the Do328 through the level of B757 which, although it was below and behind it, was overtaking at a rate of 2nm/min and therefore reducing the separation which was initially sufficient; it was however eroding rapidly. Fortunately he spotted his mistake about 1½ min later and took appropriate action, using the correct terminology, to resolve the situation as quickly as possible and prevent any compromise to the safety of either ac.

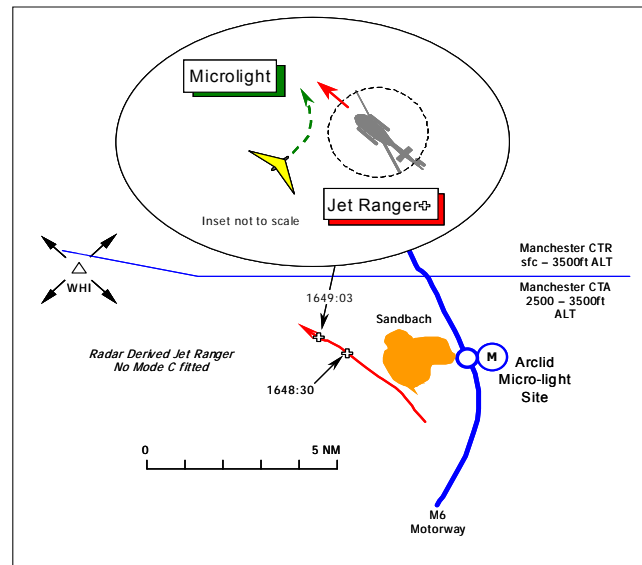
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The CLN SC descended the Do328 into conflict with the B757.

Degree of Risk: C.

AIRPROX REPORT NO 134/04

Date/Time: 23 Jul 1649
Position: 5309N 00227W
 (2nm W of Sandbach)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Microlight B206
Operator: Civ Trng Civ Trng
Alt/FL: 1500ft 1600ft
 (QNH 1024mb) ALT
Weather VMC CLBC VMC CLBC
Visibility: 20km >10km
Reported Separation:
 150ft V/nil H 200ft V/150m H
Recorded Separation:
 Not recorded

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

THE FLEXWING MICROLIGHT PILOT provided a very frank account and reports that he was conducting a general handling instructional sortie from Arclid Microlight site with a student. The microlight has a fluorescent yellow wing. He was operating in “good” VMC some 1000ft clear below cloud, flying out of sun on a heading of 040°(M) at an altitude of 1500ft QNH (1024mb) whilst instructing his student in recovery from unusual attitudes.

Approaching a position about 2nm W of Sandbach at 50kt, the helicopter was spotted late at 2 o'clock – about 300m away in level flight slightly below his machine, whereupon he initiated a climbing 45° L turn, which “*seemed the best avoiding action*” as he did not want to get caught out underneath the helicopter rotor’s down-wash. The other ac – a single rotor helicopter possibly a black Jet Ranger - passed about 150ft directly beneath his microlight with a “*high*” risk of a collision. He stressed that particular emphasis was being placed on lookout due to the nature of the exercise and reports that it is particularly worrying that the helicopter was not seen beforehand. Without his avoiding action climbing L turn he estimated that the vertical separation would have only been about 50ft.

THE B206 JET RANGER PILOT reports that he was conducting an instructional sortie flying from Wycombe Air Park to Blackpool. The helicopter has a grey underside with blue upper works and the white high intensity strobes were on. As the pilot-in-command he sat in the left hand seat, acting as an instructor to the pilot in the right hand seat who though also rated on the B206 helicopter, had fallen out of currency. They were not in receipt of an ATS but “listening-out” on 119.52MHz and were flying in VMC some 5000ft below cloud with an in flight visibility of >10km. A squawk of A7000 was selected, but neither Mode C nor TCAS is fitted.

Heading 345° (M) at 90kt, flying in level cruise at an altitude of 1600ft, their attention was drawn to two other microlights that were flying on a converging path from R to L. Because of these other ac, they spotted the subject microlight relatively late at a range of about 200m. His co-pilot in the RHS saw it first because his view was obscured by the helicopter’s doorframe. As the microlight was in a climb and appeared to have already started a turn to pass astern he elected not to take any avoiding action himself and to maintain his course and speed. The microlight passed about 150m away and 200ft above his helicopter with a “*low*” risk of a collision.

UKAB Note: The Airprox is not shown on radar recordings as the microlight is not evident at all. However, the B206 Jet Ranger is shown in transit (NMC fitted), passing 2nm W of Sandbach at the reported time of the Airprox – 1649.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It seemed to the Members that there was little dispute between the reports provided by both pilots. Nevertheless, the absence of any recorded radar data did not permit independent confirmation of the geometry of this close quarters encounter in Class G airspace. Clearly both were legitimately proceeding about their various tasks and this Airprox was fundamentally an issue of lookout in the see & avoid environment of the 'Open FIR'. The microlight pilot had reported that he was instructing his student in recoveries from unusual attitudes when he spotted the JetRanger late some 300m away. Although it was not clear exactly what manoeuvre was being flown here, the Board complimented the instructor for his laudably honest account. Undoubtedly this had been a salutary lesson to both the instructor and his student on the importance of an effective overall search for approaching ac before initiating any unusual exercise that might impede the essential responsibilities to avoid other ac during the manoeuvres themselves. Members recognised this can be especially difficult when instructing ab-initio students but the consequences are plainly apparent from this report. A Member suggested that the dark colour-scheme of the JetRanger might have adversely affected its conspicuity to other pilots especially from just slightly above as here. However, it was all a matter of contrast against the backdrop of the surrounding terrain and research has suggested to some operators that black or a very dark colour is the best overall compromise with bright contrasting upper works. Hence the black/yellow colour scheme of military training helicopters and police ac. Here the presence of the approaching helicopter had not been evident to the microlight instructor until a late stage, who in this converging situation was required to give way under the 'Rules of the Air', which in the end he accomplished. It seemed readily apparent to the Board that here was one part of the cause - a late sighting on the microlight instructor's part.

From the cockpit of the JetRanger the RHS student pilot had spotted the microlight first, and then drawn the LHS pilot's attention to it: he reported it was seen about 200m away after looking around the door-pillar, but he elected to maintain his course & speed. The hindrance to effective lookout scan caused by ac structures is well recognised: JetRanger door pillars have been a notable feature in previous Airprox reports where other JetRanger pilots have also recounted such difficulties. Pilot Members were in no doubt that a good, effective lookout regime must prevail even if it means moving the ac to facilitate looking into hidden sectors. Viewed from slightly below as here, the microlight's fluorescent yellow wing might not have been so apparent to the helicopter pilots against the backdrop of the sky. It appeared that the JetRanger pilots had seen the microlight a little later than the latter's pilot, who by that stage, had started to climb and turn away from the helicopter. The Board agreed this was again a late sighting by the helicopter pilot. The vertical separation reported by both pilots (150–200ft) seemed to be generally in accord and the microlight instructor was wise to take robust action when he climbed and turned above the Jet Ranger to remove any chance of being caught by the helicopter's rotor downwash, which could have had potentially disastrous effects on his more fragile machine. The microlight instructor's resolution of this conflict was also a factor here. Nevertheless, whilst his robust avoiding action proved entirely effective in averting an actual collision, the Members were unanimous that, in their view, the safety of these two ac had not been assured in these circumstances.

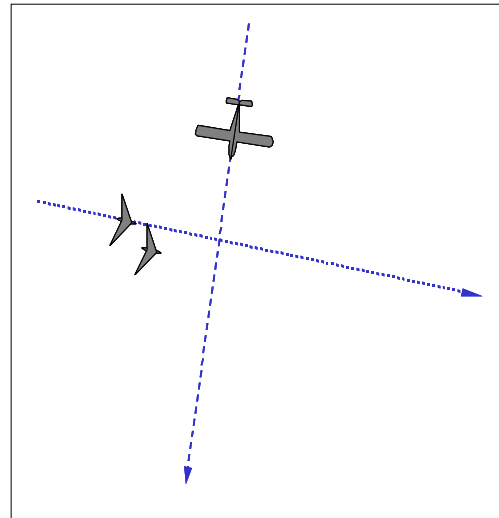
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by both pilots, the conflict being resolved by the microlight pilot.

Degree of Risk: B.

AIRPROX REPORT NO 135/04

Date/Time: 26 Jul 1807
Position: 5151N 00004W (NE of Ware)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Microlight PA32
Operator: Civ Pte Civ Pte
Alt/FL: 1000ft 1200ft
(QNH 1018 mb) (QNH 1017 mb)
Weather VMC CAVOK VMC CAVOK
Visibility: 30km >10km
Reported Separation:
0 VI <100ft H ~700ft V/800ft H
Recorded Separation:
Not recorded

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

THE MICROLIGHT PILOT reports flying a yellow, black and white microlight with a strobe fitted carrying a passenger on a local sortie from Hunsdon microlight strip. He was heading 100° at 70kt and at 1000ft, following a similar ac, which was 50ft below and 300ft ahead on his starboard side. He did not see the other ac [the PA32] until it was very close and he thought that they would have collided if it had not been for his avoiding action. He felt he should have seen the other ac sooner but his passenger who was very nervous had distracted him. He was trying to keep her calm by pointing out landmarks on the ground, which had reduced his lookout. He thought that the PA32 pilot had not seen him as the latter's flight path did not alter until about one mile after the event when the PA32 made a 180° turn. The position of the incident was taken from his GPS track log and showed a tight L turn where he believes the incident took place. The height and time were estimates as, although he was a very experienced pilot, he was very shaken after the incident. He was able to see and recall the registration of the other ac but was not absolutely sure that it was correct as the incident had taken place very quickly and the PA32 had passed within 100ft of him. He assessed the risk as being very high.

UKAB Note (1): The other ac was traced from the registration provided by the Microlight pilot and the owner confirmed that it was in the area at the time and agreed to provide a report.

THE PA32 PILOT reports flying a local GH sortie from High Cross, solo, in a red and white ac squawking 7000 with Mode C. At the time of the incident he had been turning L through 180° at 130kt and climbing through 1200ft. Some 7-800m on his port side, he saw a large red balloon that was very near to landing, being at a height of less than 30ft. He also a single red microlight from a distance of 3-4km at about 3-400ft [he was at 1200ft QNH = ~1100ft agl] and he passed about 800ft laterally behind it. He assessed the risk as nil.

UKAB Note (2): At 1805:17 a 7000NMC squawk can be seen on the recording of the Debden Radar 4.3nm NE of the reported position heading S. Although the incident is not seen on the recording, at 1807:52 a primary-only contact can be seen manoeuvring in the precise area taken from the Microlight GPS. At that time the 7000NMC squawk is 0.6nm beyond the primary contact having passed through the position.

UKAB Note (3): The leading Microlight was coloured blue. The pilot of the reporting Microlight also saw the red balloon in the position reported by the PA32 pilot, but did not see any other Microlights (or other ac) in the vicinity.

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 135/04

The Board was not able to resolve positively the differences in the separation reported by the 2 pilots. Members decided, however, that because of the Microlight's pilot's partial recall of the registration of the other ac and that both pilots reported seeing the red balloon in the area, then this PA32 had been the other ac involved. The Board then considered whether the PA32 pilot had seen the reporting Microlight or a different one. The reporting pilot was in a yellow, black and white Microlight; the ac he was following was blue but the PA32 reported seeing and avoiding a red Microlight. None of the pilots saw any other ac in the area. Although they could not be positive, Members thought that the PA32 pilot had not seen the reporting Microlight and might have seen, and avoided, the leading ac but mistaken the colour. There was also a possibility that the PA32 pilot had been distracted by the landing balloon. There was therefore some discussion by Members as to whether or not there was sufficient information to determine the cause and degree of risk.

That the Microlight pilot had seen the PA32 late was clear. Even if startled however, Members thought that the Microlight pilot would not have been mistaken by a large margin in his estimation of the separation. Further, if the pilot of the PA32 had seen the reporting Microlight, Members thought it unlikely that he would have then flown close enough to cause concern to the other pilot. Both these factors lead the Board to conclude that the PA32 pilot had seen and avoided a different Microlight, possibly the leader, but had not seen the reporting ac. In addition, Members thought that the avoiding action taken by the very manoeuvrable Microlight, although late, had been sufficient to prevent there being an actual risk of collision; the safety of the respective ac had nonetheless not been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

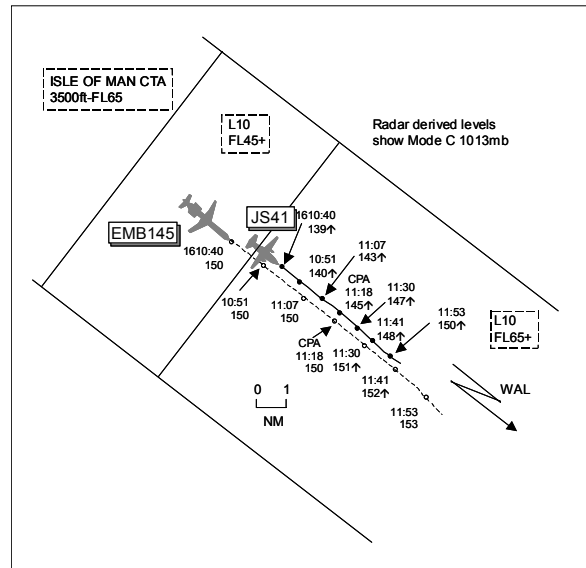
Cause: Non-sighting by the PA32 pilot and late sighting by the Microlight pilot.

Degree of Risk: B.

AIRPROX REPORT NO 136/04

Date/Time: 26 Jul 1611
Position: 5345N 00400W
 (37nm NW WAL)
Airspace: AWY L10 (Class: A)
Reporting Ac Reported Ac
Type: EMB145 JS41
Operator: CAT CAT
Alt/FL: FL150 ↑FL170

Weather VMC CLNC NK
Visibility: >50km NK
Reported Separation:
 400ft V 0.5nm H NR
Recorded Separation:
 500ftV 0.3nm H

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

THE EMB145 PILOT reports in the cruise at FL150 routing direct to WAL at 310kt and in communication with MACC. A JS41, which had departed the IOM ahead of them, was visually acquired ahead and to the L of the nose climbing through their level to FL170. Shortly thereafter, a TCAS warning 'monitor vertical speed' was annunciated followed shortly by an RA 'climb'. The A/P was disconnected and the guidance was followed, vertical deviation of 200-300ft occurred before the warning ceased. ATC were advised of the TCAS manoeuvre and of them resuming their cruise level; ATC then issued a radar heading of 180°. The turn was executed and then, when clear of the traffic, a direct routing to MIRSI was issued. He estimated the JS41 passed 0.5nm clear to his L and 400ft below as they overtook it but he did not assess the risk.

THE JS41 PILOT reports that he was aware of the incident from ATC but could add little information to the investigation. He had been aware of an ac departing Ronaldsway behind him and, as his ac was not at the time fitted with TCAS, he only saw the other ac after it had overtaken him.

THE MACC WEST/IOM COORDINATOR reports that he issued clearances to IOM/Ronaldsway ATC for both the JS41 and the EMB145 to climb to FL110 but could not recall if they were given together or separately. Both ac departed and the radar controller subsequently took control, climbing both ac to their requested levels. The sector was busy and complex, especially in the area around WAL, and STCA was observed to activate 35nm NW of WAL as the subject acs' targets and labels merged. He thought that the EMB145 crew reported a TCAS climb but he could not comment on the exact report as he was engaged in telephone coordination at the time. Separation was eventually regained.

THE MACC WEST/IOM RADAR CONTROLLER reports that he received a call from the JS41 crew airborne from Ronaldsway climbing to FL110. As there were no conflicts, he climbed the flight to its requested cruise level FL170. Shortly afterwards another flight, EMB145 c/s, called airborne Ronaldsway: this had also been given an initial clearance to climb to FL110. A recent trend with the usual type of ac (DHC8) operating between Ronaldsway to Manchester had been for the flight to request a cruising level different to that on the flight plan. Because of this, he asked the crew for their desired cruise level and was somewhat surprised to hear that the crew wanted FL150. He said that what he failed to appreciate on this occasion was that the ac type was an EMB145 jet which was faster than the JS41 ahead. He therefore saw no apparent conflict with traffic ahead and climbed the EMB145 to FL150. His attention was diverted from this area of the radar display because of a busy and complicated mix of traffic in the MACC TMA and as he did not perceive there to be a problem. He only became aware of the conflict between the subject ac when STCA activated and, as he realised his mistake, the EMB145 crew reported a TCAS climb. Although he belatedly turned both ac onto headings, which moved them further apart, the speed of the EMB145 had already moved it clear of the JS41's flight path so the turns were largely unnecessary.

AIRPROX REPORT No 136/04

ATSI reports that both controllers were operating on the combined MACC West/IOM Sector. The Radar Controller commented that he had been moderately busy in the 7min he had been in position prior to the Airprox, adding that there had been a somewhat complex traffic situation in the WAL area to resolve. The Coordinator said that he had been extremely busy in the hour he had been in position but not enough to warrant splitting the sector. He agreed that, at the time of the incident, the traffic situation in the WAL area was complex.

At 1552, a telephone call was received by the West/IOM Sector Coordinator, from Ronaldsway, requesting departure clearance for the JS41. The latter unit confirmed that the flight was being operated by a JS41 (it is understood that a B1900 is often used on the route). The Coordinator issued a clearance to FL110 and the appropriate squawk, both of which were read back correctly. In accordance with agreed procedures, between MACC and Ronaldsway, whereby *“On receipt of a clearance Ronaldsway will pass an ETD for the ac which will then be input in to HCS. Ronaldsway will not pass an actual airborne time to MACC unless it differs from the ETD already passed by +/- 5minutes”*, an ETD of 1557 was passed. Approximately 4min later, another departure clearance request was received from Ronaldsway, this time concerning the EMB145. Again the flight was cleared to FL110 and issued with the appropriate squawk but no mention of the ac type was mentioned on this occasion. Ronaldsway passed an ETD of 1601 for the EMB145. The Coordinator commented that he could not remember whether he had realised that this flight was being operated by an E145. The ‘usual’ ac used by the company on that route is a DHC8, comparable in performance to the JS41. It was reported that the E145 was not on a passenger carrying service but was on a positioning flight, following a period of maintenance at Ronaldsway, thereby explaining the ‘unusual’ type. The Coordinator reasoned that, as he had allocated FL110 for both ac, he must have assumed that the following ac was a DHC8. If he had realised that it was a jet ac then he would probably have done more to ensure separation e.g. to instruct Ronaldsway to resolve the conflict using radar headings. Assuming similar types, he had, he thought, assessed that adequate spacing would be maintained en route although no positive clearance, to guarantee it, was issued. Consequently, these two clearances did not ensure, as required, that the subject ac were procedurally safe, whether or not the ac were of similar performance. He did add that, in his experience, Ronaldsway would take any necessary action to ensure that the ac would be separated, even if he had not specified any particular action. In accordance with his normal method of operation, he would have placed the fpps for both flights in the display, ‘cocked out’, to allow the Radar Controller to incorporate them in the appropriate place as required. He added that the Radar Controller, present when the incident occurred, took over shortly after this had taken place.

The JS41 crew established communication with the MACC West/IOM Sector, at 1604, reporting passing FL55 for FL110 and routeing towards WAL. As there was no traffic to conflict, the radar controller cleared it to climb to FL170, its flight plan level. Just over 2min later, the EMB145 crew made their initial call on the frequency, reporting passing FL60 for FL110, also on course to WAL. The controller explained that he had not realised that this flight’s ac type was an EMB145, on this occasion, although the fpps did show the correct type. He added that he was aware, from previous experience, that DHC8 crews invariably requested a cruising level, which differed from that filed (FL150). Accordingly, he asked the pilot of the EMB145 his requested level and was somewhat surprised when the pilot replied FL150. He said that the Coordinator also thought this was rather unusual but made no comment about the flight being operated by a type other than a DHC8 (presumably because he was still unaware of this fact). The EMB145 crew were instructed to climb to FL150 at 1606:36, at which time the radar recording shows this ac 10.4nm behind the JS41, with a ground speed 68kt faster. It is possible at MACC to select ac ground speeds on the radar display but the radar controller could not recollect whether these were being displayed at the time. He commented that he usually opts not to display them on a regular basis, preferring to select them as and when necessary. Having cleared, what he thought were, ac of similar performance to climb to separated levels, the radar controller turned his attention to the traffic situation elsewhere in the sector, namely the WAL area. He said that he had wanted to check that the clearances issued by the Coordinator were resolving a complex situation concerning the interaction between Blackpool, Warton and Liverpool departures.

The radar recordings reveal that the EMB145 reached its cleared level, FL150, at 1610:40. By this time, the distance between the subject ac had decreased to 1.9nm with the JS41 passing FL139 and the speed differential having increased to 179kt. Separation was lost as the JS41 climbed through FL140, 1.4nm ahead of the EMB145, at 1610:51. The radar controller said that he was alerted to the situation when STCA activated, at 1611:06. Shortly afterwards (1611:25), the pilot of the EMB145 reported a TCAS climb and *“resuming flight level one five zero”*.

[UKAB Note (1): The radar recording of the event shows that the EMB145 overtook the JS41 on its RHS with CPA occurring at 1611:18 the EMB145 at FL150 passing 0.3nm SSW of the JS41, 500ft above. The next radar sweep shows the EMB145 0.4nm S of, and 400ft above, the JS41. Thereafter, the EMB145 pulls away from the JS41,

climbing and reaching a maximum level of FL153 at 1611:53 before descending, 300ft above and 1.8nm ahead of the JS41 climbing through FL150.]

The Radar Controller commented that, when the STCA activated, the labels of the subject ac were overlapping, such that it was not possible to determine their respective positions/levels. He said that he looked for the conflict alert list, which would have shown him the levels of the subject ac, but it was not readily visible, having been positioned, somewhat unusually he thought, at the bottom LHS of the display. In response to the TCAS report from the EMB145 crew and now being able to observe the relative positions of the subject ac, he instructed the flight to turn R heading 180° and the JS41 crew to turn L heading 110°. By this time, as the EMB145 had already overtaken the JS41, the controller's intention was to establish the requisite 5nm horizontal separation as quickly as possible.

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 ATSI report. An ATCO wondered whether the busy bandboxed sector should have been split, as both MACC controllers had commented. The ATSI Advisor informed Members that there would have been little advantage in splitting the sector as the majority of the traffic was on the West Sector and it was the complexity of the situation in the WAL area that had increased the workload. The West/IOM Coordinator had issued Ronaldsway ATC with departures clearances that were not procedurally separated as he had apparently assumed the second ac was a DHC8, not the EMB145. Although Ronaldsway had not mentioned this to the Coordinator, the information on ac type and speed was available on the fps. This information was not assimilated, later, by the West/IOM RC but the catch-up situation would have been clearly evident on the radar display. Members agreed that both the Coordinator, when issuing the initial clearance, and subsequently the RC had not appreciated the difference in ac performance which had been a contributory factor to the Airprox. However, when the subject acs' crews called on frequency climbing to FL110, they were laterally separated by over 10nm. The RC then climbed both flights to their requested cruising levels without ensuring standard separation between both ac and this had caused the Airprox.

Although STCA alerted the RC to the situation, he had been unable to issue any instructions immediately owing to overlapping labels. The EMB145 crew had then announced a TCAS climb which was quickly followed by the crew reporting that they were returning to FL150. The RC then issued turns to both flights to increase lateral separation as quickly as possible. The JS41 crew were aware that there was another ac behind them but only saw the EMB145 after it had overtaken them. Fortunately the EMB145 crew had seen the JS41 in a climb just below and to the L of their nose, and had then overtaken the JS41 0.5nm on its R, estimating it to be 400ft below - the radar had shown the ac displaced by 0.3nm horizontally and 500ft vertically. Thereafter the EMB145 pulled away and the crew had then initiated a climb in reaction to the TCAS RA command, climbing 300ft before descending back to FL150. During this manoeuvre, the RC had issued turn instructions to both flights. At the end of the day, the visual sighting by the EMB145 crew and subsequent TCAS manoeuvre were enough to persuade the Board that safety had been assured during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The MACC West/IOM RC did not ensure standard separation between the subject ac.

Degree of Risk: C.

Contributory Factor: The MACC West/IOM Coordinator, when issuing the departure clearance, and the RC did not appreciate the difference in ac performance.

AIRPROX REPORT No 138/04

AIRPROX REPORT NO 138/04

Date/Time: 29 Jul 1252

Position: 5123N 00215W (12nm SW Lyneham)

Airspace: CTA/FIR (Class: A/G)

Reporting Ac Reported Ac

Type: FK70 Tornado GR1

Operator: CAT DPA

Alt/FL: ↓FL140 FL150-200

Weather VMC CAVOK VMC NR

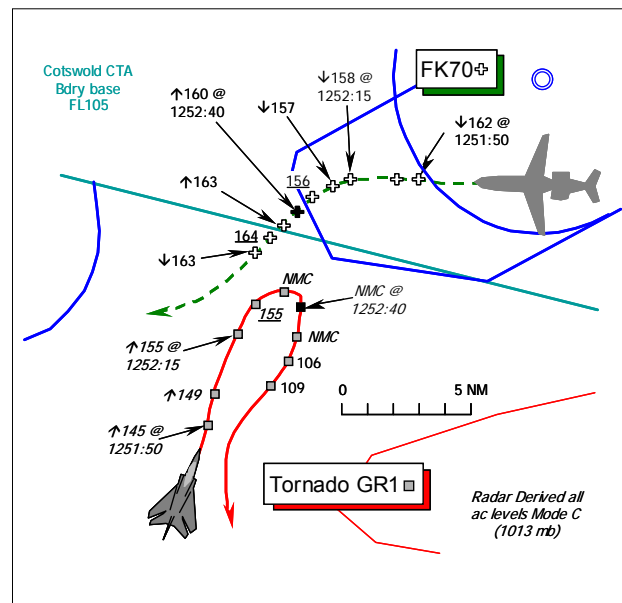
Visibility: 10km >10km

Reported Separation:

Nil V/3nm H NK

Recorded Separation:

3.7nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE FK70 PILOT reports that the 1st Officer was the PF whilst inbound to Cardiff from Amsterdam at 300kt in CAVOK weather and in receipt of an ATS from Bristol APPROACH (APP). Whilst in descent at 1500ft/min passing FL140, he thought, in a position 070° BRI at about 15nm, ATC issued an avoiding action L turn onto a heading of 140°. The other ac was then displayed on TCAS climbing toward them, first as a TA, before TCAS enunciated an RA climb command, whereupon the other ac was seen [but he did not specify the sighting range]. He assessed the minimum horizontal separation was 3nm as the other ac passed at the same level and their maximum vertical deviation as a result of the TCAS RA climb was 500ft. Bristol APP said his ac was in CAS at the time of the Airprox.

THE TORNADO GR1 PILOT reports that his ac has a red, white and blue colour-scheme and the HISLs were on whilst conducting a singleton practice test techniques sortie from Boscombe Down with a student in the front seat. He was operating in VMC at 480kt, out of sun, manoeuvring between FL150 – FL200 [UKAB Note (1): Mil ATC Ops reports it was FL70–FL200] whilst in receipt of a RIS from Boscombe ATC. A squawk of A2604 was selected with Mode C but neither TCAS nor any other form of CWS is fitted.

The manoeuvre being set-up for the practice was a climb on a heading of N towards the airway followed by a descending R turn, but these manoeuvres had to be flown closer to CAS than he would normally because of cloud to the S. ATC informed them about the other ac on the airway, but as they were remaining clear of the airway they did not adjust their manoeuvre profile. They saw the traffic briefly about 5nm away just before they entered their planned turn, but there was no conflict. He was unable to assess the minimum separation when they passed through the level of the other ac but added that no avoiding action was taken and the risk was “nil”.

THE BRISTOL APPROACH RADAR CONTROLLER (APR) provided a comprehensive account and reports that whilst operating as the APR he was supervising a trainee radar controller. The FK70 was inbound to Cardiff and had been released by LACC tracking towards the BRI descending to FL110. The flight was being afforded a RCS in Class A airspace and the crew instructed to descend. When the FK70 was about 25nm E of the BRI both he and his trainee observed a high-speed military contact squawking A2604, which was on a steady northerly heading and climbing quickly through FL110 – the Tornado. It was about 15nm SW of and converging with the FK70, which was descending through FL165. The trainee immediately issued avoiding action to the FK70 crew of a 90° L turn, he thought, and passed traffic information, whilst also starting co-ordination with Boscombe Down ATC. The Boscombe Down controller advised that their ac – the Tornado GR1 - was operating up to FL150 clear of CAS. The Tornado was less than 3nm from the edge of CAS, flying at high speed directly toward the CTA, before the jet

then commenced a very tight R turn and cleared to the S. By this time the FK70 had left CAS and the pilot reported that he had received a "TCAS warning". When the Tornado was clear, the FK70 crew resumed their course towards Cardiff. Minimum horizontal separation was 3nm but vertical separation was not observed as the Tornado's Mode C "dropped out" during its R turn.

ATSI reports with RT transcript that the FK70 contacted Bristol APPROACH at 1249, inbound to Cardiff, via the BRI. The flight had been placed by the trainee on a radar heading of 270°, descending to FL110, when both the trainee and the mentor noticed a high speed military contact tracking N, climbing through FL110, with a Boscombe Down allocated squawk - the Tornado. It was on a conflicting track with the FK70, some 15nm away so just before 1252:00, the trainee issued an 'avoiding action' turn to the FK70 crew, "[C/S] *turn left immediately heading 140 degrees avoiding action military traffic southwest of you 8 miles indicating [FL] 144 climbing*". The FK70 crew responded at once "*roger immediate left turn 140 [C/S]*". The radar photograph, timed at 1251:51, shows the FK70 heading W, passing FL162 Mode C within the Class A Cotswold CTA (base FL105) with the Tornado 12.4nm away, climbing through FL145. The controller was faced with a difficult decision as to which direction to turn the FK70. It could be contended that if this encounter had occurred in Class G airspace, then a L turn would have been appropriate. However, in the circumstances, it resulted in turning the flight away from the 'safety' of CAS, towards the unknown ac operating outside CAS. After the FK70 crew requested the other ac's altitude APR advised "*it's 148 climbing...expedite the left turn now the traffic should pass down your righthand side*". At 1252:30, APR said, "[FK70 C/S] *stop your turn heading 270 degrees traffic's now turning south of you 3 miles*". Whereupon the FK70 pilot replied "*Yeah we are climbing TCAS climb and we have the traffic in sight we...resuming altitude [sic] 110*". MATS Part 1, Section 1, Chapter 5, Page 13, states that, in Class A airspace:

"Neither avoiding action nor traffic information shall be passed unless radar derived or other information indicates that an aircraft is lost, has experienced a radio failure, or has made an unauthorised penetration of the airspace".

None of these applied although it is understandable why the controller was concerned about the potential conflict and the perceived necessity for taking some action. Having issued the avoiding action, a telephone call was made to Boscombe Down requesting co-ordination on the military traffic, which, by this time was turning away from CAS. The radar recordings reveal that the Tornado made a hard right turn and did not enter CAS.

[UKAB Note (2): The Clee Hill SSR recording reveals that horizontal separation was 3.9nm when the FK70 crew had arrested their ac's descent at FL156, still within CAS and responding to the avoiding action L turn instruction that would take the airliner outside CAS. Minimum horizontal separation of 3.7nm occurred on the next radar sweep at 1252:40 as the FK70 climbed through FL160, but no Mode C was indicated from the Tornado as the jet turned about southbound. As the FK70 exited the CTA boundary at 1252:56, the FK70 crew had ascended to a maximum of FL164 in response to the TCAS RA; but by then the conflict had been resolved, with the Tornado 4.8nm away southbound at 460kt indicating FL106.]

MIL ATC OPS reports that the Tornado GR1 crew called Boscombe Down APPROACH (APP), at 1245:51, climbing out from low level, 50nm W of Boscombe Down. The Tornado was identified and placed under a limited RIS, due to poor radar performance, to operate in the block FL70 to FL200. At 1251:59, APP reported to the Tornado crew "[C/S] *controlled airspace north east 4nm, base level FL105, traffic on the airway indicating FL160*". The Tornado pilot responded with "[C/S] *copied turning now*". At 1252:14, the Bristol APR called Boscombe Down ZONE requesting "*2604 squawk...co-ordination please against my traffic north east of it by 3nm descending*". ZONE told the Bristol APR to "*standby*" but Boscombe APP immediately stepped in on the landline and reported "*7344 OK my aircraft's turning away from controlled airspace at the moment. He's in the block FL50 to FL200*". Bristol APR is then heard in the background saying, "[C/S] *stop your turn heading 270°, traffic's turning south of you range of 3nm.*" A different voice at BRI states at 1252:43 that "*it's 2nm to the airspace heading due north at about 350kt, that is not good*" and stipulated that he was going to "*file on that*".

The Clee Hill Radar recording shows the Tornado at 1252:32, in a R turn onto a reciprocal heading when the ac is 2.5nm from CAS, but as the Tornado turns it's Mode C disappears. The Tornado was operating in the block FL70 to FL200 and was flying closer to CAS than normal due to weather in the S of his operating area. APP warned the Tornado pilot that he was 4nm from CAS and passed limited traffic information on "*...traffic on the airway indicating FL160*" - the FK70 - after which the pilot immediately initiated a R turn to remain clear. The Tornado flew no closer than 2½nm from CAS. Minimum horizontal separation between the 2 ac was 3.7nm but the minimum vertical separation cannot be determined as the Tornado's Mode C is not displayed during the jet's R turn. There are no contributory military ATC factors apparent within this Airprox.

AIRPROX REPORT No 138/04

DPA comments that this Airprox exposes a number of difficult issues, which affect the provision of an ATC service within CAS and unknown conflicting traffic. In this case, faced with a fast moving contact heading towards the boundary of the CAS, it would be reasonable for the civil controller to contend that, whilst the ac had not made 'an unauthorised penetration of the airspace', it gave the strong impression that it was about so to do. From a different perspective, the pilot of the Tornado states that he knew exactly where the CAS boundary was and had planned his flight profile to avoid penetration. Indeed events show that this proved to be the case. Both these views, in their own way, are entirely correct. Clearly, the closeness of the turn to CAS was brought about by the necessity of the Tornado operation, because of cloud, to be further to the N than might otherwise be the case. Perhaps the question might be posed, how close can a pilot fly to the edge of CAS whilst outside and how close to the edge should traffic be when being controlled inside CAS? Whatever the answer; any suggestion that CAS should be increased to avoid such incidents will simply move the problem from one place to another.

This and other similar Airprox involving Boscombe Down ac in the vicinity of Bristol indicate that a greater level of co-operation and understanding, on both sides, is required and must be encouraged.

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 ac operating authority.

Civilian controller Members recognised the awkward situation that confronted the Bristol APR when providing an ATS to flights that were within CAS, when confronted with fast moving conflicting traffic outside CAS. Here, with hindsight, if the APR had done nothing then a conflict would almost certainly never have arisen. But then the APR had no knowledge at the time of what the Tornado crew was doing; in that respect the trainee controller's concern was entirely understandable. Clearly the Tornado pilot's report, coupled with DPA's comments, showed there was no intention to penetrate CAS whatsoever and the GR1 crew was merely flying their sortie legitimately in Class G airspace whilst in receipt of an appropriate ATS from Boscombe APP. The APP controller had conscientiously reminded the GR1 crew about the CTA, about which they were entirely cognisant anyway, and evidently passed traffic information about "...traffic on the airway indicating FL160". The GR1 crew were thus aware of the FK70, that it was inside CAS and of their own proximity to the CTA boundary, but unaware at the time that the airliner might be leaving CAS because of the APP controller's choice of words. The ATSI report had made it plain that the trainee Bristol APR controller had spotted the Tornado and issued an avoiding action L turn onto 140° to the FK70 crew coupled with traffic information, whereupon the Tornado turned about to the S. Whilst recognising that the trainee was under instruction from a qualified mentor, controller Members - both civilian and military - were critical of this avoiding action turn. It was pointed out that as the Tornado was displaying a squawk assigned to Boscombe Down ATC, who are not an 'Autonomous Radar Unit' with the ability to provide a RCS in CAS, it should have been readily apparent to the mentor that the ac would not be penetrating CAS in the normal course of events. Some believed this was a 'spur of the moment' reaction by an inexperienced trainee to the approach of a high speed contact: in retrospect, a R turn would have kept the FK70 within Class A airspace and probably increased the separation, whereas the L turn instruction placed the airliner directly into conflict with this fast jet in the FIR. It would appear from the respective reports that the GR1 crew had been manoeuvring in the general vicinity S of the CTA and W of Boscombe for some time before the Airprox occurred. Indeed the radar recording revealed that the GR1 had steadied on a northerly course at least 1½ minutes before the APR transmitted the avoiding action L turn to the FK70. A controller Member familiar with this airspace thought that the Bristol APR should have spotted the Tornado manoeuvring in the FIR earlier and contacted Boscombe APP for traffic information/co-ordination earlier than he did, whereupon the intentions of the GR1 crew could have been passed or co-ordination effected before avoiding action became a priority. Conversely, if the GR1 crew was aware that they would be flying further N and closer than normal to the CTA boundary then a 'heads-up' to Boscombe APP would have been helpful, who could then have passed traffic information to the APR. DPA apparently wished to engender a greater level of co-operation and understanding between the units involved here, which was a laudable aim. In the Board's view more effective co-operation between the flying units and ATSU's in this vicinity should be encouraged. Returning to the crux of the matter, clearly the APR trainee had acted with the best of intentions, but he had based his avoiding action on an erroneous perception that the Tornado would infringe CAS. This was apparently also the perception of the mentor who had not countered the trainee's turn instruction and who was clearly also concerned at the proximity of the fast jet ac to CAS. The Board concluded therefore, that acting on a perception of a possible CAS infringement, the Bristol APR had turned the FK70 into conflict with the Tornado GR1, which the Members agreed unanimously was the cause of this Airprox.

From the reporting FK70 pilot's perspective he was following the instructions issued by the APR. The GR1 was displayed on the FK70's TCAS: a TA and then an RA was enunciated, commanding the FK70 pilot to reverse his descent into a climb above the level of the GR1 that he had also acquired visually. Whilst this would have concerned the FK70 crew at the time, the radar recording showed that at this point the Tornado was turning southbound, outside CAS, 3.9nm away from the FK70. As it was the GR1 remained 2½ nm outside CAS, its pilot having also seen the airliner briefly and who remained unconcerned. A wide-ranging discussion ensued about whether a TCAS RA might have been triggered if the FK70 had been steering a steady course inside CAS with another ac manoeuvring fast, only just outside CAS: it was considered that the RA might still have occurred anyway. The Board agreed unanimously that no risk of a collision had existed here. However, this Airprox illustrated well the difficulties which can ensue if controllers and pilots alike do not consider carefully the impact that each can have on each other's diverse operations in the limited and increasingly complex airspace available.

PART C: ASSESSMENT OF CAUSE AND RISK

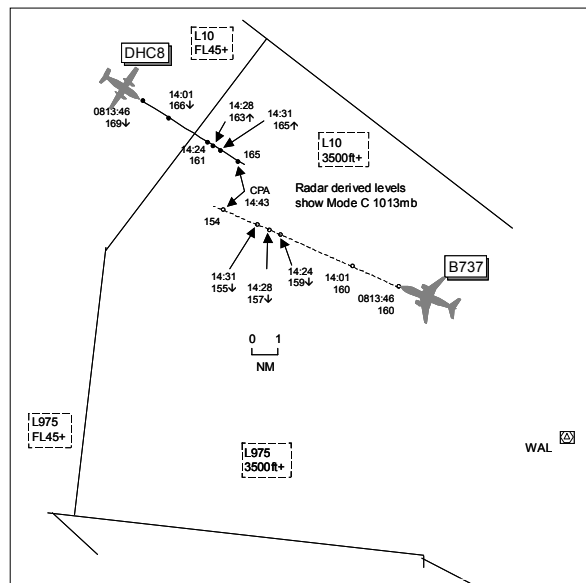
Cause: Acting on a perception of a possible CAS infringement, the Bristol APR turned the FK70 into conflict with the Tornado GR1.

Degree of Risk: C.

AIRPROX REPORT No 139/04

AIRPROX REPORT NO 139/04

Date/Time: 29 Jul 0815
Position: 5333N 00330W (16nm NW WAL)
Airspace: AWY L10/L975 (Class: A)
Reporting Ac Reporting Ac
Type: B737-200 DHC8
Operator: CAT CAT
Alt/FL: FL160 ↓FL110
Weather VMC CLAC VMC CLOC
Visibility: >10km >10km
Reported Separation:
1000ft V/2-5nm H 400ft V/0-25nm H
Reported Separation:
1100ft V 1-9nm H



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports en route to Dublin cruising at FL160 heading 290° and 320kt and in receipt of a RCS from MACC on 128.05MHz. Prior to the Airprox, the workload was low with medium RT loading and the visibility was good above cloud. About 10nm NW of WAL, he saw traffic on TCAS 20nm ahead flying in the opposite direction above his level which then commenced descent. There was no time to query this with ATC as TCAS gave a TA alert followed by an RA 'descend' command. Separation reduced to 400ft when the ac were 5nm apart but as the TCAS guidance was followed, the other ac was seen to pass 1000ft above and 2-5nm clear to the R. He assessed the risk as medium but it would have been high without TCAS.

THE DHC8 PILOT reports inbound to Manchester heading 130° at 220kt and in receipt of a RCS from MACC. Fifteen miles NW of WAL during descent at 1500fpm to FL110 from FL170, a TCAS TA alert was received on traffic about 3nm ahead showing -500ft and reducing. As the separation reached -400ft the TCAS alert rapidly hardened to a TCAS RA 'climb' demanding 1500fpm. The command was followed and the other ac, a B737, was heard to call 'TCAS descent'. The B737 was seen by the co-pilot to pass to their R looking 45° down and about 0.25nm away. At sometime during the encounter, ATC gave a turn onto 085°. He assessed the risk as high.

THE MACC WEST/IOM RADAR CONTROLLER reports the B737 was on radar heading 290° at FL160 against a DHC8 on heading 130° at FL170 with conditional clearance to descend to FL110. The heading given to the DHC8 was insufficient to maintain 5nm separation behind the B737. STCA activated so she turned the DHC8 L onto 085° and gave TI, by now there was about 9nm separation between the ac. The B737 crew reported a TCAS RA and descended to FL153, the subject ac passing with 5nm and 1000ft separation. When clear, the B737 was cleared to climb to FL160 and the DHC8 was turned back onto heading 100° and the descent clearance was confirmed.

ATSI reports that the Radar Controller was operating the combined West/IOM Sector. She commented that up until just before the Airprox occurred she had been busy but, by then, her workload had decreased significantly.

The incident occurred during her first duty back at work following a period of two cycles of leave. Concerned that she may not have been 'up to speed' after this break, she said that she had asked if she could be rostered initially in the Coordinator position. In the event, she was asked to take over as the Radar Controller rather than the Coordinator, possibly because of a problem with having suitably qualified staff to operate the sector at the time. A unit investigation of the incident resulted in a recommendation, made by local Human Factors personnel, that "all controllers are offered the option of a short period of re-familiarisation upon their return to duty after extended leave".

The DHC8 crew established communication with the West/IOM Sector, at 0800, reporting maintaining FL170, on radar heading of 140°. In accordance with the Traffic Orientation Scheme, this ac had been positioned on the S side of airway L10, prior to transfer from ScACC. Subsequently, in order to keep the flight within the confines of the airway due to a N'y wind, the controller instructed the DHC8 crew to turn L heading 130°. Approximately 5min later, the B737 crew made their initial call on the frequency, reporting at FL160, heading 300°. Radar recordings show that, at the time, the subject ac were on reciprocal tracks, 62nm apart. The B737 was about 25nm from WAL, inbound to Dublin, and was planned to route via L975, which would involve a L turn in the WAL area, to pick up the airway. Consequently, at some point, the tracks of the subject ac would have to cross. At 0811:10, the Radar Controller issued a 10° L turn as a tactical adjustment to the B737's heading. Immediately afterwards she instructed the DHC8 crew to *"descend when ready flight level one one zero"*. The radar timed at 0811:20, when this descent clearance was issued, shows the subject ac 41.1nm apart, on conflicting reciprocal tracks. The Radar Controller confirmed that she was aware that the headings issued to both ac would not ensure that the requisite 5nm radar separation would be maintained. Her intention was to monitor the progress of the two flights and when vertical separation was re-established, after the DHC8 had descended through the level of the B737, she would route the latter L along L975. She could offer no explanation why she had instructed the DHC8 crew to descend "when ready" rather than "now", especially as she was relying on this ac descending through the level of the B737.

Having issued the descent clearance to the DHC8 crew, she turned her attention to the traffic situation elsewhere in the sector. She commented that, by this time, the workload had decreased from the previous busy period. For the next 3min, during which time she was involved with controlling 4 flights, she had relaxed her concentration and did not monitor the progress of the subject ac as intended. She reasoned that this may have been as a direct result of her lack of recency. Radar recordings show that the DHC8 commenced descent at 0813:46, approximately 2.5min after it was cleared to descend 'when ready'. At the time, the two ac were 12nm apart.

At 0814, at about the time STCA activated, the Radar Controller said that she realised the situation between the two ac. Her first reaction was to instruct the DHC8 crew to *"turn further left now heading zero eight five"*. Her understanding was that the two ac were about 9nm apart at the time and the L turn issued to the DHC8, she believed, would ensure that horizontal separation would be maintained. Consequently, she did not judge it necessary to prefix the instruction with the term 'avoiding action'. The ac were in fact now about 6nm apart, with a closing speed in the region of 700kt. She issued TI to the DHC8 crew but before she could instruct the B737 to turn, its crew reported a TCAS descent. The DHC8 crew then reported a TCAS climb. Radar recordings of the event reveal that the B737 commenced its descent (0814:24) when the two ac were 4.4nm apart, with the DHC8 at FL161. The B737 continued its descent and, at 0814:28, was passing FL157, by which time the DHC8, 3.8nm away, was climbing through FL163 (the minimum recorded vertical separation). As a result of the action taken by both crews in respect of the TCAS alerts, vertical separation was restored at 0814:31, when the ac were 3.1nm apart. At the time the Radar Controller believed that the action taken had prevented a loss of separation. It was only some time later that she was informed that a loss of separation had occurred. Once again she thought she may have over estimated lateral distance between the two ac as a result of the recency issue.

[UKAB Note (1): The CPA occurs at 0814:43, the subject ac passing starboard to starboard by 1.9nm, the B737 level at FL154, 1100ft below the DHC8 at FL165.

The Radar Controller was obviously concerned about her ability to cope with a busy traffic situation having been on a period of extended leave. In the event, whilst the sector was busy she coped with the traffic situation without incident. It was only as the sector became quieter, when she allowed her concentration to decrease, that the Airprox occurred. Although it has not been possible to determine why her request to function as the Coordinator was not granted on this occasion, the unit are aware of the relevant issues and the matter is being addressed.

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 initial discussion focussed on the competency/recency issue raised by the RC. The ATSI advisor informed Members that MACC reported that it was unfortunate that her message, requesting Coordinator duties, was not passed to the people responsible for rostering on the day of the Airprox. However, it is considered that an absence of two cycles does not constitute an extended absence. Consequently, as there was no doubt as to the

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competence of the controller and she had not specifically requested the presence of another controller for monitoring purposes, then normal manning considerations would have applied.

Moving on to the incident, the RC had coped well during the period preceding the Airprox. However, she had then put both of the subject ac on radar headings and given a 'conditional' descent clearance to the DHC8 crew. She had then relaxed her concentration and did not monitor the subject ac's progress as intended, knowing that lateral separation was not assured. Members agreed that, in carrying out these actions, the MACC West/IOM RC had vectored both ac into conflict which had caused the Airprox.

The RC noticed the confliction as STCA activated and had turned the DHC8 L in the belief that horizontal separation would be maintained, not appreciating that the subject ac had a high rate of closure and were closer than estimated. Fortunately, the B737 crew had seen the deteriorating situation much earlier on TCAS and had swiftly followed the RA 'descend' command, visually acquiring and then watching the DHC8 as it passed 1000ft above and 2.5nm clear to their R. Likewise, the DHC8 crew had also been alerted to the conflict by TCAS and had quickly changed their descending flight profile by following the RA 'climb' guidance, the FO seeing the B737 pass below and close to their R. Although this had had the potential for being a serious incident, the positive and prompt actions taken by both crews led the Board to conclude that any risk of collision had been quickly and effectively removed.

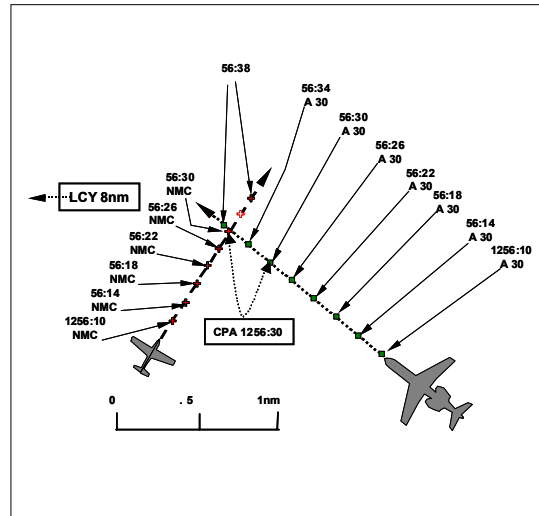
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The MACC West/IOM RC vectored the DHC8 and B737 into conflict.

Degree of Risk: C.

AIRPROX REPORT NO 140/04

Date/Time: 30 Jul 1256
Position: 5130N 00016E(8nm E Lon City)
Airspace: London TMA (Class: A)
Reporting Ac Reported Ac
Type: F900 Zlin 526F
Operator: Civ Exec Civ Pte
Alt/FL: 3000ft NR
 (QNH 1019mb)
Weather VMC CAVOK NR
Visibility: 10km NR
Reported Separation:
 0.2nm H/0ft V not seen
Recorded Separation:
 Not Recorded V/0-35nm H

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

THE F900 PILOT reports flying an unscheduled executive flight from Asturias (Spain) to London City (LCY). While level at 3000ft and 8nm just before the final descent to RW 28 LCY and heading 276° at 160kt, a very light aerobatic ac crossed from left to right at same alt 300 metres ahead of them. He assessed that the risk would have been very high had it happened 10sec later.

THE ZLIN 526F PILOT reports flying VFR at 190kt from Popham to a private site in Essex routing to the E of the London CTR and below the 2500ft base of the TMA. His ac was not fitted with IFF. He was not aware of the Airprox until contacted by UKAB some time later, did not see the other ac and could not recall most of the details of his flight at the reported time. He considered that the height of the incident reported to him by the UKAB (3000ft) is incorrect as he flies the route regularly, is aware of the height of the base of CAS and is always very careful to observe the 2500ft restriction in this area, normally flying the leg at 2000ft.

UKAB Note (1): The QNH at Popham for 1200 was 1019mb and the airfield elevation is 550ft. The London QNH at 1300 was also 1019.

THE THAMES RADAR CONTROLLER reports that at 1257 the pilot of an F900 at 8nm on the final approach reported light ac passing very close and that he would be filing an Airprox report. A primary contact was observed in the vicinity tracking NE. The crew of the F900 were informed that the other ac should be below 2400ft since the base of CAS in this area is 2500ft. He was unable to track the other ac due to poor radar performance. No TI or avoiding action was given.

ATSI reports that the traffic loading, sector workload and complexity were not reported but analysis of the rtf and radar recordings indicate all to have been moderate.

The F900 pilot established contact with Thames Radar at 1249 as the ac was approaching DET from the S at 4000ft, was informed that he would be vectored for an ILS approach to RW 28 at LCY; he was instructed to leave DET on a heading of 270°.

By 1255 the F900 had been cleared down to 3000ft and was instructed to turn further left on to 310° from a base leg heading to close the localiser from the left, to report established.

At 1256:34 the F900 pilot called Thames stating: "XXXX, we just crossed er, small light aircraft, a Zlin, same altitude and one nautical mile ?????". The Thames Controller sought confirmation that the ac was at the same altitude, as the unknown traffic should have been outside controlled airspace, not above 2400ft. The reply from

AIRPROX REPORT No 140/04

LEA051L was *"he was three thousand and one hundred, just above us"*. The crew stated that they intended to file a report on the incident and identified the other ac as a white and red Zlin.

TCAS did not activate, neither did STCA. The Radar replay shows a non-squawking return on a conflicting track at 1256:28 and the tracks crossed at 1256:34.

There were no ATC causal factors as the F900 was at least 500ft above the base of CAS, as required by MATS Part 1, Section 1, Chapter 6, Page 4.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

On the basis of the reports and tracing action, the Board had no doubt that the Zlin was the other ac involved in this incident.

Although the F900 could be verified from radar to have been at an altitude of 3000ft, since that of the Zlin could not be verified, the actual altitude at which this incident took place could not be determined positively. The Board therefore considered in detail the reports by the two pilots. Although the Zlin pilot reported that he flew the route regularly and was aware of the base of CAS at 2500ft, Members thought that it was most unlikely that the F900 pilot had made an error in his observation that the Zlin was above rather than below his altitude. Accepting that there were no hard facts to substantiate their view, the Board agreed that it was probable that the Zlin pilot had made an altimetry error which resulted in him flying at a higher altitude than he thought or had planned. This may also explain why the Zlin pilot did not see the Falcon, as it would have been below his starboard wing rather than above it.

The Board considered the height and QFE at Popham relative to London City and the London QNH but there did not seem to be any obvious linkage to the altitude that Members believed the Zlin pilot had been flying. In any case the F900 pilot had seen the Zlin, which the radar recording showed to be at a distance of 0.35nm at the CPA, and decided that the circumstances did not warrant any avoiding action. Members thought therefore that the F900 pilot did not consider that there had been any risk that the ac would have collided.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Zlin apparently entered Class A CAS without clearance and flew into conflict with the F900 which he did not see.

Degree of Risk: C.

AIRPROX REPORT NO 142/04

Date/Time: 31 Jul 1545 (Saturday)

Position: 5233N 00023W (Sibson Airfield - elev 100 ft)

Airspace: Peterborough/Sibson Free-Fall Drop Zone
(Class:G)

It has not been possible to depict this incident

Reporting Ac Reported Ac

Type: Parachutists x2 Chipmunk

Operator: Civ Club N/K

Alt/FL: 2200ft QFE N/K

Weather: VMC CLOC VMC CLOC

Visibility: >20km NK

Reported Separation:

10ft H NR

Recorded Separation:

Not recorded

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

PARACHUTIST 1 reports that at approximately 1645 on 31 July 2004 at Sibson Parachute Centre, he took part in a 3-way sky-dive. After they reached their break off altitude of 4500ft, they separated and he deployed his parachute at 3000ft. Once his deployment had completed at around 2200ft he looked directly in front of him and witnessed a Chipmunk light ac in a hard right bank turn away from him roughly 300ft away. The ac was heading directly under the run in of their Let 410 ac but in the opposite direction. Once the ac had finished banking, it was then heading directly away from him, in the same direction as the run in. Just after the Chipmunk had rolled out of its turn, the following group deployed their parachutes and 2 canopies had completed their deployment very close to the ac at about the same level. After the incident he saw video footage from the helmet camera of Parachutist 2 who was extremely close to the ac, appearing to be just a few metres away. He considered this incident to be very serious and if there had been a collision it would probably have resulted in fatal injuries to both the jumper and the Chipmunk pilot.

PARACHUTIST 2 reports that at their break-off altitude of 4500ft, he tracked away from the other skydiver at 90° to jump run. As he was tracking, he spotted a light ac 90° to the left of him. He estimated it was approximately 1000ft below and on a heading almost directly towards him. He thought that if they had continued on track, they would certainly have collided, so he deployed his main parachute immediately. As it was deploying, the ac passed about 10ft in front of him and carried on the same heading. He estimated the altitude at that point to be approximately 3000ft. He considered this to be an extremely serious incident given the proximity to himself and other parachutists. If he had deployed slightly later they would have collided with fatal consequences to himself and possibly the pilot.

THE LET 410 PILOT (PARACHUTISTS DROP PLANE) reports at approximately 1500, he departed Peterborough Sibson for the 11th parachute sortie of the day. He climbed to FL130 and at two minutes to drop, heading 220° at 85kt, he received "clear drop" signal from Sibson drop zone. All the parachutists were released from the ac and he descended without seeing any other ac during the flight.

THE JUMPMASER reports that on the 31 July 2004, she was asked to jumpmaster the 11th lift of the day. The climb and jump run were uneventful and at approximately 1min to drop, she opened the cabin door, visually assessed the jump run and saw no other ac in the surrounding area. At 0.4nm from the target area, she instructed the first group to exit the ac and then ensured that separation was maintained between them and the following groups. She was the last to exit the ac and she did not see the Airprox.

AIRPROX REPORT No 142/04

THE PETERBOROUGH PARACHUTE CENTRE comments that at 1545 a Chipmunk was observed entering their parachute-dropping zone. At this time 3 free-fall parachutists deployed their parachutes approximately 2-300ft to the ac's left. The Chipmunk then made a rapid turn to the right and flew directly below the 2nd group, a two-man formation. On seeing the Chipmunk the free fall parachutist deployed and missed the ac by less than 20ft. A video of the event accompanied the report. Centre staff was unable to trace the ac to any of the local airfields. The risk to both parachutist and pilot was considerable.

UKAB Note (1): The registration of the ac could not be seen on the video recording. A study was conducted of the exact colour scheme and markings of the ac involved; this narrowed the field to around 30 ac. Two extensive and independent attempts to trace the ac involved were conducted lasting several months which included contacting all Chipmunk operators in the UK with ac of similar colouring. Despite this, the Chipmunk pilot was not traced.

UKAB Note (2): Peterborough/Sibson is notified at the UKAIP ENR 5-5-3-3 as a Free-Fall Drop Zone up to FL150- with a radius of 1.5nm centred on position 5233.35N 00023.46W normally during daylight hours.

THE BPA comments that the present rules and procedures are quite sufficient if they are observed. It is unfortunate that the pilot could not be traced despite the best efforts of the Secretariat and AIS Mil.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports and a video film from the parachutist, a report from the pilot of the drop ac and a report from the manager of the parachute centre.

Members considered this to be a potentially very dangerous display of poor airmanship by the untraced pilot, both for flying through the well known promulgated parachute area and for failing to come forward despite in all probability being aware of the incident by way of the tracing action.

Two members very familiar with parachuting and drop zone operations considered that a good all-round visual search of the area might have revealed the presence of the Chipmunk which would have been a maximum of 3nm away at the time the 2min call was made from the ground to clear the drop. They expressed concern that there was no information in the reports to determine if such a search had been conducted.

There are a sizable number of inadvertent penetrations of protected airspace each year brought to the attention of the Board; so many that in the view of Members if such penetrations can cause a hazard to the legitimate users of that airspace, robust back-up procedures must be put in place to ameliorate if not remove the risk.

The Board determined the prime responsibility for the creation of this very dangerous incident lay with the Chipmunk pilot who in their opinion had been grossly irresponsible in endangering the lives of not only the reporting parachutist but also all others on that jump. Further, Members had little doubt that had a parachutist collided with the Chipmunk, rather than missed it by the 10ft reported, then its pilot too would have suffered fatal injuries.

The Board proposed that details of this incident, including the video if the parachutist agrees, be included in the various flight safety forums run by CAA and others.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The untraced Chipmunk pilot flew through a notified and active freefall parachute drop zone into conflict with a group of parachutists.

Degree of Risk: A.

AIRPROX REPORT No 143/04

AIRPROX REPORT NO 143/04

Date/Time: 5 Aug 2134 (Friday Night)

Position: 5113N 00231W
(12nm SE Bristol)

Airspace: LON FIR/UKNLFS(Class: G)

Reporting Ac Reported Ac

Type: EC135 C130

Operator: Civ Comm HQ STC

Alt/FL: 1700ft 250ft AGL
(QNH 1013mb) (RPS 1013mb)

Weather VMC CAVOK VMC CLOC

Visibility: >10km NR

Reported Separation:

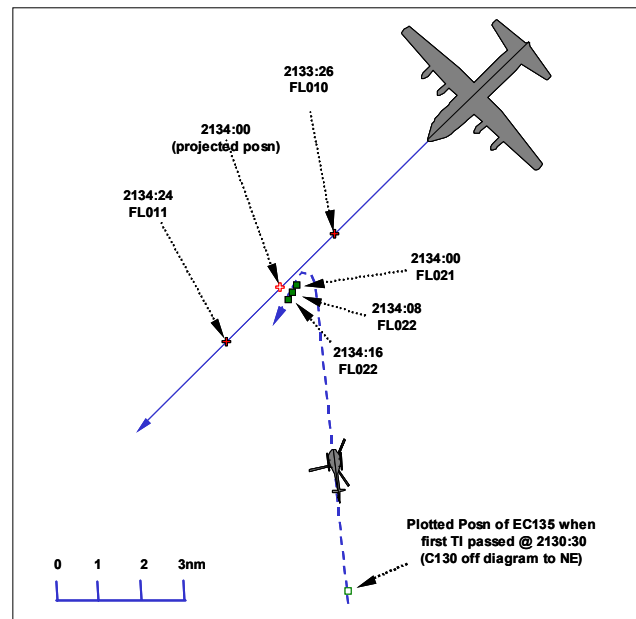
5-700ft V/Nil H 3-500ft V/¼nm H

Recorded Separation:

Not recorded

(Estimated from projected positions

1100ft V/ ¼ nm H)



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EC135 PILOT reports that he was returning to Filton in receipt of a FIS from Bristol APR and squawking 0061 [the respective Police ASU code] with Mode C. The ac had red anti-collision lights and nav lights selected on and the ac was ACAS equipped. While heading 350° at 1500ft QNH and 120kt, 10nm SW of Bath, Bristol RAD reported a C130 4-5nm SW of Bath at 1500ft. He climbed to 1700ft and saw a data tag on the ACAS approximately 6nm NE. He turned all the searchlights on. TCAS then showed the traffic at 3nm and -600ft and subsequently gave a 'Traffic, Traffic' warning. He pulled up and turned and the occupant of a rear seat saw a C130 with a single red light on the tail. He stopped the turn at 2200ft amsl 5-700ft directly above the C130. The C130 had no other lights or anti collision beacons lit, was not on the same radio frequency and did not deviate from its flightpath in any way.

This was the second occasion he had been under flown by a C130 at night and was very frightened even with the TCAS warning. From his previous military experience he understood that unless specific permission had been granted by MOD, the regulations stated that anti-collision lights had to be selected on when low flying on NVG and in such cases a NOTAM would be issued. In this incident the C130 had only one single red light on its tail.

He assessed the risk of collision as being high and reported the incident to Bristol RAD.

UKAB Note (1): Bristol Radar passed TI immediately after the EC135 pilot reported at 2130:20 that he had completed his task and was recovering to Filton. This TI gave the C130 as being 3nm E of Bath i.e. bearing 360° from the EC135's position at 18.5nm and at 1500ft. Two further TI updates followed over the next 3min and the pilot reported that he had the C130 on ACAS before he called at 2134 that he had taken avoiding action.

THE C130 PILOT reports flying a single ac with anti-collision lights on and nav lights selected on low flash, squawking 7001 with Mode C on a night low level NVG standardisation sortie at 250ft agl and on planned time on a NOTAM'd route. A helicopter was sighted at 3-4nm about 500ft above their height so he turned his ac left to avoid the helicopter but it turned towards them and then put very bright IR searchlight onto their ac. The helicopter then disappeared without incident and they felt no risk at all to their ac and were very surprised to learn that an Airprox had been raised.

UKAB Note (2): Due to the discrepancy in the lighting regime reported by the pilots, the C130 Station was contacted and asked to verify the lighting status of the C130. They responded that the standard light settings for

NVG flights are HISLS on red, anti collision light on red, Nav lights on low/flashing, which were the settings in use at this time.

THE C130 STATION comments that the C130 was flown by an extremely experienced instructor crew who had done all in their power to ensure an incident of this nature did not occur. The ac was properly lit and was flying on a NOTAM'd route which had been promulgated to all night LFS users by UKNLFS. The Station Commander was most concerned at the directing of a high power light at the C130 crew. Users of the UKNLFS should be aware of the very serious flight safety implications of this and the danger of this action 'blinding' the C130 crew.

THE BRISTOL RADAR CONTROLLER reports that a EC135 called on returning to Filton from an incident at Wincanton. As part of a previous traffic situation, Lyneham had previously advised that they had low-level traffic at 1000ft leaving their airspace to the SW. A low-level 7001 squawk was observed 3nm E of Bath tracking SW so he gave TI to the EC135 pilot saying that he believed it to be a C130. The 7001 squawk then disappeared although subsequently there were several intermittent primary contacts. The EC135's squawk did not show on radar at any time. He updated the EC135 crew with the intermittent contact 2nm E of Radstock. The pilot stated he had a TCAS contact in that location which was 6nm NE of his position. Both contacts then disappeared, appearing again 12nm SE BRI with no squawks. As he believed there was now a risk to both ac, he gave EC135 pilot TI with a bearing of 2 o'clock and a distance of ½nm from his believed position. The EC135 pilot then stated that he had taken avoiding action and would be filing an Airprox, which was done by telephone after landing at Filton. Lyneham advised him of the identity of the C130.

ATSI reports that they had nothing to add to the Bristol Controller's report other than that he did more than was expected of him in passing TI to the EC135 pilot while providing a FIS.

UKAB Note (3): Although a Y series NOTAM (Y2685/04) giving details of the C130's route was requested by RAF Lyneham. The NOTAM did not state that the ac would be operating on reduced lighting. Y Series NOTAMS are distributed only to users of the UK LFS (day or night) and AUS.

UKAB Note (4): The recordings of the Clee Hill and Burrington radars were reviewed. Although both ac can be seen intermittently operating in the area and the projected tracks apparently cross with 1100ft vertical separation less than a minute after the event, the actual incident was not recorded.

UKAB Note (5): The military regulations for operating without lights or with no Navigation or Anti-Collision lights are at JSP 550 Regulation 323 which refers to the UK Mil AIP Vol3 for Low level operations. This states:

'Exercises with navigation lights only are to be cleared through MFAC Sqn, SO2 LF who will publish appropriate NOTAM navigation warnings only'.

Although the regulations for lights out activity are clear, it has not been possible to find any MOD-wide regulation or dispensation regarding reduced lighting operations.

The RAF Lyneham Flying Order Book Order C12 (Aircraft Lighting) states:

'a. Navigation Lights Only (Bright Flash). If the Captain plans to use navigation lights only (e.g. TALO Leader), he is to include this fact in the route UKLB NOTAM request'.

HQ STC comments that the RAF Hercules force have, until this Airprox, been using a standard operating procedure (SOP) of flying with their Nav lights set to "DIM" when night low-flying on NVGs. This SOP was in accordance with the RAF Lyneham Flying Order Book. However, there was an assumption amongst the force that the MOD had an exemption to operate with reduced lighting; discussions with DAS(LA) revealed that there was no such exemption. HQ 2 Group, the operators of the ac in this incident, have taken action to amend Hercules C130 night SOPs to ensure that nav-lights are set to "ON" (full brightness) with immediate effect. They will only utilise the "DIM" setting at night on the lead ac of a pair of forming Hercules - otherwise the brighter lights will dazzle the forming Hercules. The trail, or forming, Hercules will have its nav lights at full brightness. All other flights with unusual lighting at night will be subject to NOTAM action.

Further work on this matter is being staffed and procedures for using "DIM" lighting will be discussed at a forthcoming meeting on low flying issues. This Airprox and Airprox 105/04 will be raised at this meeting.

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It is disturbing to see that the high intensity light on the helicopter was trained on another air user with the potential to dazzle the other aircrew, or in this case, 'gain-out' the electro-optical Night Vision Goggles. This practise should be discouraged on grounds of flight safety.

With reference to this Airprox, it is evident that the C130 crew saw the helicopter and had the opportunity to manoeuvre as required. From the distance of 3-4nm when the C-130 crew saw the helicopter (before being dazzled by the high intensity light) there was never a risk of collision unless the helicopter had descended towards the C130.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted the similarity between this incident and Airprox 105/04.

In common with Airprox 105/04 the pilot of the police ac, in this case an EC135, had wisely opted to request a FIS and had also been given a very good service, in this case from Bristol APR. This service followed by a TCAS warning had alerted him both to the approaching C130 and the need to take avoiding action. Shortly thereafter he was able to acquire the C130 visually, and having seen it he turned towards it, reducing the separation, and illuminated it with his 'searchlights'; Members questioned both actions. The rotary wing specialist informed the Board that this particular EC135 does not carry an IR searchlight but is equipped with a 'Night Sun' which is a visual spectrum searchlight. Although the EC135 pilot reported that he had illuminated the C130 with his 'searchlights', the specialist advised that he thought the pilot might have meant his landing light. Some Members nevertheless agreed with the HQ STC observation that the training of any light onto another ac was at best unwise and could be hazardous.

This C130 flight had been the subject of a Y series NOTAM since it flew through an area of the UKNLFS normally reserved for helicopters; the NOTAM however did not stipulate that the ac would be operating with reduced lighting. Further, the NOTAM was not forwarded by AUS to AIS Heathrow for retransmission as an A series NOTAM thereby making it available to non-military airspace users. The Board was informed that such retransmission is not routine procedure (see below).

The C130 pilot was operating on NVGs and had seen the EC135, 500ft above his height, from about 4nm. He took appropriate action to increase the existing lateral separation in addition to the vertical separation, which had increased from 500 to 1000ft as a result of the EC135's climb in response to the TCAS warning. Even allowing for this vertical separation, Members were concerned that the EC135 pilot had turned towards the C130, thereby reducing the lateral separation to about ¼nm rather than turning to the right and away from it if he felt his ac to be endangered. Nonetheless both pilots had seen the opposing ac throughout the evolving situation thus ensuring that there never had been any risk of their ac colliding. Further, due to the distances that the respective pilots had acquired the opposing ac, the reduced lighting regime of the C130 had not been a factor in this incident. Notwithstanding, in the context of this Airprox and 105/04, discussion followed regarding night low-level operations with reduced lighting.

While accepting that military ac are exempt from the external lighting requirements of the Air Navigation Order (ANO) and that the regulations for operations with no lights are clear and unambiguous, Members noted the apparently confused regulatory situation regarding the operation at night of military ac with **reduced** lighting. Although the Board fully accepted that low-level training at night was an essential military skill, Members considered that the MOD had a duty to ensure that military ac conducting such flights (including operations with external lighting below that specified in the ANO for their civilian counterparts) should be the subject of NOTAM action. For such NOTAMs to be of use to non-military pilots it is imperative that current distribution procedures be revised. HQ STC advised, on behalf of the MOD, that work is ongoing to resolve these current difficulties. The Board welcomed the pre-emptive action taken by HQ STC to improve flight safety as a result of this and another similar incident [see Airprox 105/04]. The US 3 AF advisor to the Board undertook to ensure that US forces operating in the UKNLFS were informed of these procedures. Members also noted the open approach to the promulgation of information concerning night low level training taken by the MOD through the MOD/ESH (Emergency Services Helicopter) Working Group.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the FIR (UKNLFS) resolved by both pilots.

Degree of Risk: C.

AIRPROX REPORT No 144/04

AIRPROX REPORT NO 144/04

Date/Time: 5 Aug 1543

Position: 5055N 00047W (3-5nm N GWC)

Airspace: AWY L980 (Class: A)

Reporting Ac Reported Ac

Type: A320 A340

Operator: CAT CAT

Alt/FL: ↓FL130 FL130

Weather VMC VMC CLOC

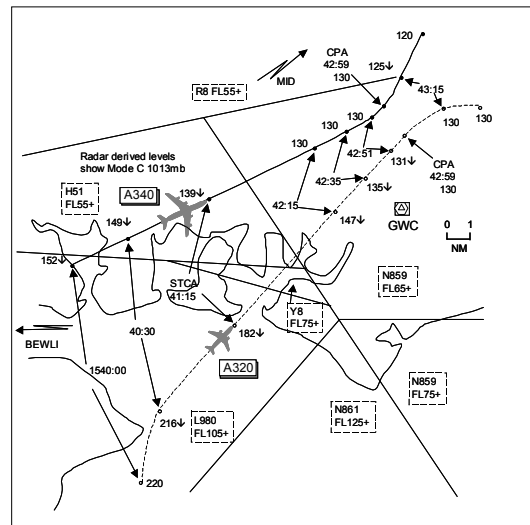
Visibility: NR 10nm

Reported Separation:

Nil V 2nm H Nil V 1nm H

Recorded Separation:

Nil V 1.6nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A320 PILOT reports inbound to Gatwick approaching FL130 in descent near to GWC at 250kt and in receipt of a RCS from London on 135.05MHz. After receiving a TCAS TA alert on traffic below, showing -600ft in level flight at FL130, the ac was spotted in his 10 o'clock as an A340 turning away at a range of 2nm. The A340 moved to his 0930 position, owing to the slow catch-up speed, and when he reported levelling at FL130, ATC issued an avoiding action R turn onto heading 150°. He had no knowledge of the other ac which was on a different frequency and holding because of Heathrow weather closure. ATC was very busy at the time, however the A340 had been seen earlier on his TCAS display, 2100ft below descending, as he was expediting his descent to FL130 and reducing speed from 280kt to 250kt. He assessed the risk as medium.

THE A340 PILOT reports inbound to Heathrow routeing to OCK heading 070° at 250kt and at FL130 and in receipt of a RCS from London on 134.12MHz. An ac was seen on TCAS in their 3 o'clock range 1nm indicating +500ft and descending. After the Capt, PNF, called ATC as the other ac showed +300ft, a TCAS TA alert was received followed by ATC issuing an avoiding action L turn and descent to FL120. The FO, PF, took out the A/P and initiated descent, as TCAS indicated nil vertical separation and 1nm horizontal against the other ac on their RHS. During the encounter, the other ac was not visually acquired, the crew were busy on the RT and following ATC instructions as well as assessing weathers and fuel owing to thunderstorms present at Heathrow. He assessed the risk as medium.

THE SECTOR 20 TACTICAL (S20T) CONTROLLER reports she agreed a course of action with S19T for her presentation of the A340 to the TC OCK Sector against S19T's presentation of the A320 to TC WLO. As soon as they had finished their coordination, the S19P shouted across that TC OCK Sector wanted the A340 descending to FL130 heading 070°. Being different from her agreed coordination with S19T, she asked S19P to confirm again what was required, the latter did so and wrote 070 on her fps. She pointed to the A340 on S19T's radar display and said "heading 070°, down to FL130 and to TC now". The S19T said yes so she did so. The environment around S19/20 was very busy, confusing and noisy but at the time she was content that coordination was effected. She then became very busy with holding traffic at BEWLI and other S20 traffic and did not notice the developing situation with the A320.

THE SECTOR 19 TACTICAL (S19T) CONTROLLER reports starting his session as an OJTI and when a zero landing rate for Heathrow was declared, he and his trainee decided to hold Heathrow inbound traffic at BEWLI. However, as the situation became complicated, he terminated training and took control of the position whilst the S19 Planner (S19P) took on a secondary controller. As well as coordinating with S20T, he was receiving verbal information from S19P and the secondary S19P was writing on, and moving around, his fpps in what he believed was an attempt to assist his 'picture'. The A340 had been coordinated with him by S20T to leave BEWLI hold descending to FL130. He opted not to work the flight but advised the S20T that the subject A320 inbound to

Gatwick would be heading 045° descending to FL130 and it was agreed that the A340 would also be heading 045°. He then forgot to transfer the A320 onto the next TC sector. Whilst involved with another traffic situation, he was simultaneously alerted by the South LAS and the crew of the A320 about a loss of separation. He issued an avoiding action R turn to the A320 crew followed by TI and once separation had been restored, the A320 was routed direct to HOLLY and transferred to TC.

THE SECTOR 19 PLANNER (S19P) CONTROLLER reports that during split sector operations the Planner position was being 'manned and boyed' owing to zero landing rate at Heathrow with TC telling them to hold all Heathrow inbound 'out' so this traffic was holding at BEWLI. During one telephone conversation the TC controller agreed to take the A340 from BEWLI at FL130 so she told the 2 tactical controllers, who agreed a course of action between themselves. When she telephoned TC and asked how they would like the A340 positioned, the TC controller said heading 070°. She informed both the S19&20Ts, the S19T said that he would not work the flight and that the S20T should pass it direct to TC heading 070° descending to FL130; this was done by the S20T. A couple of minutes later, there was an A320 flight inbound to Gatwick which was a lot faster than the A340. She then became busy coordinating with TC, S20T about other traffic in and out of the BEWLI hold and S25, and did not hear the S19T descend the A320 to FL130 whilst it converged with the A340, which was still maintaining FL130. STCA activated and the S19T turned the A320 sharply R with avoiding action. She telephoned TC to see if they were speaking to the A340 crew and to turn it L.

THE SECTOR 19 PLANNER (S19P) SECONDARY CONTROLLER reports being asked to 'man and boy' the Planner position because the situation was very busy and complex. Whilst concentrating on the Planner tasks, she heard the A320 crew ask about traffic at the same level so she looked at the radar and saw the STCA activate; the S19T turned the A320 R to increase separation.

THE TC OCK SECTOR CONTROLLER reports having just taken over the position in an extremely complex traffic scenario with weather affecting the majority of the sector. The standing agreement into the sector for Heathrow traffic had been suspended with traffic being individually coordinated. The A340 had been coordinated into the sector at FL130 on a heading of 070°, which the ac tracked but he noticed a Gatwick inbound (the subject A320) descending to the same level. The A340 crew reported a 'traffic alert' on TCAS so he gave the flight an avoiding action descent to FL120 which the crew eventually complied with.

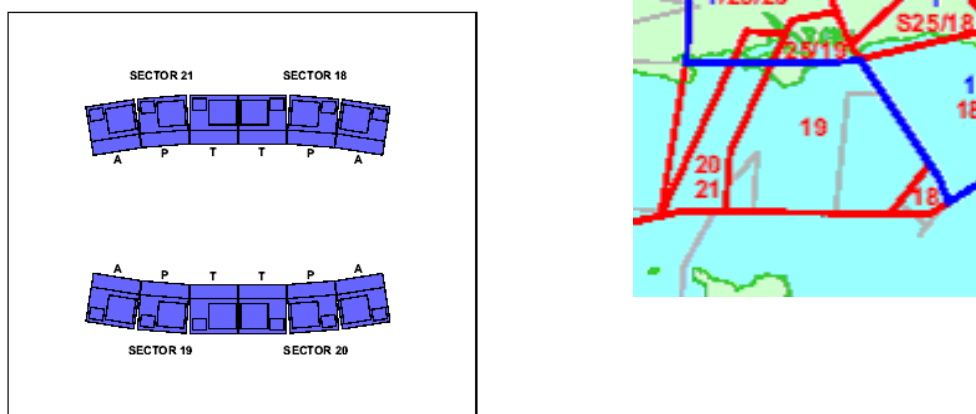
ATSI reports that at the time of the Airprox, the A320 was in communication with the S19T and the A340 was in contact with the TC Ockham SC, having just been transferred to his frequency by the S20T. The S19T described his workload as 'High in a complex situation' whilst the traffic loading was 'Medium'. The S20T described her workload as 'Medium but complex' and the traffic loading as 'Low'.

All controllers explained that a zero landing rate had been declared for Heathrow some 10–15min before the Airprox occurred. This resulted in ac, inbound to Heathrow, being held at BEWLI (approximately coincident with Bournemouth International Airport) and having to be individually coordinated between S19 and TC Ockham, rather than relying on the Standing Agreement, into the London TMA. As a result, the workload of the Local Area Group (LAG), comprising of Sectors 18, 19, 20 & 21, quickly increased in volume and complexity, leading to a number of interested observers standing behind the controllers at operational positions. Several of the controllers commented that the environment behind S19 and S20 was 'very busy, confusing and noisy'. This, some of them felt, was a distraction.

At the time of the Airprox, one controller was in the process of taking over the S19P position. Throughout the report, the controller in situ is referred to as Planner (A), and the controller taking over the position as Planner (B).

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The diagram below shows the layout of the LAG at LACC, for the sectors involved.



Key: A = Assistant P = Planner T = Tactical

It is necessary for some eastbound LTMA traffic routing via S20 to pass through S19 before entering TC's airspace, as the two sectors exist alongside each other with abutting airspace. It is common practice for the S19 and S20 Tactical controllers to agree between themselves whether ac can be transferred from S20 direct to TC, or whether S19 needs to communicate with them. However, the responsibility for coordination from S19 airspace into TC Ockham's airspace lies with the S19P, regardless of which Tactical controller transfers the ac to TC.

The A320 crew established communications with the S19T at 1529:55, descending to FL330 and routing northbound from the Cherbourg Peninsula to GARM. The S19T instructed the crew to fly a heading of 030° and advised that they could expect a WILLO 3C STAR for Gatwick. At that time, the A340 crew were in communication with the S20T and established in the hold at BEWLI. At 1530:55, the S19P (A) telephoned the TC SW Coordinator for an update on the situation with respect to Heathrow inbounds. As a result of this conversation, they coordinated the A340 into TC Ockham's airspace at FL130. This information was passed to the S20T who, at 1532:15, cancelled the hold for the A340. The flight continued eastbound towards BEGTO and was cleared to descend to FL180.

Shortly afterwards, the S19T instructed the A320 to turn L onto 010° and descend to FL200. This was later changed to FL220. These actions put the subject ac on converging tracks, the A340 heading E and the A320 virtually N. At 1536:20, the S19P (A) telephoned the TC SW Coordinator to establish where Heathrow inbounds should be routed. The reason for this query was that previously, the TC SW Coordinator mentioned that, due to weather, it might be necessary to hold traffic at Midhurst VOR, which is not normally used as either an en-route hold or inner stack for London TMA inbounds. At the time, the A340 was just S of Southampton and so the Coordinator requested that the ac should be placed on a heading of 070°. This information was relayed to the S20T by the S19P (A), and in turn it was relayed to the flight. The crew were also instructed to descend to FL130 before being transferred to TC. Although the flight would pass through their sector, S19 had opted not to work the A340, however, they still remained responsible for ensuring that the appropriate coordination with TC took place. At 1539:10, the A340 crew established communication with the TC Ockham SC reporting that they were passing FL162 for FL130 on a heading of 070°.

Meanwhile, the A320, still with the S19T, was maintaining FL220 in the 2 o'clock position of the A340 at a range of 14nm. At 1540:00, the S19T instructed the crew of the A320 to turn R, from the heading of 010°, onto 045° and descend to FL160. Shortly afterwards (1540:30) he added "A320 c/s descend flight level one three zero expedite your rate of descent please". The A340 was now 7.5nm N of the A320, still heading 070° and passing FL149 for FL130. At 1541:15, STCA activated as the A340 was passing FL139 with the A320 in their 3 o'clock position, range 5.7nm, passing FL182.

At 1542:15, the TC Ockham SC asked the crew of the A340 whether they could turn L for Ockham and the crew replied with a request for information on any weather showing on the radar. On being advised that weather returns are suppressed on the ATC radars, the crew reported turning for Ockham. The two ac were now only 3nm apart

and converging, the A340 level at FL130 heading 070° and S of it, the A320 passing FL147 heading 045°. At 1542:35, the TC Ockham SC transmitted "A340 c/s you can actually turn further left now and to descend now flight level one two zero it's avoiding action descend level one two zero". The crew acknowledged this and reported traffic in sight in their 3 o'clock at 1.5nm. At 1542:50, some 90sec after STCA had started activating, the S19T transmitted "A320 c/s avoiding action turn right immediately heading one five zero degrees". Shortly afterwards, the S19T informed the crew of the A320 that the conflicting traffic was turning L and descending. The two ac continued closing towards each other with separation reducing to a minimum, at 1542:59, when the A320 was in the 3 o'clock position of the A340 at a range of 1.6nm, with both ac at FL130. Shortly thereafter, the avoiding action instructions took effect and separation was quickly restored.

The S19P (A) advised that her workload had increased because of the need to hold traffic at BEWLI. It was explained that if traffic was flight planned to route close to BEWLI, as indeed the A340 had, then it was a relatively simple matter to update the electronic data. However, if traffic was not planned to follow routes via or adjacent to BEWLI, such as flights routing via the Cherbourg Peninsula, the process of changing the electronic data system was complex and time consuming. This holding scenario had not occurred very often since S19P (A) had validated, but it had been covered during her training.

On this occasion, agreement had been reached, originally, that both the A340 and the A320 should be transferred to TC heading 045° and descending to FL130. The A340 would be transferred from S20 direct to the TC Ockham SC, and the S19T would transfer the A320 to the TC WILLO SC having complied with the agreed coordination. This effectively meant that the S19T would have to ensure the requisite lateral separation between the subject ac.

Planner (B) was asked to take over the S19P position from Planner (A) and she started to do this some 5min before the Airprox occurred. When Planner (B) arrived at the position, Planner (A) was still carrying out the operational tasks, and so Planner (B) started to familiarise herself with the traffic situation. Recollections of what had taken place around this time, differed. Planner (B) believed she had been there to take over the position, although this was at variance with what was stated in her 1261, which describes her arriving at the sector to operate in a 'man and boy' mode. Planner (A) was under the impression that the situation was too complex (due to the holding at BEWLI) to handover, and so Planner (B) was there to assist in a 'man and boy' mode. It is reported that Planner (A) moved away from the planning position to behind the tactical controllers, shortly after the arrival of Planner (B). However, the Local Area Supervisor (LAS) instructed Planner (A) to remain on the sector due to the complexity. Planner (A) then returned to the S19P's position and continued with the executive tasks of the planner role.

Coordination was being effected, in part, by word of mouth from the S19P (A) to both the S20P and S20T. This added to the noisy environment around the sectors. The S19T and S20T each recalled the initial coordination agreed for the A340 and the A320 as heading 045° and descending to FL130 for both ac. However, as stated earlier, S19P (A) subsequently checked with the TC Coordinator as to the required coordination in respect of the A340, as the possibility of holding traffic at Midhurst had been mentioned. The TC Coordinator advised that the A340 should be placed on a heading of 070° descending to FL130. This information was passed to the S20T who asked for the S19P to repeat it. The S19P (A) did this and then wrote '070' on the S20T's fps. The S20T said that she had pointed to the A340 on the S19T's radar display and stated "Heading 070°, down to FL130 and to TC?", implying that this was her intended course of action and was seeking approval from the S19T. She went on to say that she was convinced the S19T had given a positive acknowledgement of this.

In obtaining this 'approval', it was reasonable for the S20T to expect that the S19T would ensure separation was provided between the A320 and the A340. The S19P (A) recalls this conversation taking place, and she too believed that she had provided this information to the S19T. The latter advised that he had no recollection of the change of heading being communicated to him. He went on to say that his fps for the A340 had '180 130' in the level box and two lines drawn through the callsign. This indicated to him that he would not be in communication with the ac but it would be transferred direct from S20 to TC Ockham descending to FL130. There were no headings written on the strip, neither the original 045° nor the revised heading of 070°. MATS Part 1, Appendix D page 1, para 2.3 states: *'The flight data display shall be updated immediately to reflect the current traffic and control situation whenever necessary. In order to ensure that all relevant air traffic control actions are reflected in the data display, it is essential that agreements made during controller to controller communication, whether this is effected by the use of recorded telephone lines or intercom systems or by 'face to face' verbal coordination, are indicated on the flight data display. All items such as levels, pertinent traffic, headings and/or speeds must be recorded on the data displays of both controllers involved.'*

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For reasons undetermined, the unit were unable to find the S19T's fps for the A340 so his recollections could not be corroborated. The S19P (A) recalls writing the revised heading of 070° on the S20T's strip but not on the S19T's strip. Additionally, the face-to-face coordination between the two Tactical controllers resulted in just the coordinated levels being recorded and not the heading. The unit's MATS Part 2, MOPS Chapter 3 para 3.3 states, under the heading of 'Planner Strip Marking': *'Coordination out of the sector shall be annotated in Box D'*.

The S19T advised that he had taken over the position some 10min prior to the Airprox taking place. He was intending to operate as an OJTI with his trainee, however, he quickly assessed that the complexity was too much for the trainee at his present level of training. The trainee unplugged from the position and sat behind observing for a while before leaving the sector. The S19T described the environment around the sector as noisy and busy. The Planners were shouting to each other over the heads of the Tactical controllers. There were also problems with producing strips which he suggested might have been the failure to remove the electronic 'Hold message' from ac about to leave the BEWLI hold. The S19T stated that the S19P (B), who had just arrived on the sector, was engaged in writing on and moving around his strips into Expected Approach Time (EAT) order. He believed that this was an attempt to assist him in retaining the up to date traffic situation, but this was not his normal method of operating and was a distraction to him. Planner (B) could not recall doing this but stated that the situation, although complex and busy, was under control.

The S19T said that having agreed the coordination in respect of the A340 and the A320, both heading 045°, he concentrated on his other tasks. He had no recollection of the heading on the A340 being changed and when he looked at the radar, he thought that the flight was following a track commensurate with a heading of approximately 045°. He had instructed the A320 crew to turn R onto 045° and then issued descent instructions, first to FL160, on top of the A340, and then to FL130, the agreed level for transfer to TC. Although STCA had activated at 1541:15, when the A340, working TC Ockham, was passing FL139 and the A320 FL182, he had not seen this due to concentrating on his other traffic. It was only when the LAS, who was observing from behind, pointed at the radar screen and the crew of the A320 reported that they were levelling at FL130 that he saw the conflict. He immediately gave avoiding action and, shortly afterwards, passed TI.

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 sympathised with the LACC and LTCC ATCOs involved in this incident. The imposition of a zero landing rate at Heathrow had rapidly increased the workload of all the controllers involved and created a very busy, complex and unusual situation. The S19 team had drafted in extra staff to help although it was not clear whether the S19P (B) had arrived to take over the position or assist in 'man and boy' operations. The S19T had said that the S19P (B) had been 'helping' him by writing on and moving the fps around into EAT order but as this was not his normal 'modus operandii' it had been a distraction. It appeared that there was no clear guidance as to where responsibilities lay during these 'man and boy' operations. Other team members had found the environs 'noisy and busy' owing to the Sector Planners' 'word of mouth' coordination, over the Tactical controllers' heads, and the number of 'observers' standing close-by. Undoubtedly, at the time, the intentions of all of the controllers involved was to put 'all hand to the pumps' to sort out the traffic situation but the number of people around the area most probably, at times, distracted one or other of the controllers from the 'matter in hand'. Members agreed that the sum of these elements had caused the S19 and S20 teamwork and actions to be confusing and disjointed which had contributed to the Airprox. The S19T and S20T had agreed coordination to place the A340 and A320 on parallel headings (045°) with both descending to FL130 for transfer to their respective LTCC sectors. However, it appeared that the heading information had not been annotated onto the respective fps. Following the TC Coordinator requesting a heading change for the A340 onto 070°, the S19P (A) had informed the S20T and written the information on his fps. Without the S19T's fps being available nor a recording of the actual conversation that took place, it was unclear exactly what information had been displayed to the S19T but from the S20T and S19P (A)'s perspective, the change of heading for the A340 had been acknowledged by the S19T, after it had been pointed out to him on the radar display, and so the revised coordination request had been agreed. This was not remembered by the S19T who could only recall the cleared level of FL130 and the two lines drawn through the c/s part of the fps: he had not assimilated the new, revised heading. It was clear that a positive read back should have been obtained from the S19T and then the agreed coordination should have been written on the fps. Members agreed that because the fps marking on flight data display did not accurately reflect the situation at the time, it had denied all controllers in the Sector team of a visual 'aide memoir' record of what had been agreed

during their 'face to face' coordination, and this had also been contributory factor to the Airprox. The S19T had then assessed that the A340's track was as expected and vectored the A320 onto the originally agreed heading and descended the flight to FL130 which had brought the subject ac into conflict which had caused the Airprox. Following these instructions, the S19T had turned his attention to other traffic, forgetting to transfer the A320 to the next TC sector which would normally occur well before GWC. The S19T and S19Ps (A) and (B) had all apparently not seen STCA activate, only becoming aware of this when it was pointed out by the LAS standing behind. This 'safety net' had been active for approximately 90sec prior to remedial action being commenced, during which period there was a chance to break the chain of events. These two elements were felt to have been the last contributory factors. Had the A320 been transferred to TC, it would almost certainly allowed the expecting WILLO SC to take control earlier and effect action to resolve the deteriorating situation.

Turning to risk, the A320 crew was given an early 'heads-up' on TCAS of the A340 below them, as they expedited their descent, and received a TA alert as they approached FL130. The ac was visually acquired and, as they started to pass 2nm abeam it, ATC gave an avoiding action R turn onto 150°. The A340 crew had also seen the A320 on TCAS, 1nm to their R, 500ft above and descending. Simultaneously with a TA alert, ATC issued an avoiding action L turn and descent, which was complied with, although the A320 was not seen visually but TCAS indicated 1nm separation. The LACC and LTCC controllers involved had seen the situation late but had issued robust avoiding action instructions to resolve the conflict. These actions, combined with the 'sightings' by both crews and the actual geometry of the encounter, were enough to persuade the Board that the safety of both ac had been assured.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: During a complex and busy situation, the S19T did not assimilate the revised coordination request regarding the A340 and vectored the A320 into conflict with it.

Degree of Risk: C.

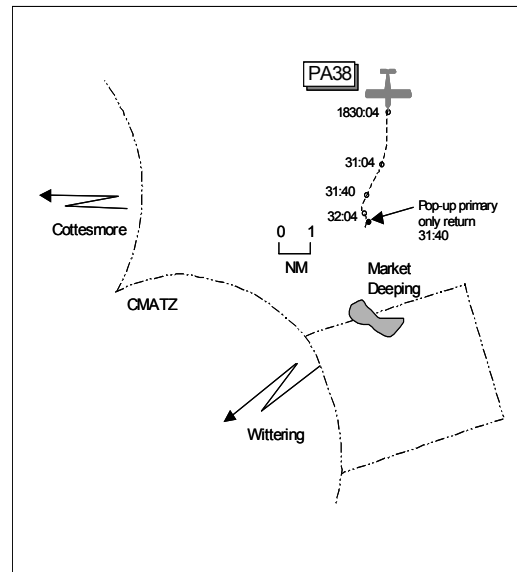
Contributory Factors:

1. The S19T did not transfer the A320 flight to LTCC nor notice STCA.
 2. Apparent lack of annotation of coordination or headings on fpss.
 3. The S19/20 teamwork and actions were disjointed.
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AIRPROX REPORT No 145/04

AIRPROX REPORT NO 145/04

Date/Time: 1 Aug 1832 (Sunday)
Position: 5244N 00019W
(3nm N of Market Deeping)
Airspace: LFIR (Class: G)
Reporting Ac Reported Ac
Type: PA38 Aviasud Mistral
Operator: Civ Pte Civ Pte
Alt/FL: 1000ft NR
(QFE 1021mb) NK
Weather VMC HAZE VMC CLNC
Visibility: 5000m >10km
Reported Separation:
Nil V/200m H NR
Recorded Separation:
Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA38 PILOT reports flying a local sortie from a private site near Sleaford heading 180° at 85kt and 1000ft agl and not in communication with any ATSU squawking 7000 with NMC. The ac was coloured white/orange and the wing-tip strobe lights were switched on. Although the weather conditions were hazy (5000m), the visibility was such that safe flight was possible. About 2nm N of Market Deeping he spotted a Microlight, an Aviasud Mistral Biplane, in his 11 o'clock range 300-400m at the same level on a converging/crossing course L to R. It was coloured white with no strobe lights apparent, cruising straight and level. He immediately executed a steep L turn to avoid it, estimating it passed 200m to his R. He believed the pilot of the Mistral was not aware of his presence as no avoiding action was seen to be taken by the other ac. He assessed the risk as 'B' opining that the cause of the incident was poor observation by himself and the other pilot.

THE AVIASUD MISTRAL PILOT reports heading 270° at 55kt enroute from Fenland to a private site near Coalville, Leicester, and not in communication with any agency; he would normally be in contact with Cottesmore but they were closed. Neither transponder nor lighting was fitted to his white/red coloured biplane. Although he remembered the incident occurring to the N of Market Deeping, he was traced over 1 month after the event so his recollection of distances and the other ac's details were vague. The visibility was good, >10km, but some leftover haze remained and he was flying into sun. This may have been why he spotted another ac late, in his 3 o'clock range 500m at the same level. His lower wing also may have possibly obscured it. No avoiding action was taken as the other ac was seen to turn L to pass behind. He assessed the risk as low.

UKAB Note (1): The Met Office reports that Cottesmore and Wittering aerodromes were closed but automatic SYNOPS for the area in the period 1800-1900Z reveals that the visibility was between 10-15km with clear sky conditions.

UKAB Note (2): The Rules of the Air Regulations 1996 Rule 17 Rules for avoiding aerial collisions Para (1) General (d) states "An aircraft which is obliged by these Rules to give way to another aircraft shall avoid passing over or under the other aircraft, or crossing ahead of it, unless passing well clear". Para (2) Converging (b) (ii) states "...when two aircraft are converging in the air at approximately the same altitude, the aircraft which has the other on its right shall give way".

UKAB Note (3): Analysis of the Debden radar recording proved inconclusive. At 1830:04 a 7000 squawk showing NMC is seen, believed to be the PA38, 6nm N of Market Deeping tracking S which 1min later turns R to track 210°. Forty seconds later a single pop-up primary only return, possibly the Aviasud Mistral M/Light appears the PA38's 11 o'clock range 0.75nm; the contact disappears on the next radar sweep so no track is discernible. The PA38

continues tracking 210° until 1832:04 when it is seen tracking SE, having turned sharply L, which is maintained for two sweeps before turning onto a S'y track. This manoeuvre, 3nm N of Market Deeping, correlates with the avoiding action described by the PA38 pilot but the Airprox, per se, is not seen on recorded radar.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

There was no doubt that this had been a conflict in Class G airspace where 'see and avoid' pertained. Although the Mistral pilot was required to give way, compliance with the Rules of the Air is dependant upon pilots seeing each other. From the sighting distances quoted in each report, it was clear that both pilots had seen each other late and this had caused the Airprox. The Mistral pilot was flying into sun which, when combined with any residual haze, would have made visual acquisition more difficult. He had seen the PA38 about 500m away to his R and taken no action as it was seen to turn L to pass behind. The PA38 pilot had seen the Mistral, slightly later, in his 11 o'clock range 300-400m crossing L to R and had immediately executed a steep L turn to avoid it, estimating it passed 200m away to his R. One Member thought that from the geometry of the encounter and the separation distances quoted, safety had been compromised during the encounter. This view was not shared by the majority of the Board. Although these had been late sightings, the robust avoiding action taken by the PA38 pilot was enough to ensure that any risk of collision had been quickly and effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by both pilots.

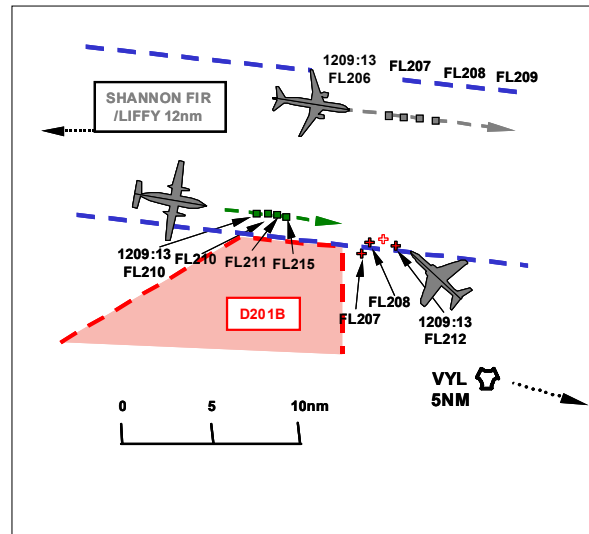
Degree of Risk: C.

AIRPROX REPORT No 146/04

AIRPROX REPORT NO 146/04

Date/Time: 3 Aug 1210
Position: 5328N 00503W (15nm East LIFFY)
Airspace: Airway L975 (Class: A)
Reporting Ac Reported Ac
Type: Dash 8-300 Hawk
Operator: CAT HQ PTC
Alt/FL: FL210 FL200

Weather VMC VMC CLOC
Visibility: 10km >10km
Reported Separation:
700ft V/5-6nm H Not seen
Recorded Separation:
500ft V/5.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DASH 8-300 PILOT reports flying a scheduled passenger flight from Shannon to Manchester in good weather. While heading 100° at 260kt and FL210 in Airway L975, he became aware of a developing situation when Dublin ATC advised another ac ahead of them to stop climb at FL210 due to fast moving military traffic. At this time they saw 'other traffic' displayed on TCAS at 5-6nm range in their 2 o'clock. Almost immediately they got an RA indication followed moments later by a TCAS 'Climb', 'Climb now', which coincided with ATC instructing them to turn left onto 070°. TCAS initially requested a climb rate of 1500ft/min and on passing FL215 it announced 'adjust vertical speed' to 300-400ft/min. ATC was advised of the TCAS climb and the conflict cleared at FL217 whereupon the ac was restored to FL210, the cleared level. The first officer became visual with the infringing traffic as it turned left away from them at close range.

THE HAWK PILOT reports flying an instructional sortie with a student in the front seat as PF in a black ac with HISLs, nose and anti collision lights on. He was conducting a spinning exercise in the only clear weather area to the W of Valley. He contacted Aberporth and obtained a clearance into N part of D201 [adjacent the S boundary of L975]. He was aware that they were drifting to the N in order to stay in the good weather. Following a spin recovery flown by the student, he (the student) entered a slack left turn. The QFI was aware they were operating close to the N boundary of D201 so he checked his position and the TACAN showed they were approaching the VYL 300° radial at 18nm, so he told the student to tighten the turn, continue left onto S and start working clear of the northern edge. The student turned to the S and, having started at FL200, descended to FL180 in the turn. At no time did he feel they were in CAS, their limited navigation aids indicating that they had remained outside; he was however, aware they were close to the N edge of the Danger Area at the time of the turn onto S, hence the call to the student to tighten the turn.

UKAB Note (1): TACAN position VYL 300/18nm equates to 5323.4N 00459.5W which is ½nm inside the S edge of Airway L975. This corresponds precisely with the position shown on the St Annes radar recording at 1209:26, a few sec after the left turn had been commenced.

THE DUBLIN CONTROLLER reports that the DASH8 was 10nm E of LIFFY level at FL210 heading E; at the same time another ac, 4.7nm NE of it was in the climb to FL230, also heading E. A 7000 Squawk was seen tracking NE with an unverified Mode C showing it climbing through FL160 and entering L975. A 'Traffic Advisory' was passed to all relevant traffic. The DASH8 pilot informed the Controller that he was responding to a TCAS RA just as the 7000 squawk was about to leave CAS heading S.

UKAB Note (2): The recording of the St Annes radar shows the 2 civil ac in L975 both heading E. The ac that was not involved was just inside the N boundary of the airway, initially abeam and below the DASH8 which was at

FL210 but cleared to climb to F230 through its level; the tracks were separated laterally by 6.4nm as it overtook the DASH8. The DASH8 was level at FL210, 1.3nm inside the S edge of the Airway as the Hawk penetrated CAS 8.1nm ahead of it, initially heading NNW, but immediately commencing a hard L turn. As the Hawk left CAS 23sec later the DASH8 was 5.2nm away climbing through FL213 in response to the TCAS RA.

UKAB Note (3): MATS pt 1 at S1 Ch5 P11 12.1.4 states:

“Although ac operating in controlled airspace are deemed to be separated from unknown ac flying in adjoining uncontrolled airspace, the radar controller should aim to keep ac under his control at least two miles within the boundary where possible. Unpredictable manoeuvres by unknown ac can easily erode separation.”

HQ PTC comments that they are mindful that Valley based Hawks are poorly equipped to maintain accurate navigational awareness, easily and with confidence. The proximity of regulated airspace and the need for clear air often (literally) backs their pilots into an unenviable corner if they are to complete the task. The Hawk's TACAN was telling the accurate truth: our pilot was just in the airway. The GPS fleet fit is almost complete and will provide a confidence crosscheck against the TACAN range/bearing. The Hawk T1 replacement will have the nav kit of the future. Meanwhile, we shall warn our crews to leave a better margin for error when operating close to airways.

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 and operating authorities.

The ATSI advisor clarified the procedures to be applied in the area of the occurrence (i.e. area of delegated ATS) which are outlined in a LoA between Dublin ATCC and London ACC; Annex F, Para F2.2.8 states: '.... when traffic is positioned tactically on Airways L975 or L70 the transferring controller shall ensure that:

Traffic, in any circumstances, is positioned not less than 2nm from the northern or southern edge of the airway'.

Despite the statement in MATS Pt1 at UKAB Note 3 above, the Board was informed by ATC Members that it is common practise to effect separation by putting ac at the opposite extremities of Airways. The reason for the cautionary advice at both statements in the MATS and the LoA is to ensure that separation is not eroded in exactly the circumstances of this Airprox when an unknown contact penetrates the edge of an airway. Notwithstanding the guidance above, ATC specialists informed the Board that the current density of traffic made the lateral separation of same-way, same-level airway traffic almost unavoidable.

In this case however, before the Controller was able to take any action following the brief Hawk incursion, the DASH8 pilot received and reacted correctly and in a timely manner to a TCAS RA. The RA had also allowed him to acquire the Hawk visually and a combination of his actions had prevented there being any risk that the 2 ac would have collided. Members thought it worthy of note that, in their opinion, the DASH8 pilot would still have received, and have had to react to an RA, even if the Hawk's turn had been early and tight enough to keep it just clear of the Airway.

Despite the weather constraints and that in this case there had been no risk of collision, Members thought that the Hawk pilot was unwise in choosing to operate in that area. Military aircrew Members agreed that when conducting GH, pilots should **always** allow a good safety margin from CAS thus avoiding inadvertent infringements such as occurred here. The Board considered that the Hawk pilot's poor judgement had contributed to the incident.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: TCAS RA followed by a visual sighting in Airway L975.

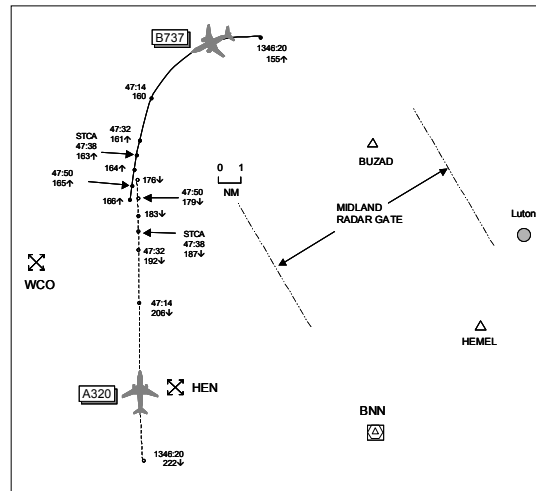
Degree of Risk: C.

Contributory Factors: Unauthorised penetration of Class A CAS by the Hawk pilot.

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AIRPROX REPORT NO 147/04

Date/Time: 12 Aug 1348
Position: 5153N 00150W (5nm NE WCO)
Airspace: Daventry CTA (Class: A)
Reporting Ac Reported Ac
Type: A320 B737-800
Operator: CAT CAT
Alt/FL: ↓FL170 ↑NR
Weather VMC CLAC VMC CLOC
Visibility: >10km NR
Reported Separation:
600ft V/0.25nm H NR
Recorded Separation:
1200ft V 0.3nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A320 PILOT reports inbound to East Midlands heading 360° at 320kt and cleared by London ATC on 130.92 MHz to descend to FL170. Passing FL200 TCAS gave a TA alert on traffic in his 12 o'clock so he reduced his ROD. Descending through FL185 ATC gave avoiding action 'level-off at FL180 and turn R onto 090°': however, owing to his ROD, he levelled at FL175. As this was achieved, a B737 was seen passing through his 8 o'clock range 0.25-0.5nm away and 600ft below at FL169. After being recleared enroute to SAPCO and given descent to FL100, ATC told him that the B737 was apparently only cleared to climb to FL160. He assessed the risk as medium.

THE B737 PILOT reports that he could only recall some aspects of the incident after completing his report from memory some 3 months post incident. The weather was very unstable with many large and active Cb clouds and hence the RT was busy with pilots requesting weather avoidance. He had been issued a step-climb clearance when southbound close to WCO and had heard another ac being given descent clearance. He heard another ac being given 'avoiding action', he thought, whilst TCAS simultaneously sounded a TA alert. His ROC was moderate with v/s selected on the MCP. The v/s was reduced and visual contact was established with a medium sized ac above them in their 10 o'clock turning away to the NE. An unresolved discussion then took place on the flight deck as to whether the conflicting ac had been cleared down to, or through, their level. As safely resolved TAs are not unheard of in the LTMA they continued normal operations.

THE TC CAPITAL SC reports taking over the position having just been working as the CAPITAL Coordinator for 50min. He mistakenly believed that working as the Coordinator he had obtained a 'RFC' (released for climb) for the B737 on a Stansted SID from TC MIDLANDS. Therefore when the B737 crew checked-in on the frequency he climbed the flight to FL180 which put it into conflict with an A320 inbound to East Midlands, which had been descended through a section of his airspace without coordination.

THE TC WELIN SC reports that she had just taken over the sector 5min after working as the TC LAM SC. The A320 was avoiding weather and was routing from OCK direct to WELIN descending to FL220 on a standing agreement. Having checked with TC COWLY, via the Coordinator, she instructed the A320 crew to descend to FL170 on top of any CPT departures including the subject B737; this latter flight was opposite direction traffic, seen at FL160, but was not on her frequency. As the subject ac approached each other she saw the B737 was climbing. She told the A320 crew to stop descent at FL180 and, knowing that it may well pass through that level and not knowing the level to which the B737 was climbing, she gave the A320 crew an avoiding action turn onto 090° with TI. The A320 crew reported seeing the B737 pass down their LHS and also stated that they would be filing an Airprox.

ATSI reports that it was not possible on this occasion to conduct a Field Investigation into this Airprox. The following report has therefore been completed from radar and RT recordings and ATC reports.

The A320 was inbound to East Midlands from Faro and following a direct route between OCK and WELIN. The flight had been transferred from LACC Sector 26 to TC WELIN in accordance with the standing agreement. The standard route for such flights is via the Midlands Radar Gate which is situated between Luton and Westcott. However, on this occasion the A320 was not on the 'standard route' and was W of the normal track, this deviation was for weather avoidance. The A320 crew contacted the WELIN SC and reported descending to FL220, the standard level for transfer from LACC S26. The WELIN SC requested that the MIDLANDS Coordinator coordinate further descent to FL170. The sequence of sectors through which the A320 would pass was as follows: LACC S26 – TC WELIN – TC COWLY. However, if the ac was descended early by the WELIN controller whilst following this non-standard track, it would also enter the TC CAPITAL sector airspace.

Shortly after the request for further descent, the WELIN SC reported that the MIDLANDS Coordinator advised her to descend the A320 'now'. However, unbeknown to the WELIN SC, the MIDLANDS Coordinator had only coordinated with the COWLY sector and not the CAPITAL sector into whose airspace the A320 would enter if it descended at that time. Had the coordination that had actually taken place, i.e. only with the COWLY sector, been annotated on the WELIN SC's flight progress strip it should have been apparent that the complete coordination required had not been undertaken. MATS Part 1, Appendix D page 1, para 2.3 requires the flight data display to be updated to reflect the current traffic situation as well as any agreed coordination whether face-to-face or by telephone or intercom.

When the A320 was instructed to descend to FL170, the ac was 11nm SW of the western edge of the Midlands Radar Gate and following a northerly track so that it would pass at least 6nm W of the Radar Gate. This meant that it was descending into CAPITAL's airspace, which exists from FL195 – FL215 in that position. Had the flight followed the standard track then it would have been to the E of this and remained within WELIN sector's airspace.

The B737 was outbound from Stansted, following a CPT SID and had been climbed to FL160 by the BNN sector and then transferred to the CAPITAL sector. Prior to taking over the CAPITAL SC position, the controller had been working in the CAPITAL Coordinator position and he had believed, mistakenly, that he had coordinated further climb for the B737, with the COWLY/WELIN sector. However, this was not the case and the fps was correctly annotated in that it did not indicate that any such coordination had been undertaken.

The result of these two omissions was that the A320 was descending into CAPITAL's airspace without coordination being effected and the B737 was being climbed from CAPITAL's airspace into WELIN's, again without the requisite coordination having been undertaken.

At the time the WELIN SC instructed the crew of the A320 to descend below FL220 (1346:10), the B737 was 19nm to the NNE and passing FL155 climbing. The B737 was turning L onto a near reciprocal track to that of the A320. As soon as the B737 crew contacted the CAPITAL SC (1347:15), he instructed them to climb to FL180, mistakenly believing that this had been coordinated.

[UKAB Note (1): As the B737 commences climb at 1347:32 (FL161), the A320 is 4.9nm to the S of it, passing FL192 in its descent.]

The WELIN controller quickly spotted the problem and instructed the crew of the A320 (1347:45) to stop their descent at FL180. However, realising that the A320 might be unable to arrest its descent at that level, an avoiding action turn onto 090° was issued as well as passing TI. Meanwhile, the CAPITAL SC was alerted to the confliction by STCA (1347:38) and started to transmit to the B737 crew. However, he did not believe he could do anything to resolve the confliction and simply said "B737 c/s ah disregard".

[UKAB Note (2): The CPA occurs between radar sweeps. At 1347:50, the A320 is descending through FL179 0.6nm S of, and 1400ft above, the B737 indicating FL165 climbing. At the next sweep 6sec later the ac have passed, the B737 is now climbing through FL166, 0.9nm S of, and 1000ft below, the A320 indicating FL176. It is estimated that at the CPA, vertical separation was 1200ft as the subject ac pass each other, port to port, 0.3nm apart.]

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

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The NATS Advisor informed Members that a Temporary Operating Instruction TO1142/04 has since been released promulgating a trial procedure effective from the 1st January 2005 on all TC sectors providing guidance to controllers with regards to the requirements for the layout and content of coordination messages and the associated strip marking. It was clear that tactical coordination was required on this occasion as the A320 was routing W of the Midlands Radar Gate. Ac flying through this radar gate would be in compliance with a standing agreement which is designed and established so that individual coordination is not required. An ATCO, familiar with TC operations, informed Members that when the WELIN SC earlier descended the A320 from FL220, it had been through a thin layer of CAPITAL airspace from FL195-215 without coordination. However, Members agreed that the Airprox had occurred later, well within COWLY Sector airspace where tactical coordination had been effected between the WELIN and COWLY SCs via the MIDLANDS Coordinator. The CAPITAL SC had received the B737 at FL160 from the BNN Sector but with the ac within the COWLY Sector. Therefore any further climb could only be effected by the CAPITAL SC if he had coordinated climb with the MIDLANDS Sector or if he had waited until the ac crossed his sector's airspace boundary, a line from a position 5nm N of CPT to BNN VOR. The CAPITAL SC believed that he had coordinated climb with the MIDLANDS Sector when operating as the CAPITAL Coordinator immediately prior to taking over the SC position. This was not the case and this erroneous belief had led the TC CAPITAL SC climbing the B737 into TC MIDLANDS airspace without coordination and into conflict with the descending A320 which had caused the Airprox.

The A320 crew were aware of the potential conflict when receiving a TA alert and they had reduced their ROD. The WELIN SC had also noticed the developing situation and had issued an avoiding action 'level-off' instruction and a R turn, which the A320 crew actioned immediately, arresting their descent at FL175 and visually acquiring the B737 as it passed their 8 o'clock about 0.25-0.5nm away and about 600ft below. The B737 crew had also received a TCAS TA alert and they had adjusted their ROC, seeing the A320 in their 10 o'clock passing to their L and above. These actions taken by all parties, when combined, had been very effective in taking the heat out of the situation, the subject ac passing separated by 1200ft vertically. This led the Board to conclude that safety had been assured during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The TC CAPITAL SC climbed the B737 into TC MIDLANDS airspace without coordination and into conflict with the descending A320.

Degree of Risk: C.

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ATSI reports with RT transcript that at the time of the Airprox the A320 was under the control of the Heathrow INTERMEDIATE DIRECTOR NORTH (DIR) and the Global Exp was under the control of the LTCC NE DEPS. The DIR reported that he had been in position for about 40min and described his workload as “high” with a “medium” traffic loading.

TC had been holding inbound traffic at BRASO (20nm E of LAM) at FL180 and above, prior to ac routeing in towards LAM. DIR advised that he had just ‘emptied’ the LAMBOURNE stack and was awaiting further traffic. He added that the Traffic Manager was trying to keep the delays to 15min or less. The A320 was inbound to Heathrow via LAMBOURNE, followed by an MD11, which had an earlier Expected Approach Time and would have to be positioned ahead of the A320 in the landing sequence. TC NE descended the A320, in steps, down to FL100 entering the LAM hold at 1929:25, before being transferred to the DIR at 1931:00.

Meanwhile, the Global Exp had departed Luton following a DOVER SID. At 1926:00 the Global Exp crew established communications with the TC NE DEPS who instructed them to route direct to BROOKMANS PARK (BPK) and issued a climb clearance progressively to 5000ft QNH, 6000ft QNH and then to FL80. At the time the latter clearance was given, the A320 was levelling at FL140 just approaching LAM with the Global Exp at 2 o'clock - 11nm passing 5600ft. At this point, the MD11 was 18nm behind the A320 and maintaining FL180 having been cleared from BRASO to LAM. The DIR explained that his plan had been to give the A320 one complete hold, during which time the MD11 would have reached LAM and been vectored straight off to the W and fitted into the landing sequence, ahead of the A320. The TC MATS Part 2 HRW4.4 para 4.4.3.1 states:

*“To facilitate departures from Stansted, Luton and Northolt routeing via DET, **Minimum Stack Level is allocated to TC North East for use by all traffic routeing east of the LAM VOR**”.*

The ‘Minimum Stack Level’ is defined in the MATS Part 2, GEN 2.18 as:

“...the lowest whole flight level giving a minimum of 1000ft separation above the transition altitude”.

The current TC Minimum Stack Level is displayed at the bottom of the radar display in a small palette labelled ‘Min Stack’. At the time of the Airprox, the QNH was 1012mb and the Minimum Stack Level was, therefore, FL80. The MATS Part 2 DAT4.3 para 4.4 states:

“When a flight level is not available for use due to pressure changes, the flight level is to be blocked out”.

Consequently, FL70 was not available to the DIR and should, accordingly, have been crossed out on the relevant flight progress strip (fps).

When the A320 crew contacted the Heathrow DIR they reported passing FL110 descending to FL100. At 1931:20, DIR responded “[C/S] thank you descend flight level 80 delay from now is just over 5 minutes”. This was clearly read back by the crew “...descending level 80”. The A320 was passing S abeam LAM, established in the hold passing FL115, with the Global Exp level at FL80, 10nm to the N on an ESE track. The DIR explained that he had been concentrating on the situation between the MD11 and the A320 and realised the need to descend the latter as soon as he could. Investigations have shown that the London QNH had dropped from 1013mb to 1012mb at approximately 1830. This resulted in the lowest useable level available to the Heathrow DIR, in the vicinity of LAM, changing from FL80 to FL90. DIR had been in the operational position since 1850 and so was aware of both the QNH and the Minimum Stack Level. He acknowledged that he had not crossed out FL70 on his strip as is required according to MATS Part 2. In his experience, this was an omission that occurred regularly amongst controllers, although some ATSA's crossed out the unusable levels on strips.

DIR remained unaware of the developing conflict but, at 1932:40, as the A320 reached the end of the outbound leg of the hold and turned L inbound towards LAM, the pilot transmitted “[A320 C/S] please confirm cleared level”. DIR immediately saw that the Global Exp was in the A320's 12 o'clock at about 2.6nm with the Global Exp maintaining FL80 and the A320 passing FL89 in descent. He transmitted at 1932:50, “[A320 C/S + shortened A320 C/S] avoiding action turn left heading 260 degrees traffic in your 1 o'clock range 3 miles flight level 80”. During this transmission, at 1932:52, STCA activated at ‘low severity’ before changing to ‘high severity’ at 1933:08. The A320 crew promptly acknowledged the instruction at 1933:00, “[C/S] left turn heading 260...”. At the same time, the TC NE DEPS was instructing the Global Exp crew to “[C/S] turn left now heading of er 09 er correction turn left heading 090 degrees avoiding action”. The Global Exp crew acknowledged immediately “to 090...not a

factor". [UKAB Note: The controller then instructed the Global Exp crew to descend to an altitude of 6000ft at a good rate, which the crew acknowledged and actioned before they were instructed 30sec later to resume their own navigation direct DET and climb back to FL80. Later, when advised by the controller that an Airprox report would be filed the Global Exp crew reported "okay it wasn't a factor we had him in sight....all the time miles away".] The turn instruction issued to the A320 quickly took effect and minimum separation occurred at 1933:01, when the Global Exp was in the A320's 3 o'clock at a range of 0.6nm and 600 ft below it. Shortly thereafter, the two ac were tracking away from each other and separation was quickly restored 24 sec later.

DIR was aware that there was an option to co-ordinate a descent for ac below 'Minimum Stack Level plus 1000ft' but the controller had not carried out any such co-ordination in respect of the A320. He stated frankly that the descent clearance had been given in error, due to focusing on the two inbound ac, rather than in the mistaken belief that such a descent had been coordinated. DIR did not cross out the levels that were not available to him on his fps, as is required by MATS Part 2. It is important that DIRECTORs follow this procedure in order to remove potential confusion as to which levels are available for use. Had he done so here, this may well have reminded him that FL80 was not available without prior coordination. As it was, this descent instruction brought the A320 into conflict with the Global Exp, which was maintaining this level in order to pass under the LAM hold.

It is understood that work is progressing towards the automatic deletion of unusable levels, when strips are printed. However, until this facility is available, Local Competency Examiners should ensure that controllers are complying with the relevant MATS Part 2 procedure.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was readily apparent from the controller's laudably frank account and the comprehensive ATSI analysis that this Airprox had resulted from an honest mistake by the DIR which the controller had conscientiously reported. The ATSI report had shown that DIR had erroneously instructed the A320 crew to descend to the Minimum Stack Level of FL80 when the airspace at this level was delegated, in accordance with standard procedures, to the TC NE DEPS SC. This brought the A320 into conflict with the Global Express, which was maintaining this level in order to pass under the LAM hold. However, there followed considerable debate regarding the topic of fps marking. A civilian controller Member intimately familiar with the standard operating procedures used within LTCC Sectors explained the intricacies of this particular aspect to the Board. He said that the ATSI report had observed that the DIR had incorrectly descended the A320 to a level not available to him because it was ceded to TC NE DEPS for outbound traffic. Whereas to the E of LAM and within the hold, DIR could only descend his traffic in the stack down to the minimum stack level +1000ft (here FL90) prior to departing LAM westbound, it was not entirely correct to say that the minimum stack level was not available to him. To imply that this level (here FL80) should be blocked out on the printed fps by the DIR, thereby indicating that it was not available to be assigned by him, was not what the MATS Pt2 required as this level can indeed be used by DIR when controlling traffic W of LAM. Other controller Members concurred and realised that this level might be assigned to a flight by the DIR – correctly – later on during the approach. Consequently, it should not have been blocked out on the fps in use at the time. Because of the pressure changes FL70 was not an applicable level and had been correctly blocked out, therefore, in the Member's opinion the controller had indeed operated within the requirements of the MATS Pt2 regarding this particular aspect. He added that when the pressure is dropping and the QNH is around 1013/1012mb this could present additional complications for controllers, which would not be readily apparent. The fpss are printed out for use on the sectors in advance of the flights arriving on the sector frequency. Over a period of time if the pressure is varying around 1013-1012mb, the minimum stack level will change and its availability to the Heathrow Intermediate Director could fluctuate. Whilst operating in accord with the stipulated guidance, controllers do have to use their own judgement as continually reprinting strips in such a scenario would be very unwieldy and could potentially lead to other mistakes. The Board was briefed that work is progressing towards the automatic deletion of unusable levels when strips are printed. However, this facility will probably not be available until Autumn 2005. Nevertheless, the fps level 'blocking out' issue was just a visual cue to the DIR not to assign inappropriate levels which, by virtue of the extant procedures, were not available to the DIR in this portion of the LTMA without co-ordination. The Board concluded unanimously, therefore, that this Airprox had resulted because the LTCC Heathrow Intermediate Director North descended the A320 to a level allocated to another Sector and thus into conflict with the Global Express.

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Turning to risk, it was apparent that the A320 crew had astutely detected the presence of the Global Express beneath them as they descended towards it. The radar recording had shown that the A320 had 'bottomed-out' at FL86 – not 200ft below FL90 as the crew had thought. Both controllers had issued traffic information and avoiding action away from each other's ac, the DIR's barely 8sec before the CPA. Similarly, that issued to the Global Express crew at 1933:00 by NE DEPS had little effect on the eventual outcome as it was transmitted after the CPA, just as the ac tracks were opening away from each other. A civilian controller Member said that the A320 crew had demonstrated sound situational awareness by reducing the rate of descent in this fast-paced but fleeting scenario and contrary to their last instruction had eventually climbed before descending once more. However, from the A320 pilot's brief account it was not evident if he had been assisted by TCAS with either a TA or an RA. The radar recording evinced a climb from 1933:09, eventually to FL89 after the CPA but in a CAT pilot Member's view he thought an RA in the A320 unlikely. Nevertheless, the Global Express crew had spotted the A320 visually from some 3nm away following their TA and were ready to take more robust action if needs be, which the Global Express pilot reported it was not. This coupled, with the pilot's own assessment, convinced the Board that no risk of a collision had existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

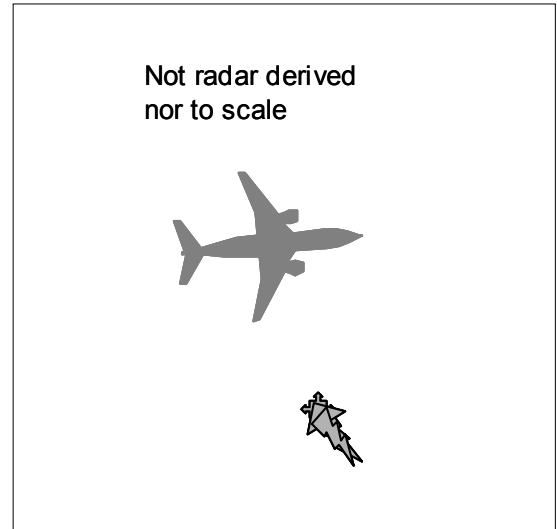
Cause: The LTCC Heathrow Intermediate Director North descended the A320 to a level allocated to another Sector and thus into conflict with the Global Express.

Degree of Risk: C.

AIRPROX REPORT NO 150/04

Date/Time: 15 Aug 1605 (Sunday)
Position: 5157N 00033W (8nm NW Luton)
Airspace: AWY L10 (Class: A)
Reporting Ac Reported Ac
Type: B737-300 Untraced Parachutist
Operator: CAT N/K
Alt/FL: FL100 (N/K)

Weather VMC CLOC NK
Visibility: >10km
Reported Separation:
 Nil V <0.5nm H
Recorded Separation:
 NR

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

THE B737 PILOT reports heading 080° at 250kt inbound to Luton under a RCS from TC. About 5nm W of Luton at FL100 both pilots noticed a free-fall parachutist pass <0.5nm on their starboard side. The parachutist was wearing a red suit with yellow and blue stripes on the arms and legs. He reported the incident to the controller, assessing the risk as high.

AIS MIL reports that the B737 was monitored from W of Cranfield until it turned onto base leg for Luton. During this period, no radar returns were seen that could be identified as being a parachute-launching platform on, or near to, the B737's route. The BPA were contacted who stated that 9 parachute displays were notified on the day but none were near to the reported Airprox position. The NOTAM Office were not aware of, nor issued any NOTAMs for, any parachute dropping activities or mass balloon releases in the area on the day in question.

ATSI reports that the B737 was inbound to Luton from Prestwick and was being vectored for a RH cct to RW26. As the ac was passing approximately 8nm NW of Luton, descending to FL100, the crew reported a close encounter with a parachutist. Examination of the radar recording indicates no likely parachuting ac and there was no activity at the nearby parachuting sites that had been notified to TC. A suggestion was made in the unit report that as a B777 had passed underneath the B737 at FL90, close to the time of the reported sighting, it is possible that the company logo on the forward fuselage or the B777's tail colour scheme might have been mistaken for a parachutist wearing a colourful outfit. It has not been possible to determine exactly what the reporting crew saw.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the B737 crew, transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

There was very little information available to members on which to assess this incident. It was thought that if the object seen had been a freefall parachutist, there must have been a 'launch vehicle' in the immediate area at the time of the incident. However, no contenders were seen on radar, there being no unknown returns in the area. The only piece of positive information was from the B737 crew who reported the incident on RT at the time and then subsequently completed an ASR which provided a graphic description of the parachutist's clothing and stating that it passed within 0.5nm. The B737's flight path at the time was firmly within Class A airspace, well clear of any adjacent notified parachuting sites none of which were active. From the facts that were known and without any hard evidence that whatever was seen was a parachutist, discussion moved on to consider what other possibilities remained. Previously, mass balloon releases have generated colourful objects in the middle airspace levels but for the day in question none had been notified to AUS through the normal channels. At the end of the

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day, Members were unable to add any further credence to this incident: all that could be said was that the B737 crew had seen something and had perceived a conflict with an unknown object. Owing to insufficient information available, the Board were unable to make an assessment on the risk.

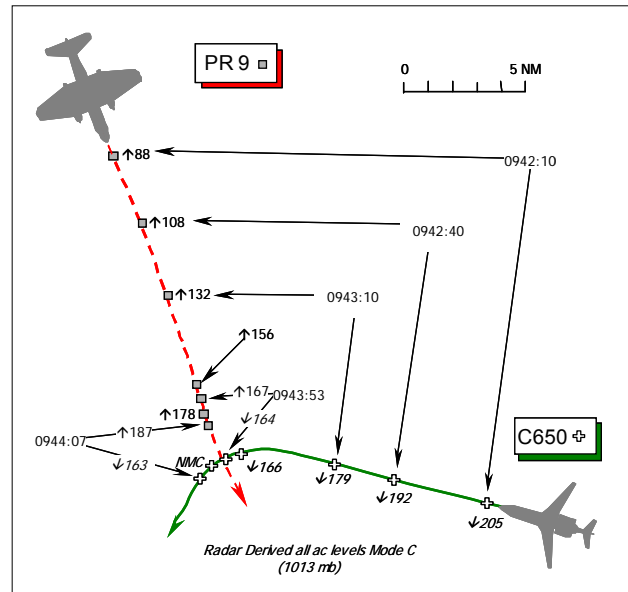
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Perceived conflict with an unknown object.

Degree of Risk: D.

AIRPROX REPORT NO 151/04Date/Time: 23 Aug 0944Position: 5728N 00254W
(22½nm WNW of ADN VOR)Airspace: Scottish FIR (Class: G)Reporter: ScACC MORAY SCFirst Ac Second AcType: C650 Citation Canberra PR9Operator: Civ Exec HQ STCAlt/FL: FL140↓ ↑FL390Weather VMC NR VMC CLBLVisibility: >10km NRReported Separation:MORAY SC: 2.73nm H/500ft V
500ft V/2.7nm H nil V/2nm HRecorded Separation:

2nm H

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

THE ScACC MORAY COMBINED TACTICAL & PLANNER CONTROLLER (MORAY SC) reports that the Cessna Citation was inbound to Inverness and in receipt of a RIS in Class G airspace. The flight had passed the ADN descending for their assigned level of FL110, as previously agreed with Lossiemouth RADAR. He was about to effect a hand-over on the Cessna Citation to Lossiemouth RADAR when STCA was triggered by another ac - the Canberra - climbing up through FL140 towards the Cessna. As the Canberra was displaying a ScATCC (Mil) squawk, he telephoned Console 3 for co-ordination, he was informed by the controller that the Canberra was "looking for" FL390 but still under the control of Lossiemouth RADAR. Because both ac were rapidly approaching each other both vertically and in azimuth he instructed the Cessna Citation crew to turn L onto a heading of 200° for avoiding action. The pilot readback a heading change of 20° to the L so he corrected this and also gave traffic information about the Canberra, which was now at 2 o'clock - 4nm. The Citation pilot reported the traffic in sight and that it was "pretty close", but declined to file an Airprox when asked. He assessed that the minimum separation from the Canberra was 2.73nm horizontally and 500ft vertically. When clear of the Canberra the Citation was turned back toward the INS VOR and handed over to Lossiemouth RADAR.

THE CESSNA 650 CITATION PILOT reports that his ac has white, black & red livery and the HISLs were on whilst inbound to Inverness from Berlin-Templehof and in receipt of a RIS from Scottish CONTROL. The assigned squawk was selected with Mode C and TCAS is fitted.

Some 20nm W of Aberdeen, heading 295° at 280kt whilst descending through FL140 he thought, the Controller passed an avoiding action turn onto 200°. He immediately complied with the turn instruction and then spotted the other ac visually which had also been displayed on TCAS about 30sec to 1 min beforehand, in a steep climb about 2-3nm away, so he also decreased his rate of descent. The other ac - he thought it was a low-wing twin-engine turbo-prop - passed about 2.7nm away and some 500ft above them after the avoiding action had been taken. Only a TA was enunciated but he assessed the risk as "medium", adding that the information from the controller came late, but it did seem to him that the other ac had a steep climbing attitude.

THE CANBERRA PR9 PILOT reports his ac has a hemp & grey camouflage-scheme, but the HISLs were on whilst outbound from Lossiemouth for Marham. The assigned squawk was selected with Mode C, but neither TCAS nor any other form of CWS is fitted. During the climb out from Lossiemouth they were advised by ATC of traffic in their 10-11 o'clock. They were initially under a RAS he thought, but once they were clear of cloud and VMC they downgraded to a RIS, still climbing but into the sun. Whilst southbound to the W of Aberdeen climbing at 350kt, he manoeuvred his ac during the climb to aid his own ac's conspicuity and assist in looking for the

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reported traffic. Another ac was then spotted about 2nm away approaching from their port side at the same level. Whilst he believed this to be the other ac involved, he had no way to confirm this at the time and in his view as they were talking to ATC throughout they could not believe an Airprox had occurred.

He stressed that the ac is painted in hemp-grey and is difficult to see adding that throughout the period leading up to and beyond the incident he was in contact with either Lossiemouth RADAR or SCOTTISH MILITARY.

THE CANBERRA PR9 PILOT'S STATION comments that the Canberra crew was under a radar service throughout the period leading up to and including the time of the reported Airprox. He had been warned of the traffic and responded accordingly. The traffic he saw was well clear of his own ac but he advises it was too far away to identify the ac type. In the Canberra pilot's opinion there was no risk of collision and he was surprised to find himself the subject of an Airprox. The Canberra is not equipped with HUD or cockpit voice recorders.

MIL ATC OPS reports that the tape timings at Lossiemouth were found to be wrong by 6 min. Checks are being carried out to ensure that timings at Lossiemouth remain accurate and military ATSU's have recently been reappraised of the requirement to regularly synchronise their recorder time references.

The Canberra PR9 was departing from Lossiemouth to return to Marham with a requested cruising level of FL390. The Canberra crew called Lossiemouth DEPARTURES (DEPS) on climb out at 0939:56 requesting a RIS, but DEPS placed the flight under a FIS initially as the ac was below radar cover and instructed the pilot to climb to FL240. At 0940:16, the Canberra crew acknowledged the climb and requested a R turn onto 155°, whereupon DEPS issued a squawk of A4633, identified the ac and placed the flight under a RIS just before 0940:45, instructing the Canberra crew to "*turn right heading 155°*". This R turn brought the Canberra onto a conflicting track with the Cessna: traffic information was first passed to the Canberra crew about the Cessna Citation at 0942:48, when DEPS transmitted "*traffic left 11 o'clock 15 miles crossing left-right indicating FL180 descending*". The Canberra pilot responded with "[C/S] *looking requesting RAS on a heading of 160°*". DEPS placed the flight under a RAS at 0942:57 and then placed the Canberra crew under their 'own navigation' that necessitated a 5° R turn. However, at 0943:13, the Canberra pilot reported "*victor mike above, Radar Information, request an update on the traffic*", so DEPS reapplied a RIS and called the Citation for the second time "*traffic now left 10 o'clock 10 miles crossing left-right indicating FL175 descending*". Traffic information was passed again at 0943:48: "*traffic 11 o'clock, 5 miles crossing left-right, indicating FL165 descending*", whereupon at 0943:54, the Canberra crew reported visual and left the frequency 1min later. No deviation was observed in the Canberra's track. DEPS had correctly applied the RIS to the Canberra and had passed accurate traffic information on 3 occasions regarding the Cessna - once at the pilot's request and twice on his own initiative. Once the Canberra pilot was visual with the Citation after the 5nm range call there was no further requirement to update the traffic.

[UKAB Note (1): The Aberdeen Radar recording shows the Canberra climbing out of Lossiemouth at 0940:40, squawking A4633 and climbing on a track of 090°. The Citation is 33nm SE of the Canberra, tracking 290° and indicating FL233 descending. The Canberra starts a R turn at 0940:50 and steadies on a track of 160° at 0941:27. The Canberra's Mode C disappears for one sweep at 0942:04, whilst the Citation is indicating FL208 descending. Both ac contacts continue to converge and STCA activates at 0942:40, when the Canberra is indicating about FL108 climbing and the Citation is indicating FL192 descending; the lateral separation between the two contacts is 15nm. The Citation is seen initiating a L turn onto a track of 200° when the lateral separation between the ac is 4.5nm and the Canberra is indicating FL138 climbing up toward the Citation, which is displaying FL173 descending. At 0943:53, both acs' trajectories have crossed - the Canberra indicating FL167 climbing some 300ft above the Citation passing FL164 descending; the lateral separation at this point is 2¾nm. The point of minimum horizontal separation of 2nm is achieved on the next sweep but no Mode C is displayed by the Citation. About 2400ft of vertical separation is evident on the next sweep at 0944:07, as the horizontal separation between the 2 ac increases.]

ATSI reports that the Cessna Citation was inbound to Inverness from Berlin at FL360, via the Aberdeen VOR and in receipt of an area control service from the ScACC MORAY Sector. At 0931:30, Scottish passed an estimate for Inverness of 0949 to Lossiemouth in accordance with agreed procedures. After some initial confusion on the part of Lossiemouth, it was agreed that the ac should descend to FL110 and a handover would be effected to Lossiemouth. At 0938:20, the MORAY SC instructed the Cessna Citation to descend to FL110 and informed the crew that it would be a limited RIS below FL245, which they acknowledged.

Sometime later, STCA activated in respect of the Cessna Citation and an ac displaying a Scottish Military squawk - A4633 - and so at 0942:50, the MORAY SC telephoned ScATCC (Mil) Controller 3 to enquire what level the conflicting ac - the Canberra - was climbing to. Controller 3 replied that the ac was still working Lossiemouth but was requesting FL390 with him. Even though the ac was in receipt of a RIS, the MORAY SC elected to pass avoiding action and traffic information to the Cessna Citation crew. The radar recording shows the track of the Canberra change from south easterly onto a southerly one, which was in direct conflict with the Cessna Citation. At 0943:47, the Cessna Citation was passing FL166 with the Canberra in its 2 o'clock at a range of 3.4nm, passing FL156. The Mode C of the Canberra then 'dropped out' as the two ac continued to converge until, at 0944:10, the Canberra is shown passing FL192 in the Cessna Citation's 5 o'clock position and passing behind it. Analysis of the Separation Monitoring Function indicates that the minimum separation was 2.87nm and 500ft.

At 0945:00, the MORAY SC telephoned Lossiemouth ATC to handover the Cessna Citation. When he queried the outbound Canberra, the response from Lossiemouth was "*Erm yeah disregard that carry on with handover*". The MORAY SC advised that he had taken avoiding action with the Cessna Citation against the Canberra. The handover was completed and the Cessna Citation crew was instructed to contact Lossiemouth at 0946:10. Subsequently, the MORAY SC elected to file an Airprox report. Even though the Cessna Citation was in receipt of a RIS, the decision by the MORAY SC to pass avoiding action is commended.

HQ STC comments that this encounter in the Open FIR (Class G) would seem to have generated more alarm than would be usual for a 2nm+ encounter. The Canberra crew were visual with the Citation from 5nm and had no concern as it yielded and manoeuvred across its nose in accordance with Rule 17 of the Rules of the Air. When coupled with the Citation's reported sighting of the Canberra of 2-3nm away it is difficult to imagine that there was ever any risk of collision. Indeed, with both ac operating under RIS, where the pilot remains responsible for his/her own separation, it is surprising that the Citation pilot chose to continue his flightpath with the Canberra advisably displayed on his TCAS out to the right hand side.

The Canberra, like most other military ac, can and will achieve climb rates that exceed those normally executed by civil ac. It would appear that the Canberra's climb rate in excess of 5,000ft/min in the final minute of the encounter had surprised the controller. However, it is difficult to judge the effectiveness of the avoiding action given to the Citation as it would appear to have made the Citation crew lose sight of the Canberra. This unsighting may be the reason why the Citation crew felt uncomfortable during the encounter, whereas the Canberra pilot, having the Citation fully in view, could not believe that this was an Airprox. That said, it is pleasing to see that the ScACC controller attempted to keep both ac apart even when it was not dictated to do so under the terms of a RIS.

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 Canberra crew were apparently unconcerned by the incident. Furthermore, the Citation crew had not been inclined to report this Airprox themselves. The MORAY SC's report had evidently stemmed from the co-ordination difficulties he experienced at the time. Furthermore, the Board appreciated the difficulties over the provision of radar services in the Open FIR where many ATSU's are legitimately providing a whole range of services to a wide variety of different flights all conducting various tasks. But the crux of the matter here, as far as civilian controller Members were concerned, was the assignment and use of ScATCC (Mil) squawks by military terminal units prior to handing the ac over to the Centre. This topic had been discussed at length by Members before, but there was also a general observation that the Canberra should have been handed over to ScATCC (Mil) a lot earlier. If the Canberra had been transponding a Lossiemouth allocated squawk from the outset the MORAY SC would have realised which unit was providing the radar service and co-ordination could have been swiftly concluded. A civil controller Member pointed out that this Airprox had occurred over 20nm from Lossiemouth and a military controller advisor believed that the unit was exceeding its remit in providing a radar service to the Canberra crew above FL150 at this range. Another military controller Member opined that invariably this topic would be covered in an LOA between the terminal unit and the military ATCRU; this procedure was commonplace in both FIRs, but civil controllers opined that it was still at odds with the UK SSR Code Assignment plan promulgated in the UK AIP. Once again, the Mil ATC Ops advisor agreed to research this issue outwith the meeting.

AIRPROX REPORT No 151/04

The ATSI report had shown that the MORAY SC had passed details on the flight to Lossiemouth ATC and it had been agreed that the Citation would be descended to FL110 and a hand-over effected. Lossiemouth ATC are indeed charged with providing a radar service to civilian ac inbound to Inverness under an MoU (Mon – Fri only). Moreover, the Citation was in effect 'known traffic' to Lossiemouth ATC who should have been expecting the ac. However, it was evident that both flights were being afforded a RIS where neither controller was responsible for effecting separation between these two ac. In the case of the MORAY SC this was dictated by Unit policy rather than the pilots' choice. Nonetheless, the Board was concerned that it resulted in avoiding action being issued, which good practise would suggest could have been prevented through co-ordination. The Mil ATC Ops report revealed that Lossiemouth RADAR had conscientiously passed accurate traffic information on three occasions, which enabled the Canberra crew to sight the Citation from a range of 5nm. Consequently, from their perspective the Canberra crew had early sight of the other traffic and it was not surprising that they were content with the separation that existed as they climbed above the Citation over 2³/₄nm away. All this was unknown to the MORAY SC whose laudable attempts at co-ordination had been frustrated at the time because he was not aware that Lossiemouth was still controlling the Canberra prior to hand-over to ScATCC (Mil). Perhaps understandably concerned, therefore, at the proximity of the Canberra climbing rapidly towards the C650, the SC issued avoiding action to the Citation crew, who it turned out was also aware of the presence of the climbing Canberra from the TA and had sighted it 2-3nm away. With the benefit of the comprehensive reports provided, the Board recognised that this report had resulted from a perceived confliction by the MORAY SC whilst undoubtedly acting with the best of intentions. The Members concluded unanimously that no risk of a collision had existed in these circumstances.

[Post meeting Note: The Mil ATC Ops Advisor provided a copy of the extant LOA between Lossiemouth and ScATCC (Mil). This LOA enables Lossiemouth controllers to switch pre-noted traffic to ScATCC (Mil) without a formal hand-over being effected - effectively a 'silent handover' - when passing FL80 whilst squawking the assigned ScATCC (Mil) code. However, the ac must be "...free from co-ordination and clear of confliction". Hence, with the Citation in evident confliction against the Canberra the terms of the 'silent handover' could not be complied with before the ac had passed each other. Co-ordination could have been effected by Lossiemouth DEPS with the MORAY SC, where a short phone call could have resolved any difficulty. However, a formal hand-over to ScATCC (Mil) Controller 3 would have been required. ScATCC (Mil) have elected to address the topic of unit assigned squawks being displayed prior to hand-over within a forthcoming periodic safety audit.]

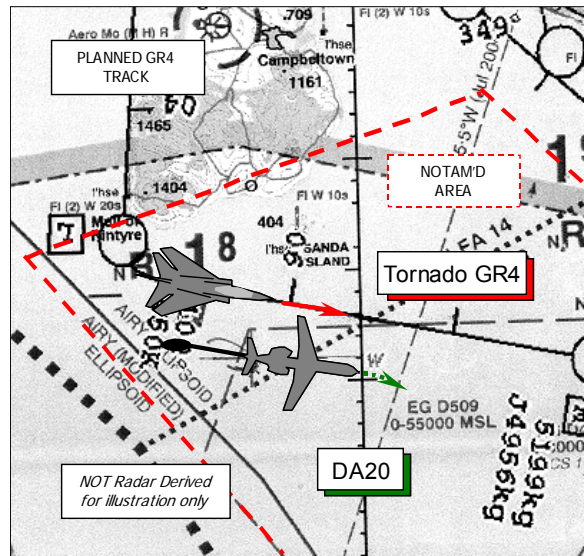
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Controller perceived confliction.

Degree of Risk: C.

AIRPROX REPORT NO 152/04

Date/Time: 24 Aug 1100
Position: 5511N 00539W (10nm SE of Mull of Kintyre light)
Airspace: Scottish FIR (Class: G)
Reporting Ac Reported Ac
Type: Falcon DA 20 Tornado GR4
Operator: Civ Comm HQ STC
Alt/FL: 1800ft 250-750 ft
(1004mb) (Rad Alt)
Weather VMC Sky Clear VMC HAZE
Visibility: 30km >15km
Reported Separation:
1100ft V/2nm H Not seen (3nm)
Recorded Separation:
Not recorded

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

THE FALCON DA20 PILOT provided a very comprehensive account, reporting that his ac has a blue livery and the HISL was on whilst towing a low-level height-keeper target in the prevailing maritime weather of no cloud and a visibility of 30km out of the sun. He was operating over the sea conducting a trial with a surface vessel that was providing “*radar control*” [tactical radar direction] on a discrete UHF frequency. Although TCAS is fitted neither a TA nor an RA was enunciated during the period of the Airprox.

Whilst flying at 256kt (TAS) level at 1800ft on a pressure setting of 1004mb (1mb below QNH), the towed Hayes target was reeled out on a towline of some 10,000ft [over 1.66nm] in length, the resulting 950ft line droop placing the target at an altitude of about 850-900ft amsl. He added that the target is also displaced to the L of the ac’s track but by an unknown distance.

At position 55°11’N 005°39’W, whilst heading 100° and just before he was about to descend the Falcon to 900ft - for a target altitude of 25ft - two jets were spotted, firstly on TCAS and then by the ship’s radar controller as they flew past at a range of between 3-5nm. The test run was aborted as a Tornado GR4 flew N of his ac’s track but behind them as he carried out a gentle R turn in avoidance onto 120°. Stressing that he was restricted in his ability to manoeuvre whilst towing, he could only assess the range from TCAS. He estimated that the Tornado was about 2nm horizontally/1100ft vertically from his Falcon jet, but it was difficult to estimate how close the Tornados flew to the cable and target astern and suggested it was approximately 2nm and 500ft to 800ft. He assessed the risk of a collision with his ac as “*low*” but against the towed target “*medium*”. [UKAB Note 1. The second ac seen by the Falcon pilot was most probably the Hawk ‘bounce’ ac referred to below.]

THE TORNADO GR4 PILOT reports he was flying a singleton low-level evasion sortie in his grey/green camouflaged jet against a single Hawk bounce ac. A squawk of A7001 was selected with Mode C, neither TCAS nor any other form of CWS being fitted. Flying in VMC with a visibility of 15km cross-sun, they were aware that EG D509 was active and had planned to stay clear of it. He was also aware of the large NOTAM’d warning area within which a target-towing ac was flying that was unable to comply with the ‘Rules of the Air’. However, they were flying a visual-evasion sortie so optimum lookout was required under the principle of see and avoid.

During the time of the incident they were flying at about 420kt on an approximate heading of 102° at between 250-750ft Rad Alt. The Falcon ac was not seen and they were only made aware of it when the bounce ac pilot informed them that he had heard a call on RT which they had missed.

An officer from Faslane telephoned the Sqn after they had landed to discuss the occurrence.

AIRPROX REPORT No 152/04

THE TORNADO GR4 PILOT'S STATION provided a particularly helpful contribution to the investigation of this Airprox and commented that NOTAM H909/04 warned that from 0800-1900 daily on 23-27 Aug 04, up to 2 DA20 and 1 Hawk ac would conduct various serials in a block measuring some 20nm by 20nm from surface to 8000ft amsl.

During the planning of their sortie the Tornado crew had tried to avoid this area, on all 3 occasions planning to transit between Prestwick and EG D509. When this became impractical they planned to route one leg through the NOTAM'd area, but had avoided the Danger Area itself [EGD 509] to the N. The Tornado was flying a low level sortie against a Hawk 'aggressor' that was setting up for the next 'bounce' at medium level at the time of the Airprox. The Tornado was on track at the time of the Airprox and measurement of the distance between the Falcon pilot's reported position and the Tornado's track suggests that the horizontal separation was in the order of 3nm.

The Tornado crew did not see the Falcon but suggest that their lookout was enhanced by the nature of the sortie; whilst this would certainly be the case, the nature of these sorties requires an increased proportion of lookout time to be high and to the rear. Thus lookout, while enhanced, is spread over a larger volume of sky. In any event, had the Falcon been on an intercepting track rather than 3nm distant on a diverging track it would have almost certainly been spotted.

The navigator of the Tornado offered the opinion that if the Falcon required avoidance criteria for their NOTAM then it should have been promulgated as an 'avoid' rather than a warning. Certainly this might be a sensible option for short periods on the riskier serials if these times are known in advance. Alternatively, in this case, a safety frequency could have been promulgated in the NOTAM which would have allowed the Tornado and Hawk to establish where the Falcon was operating.

HQ STC comments that the towing of such a large target should attract segregated airspace. It is doubtful whether the GR4 crew had realised that the tow length was 1.66nm long otherwise they would not have been happy to fly in its vicinity – unfortunately they fell into the trap of "it's just another warning". It is doubtful whether this complacency will occur again amongst this particular crew but could in the future with others. It is requested that DASC run a tri-service flight safety article in AVIATE on this event and give detail on the type of tow and target. The establishment of a safety contact frequency is supported and should be considered by the relevant authority.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, a brief report from the trial sponsor and reports from the appropriate operating authority.

The Board noted that the GR4 navigator was of the opinion that if the Falcon's target-towing evolution required "avoidance" then the NOTAM should have promulgated it as an 'avoid' rather than a warning. OC MFACS (Post title change to OC LF Ops) advised the Board that he could promulgate mandatory avoidance criteria within the UKDLFS for observance by military crews from the surface to 2000ft msd only. It was suggested that AUS might be able to do this in the FIR for the aviation community as a whole, but Members realised that this was probably not feasible in Class G airspace as they thought AUS had no mandate to prohibit ac from entering a NOTAM'd area. [Post meeting Note: Consultation with OC AUS after the meeting confirmed this view was correct.] Members considered that publication and adherence to more specific timings for the activity might be more beneficial. However, it was pointed out that the combinations of the ship's programme/ac serviceability and the weather could all interfere with the best-laid plans. Nonetheless, the NOTAM had contained landline & mobile telephone numbers upon which the sponsor could be contacted before flight; in advance of the trial and also during the event itself. The Board was briefed that the sponsor had accepted that it would be feasible to promulgate the UHF frequency in use for the trial, which might potentially enable military crews to obtain more specific and up-to-date information on the status of the activity: the Board agreed that this could be advantageous.

Returning to the Airprox itself, penetration of the NOTAM'd areas was solely a matter of airmanship for those involved. There was nothing preventing the GR4 crew from entering the NOTAM'd area. Nevertheless, some Members did not consider that it was entirely wise to do so. At the time, whilst the GR4 crew was aware of the NOTAM'd activity, they were perhaps not entirely cognisant of the overall extent of this target-towing evolution. Hence the HQ STC Member's comment regarding widespread publicity about it for the education of military crews. Here the GR4 crew had reported they had made a conscious decision to plan their flight into the NOTAM'd area on a 'see and avoid' basis, but to remain outside of the active Danger Area - D509. Significantly, the NOTAM had

not included the information about the length of the towline that was in the order of 1.66nm. As it was, the GR4 crew had not seen the Falcon ac at all: had they been aware of the amount of wire being trailed around (and the nature of the target on the end of it) they might have decided differently about penetrating this area, given the difficulties of seeing and avoiding this virtually invisible hazard. In their assessment of the inherent cause and risk, the Board only ever considers what *actually* happened, not what *might* have happened if things had turned out differently. Without complete recorded radar data illustrating the event it was difficult to ascertain the minimum separation between the GR4 and the target (apparently the closest object to the GR4) but with the Falcon pilot's best estimate of 2nm, it was the unanimous opinion of the Members that this Airprox was the result of a sighting report (TCAS) during target towing operations and that there had been no risk of a collision in the circumstances reported here.

Considerable debate ensued about the efficacy of such hazardous evolutions occurring outside established permanent Danger Areas. The CinC Fleet Member explained that such evolutions are regularly conducted in the Royal Navy's South Coast Exercise Areas (SC EXAS) situated in the English Channel, under the auspices of Flag Officer Sea Training. Indeed, this particular surface vessel was scheduled to continue with these trials in the SC EXAS after the period of this Airprox. But there they have the added benefit of radar surveillance from an ATCRU by an Air Traffic Controller of the ranges with a complete Danger Area Crossing Service & Danger Area Activity information Service available to aircrew, on call, from Plymouth Military. In some experts view, this setup was a model for the 'flexible use of airspace' which undoubtedly enhances safety for participants and transit pilots alike and a safe method of conducting such evolutions where any inherent risk is reduced to minimal proportions. He added, however, that anecdotal evidence suggested that the number of incidents occurring with target towing flights manoeuvring outwith the Danger Areas appeared to be on the increase, which was noted by the members.

Whilst HQ STC had suggested that DASC might promulgate more information on this activity. The DASC advisor was not convinced that the very generalised approach of an article in a tri-service flight safety publication was entirely beneficial. In his view, more comprehensive information within the NOTAM might have been more useful here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A sighting report (TCAS) during target towing operations.

Degree of Risk: C.

AIRPROX REPORT No 154/04

AIRPROX REPORT NO 154/04

Date/Time: 25 Aug 1332

Position: 52591N 00058W (Syerston - elev 228 ft)

Airspace: Syerston ATZ (Class: G)

Reporting Ac Reported Ac

Type: Vigilant T Mk 1 R44
Motorglider

Operator: HQ PTC Civ Trg

Alt/FL: 800ft 1000-2500ft ALT
(QFE 1000mb) (QNH)

Weather VMC CLBC VMC

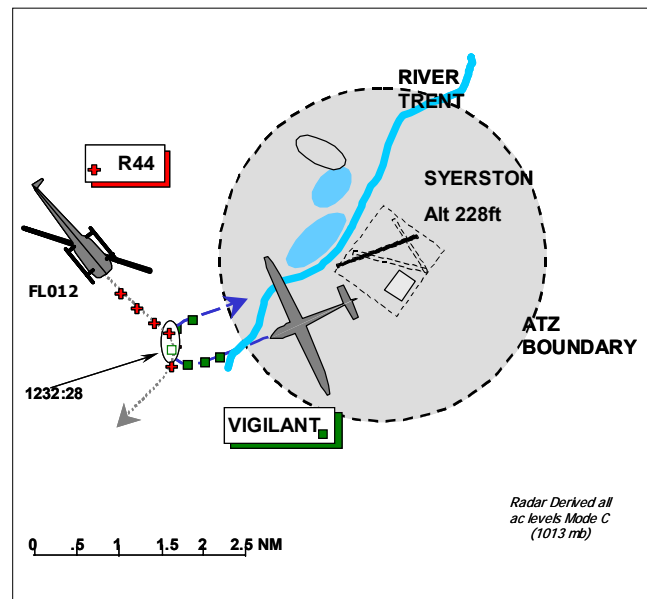
Visibility: 25km NR

Reported Separation:

100ft V/25-50m H Not seen

Recorded Separation:

Less than 300m H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VIGILANT T MK 1 PILOT reports flying dual on a local instructor-training sortie in a white ac with red markings with nav, landing and strobe lights on, in contact with Syerston Radio and squawking 7000 with no Mode C. Following a roller landing on RW25 and while carrying out a right hand circuit, a blue medium sized helicopter was observed passing under the left wing when rolling out of the downwind turn heading 070° at 60kt. No avoiding action was possible in the time available and the downwind turn provided separation.

THE R44 PILOT reports that he was not aware of the incident until contacted by AIS (Mil) some days later. He had been airborne at the time and in the area instrument training and GH sortie but had no recollection of the events.

UKAB Note (1): Syerston is notified in the UK AIP ENR 2-2-2-4 as having an ATZ of 2nm radius centred on 530121N 0005447W up to 2000ft aal. The airfield elevation is 228ft and the main RW is 07/25.

UKAB Note (2): At 1229:43 a 7000 squawk, presumed to be the R44, can be seen on the recording of the Claxby radar 4.1nm to the NW of Syerston tracking SSE at FL012. It passes 2.7nm to the W of the airfield and departs to the SW. At 1230:19 a 7000NMC squawk appears on the radar 0.6nm SE of Syerston tracking SW. The 7000 NMC squawk, presumed to be the Vigilant, disappears from radar for 1 sweep while turning onto the downwind leg 2.7nm SW of the airfield. During this 14sec period the incident appears to have taken place. At the time the R44 was flying at a constant height of FL012 and had just commenced the right turn onto a SW track and the Vigilant is in the right turn, as reported by its pilot at 800ft agl (1030ft amsl). The QNH at 1230 for the Syerston area was 1005mb putting the R44 at 960ft amsl.

UKAB Note (3): The R44 pilot stated in a telephone conversation with AIS (Mil) that he was familiar with the area and often operates in the vicinity of Newton disused airfield (4nm SW of Syerston).

HQ PTC comments that they are conscious that Syerston, straddling as it does a number of prominent line features to tempt VFR fliers, has suffered a disproportionate number of incursions in recent times. However, this incident, although undoubtedly an Airprox, took place outside the ATZ and therefore the VFR rules unequivocally apply.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Although only about ½nm outside the protection of the Syerston ATZ, this incident took place in Class G airspace of the open FIR where 'see and avoid' is the prime means of deconfliction. Although sympathetic to the infringement problem of the Syerston ATZ, the Board determined that, in this case, it had had no bearing on the incident. The incident took place in a well known busy bottleneck area for VFR traffic and specialists considered that the helicopter instructor had not only been unwise to select that area to conduct GH training but should also have been looking for Syerston traffic. Additionally, the Vigilant pilot by conducting instructional duties on very large circuits outside the ATZ was thought by Members to be equally unwise, possibly demonstrating poor technique. Having elected to fly outside the ATZ, he too should have been looking for other (transit) traffic.

That neither pilot saw the opposing ac was of concern to the Board. At the time of the confliction both ac were in a right turn and the respective pilots would probably have been looking into the turn. Such turns however do not absolve aircrew from the need to clear their flight paths, quite the reverse in that it becomes even more important. Members thought that the R44 would have been obscured to the Vigilant pilot by the left wing until he rolled out of the turn. On the other hand, the Vigilant should have been visible to the R44 pilot from the right hand seat so it was thought likely that he may have been distracted by other tasks.

Members considered that none of the 4 pilots had seen the opposing ac at the precise moment of the encounter and only the Vigilant Instructor had seen it after the ac had passed. The Board thought that it followed that only good fortune had prevented the ac colliding; there had therefore been a significant risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

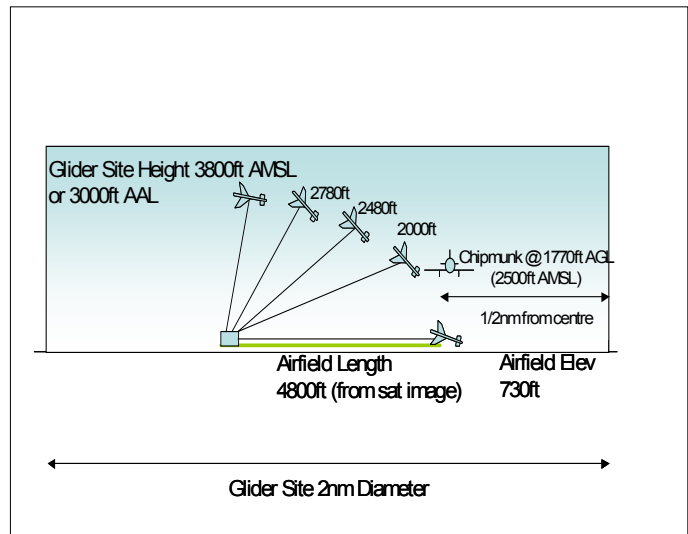
Cause: Non-sighting by the R44 pilot and effective non-sighting by the Vigilant pilot.

Degree of Risk: A.

AIRPROX REPORT No 155/04

AIRPROX REPORT NO 155/04

Date/Time: 28 Aug 1357 (Saturday)
Position: 5120N 00132W (Rivar Hill Airfield - elev 730 ft)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Astir Glider Chipmunk
Operator: Civ Club Civ Pte
Alt/FL: 800ft 2500ft
(QFE 987 mb) (RPS)
Weather VMC CLOC VMC CAVOK
Visibility: >10km >10km
Reported Separation:
100ft V/O H Not seen
Recorded Separation:
Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ASTIR PILOT reports that he was at 800ft on a winch launch from Rivar Hill Airfield, heading 180° at 60kt and 45° nose-up when he saw a Chipmunk ac with military markings and was able to describe the colour scheme. [UKAB Note (1): He also reported seeing another similarly marked Chipmunk but did not describe its relative flightpath or timing]. The (first) ac crossed 100ft directly above him from his right to left. He was not able to take any avoiding action in the time available and assessed that it was safe to continue with the launch. He assessed however that the risk was high as he opined that the other pilot had not been aware of the airfield. In the opinion of the winch driver, with a slight variation in timing or position, there could have been a collision or the reported ac could have hit the winch cable with fatal consequences.

THE CHIPMUNK PILOT reports that at the time of the occurrence he was returning from Henstridge to Halton at 2500ft amsl and 95kt having flown outbound on the same route that morning. The route took him N from Gillingham then tracked via Westbury to Newbury Race Course and then NE direct to Halton. This route aimed to keep him clear of D123/D124 which he had ascertained by telephone in the morning were active up to 3000ft. The NOTAMS and Weather were checked before the morning departure.

The visibility on the return leg was excellent with only scattered cloud at a base of 4000ft. Because of the number of gliding sites en-route and because they had seen gliders in the air around Upavon, Keevil and Rivar Hill in the morning, he and his passenger were keeping a sharp lookout on the return trip. VFR navigation was straightforward with landmarks appearing on time and in the correct place. His planned track aimed to take him N of the Rivar Hill side, and though not as obvious as the other glider sites mentioned above, he noted it on both legs.

He did not observe any gliders in the air around Rivar Hill on his track and thought that he had flown clear of the site. His ac is based at a mixed-use grass airfield with winch and tug launches and opposite circuits for powered and unpowered ac and thus he is very glider cautious. He could not conceive that he would ever fly directly over an active gliding site.

UKAB Note (2): The nearest METAR available was the 1350 for Lyneham:

EGDL 281350Z 26010kt 9999 SCT 035 BKN 050 18/16 Q1013 BLU NOSIG=

The Cotswold RPS for 13-1400 was 1009mb.

UKAB Note (3): Rivar Hill is promulgated as a Glider Launching Site up to 3000ft agl in the UK AIP ENR 5-5-1-4 operating daily during daylight hours.

UKAB Note (4): A direct track from Westbury (town) to Newbury Racecourse passes approximately 0.8nm N of the centre of the Rivar Hill Glider site.

UKAB Note (5): Although several intermittent contacts are shown on the radar recording, it has not been possible to determine which, if any, of those are the glider and Chipmunk in question. Further, there is no contact corresponding to the second Chipmunk reported by the glider pilot.

UKAB Note (6): The elevation of Rivar Hill Airfield being 730ft puts the glider at an altitude of 1,530ft, climbing steeply, at the time of the Airprox. On a comparable altimeter baro setting, the Chipmunk would have been at an altitude of approximately 2,440ft.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The BGA Advisor provided a written comment in which he advised that Rivar Hill is notoriously difficult to see in all light conditions. He stressed that it is most important that all ac keep well away from winch cables, as any collision would almost certainly remove a wing especially if the cable speed is high as it acts similarly to a chainsaw. Additionally, should the ac strike half way up the cable length, up to $\frac{3}{4}$ mile of cable (the top half) may wrap itself around the ac's fuselage and tail with disastrous effects. He also pointed out that once a glider is in the launch phase there is little chance of the pilot seeing conflicting traffic unless it is slow and comes from behind, because of the extreme climb angle. Similarly, the winch driver will probably not see any traffic until quite late since they must maintain an unbroken watch on the launching glider. Although others at the control point may see potential danger, there will always be a delay in communicating the stop signal to the winch driver.

There are frequent incursions, mainly by light ac into active glider sites, and procedures, if followed, should be robust enough to disclose the presence of intruding ac. While accepting the BGA advice above, assuming that the position of the Chipmunk reported by the glider pilot was accurate, Members considered that in this case the Launch Control Party should have seen the Chipmunk approaching before the launch was commenced and ordered a delay until the area was safe.

Members were in little doubt that the Chipmunk pilot had planned his route correctly but had flown closer to Rivar Hill than he intended. Although the Rivar Hill Glider site is very difficult to see, as it is a grass strip and blends into the farmland background, the Chipmunk pilot was familiar with it and should have offered it a wider margin.

The glider pilot however saw the Chipmunk and, from his height, he could have abandoned the launch and landed safely back on the strip if he had considered that there was any risk by his proceeding. He opted however, to continue which implied to the Board that there had been no risk that the ac would have collided.

PART C: ASSESSMENT OF CAUSE AND RISK

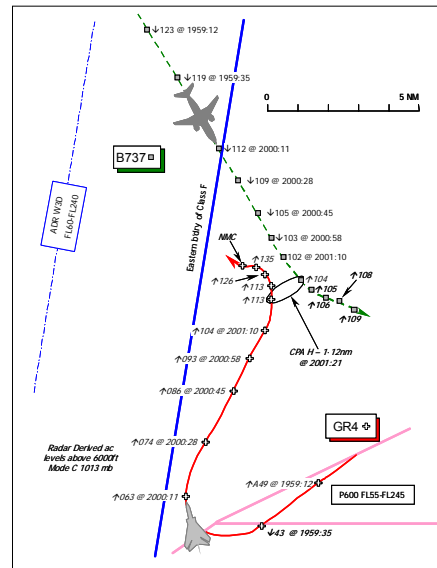
Cause: The glider was launched into conflict with the Chipmunk which was flying very close to a notified glider site.

Degree of Risk: C.

AIRPROX REPORT No 156/04

AIRPROX REPORT NO 156/04

Date/Time: 26 Aug 2001 Night
Position: 5622N 00406W (35nm NW of Edinburgh)
Airspace: Scottish FIR (Class: G)
Reporter: Edinburgh APR
First Ac Second Ac
Type: B737-300 Tornado GR4
Operator: CAT HQ STC
Alt/FL: FL100↓ NK
Weather IMC In Cloud NK
Visibility: "0" NK
Reported Separation:
NR Not seen
Recorded Separation:
900ft @ 1.12nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EDINBURGH APPROACH RADAR CONTROLLER (APR) reports that the B737 was inbound to Edinburgh and under a FIS in Class G airspace [the ATSU had erroneously suggested it was a RIS, which was not apparently the case]. The flight had been the subject of a handover from ScACC TAY Sector, but there had been no mention of any conflicting traffic at that time and he could not recall any other radar blip in the area. Four Tornado jets had however just completed a flypast of Edinburgh Castle for the Edinburgh Tattoo. Whilst he had turned his attention to traffic approaching from the S, the TAY SC rang him again to advise him of a confliction to the NW. An unknown contact was then spotted about 10nm away approaching the B737 from the SW. He passed avoiding action [UKAB Note (1): Initially it was just a turn instruction onto 110°] and traffic information to the B737 crew as the ac was still descending to the "min stack" level of FL80 and the other unknown ac was climbing. He received no reply to the avoiding action turn from the B737 crew but he then saw the unknown ac commencing a hard L turn away from the B737. The B737 pilot then advised he was responding to a TCAS RA and climbing: by this stage the respective radar returns were opening away from each other in opposite directions. Subsequently, the B737 was given further vectors for his approach to RW24 at Edinburgh. Although he did not quantify the relevant minima, he opined that prescribed separation was 'lost'.

THE B737-300 PILOT reports that the fin and engine cowling strobes, navigation, landing lights and anti collision beacons were all on whilst inbound to Edinburgh from Keflavik in IMC in cloud with "0" visibility. He was in receipt of a "radar" service from SCOTTISH CONTROL, he thought, and they had been "cleared" direct to STIRA descending to FL80. Flying at 240kt descending through FL100 at about 900ft/min some 35nm NW of Edinburgh a TCAS TA was enunciated which changed to a "CLIMB" RA approaching FL95. A TCAS climb was initiated and ATC informed, who replied "Roger" and then told him to fly a heading of 110°. They climbed to a maximum level of FL110. After landing he called ATC and the controller advised that the other ac was a military jet, which he did not know about, and that he would be reporting the incident.

UKAB Note (2): From information provided by the U. S. Naval Observatory, sunset occurred at 1926UTC, thus, "night" pertained at the time of this Airprox.

THE TORNADO GR4 PILOT reports some 2 months after the event that the HISLs and all other ac lighting was on whilst flying as the "airborne spare" for the Edinburgh Tattoo Flypast. He was not required to participate in the actual flypast and they had planned an alternative single ac short night low-level sortie. Before entering the UKNLFS N of Leuchars he established 2-way RT contact with Leuchars ATC and maintained an RT watch until his ac was well clear to the W, whereupon they switched to the LFS common frequency of 300.8MHz. After a short period at low-level, the weather was deemed unfit to continue so they aborted into a climb, straight ahead, until

above the safety altitude - 6500ft - when they turned R to RTB at Lossiemouth at medium level and in contact with SCOTTISH MILITARY. At no time during the abort from low level did they see another ac or was one reported to them, he thought.

THE TORNADO GR4 PILOT'S STATION comments that the delay in the processing of this Airprox is regretted. The GR4 pilot had apparently been told that the Airprox had occurred on the W Coast of Scotland and since he had carried out a weather abort before reaching the W Coast he had assumed that he was not the other ac involved. Further delay was caused by the pilot's participation in a 2-week exercise at St Mawgan. Consequently, the crew's recall of the incident has not been 'total'.

The subject GR4 had been the 'whip' and spare for the Edinburgh Tattoo flypast. When the ac was no longer needed for this task it departed from the Edinburgh area and transited to the W of Leuchars under a LARS. As the GR4 cleared the western edge of Airway P600 the LARS was terminated and the crew switched to an en-route frequency. After 2 min, the GR4 crew encountered bad weather and the crew were forced to carry out a weather abort at about 1959UTC. The ac was turned onto a westerly heading to ensure adequate separation from the Scottish TMA and climbed straight ahead to above the relevant Safety Altitude of 6500ft RPS. Once above Safety Altitude the GR4 crew turned R, away from the advisory route onto a heading of about 020°(T) toward Lossiemouth. During this climb in IMC the crew tried to contact SCOTTISH MILITARY for a radar service. However due to a combination of the Tornado's poor radios and mountainous terrain SCOTTISH MILITARY was unable to identify the GR4 until it was at medium level. The crew had assumed that as they were clear of CAS and deconflicted from other low-level traffic in the UKNLFS that there would be no conflicts. Unfortunately, in this case, the direct track and descent of the B737 put the airliner in the same piece of airspace.

UKAB Note (3): The ScACC Lowther Hill radar recording shows the GR4 executing the abort from the UKNLFS as it turns NNE and climbs through FL63 Mode C (1013mb). Meanwhile the B737 is shown descending through FL112 Mode C (1013mb) and clearing E of the eastern boundary of ADR W3D into Class G airspace. As the GR4 steadied onto a track of 020° at 2000:28, the Mode C indicated the jet was climbing through FL74. At this point the B737 is 9nm N of the GR4, indicating FL109 descending, still on a converging track. The GR4's Scottish (Mil) squawk of A4611 was displayed just before climbing through FL93 Mode C at 2000:58, with the B737 5nm to the N and some 1600ft above the GR4 descending through FL103. At 2001:10, the GR4 is shown passing FL104 having crossed through the level of the airliner that is some 2.45nm away at FL102, but the GR4 displays a spurious code followed by a loss of both the Mode A & C level data at the next sweep. The GR4 pilot's response to the ScATCC (Mil) controllers avoiding action turn is also evident. The B737 bottoms out at FL102 and thereafter climbs in response to the reported TCAS RA, when the APR's left turn instruction onto 110°, first passed to the crew on RT just after 2000:45, becomes evident as well. Minimum horizontal separation of about 1.12nm is attained at 2001:21, when the GR4 displays the *SSR data unreliable code* of A0000 coupled with a Mode C indicating FL113, whilst the B737, indicates Mode C FL104 climbing, below the Tornado. The GR4 is seen initiating a L turn directly afterwards and the 2 ac diverge and climb.

MIL ATC OPS reports that the Tornado GR4 was climbing out of low-level 10½nm NW of GRICE on a SW'ly track. The GR4 crew initially called the ScATCC (Mil) Controller at 1959:45, but good 2-way communication was not established until 2000:20 when the GR4 crew requested "*Single GR4 aborted from low-level currently about 40 miles west of Leuchars passing seven five heading 025°, in the climb to FL150 RTB Lossie*". ScATCC (Mil) assigned the flight a squawk and requested "*what type of radar service*" the crew required, who then requested an "*advisory*" service. ScATCC (Mil) identified the GR4 at 2001:00 and started to pass traffic information about "*traffic left...*" but then broke off the transmission to immediately pass the GR4 crew "*avoiding action turn hard left heading 280°, traffic 12 o'clock 2 miles crossing left - right indicating FL100 descending*". The GR4 crew acknowledged the turn and at 2001:17, was instructed by ScATCC (Mil) to "*expedite climb FL50, radar advisory*". At 2001:39, ScATCC (Mil) informed the GR4 that the "*previously called traffic is now well below maintain track en-route Lossie*". The GR4 continued the sortie with no further incident.

It would appear that initially there were problems establishing good 2-way RT communication between ScATCC (Mil) and the GR4 crew. However, once 2-way RT was satisfactorily established ScATCC (Mil) allocated a Mode A squawk and attempted to identify the ac. During the identification process ScATCC (Mil) found it necessary to decrease the displayed radar range from 90nm to 50nm and then to alter the positioning of the SSR Labels of both the GR4 and B737 as they were garbling together. Having done so, the controller observed that the GR4 was in direct conflict with the B737 and at 2001:03, interrupted the identification of the GR4 to transmit "*avoiding action turn hard left heading 280°, traffic 12 o'clock 2miles crossing left right indicating FL100 descending*" when the 2 ac

AIRPROX REPORT No 156/04

were only about 3nm apart. Whilst the controller issued appropriate avoiding action, the radar recording reflects that the GR4 pilot did not initiate this turn until 2001:10, when the 2 ac are laterally 2.45nm apart. It is believed that the transmission made by ScATCC (Mil), at 2001:07, requesting the GR4 crew to "*expedite climb...*" included an erroneous level as the GR4 crew had already reported passing FL75. In our view the ScATCC (Mil) controller reacted in an appropriate manner; the avoiding action passed to the GR4 crew was appropriate given the situation at the time.

ATSI reports that the B737 was transferred to Edinburgh APPROACH from the ScACC TAY Sector, outside CAS, descending to FL80 routing to STIRA. The flight called the APR at 2000:30. Shortly afterwards the APR was advised of conflicting traffic by the TAY Sector, that had not been seen before the handover, but was subsequently observed on his display as it climbed out from the LFS. An avoiding action L turn onto a heading of 110° was given and traffic information passed to the B737 pilot who reported climbing in response to TCAS.

[UKAB Note (4): The Edinburgh APPROACH RT transcript reveals that just after 2000:45, the APR instructed the B737 crew to "[C/S] *turn left heading 110*", which was not acknowledged by the crew. Shortly after 2001:00, but before 2001:15, the APR transmitted to the B737 crew "[C/S] *avoiding action I say again turn left heading 110 traffic south of you by 3 miles mode charlie 101 climbing*", whereupon at about 2001:15, the B737 crew acknowledged "*heading..110 [C/S]*".

Whilst the phrase 'immediately' was not used in the avoiding action phraseology and the pilot was not informed of the ATC service being provided, there are no ATC causal factors apparent within this Airprox.

HQ STC comments that the GR4 pilot made every attempt to mitigate the chances of an encounter and stayed clear of ADR W3D during his weather abort to get above the safety altitude of 6500ft. The GR4 pilot also attempted to get 2-way RT with Scottish MILITARY at the earliest opportunity, which he did at 2000:20, some 10nm away from the B737. Once identified the ScATCC (Mil) controller made a swift and rapid decision to take avoiding action against the B737 and achieved a safe, albeit quite close, distance.

The GR4 has been identified for a V/UHF radio upgrade in the future and also the GR4 Collision Warning System program has been reinvigorated. Both these upgrades will help to reduce the chances of recurrence.

Had the B737 crew received and acted on the first instruction then the miss distance would have been far greater, albeit, that there is no prescribed separation distance for this type of encounter in Class 'G' airspace.

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 Mil ATC Ops report had explained that the GR4 crew had experienced some difficulty in establishing good 2-way RT with ScATCC (Mil). Difficulties over RT reception in mountainous terrain are well known but a civilian controller commented that at these levels there should not have been a problem communicating through the RT forward relays at Lowther Hill. He opined that, in very general terms, if the ac can be seen on radar you should be able to talk to the crew on RT. The STC Member reinforced the Command's comment, highlighting that the GR4 fleet was scheduled to receive an upgraded radio fit that might well address the difficulties experienced here. Furthermore, he added that it was envisaged that the whole GR4 fleet would be equipped with a CWS equipment by 2009. This was encouraging; the benefit of TCAS II was certainly well proven and any device which could *inter alia* assist a crews' lookout was to be welcomed. It was evident that here the GR4 crew had sensibly free-called ScATCC (Mil) for a radar service subsequent to their weather abort from low-level but it was another 40sec before the controller passed avoiding action and about 50sec to the CPA, all attesting to the efficiency with which the ScATCC (MIL) controller had handled the situation. The Mil ATC Ops report had made it plain that the controller had just identified the jet when the conflict with the B737 was detected. Thus the GR4 crew, climbing up through cloud in IMC, was unaware of the B737's presence until the controller passed avoiding action and traffic information under the requested RAS which had enabled the GR4 crew to turn away from the airliner at the crucial moment. It was evident that the GR4 pilot's recollection was in error when he said that no other ac had been reported to him but this did not surprise the Members as his report had been rendered some time after the event.

The Board commended the ScATCC (Mil) controller for his adept appreciation of the developing scenario and for passing avoiding action instructions so promptly which undoubtedly stopped the situation from deteriorating.

This conflict occurred in Class G airspace where both acs' crews were proceeding about their respective flights quite legitimately. None of the Members doubted the right of either crew to be operating where they were. Concern was expressed, however, over the routeing of the B737, a CAT flight operating under IFR through the Open FIR where 'see and avoid' prevails. Some Members wondered if this was a matter of expediency or whether the crew had made a conscious decision to route through Class G airspace. It would appear that the B737 operator had planned this flight in the UAS via STORNOWAY (STN) – FINDU and there was considerable debate about why the B737 had departed from the established ATS route structure. Whereas there are no Class A airways in the MAS underlying the UAR from STN, there is an ADR (A1D) that enters the Scottish TMA via GOW. The STC Member reinforced that military FJ crews are under a remit to avoid ADRs if they can (it would appear that the GR4 crew had taken positive action to stay clear of W3D here) and will generally not cross such ATS routes unless they are in receipt of a radar service. Thus, there was a routeing available to the B737 crew which would have allowed them to enter the Scottish TMA via the ADR remaining in Class F airspace. Unfortunately, as no transcript had been provided for the TAY Sector nor a report obtained from the TAY SC, it was unclear whether the B737 crew had requested a direct routeing off STN or had been instructed by TAY Sector to route through the MAS direct to STIRA prior to entry into the Scottish TMA. A civilian controller Member was concerned that because the ATSI report had not delved into this topic any lessons on this aspect may well have been lost. The NATS Ltd advisor said that the Edinburgh ATC investigation into the unit aspects of this Airprox had revealed a number of lessons which had been promulgated throughout the unit. Although the unit had suggested that the APR was providing a RIS, a civilian controller Member commented that he had consulted with the APR who stressed that it was only a FIS that was being provided. The NATS Ltd advisor also added that as the civil ATC provider to the B737, the company policy is that it will not provide a RAS to any flight in Class G airspace. Albeit here this CAT flight had benefited from avoiding action proffered under a FIS by the APR without the benefit of an established RAS.

In the B737's cockpit with the indisputable benefit of TCAS to help them, the crew had apparently detected the GR4 climbing up towards their ac before the APR had instructed them to turn onto a heading of 110° to avoid the jet. Again, the airliner's crew was flying IMC, in cloud, established in an en-route descent toward their destination and although the pilot thought that they were in receipt of a "radar" service, technically this was not actually the case at this point outside CAS. Nevertheless, following the prompt from the astute TAY SC who had also detected the GR4's weather abort, it would appear that the APR had spotted the conflict and passed the turn instruction within the same time frame as the avoiding action was being passed to the fast jet crew by the ScATCC (Mil) controller. It was indeed fortunate that the APR had assimilated the seriousness of the situation when he did and notwithstanding that the APR had not formally established the nature of the ATS that was being provided (where some might not condone the passing of avoiding action under a FIS or RIS) it was clear that the APR had acted wisely and had taken positive action which had also contributed to the swift resolution of the conflict. From the ATSI report, it was also clear that neither controller had time to dwell here, for this Airprox occurred less than 50sec after the B737 crew had first called the Edinburgh APR. The Board concluded, therefore, that this Airprox had resulted from a conflict in IMC in Class G airspace.

Although this flight was operating in IMC at night in the Open FIR without a radar service, with all the associated risks that this entails, the radar recording showed that the GR4's rate of climb had taken it through the B737's level and clear above it before the point of minimum horizontal separation had been reached, even though the B737's TCAS RA was being complied with. Furthermore, the course of the GR4 was, fortuitously, always passing astern of the airliner. This coupled with the combined avoiding action turns provided to each crew had ensured that minimum separation was not eroded below 1.12nm horizontally at the CPA. In the Board's view, this was all just enough to remove any risk of a collision in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

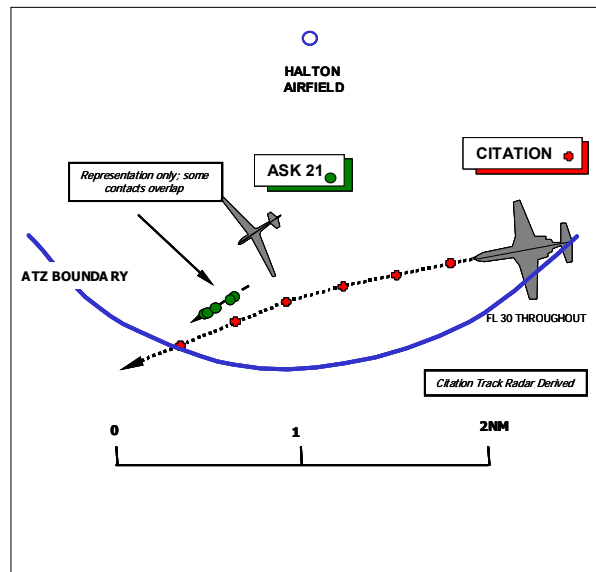
Cause: Conflict in IMC in Class G airspace.

Degree of Risk: C.

AIRPROX REPORT No 159/04

AIRPROX REPORT NO 159/04

Date/Time: 31 Aug 1239
Position: 5145N 00044W (2nm S Halton Airfield - elev 370ft)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: ASK 21 C560
Operator: HQ PTC Civ Pte
Alt/FL: 2500ft 2500ft
(QFE 1007 mb) (QNH 1019 mb)
Weather VMC CLBC VMC CLBC
Visibility: >10km >20km
Reported Separation:
0 VI/<150m H 0 V/250m H
Recorded Separation:
NR VI/~200m H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ASK 21 PILOT reports flying a white glider on an instructional sortie from Halton, listening out on Halton Radio. While heading 200° at 50kt and at 2500ft agl, a low-wing twin jet ac passed him from his 6 o'clock displaced to his left by about 150m at the same altitude. As the commercial ac track was from behind his glider, he was unable to take any evasive manoeuvres. He expresses the view that the pilot of the jet apparently took no avoiding action as required by the rules of the air. He appreciates that the incident occurred in Class G airspace and that collision avoidance is achieved by the 'see and avoid' principle. He expressed great concern however, that a commercial operator chose to fly so close to a busy airfield which is clearly marked on CAA charts, which hosts intense operations by gliders, motor gliders, microlights, powered ac and tug ac.

THE C560 PILOT reports flying a positioning flight from Luton to Oxford at 2500ft, squawking a Luton code and in receipt of a 'Traffic Info' service from them just before he transferred to Oxford. While heading approx 230° at 210kt they saw a glider in their 12 o'clock approx 1km ahead. The glider was in a continuous right turn and they decided to turn to the left to stay clear of his turning circle. From the moment they saw the glider until they were well past, they had it in their sight and at all times they kept evaluating the situation and found that the change in heading they had made would be enough to stay clear. If needed they were ready to also initiate a climb or descent.

UKAB Note (1): The base of the London TMA in the immediate vicinity of the incident is 3500ft amsl.

UKAB Note (2): The QNH at 1250 for Luton was 1018mb. This means that FL30 equated to 3150ft amsl or 2780ft agl.

UKAB Note (3): The UKAIP ENR 2-2-2-2 promulgates Halton as having an ATZ of 2nm radius centred on the longest notified RW to 2000ft aal (2370ft amsl) active 0700-1900 or Sunset (1hr earlier in Summer).

UKAB Note (4): The recording of the Heathrow radar shows the incident as taking place 1.8nm SSW of Halton at 1239:00. The C560 paints throughout at FL30 and a primary-only contact (presumed to be the glider) can be seen circling then rolling out on a SW heading. The incident occurs between sweeps but the track of the C560 passes 1.5nm to the S of the centre of Halton airfield and misses that of the primary contact by 200m (as accurately as can be measured).

HQ PTC comments that the glider operators, although a service-sponsored organisation, operate under the aegis of the CAA and BGA but from an airfield on PTC land.

This was clearly a legitimate encounter in Class G airspace that seems to have been safely resolved by the Citation pilot, who had the advantage of a favourable closing aspect; however, the increasing mixture of GA ac operating at disparate speeds squeezed beneath the base of the LTMA places a heavy reliance on the “see-and-avoid” principle. This, in turn, relies on strict compliance with VMC. We are concerned that the lack of easy access to low transit levels within the LTMA and that commercial pressure may be leading to some risky corner-cutting. Halton’s location makes it particularly vulnerable to this.

THE FLIGHT OPS INSPECTOR (FOI) comments that the Chief Pilot (CP) was contacted and reported that the C560 pilot had seen the glider at 1km. The Inspector questioned the appropriateness of routeing so close to Halton, but the CP stated that other options were not viable. He also stated that his crews were aware of Halton and that this incident has been highlighted in their Flight Safety programme. The CAA routinely audits this programme.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, a radar video recording, reports from the FOI and the RAF Halton operating authority.

Members were informed that RAF Halton is now a very busy airfield routinely operating a considerable number of light ac and gliders on a daily basis. There has been a threefold increase in traffic density over the last year or so.

Although this incident occurred in the open FIR it was only about 400ft directly above the top of the Halton ATZ in an area where many gliders will routinely be operating.

Members were surprised that the FOI did not comment on the route selected by the Citation pilot as expert opinion thought the routeing, although quite legal, was ill-advised. Contrary to the comment made by the company CP regarding the routeing chosen, the Board was advised that opting to transit farther to the N would have maintained a greater margin from the known busy airfields in that area. Members were also informed that the standard exit altitude from Luton Class D airspace in that area is 3000ft and, while accepting that there are many limitations of such a service, they thought that the C560 pilot would have been wiser to utilise a LARS service, in this case from Brize Norton.

Nevertheless, the C560 pilot did see and avoid the glider. Accepting that there was little room to manoeuvre vertically, Members thought however that he should have afforded it a wider lateral margin.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The C560 pilot flew close enough to the ASK 21 to cause its pilot concern.

Degree of Risk: C.

AIRPROX REPORT No 160/04

AIRPROX REPORT NO 160/04

Date/Time: 6 Sep 1150

Position: 5251N 00105E (6nm NW Coltishall)

Airspace: London FIR (Class: G)

Reporting Ac Reported Ac

Type: E3D Sentry F16

Operator: HQ STC Foreign Mil

Alt/FL: FL160 FL160

Weather: VMC CLAC VMC CLAC

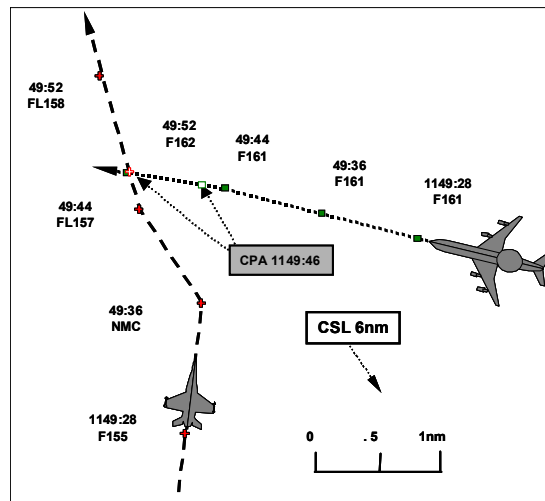
Visibility: >20km >10km

Reported Separation:

0 V/0.5nm H 4000ft V/3nm H

Recorded Separation:

400ft V/0.5nm-H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE E3D SENTRY PILOT reports recovering his ac from an overseas deployment IFR and OAT in receipt of a RIS from London Mil. While heading 290° at 360kt during the descent into Coningsby, ATC reported a large number of manoeuvring ac to NW of their position. TCAS initially indicated 4-6 contacts between 10-12 o'clock at 4-6000ft below. While the crew tried to locate the contacts visually, TCAS gave TA. At that point crew visually acquired the TA traffic about 5nm away, low in their 10 o'clock and manoeuvring. Their descent was stopped at FL160 whilst the conflicting traffic's flight path was assessed but the traffic continued to manoeuvre into their path and caused TCAS RA and the pilot reacted to RA climb instruction. The crew maintained visual contact with traffic throughout. An Airprox was reported to London Mil and he assessed the risk as being moderate.

THE F16 PILOT provided a report although it did not contain a great deal of significant information except that he first saw the E3D at a distance 12nm, kept it in sight, took no avoiding action as such was not required and avoided it by the margins above.

UKAB Note (1): The F16 pilot did report that he was squawking 1604 with Mode C, which confirms that his ac was the one which painted on radar and was the one involved in the Airprox.

THE SENTRY STATION (RAF Waddington) comments that the E3D in question was returning from an operational deployment overseas on an OAT routing. It had started its descent into Coningsby and was cleared to descend by London Mil to FL100. After receiving TI the crew sensibly elected to level at FL160. The TCAS, recently fitted to the ac, was instrumental in alerting the crew to the proximity of the F16 and in giving avoidance action in the form of a TCAS RA. The incident highlights the difficulty of operating a large ac, with limited manoeuvrability, in busy Class G airspace, and the need for crews to keep a good look out at all times.

MIL ATC OPS reports that Controller 14 (CON14) was a student and mentor team providing a RIS to an E3D routing from NAVPI to Coningsby; at the time it was cleared to descend to FL100. At 1147:21, as the ac was tracking towards a group of manoeuvring F16s, CON14 informed the E3D "...limited traffic information..." due to high traffic density and shortly afterwards he added "...multiple contacts in your 12 o'clock at 15 miles, manoeuvring...part of exercise TLP". The E3D pilot acknowledged this and at 1148:22 CON 14 called the subject F16's position "...left 11 o'clock 12 miles...FL160" and again the E3D crew acknowledged the TI. At 1149:12 the pilot reported: "...got TCAS climb RA." CON14 acknowledged this and passed further TI on the pair of F16s: "...traffic southwest 5 miles, manoeuvring in again at FL120, further traffic southwest, 3 miles, manoeuvring, indicating FL155." The E3D pilot reported: "...tally" but did not state which ac he was visual with. CON 14 continued to pass TI, stating "...previously called traffic now 12 o'clock, 1 mile, indicating similar level." The E3D crew responded with "...we have multiple RAs but we've maintained level...good visual." CON 14 and the E3D pilot had a short interchange about the incident in which CON 14 updated the TI and the pilot of the E3D confirmed

his intention to file an Airprox followed by “...it's a nice day but he was belly up and we relied on the RA with the India Mike Charlie.”

Analysis of the Claxby radar at 1147:21, when CON 14 limited the TI, shows the E3D 8.5nm E of Coltishall, tracking 280° and indicating FL201. At the same time there are multiple tracks, including the subject F16, between 22 and 54nm ahead of the E3D. At the time when CON 14 first passed TI, a pair of F16s can be seen manoeuvring 17nm ahead of the E3D indicating FL114 and FL122 but their squawks are frequently garbling. At the same time the subject F16 is seen 8nm northwest of the manoeuvring F16s, heading towards them and indicating FL157. As the E3D maintains track in a steady descent, the pair of F16s are seen to establish a SE track with the subject F16 closing in from 8nm behind them and indicating FL157. At 1148:22 the pair of F16s are between 9 & 12nm SW of the E3D, both indicating FL119 whilst the E3D is indicating FL180. At this point the subject F16 is 16nm in the E3D's 12 o'clock indicating FL157. Shortly afterwards the pair of F16s make a tight left turn all the way round to take up a SW heading. At that point their Mode Cs garble but one ac can be seen to indicate FL121 and neither ac is closer than 2nm to the E3, which was indicating a descent through FL163. The subject F16 travels to the SW of the pair of F16s and then turns NE and passes through the pair, indicating a slight descent to FL156. The subject F16 then continues NE away from the pair and towards the E3D which at this point appeared to have levelled indicating FL161. The subject F16 indicated FL157 just before passing the E3D and FL158 just afterwards. The CPA was at 1149:51 when the subject F16 passed 0.5nm, left to right, in front of the E3D indicating 400ft below it. Thereafter the ac diverge until 1152:38 when the F16 has completed a left hand turn onto a track of 200° and back onto a conflicting course with the E3D. As the F16 steadies onto track the Mode C indication is FL157 whilst the E3D has descended to FL113. The F16 passes directly in front of the E3D with the F16 indicating FL158 and the E3D indicating FL103. No further conflict is evident between the 2 ac.

Con 14 was aware that there was a large amount of TLP exercise traffic manoeuvring in East Anglia and consequently limited the RIS in plenty of time to allow the E3D crew to consider their options. Con 14, obviously aware of the nature of TLP traffic, passed timely TI correctly and updated it regularly to give the E3D crew the greatest opportunity of sighting the other ac. In addition, believing that the traffic continued to constitute a definite hazard, he continued to update the TI. Though there were some minor inaccuracies in the TI this is natural when a controller is passing TI on fast moving manoeuvring traffic and did not influence to incident. From the F16 pilot's reported estimated separation, at the time of the Airprox, it is evident that he may have been passing details relating to the second crossover between the 2 ac as opposed to the first which was considerably closer.

UKAB Note (2): The TLP exercise was the subject of an ACN and resulting NOTAM H6423/04 which advised that up to 32 fighter ac would be operating from 500ft to FL240, outside CAS in the East Anglia area.

HQ STC comments that the E3D flight crew should have been aware of the chances of a FJ encounter from the NOTAM and they could then have planned a different arrival and descent profile if a FJ exercise was going to give them a concern. That said, the system would appear to have worked well in this instance for the E3D:

1. The Mil ATCO provided adequate TI to the E3D.
2. The E3D sensibly acted on the ATCO's TI by levelling off and maintaining a visual on the traffic.
3. The TCAS provided adequate warning and a sensible resolution to the problem.

However, from the F-16's perspective it would appear that his description of the encounter was his second one with the E3D. It would be reasonable to consider 2 options from the FJ's perspective, he saw the E3D and was happy to fly 0.5nm and 400ft vertically across the nose of the E3D or the FJ pilot never saw it.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Although this incident took place in Class G Airspace where 'see and avoid' is the prime means of collision avoidance, there were several important factors that could have prevented it from taking place. Despite the NOTAM, which should have advised the E3D flight deck crew of the intense exercise traffic in the area, they opted to route straight through the area on a RIS. Members thought that either avoiding the exercise area completely

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or asking for a RAS would have been more sensible. The London Mil Controller had provided timely, accurate and virtually continuous TI but the traffic density was such that it was of little use to the E3D pilot. In addition, he reported receiving multiple TCAS RAs which may have given a confused picture. A combination of the above did however succeed in getting the E3D pilots concentrating heavily on lookout which enabled them to see and avoid the F16. As evidenced by the radar recording however, the E3D pilot did not react to the RA generated by the subject F16 (assuming that the reported F16 triggered an RA as the parameters suggest that it should have). This suggests perhaps that the E3D pilot's mental picture of the situation was confused. [At the time there were 3 F16s in the area, two 5000ft below and level and the subject ac].

The Board agreed that it was most likely that the distances reported by the F16 pilot were those on the second encounter. Members thought therefore, that it followed that the F16 pilot had not seen the E3D on the first occasion since he may have been belly-up to it.

The Board assessed that, although the F16 pilot had probably not seen the E3D, the E3D pilots had seen and avoided the F16 by $\frac{1}{2}$ nm horizontally and that there had been some – albeit a little - vertical separation. This being the case there had not been any risk that the ac would have collided.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the FIR.

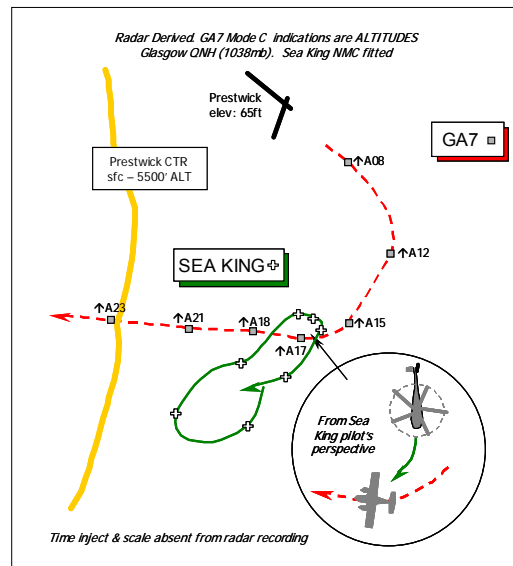
Degree of Risk: C.

Contributory Factor: Possible non-sighting by the F16 pilot of the E3D.

Post Meeting UKAB Note: As a result of additional information provided at the meeting by HQ STC, the NATS Radar Replay System (NRRS) data files were subsequently checked for a short period after the initial CPA. It shows that the 2 ac come together again at 1153:13; the F16 approaches the E3D, which is still on a NW heading, from the N. On this occasion, however the F16 is 4000ft below the E3D and displaced by about 3nm as the E3D passed ahead of it.

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Date/Time: 7 Sep 1328
Position: 5530N N 00435W (Prestwick Cct - elev 65 ft)
Airspace: ATZ/CTR (Class: D)
Reporting Ac Reported Ac
Type: Sea King Mk5 GA7
Operator: CinC Fleet Civ Trng
Alt/FL: 2000ft ↑6000ft
(QFE 1036mb) (QNH 1037mb)
Weather VMC Nil Cloud VMC Sky Clear
Visibility: 20km+ 10km+
Reported Separation:
200ft V/100m H, Not seen
Recorded Separation:
Indeterminable

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

THE WESTLAND SEA KING MK5 PILOT reports his SAR helicopter has an ocean grey and red colour scheme and the HISL, landing lamp and forward facing floodlights were all on whilst flying in the RH circuit to RW03 at Prestwick Airport conducting practise autorotations under VFR. There was no cloud and a visibility of 20km+, but he was looking into the sun. An SSR Mode A squawk of A4514 was selected but Mode C is not fitted. Neither TCAS nor any other form of CWS is fitted. He was in receipt of an Aerodrome Control Service from Prestwick TOWER on 118.15MHz. The ac crew complement included a co-pilot, observer and aircrewman.

He was orbiting R through 360° flying level at 2000ft Prestwick QFE (1036mb) before turning onto finals to the threshold of RW03 at 70kt. Whilst passing through S, he thought, a light twin engine fixed wing ac – he quoted the GA7 C/S - was spotted climbing out as it passed about 200ft below his ac and approximately 100m just R of the nose as it climbed up on a departure from RW13 eventually through his level and cleared to the W. No avoiding action was taken as the GA7 had already passed the CPA when first spotted, but he assessed the risk as “significant”.

THE GA7 PILOT, a flying instructor, reports his ac has a white colour-scheme and all the ac’s lighting was on whilst departing Prestwick IFR for a multi-engine instrument rating training flight with a student. He was in receipt of an Aerodrome Control Service from Prestwick TOWER on 118.15MHz and squawking the assigned code of A5053 with Mode C; TCAS is not fitted.

After take-off from RW13 his IFR departure clearance required them to turn R direct to FULMA and climb to 6000ft QNH. TOWER passed traffic information about the helicopter prior to entering RW13 and they were visual with it prior to take off. They followed their departure clearance after take-off from RW13, climbing at 95kt through 1200ft Prestwick QNH (1037mb) then into a R turn into sun onto a heading of 270°. Although the Sea King was seen during the initial climb and turn, they lost sight of the helicopter because of the sun, so they continued their R turn “assuming perhaps wrongly in hindsight” that the Sea King pilot, who was flying VFR, still had them visual, adding that the helicopter was not in his field of vision during the turn. He did not see the helicopter at the time of the Airprox, and he thought that they had passed to starboard of the Sea King and about 500ft below it whilst in the R turn. He thought that the Sea King was never in his flight path or field of vision, but he also opined that it might have been masked by his port wing in the R turn. “In hindsight there could have been a risk”, he said, but there was no radio communication at the time regarding any incident.

THE PRESTWICK TOWER CONTROLLER (TOWER) comments that the Sea King was orbiting VFR at ‘FINALS’ to RW03 because of the GA7 departing from RW13. The Sea King pilot was flying 2000ft Ccts to RW03 and the GA7 crew was given traffic information about the Sea King before departing RW13 IFR, with a R turn to the SW

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on track to FULMA climbing to an altitude of 6000ft QNH (1037mb). Traffic information was passed to both pilots about each other's ac.

After the Sea King had landed the pilot telephoned the Tower to report an Airprox. The Sea King pilot said that a light ac – the GA7 - had departed from RW13 and passed about 200ft underneath his helicopter in a climb. She was unable to determine how close they flew to one another as the Sea King was orbiting 'FINALs' for RW03 at the time of the Airprox, and the point of conflict with an ac departing from RW13 is behind the Control Tower.

UKAB Note (1): The 1320UTC Prestwick weather was reported as a surface wind of 030°/7kt; visibility of >10km; CAVOK; QNH 1037mb. The Glasgow QNH was 1038mb

UKAB Note (2): The Visual Control Room (VCR) within the Control Tower at Prestwick is equipped with an Airfield Traffic Monitor (ATM), which was serviceable at the time of the Airprox.

THE WESTLAND SEA KING MK5 PILOT'S UNIT comments that Prestwick is a busy international airport where dual-runway operations are normal practice to maximise the available Ccts for training. This incident highlights the dangers of using one runway for visual Ccts and another for IFR departures. All Unit aircrew have been rebriefed of the dangers and have been reminded to be vigilant at all times.

UKAB Note (3): The poor quality of the Lowther Hill radar recording provided by ScATCC (Mil) showed neither time nor a suitable scale on which to gauge the separation of the two ac involved. The Sea King is shown established in a right-hand orbit S of the Airport as the GA7 climbs into coverage through 800ft Glasgow QNH (1038mb), after departure from RW13. The GA7 is shown turning R in conformity with the departure clearance onto a track for FULMA, passing only marginally to the S of the Sea King as reported as the helicopter turns R through east. As it does so the GA7 climbs through 1700ft QNH (1038mb); given the Sea King pilot's reported height of 2000ft QFE 1036mb this would equate to vertical separation in the order of 360ft at this point, generally in accord with the latter pilot's report. The GA7 climbs further through 1800ft QNH on the next sweep when W of the helicopter and thence through the level of the Sea King whilst opening to the W but the exact range cannot be determined with certainty.

ATSI reports that the Prestwick TOWER controller reported her workload as *"moderate and complex"* whilst the traffic loading was *"moderate"*.

The Sea King crew was conducting training in the Cct and operating under VFR, whereas the GA7 crew was engaged in a dual instrument training flight under IFR. The Sea King pilot had been carrying out right-hand Ccts to RW03 and shortly after 1321, the pilot requested a climb to 2000ft QFE to operate for the next 10min, which was approved by TOWER. Meanwhile, the GA7 crew had requested taxi clearance at 1317, and had been instructed to taxi to holding point 'MIKE' for departure from RW13. At 1322:45, TOWER passed the following clearance "[GA7 C/S] *after departure right turn out on track FULMA Foxtrot Uniform Lima Mike Alpha climb to maintain altitude six thousand feet QNH one zero three seven climb when instructed by Scottish Radar flight level six zero and squawk five zero five three*". (FULMA is located 15nm W of Prestwick). This was correctly read back by the GA7 crew and at 1323:30, the pilot reported ready for departure. A L turn from RW13 would have required the GA7 to cross through the FAT of the runway in order to establish a course for FULMA. TOWER instructed the GA7 crew to hold position and then the Sea King reported late downwind at 2000ft QFE for RW03. The controller replied "[Sea King C/S] *report before turning final light aircraft about to depart Runway 13*". Whereupon the Sea King pilot responded with *"... happy to turn final we'll orbit at...late final if you're happy"*. The controller acknowledged this and the pilot of the Sea King advised that he was *"orbiting on final [C/S]"*. TOWER cleared the GA7 crew for 'TAKE-OFF' but there was no response. The controller called the GA7 crew again who then replied so the controller transmitted "[GA7 C/S] *clear take off Runway 13, [sw] 050 degrees 7 knots traffic is a Sea King orbiting final Runway 03 and a Cessna 337 4 mile final Runway 13*". The pilot responded with "[GA7 C/S] *clear take off Runway 13 and traffic copy*". The Sea King pilot was instructed to continue orbiting until advised and at 1327:50, the GA7 crew was transferred to the Prestwick RADAR frequency. When the Sea King had completed its training detail, the pilot telephoned ATC and informed them that he would be filing an Airprox against the departing the GA7, which had passed underneath his helicopter whilst it was orbiting on final approach.

The Prestwick CTR is Class D CAS and one of the requirements for this, as specified in MATS Part 1, Section 1, Chapter 2, page 1, is that ATC will pass traffic information to IFR flights on VFR flights and give traffic avoidance if requested. Additionally, ATC will pass traffic information to VFR flights on IFR flights and other VFR flights. The

TOWER controller explained that the helicopter was carrying out autorotation exercises, commencing from 2000ft above the RW03 threshold markings onto the runway. The controller, when seated in the VCR, faces NE and so such traffic, when holding over the RW03 threshold, would be behind the controller and above their line of sight.

MATS Part 1, Section 2 Chapter 1 Page 9 para 13.4 states that:

'A take-off clearance shall be issued separately from any other clearance message. If an aircraft is lined up on the runway and a revised clearance or post departure instructions need to be passed, the revised clearance or post departure instructions shall be prefixed with an instruction to hold position'.

Although the controller satisfied the requirement of passing traffic information to the departing GA7 crew about the Sea King, this was given in the same transmission as, but after, the take off clearance which does not conform to the above MATS Part 1 requirement. However, the pilot of the GA7 did respond with "[GA7 C/S] clear take off Runway 13 and traffic copy", thereby indicating that the traffic information had been received. The controller did explain that her normal practice was to pass traffic information first and then the departure clearance. She added that, when passing traffic information to military pilots, it was normal to refer to a 'light aircraft' in the traffic information, rather than a specific type, as some of the aircrew were not familiar with the variety of types that use the airport.

The GA7 crew was operating under IFR and the Sea King under VFR, both ac being within the ATZ and Class D airspace. In the GA7 pilot's report he stated that they had the Sea King in sight prior to take off, but, in their R turn from the RW heading of 130° onto their desired track of 270°, they lost sight of it. The TOWER controller complied with the requirement to pass traffic information to the IFR flight before it departed. The phraseology used by TOWER was not as specified in MATS Part 1: however, evidently the crew of the GA7 crew received and assimilated this information. At no stage did the crew request ATC to provide traffic avoidance. The Sea King helicopter was not visible to the TOWER controller from her position in the VCR and so, quite correctly, she concentrated on observing the departing GA7. Having been passed traffic information on the helicopter, it was reasonable to believe that the crew of the GA7 would take this into account when they were determining when to turn R onto their required track.

ATC fulfilled their responsibilities and having provided both flights with appropriate traffic information, it was reasonable for the controller to believe that the respective ac's crews would take the presence of the other ac into account.

CinC FLEET comments that it is unfortunate that the MATS Part 1 rules effectively allowed the controller to mix IFR and VFR traffic with nothing more than a traffic information call to the GA7 on an IFR departure from a different runway to the one being used by the VFR traffic. Taking into account the holding position of the Sea King, the position of the sun, the blind spots from the VCR and the known IFR profile to be flown by the GA7 this Airprox could have been avoided if the controller had held the GA7 (no pressure to launch against the RW13 inbound Cessna 337 as the GA7 was only at the hold and not on the runway) and the Sea King had continued, calling finals for the auto-rotation to RW03. The Sea King pilot effectively held in a position of potential conflict and despite being VFR was always going to be in a poor position to spot a conflict approaching from below. The controller could not see the Sea King, but should still have been able to identify the point of conflict based on the Sea King pilot's reported position and the IFR profile that the GA7 was about to fly.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The ATSI report had clearly explained that in Class D CAS whilst separation is afforded by ATC between IFR v IFR and IFR v Special VFR flights, only traffic information is provided to IFR flights (the GA7) about VFR flights (the Sea King). Furthermore, the GA7 crew had not sought any advice on traffic avoidance. In the provision of an Air Traffic Control Service to VFR traffic operating in the Class D ATZ here, no separation is afforded by ATC, only traffic information is provided. It was evident to the Board that TOWER had fulfilled their responsibilities to both of the ac crews involved in this Airprox in that respect. To those familiar with the layout of the Prestwick TOWER VCR it was not surprising that the controller had not witnessed the event. They said the tower's size prevented

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the controller from having a complete view of the Cct area out of the VCR windows, especially high cct traffic such as the helicopter here. It appeared that the information provided by TOWER about the departing GA7 had caused the Sea King pilot to initiate his orbit on finals to RW03, presumably with the laudable intention of causing the least disruption to other pilots. TOWER had acquiesced to this and had immediately passed traffic information about the Sea King to the GA7 crew which had been duly acknowledged at the second attempt. Thus, each pilot having been made aware of what the other ac was doing, it was reasonable for the TOWER controller to expect that each would keep the other pilot's ac in sight and avoid it by a suitable margin. Some Members sympathised with the GA7 crew's situation departing on instruments under IFR and endeavouring to follow a departure clearance issued by ATC as best they could. But with instrument flight (IF) screens presumably fitted, only one of the two pilots – the instructor - would be able to keep a good look out whilst acting as the safety pilot. The GA7 pilot's laudably frank account had revealed that he had lost sight of the helicopter after take-off and had not seen it as they turned outbound for FULMA. Whilst practising IF with screens, although they do obscure the view forward and down for the trainee pilot, they should be so constructed and fitted that they have minimal impact on the safety pilot's field of view whilst performing his essential function of lookout. Given that the GA7 instructor still had an implicit responsibility to sight and afford appropriate separation to other aerodrome traffic as they departed toward FULMA, which was not on a SID, he evidently did not do so and had reported that he had lost sight of the helicopter after take-off owing to a combination of the sun and the ac's structure. A civilian controller Member observed that the GA7 training flight whilst operating under IFR would be afforded no more priority than other aerodrome traffic. The Sea King pilot was flying under VFR conducting visual circuits, with a co-pilot and a total of four pairs of eyes distributed about the helicopter, which should have been looking for the departing GA7 as TOWER had specifically told them about it. It seemed to some Members that the Sea King crew was much better placed to see and avoid the GA7, a helicopter pilot Member explaining that the Sea King pilot's view forward and down is surprisingly good. So whilst holding prior to the autorotation there should have been ample opportunity for the Sea King pilots to sight the GA7 departing from RW13 and climbing up toward them whilst keeping it in view as it turned outbound, which they did not. In practical terms, it could be said that whilst operating under VFR, there was a greater onus on the helicopter pilot to see and avoid known instrument traffic. Nonetheless, it had been shown that within the Class D ATZ/CTR, the GA7 pilot had an equal responsibility to sight other aerodrome traffic and avoid it. Evidently, neither the GA7 instructor acting as the safety pilot nor the Sea King crew had maintained visual contact on each other's ac at the critical moment, as they were mutually required to do. Therefore, the Board concluded that this Airprox had resulted from effectively a non-sighting by both pilots despite traffic information being passed to both flights about each other's ac.

From the radar recording (though unfortunately the scale could not be gauged) it had been shown that the helicopter was out to starboard of the GA7 and above them on the inside of their turn throughout the encounter. The GA7 pilot was therefore mistaken when he reported that the Sea King might have been masked under the port wing in the turn: it was there to be seen and should have been visible from the right hand seat of the GA7 in the reported clear sky. In this instance it was not possible to ascertain the minimum separation, but there was nothing to suggest that the Sea King pilot's estimate from sighting the GA7 after the CPA was too far wide of the mark. However, without any Mode C data from the Sea King the vertical separation at the time could not be determined either. With neither pilot having the other ac in sight as the GA7 turned around the helicopter it appeared that only providence had kept them apart: a controller Member contended that there was a definite risk of a collision here as the GA7 passed in close proximity to the S of the helicopter, but this was a solitary view. Members were swayed by the Sea King pilot's assertion that the GA7 had climbed gently through his helicopter's level and the radar recording had confirmed that the relative horizontal separation was much greater when the GA7's Mode C showed the ac was out to the W above 2100ft (1038mb) and thereby just through the Sea King's reported height of 2000ft (1036mb). This was enough to convince the Members that whilst fortuitously a collision had been avoided, the safety of the ac involved had indeed been compromised.

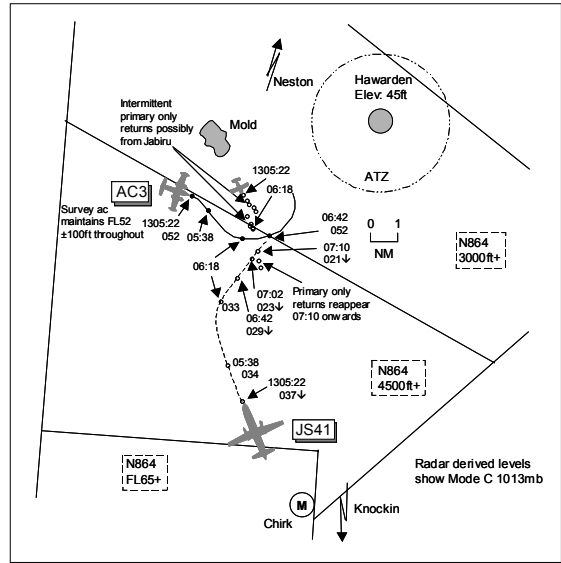
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively a non-sighting by both pilots, despite traffic information being passed to both flights.

Degree of Risk: B.

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Date/Time: 8 Sep 1307
Position: 5305N 00306W (6.5nm SW Hawarden - elev 45ft)
Airspace: LFIR (Class: G)
Reporting Ac Reporting Ac
Type: JS41 Jabiru
Operator: Civ Comm Civ Pte
Alt/FL: 2700ft↓ 2900ft
(QNH 1034mb) (QNH 1034mb)
Weather VMC CAVOK VMC CLOC
Visibility: NR 10km
Reported Separation:
100-200ft V nil H 150m V 200m H
Recorded Separation:
NR



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JS41 PILOT reports being coordinated by Manchester ACC (MACC) initially, and vectored around a surveillance ac before being turned back towards Hawarden and handed-over to APP. The weather was CAVOK and he reported visual with the airfield and intercepted the ILS LLZ. Descending through approximately 3000ft QNH 1034mb on the G/P heading 042° at 130kt, the APP told him that a survey ac was a target to his L either at FL50 or possibly 5000ft, he was not sure, and above. He looked L and spotted what he thought was a C172 coloured white in his 1030-11 o'clock position range 400m on a converging, almost head on, track about 200ft above his level of 2700ft. He called out "registration XXXXX", realised that it would pass over their ac, which it did, and as they were descending took no avoiding action. He assessed the risk as high. He later learnt that the ac sighted was a microlight similar in design to a C172 but half the size which would have meant that it had passed within 100ft vertically of their ac. During a conversation with Hawarden ATC after landing he learnt that the survey ac had been a C310 type.

THE JABIRU PILOT reports flying VFR from a private site near Neston, Wirral en route to a farm strip in Wales. The visibility was 10km in VMC and the ac was coloured white with tail and under fuselage strobe lights switched on. No transponder was fitted to the ac. He had obtained the Liverpool ATIS Information on departure and after speaking to Liverpool APPROACH he transferred to Hawarden frequency when at the S bank of the Dee. The Hawarden frequency was busy and he was unsuccessful in establishing two way contact owing to several simultaneous transmissions. He was aware that a Jetstream was descending in the area and he elected to focus his attention on lookout and sighting the traffic. By now his time on frequency had been 3-4min and he was about 6nm S of Mold cruising at 95kt and 2900ft QNH 1034mb heading 170°. He first spotted the Jetstream in his 2 o'clock range 1000m crossing R to L at the same level descending. Immediately he initiated a full power climb to avoid and saw the JS41 pass 200m in front and 150m below, at which point his altitude was approaching 3000ft. He felt decidedly stressed and shaken by the event and made a direct track towards Chirk for a possible landing. In the end he continued to 'fly the aeroplane' and, being out of radio range with Chirk, he continued to his destination with the intention of telephoning Hawarden ATC to report an Airprox. This was carried out early the next morning, the controller acknowledging that it had been a busy time but had stated that an early call was required. The controller recognised him from his operations with another ac from a different microlight site in the area for 6 years, and during that time he had given timely RT calls without incident. Also he was told that his ac was not showing on the radar and that ATC were unaware of his presence.

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THE HAWARDEN APR reports that the JS41 crew reported visual when 12nm SW of the airport at 4000ft and approval was given to their request for a visual join straight-in for RW05. MACC TMA SW had handed the ac over late because they wished to ensure that separation was maintained against a C310 survey ac at 5000ft. He cleared the flight for descent during the visual approach and continued to give TI on the C310 as it was turning towards the JS41. When the JS41 was approximately 6nm on final he called the C310 at 12 o'clock range 1nm at 5000ft, the pilot responded that it was very close; he repeated that the survey flight was indicating 5000ft. About 1min later, he became aware of a very slow moving intermittent primary only radar contact 1.5nm S of the RW05 C/L heading 170°. This ac continued to show for approximately 2-3nm before fading. He telephoned Shawbury and requested information on this ac and if its pilot called on their frequency. The Shawbury Supervisor called to report that flight had not called them but it was seen to fly into a private strip at Knockin. The Capt of the JS41 telephoned and confirmed that the ac seen by him was a high wing single engine ac registration marks "XXXXX" which was also confirmed by the Knockin owner as being a microlight that used the private strip.

UKAB Note (1): The Hawarden weather passed on the RT at 1257 gives surface wind 140/09kt, CAVOK 22/10 and QNH 1034mb QFE 1032mb.

ATSI comments that the JS41 crew established communication with the Hawarden APR at 1257, requesting the weather and passed an estimate for the airfield of 1310. Following coordination, at 1305:20, the crew called the APR again and reported heading 345° and levelling 4000ft. In the area was an ac carrying out a photo survey, AC3, at FL50/5000ft and the Hawarden APR had been informed of this ac's presence.

The crew of the JS41 was then cleared for a straight in visual approach to RW05 and TI was passed on the survey flight (1305:40) reported as being 3nm N of the JS41 maintaining FL50 (sic). At 1306:40, the APR updated the TI stating that it was now 12 o'clock range 1 mile crossing from L to R at 5000ft and the crew of the JS41 reported visual. A short time later, the pilot commented that the traffic was close and was at 4000ft maximum, and not 5000ft as passed. The APR responded with "*Negative, he's indicating Five thousand One hundred feet and you're indicating Three and a half er you're indicating Two Six now*". It subsequently transpired that the other ac involved in this Airprox was not the survey flight AC3 but another, completely unknown to the APR.

Analysis of the St Annes radar shows that at the time the JS41 crew contacted the APR there was an intermittent primary return observed approximately 7nm N of the ac, and in close proximity to the survey flight. This primary return fades and is not visible at the time the APR passed TI to the JS41 about the survey flight. However, the unit report states that the primary radar cover from both the Warton and Hawarden radars in that area is poor and the ability to see traffic S of Hawarden is restricted.

Subsequently the APR contacted the Liverpool APR, in an attempt to identify the subject ac. It was not known to the Liverpool APR, however, it was tracked on radar and was observed landing at Knockin near Oswestry.

UKAB Note (2): Analysis of the St. Annes radar recording at 1305:22 shows the JS41 11nm SW of Hawarden tracking 345° descending through FL37 (4330ft QNH 1034mb) with the survey ac AC3 7.5nm to its NNW turning R through heading 110° level at FL52 (5830ft QNH). Simultaneously, a primary only return, possibly the Jabiru, is seen 7nm N of the JS41 tracking SSE but suffers from fading and track jitter during the period of just under a minute before fading from radar at 1306:18 6nm SW of Hawarden. Meanwhile, the JS41 has levelled at FL34 (4030ft QNH) at 1305:38 whilst AC3 has rolled out on a SE'y track 5.5nm to its N. Forty seconds later the JS41 has turned R and established on a NE'y track towards Hawarden, indicating FL33 (3930ft QNH) with the survey ac now turning L through an E'y heading 2.5nm to its NE and 1900ft above at FL52 as the Jabiru's primary return fades in the JS41's 1130 position range 3nm. Thereafter the JS41 commences a descent, passing through FL21 (2730ft QNH) at 1307:10 as the Jabiru's primary only return reappears, 0.3nm to its S. The Airprox is believed to occur immediately prior to this, when the Jabiru is not showing on 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, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

Members noted that the Jabiru pilot's intended route to the W of Hawarden southbound would cross the RW05 FAT but that pilots would need to assimilate this from the topographical chart, there being no 'feather' symbol

aligned on that RW to alert pilots to that possibility. (A 'feather' symbol shows aerodromes having one or more IAPs outside CAS but is aligned to the main instrument RW). Pilots who intend to fly to or route adjacent to aerodromes with IAPs are strongly recommended, when flying within 10nm of the aerodrome, to contact the ATSU. It was unfortunate that the Jabiru pilot had been unable to establish two-way communications with the Hawarden APR who was unaware of the Jabiru's presence, as it was not showing on his radar display. Members commented that proposed future requirements for VFR flights to carry Mode S transponders from 2008 would have made the Jabiru more conspicuous, both to ATC and to the crew of the TCAS equipped JS41, thereby allowing earlier acquisition and avoidance measures to be taken by both parties. Although the JS41 was flying under IFR, the responsibility for collision avoidance during this encounter in Class G airspace lay squarely in both cockpits, under 'see and avoid'. The JS41 crew had been better placed for early visual acquisition, flying down-sun, but Members agreed that both crews had seen each other late and this had caused the Airprox.

Fortunately, the JS41 crew had been given TI on the survey ac, AC3, which led them to see the Jabiru approaching from their 1030-11 o'clock position at a range of 400m 100-200ft above. Quickly assessing that the other ac would pass above, no avoiding action was taken as they were already descending. The Jabiru pilot had assimilated from the RT that the Jetstream was inbound and had seen it slightly earlier, in his 2 o'clock range 1000m crossing R to L, at the same level. He had initiated an avoiding action climb, the JS41 passing 200m ahead and he estimated 150m below. It was clear that the visual sightings by both crews, albeit late, and the subsequent actions taken, particularly by the Jabiru pilot, had been enough to ensure that the subject ac were not going to collide, but the flight paths flown and proximity of passage were enough to persuade the Board that safety had not been assured during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sightings by both crews, the conflict being resolved by the Jabiru pilot.

Degree of Risk: B.

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AIRPROX REPORT NO 163/04

Date/Time: 8 Sep 1312

Position: 5120N 00548W (28nm W of MERLY)

Airspace: UAR/MRSA (Class: B)
Reporting Ac Reported Ac

Type: C130J Hawk

Operator: HQ STC CinC Fleet

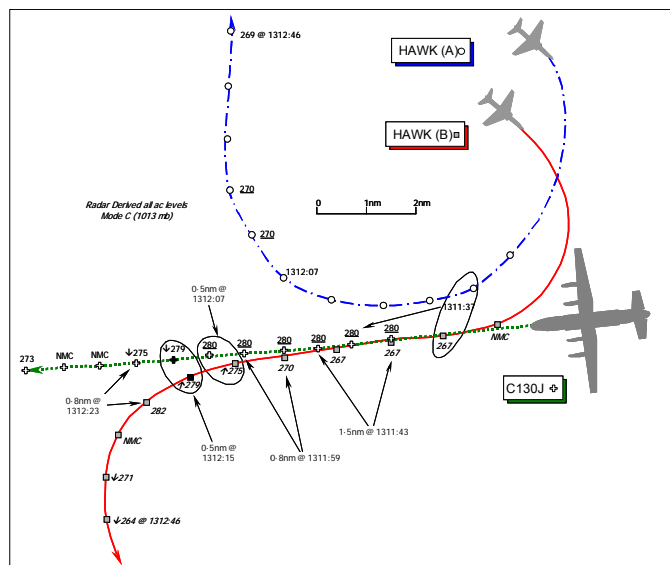
Alt/FL: FL280 FL270

Weather VMC CLOC VMC CAVOK

Visibility: >10nm >10nm

Reported Separation:
Nil V 2nm/1000ft

Recorded Separation:
Nil V/O-5nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE C130J PILOT reports his ac has a grey camouflage scheme but the HISLs were on whilst flying IFR in level cruise in VMC, outbound from Lyneham to Gander. He was in receipt of a RCS from LONDON CONTROL at LACC on 132.95MHz, the applicable squawk was selected with Mode C and TCAS is fitted.

Just off the S Wales coast at FL280, heading 265°(T) at 315kt, TCAS enunciated a TA that was rapidly followed by a "CROSSING DESCENT" RA command. He responded to the RA but neither he nor his co-pilot was able to determine exactly where the traffic was in relation to his ac due to the displayed radar scale. A "MAINTAIN ALTITUDE" command was enunciated as they passed FL273 in descent and once the displayed scale was reduced the other traffic was determined to be in their 6 o'clock. Visual contact was subsequently gained on what appeared to be a Hawk, now in their 7 o'clock position about 500ft above at a range of 2nm heading away from his ac. ATC was notified and reported that the other ac was not under their control but should have been maintaining a minimum of 1000ft vertical separation below his C130.

THE PILOT OF HAWK (B) reports his ac has a black colour-scheme and the HISL was on whilst operating under the direction of the Royal Naval School of Fighter Control (RNSFC - the 'D' School) conducting precision intercepts for a fighter controller (FC) training sortie. He was flying - Hawk (B) - as the No2 of a pair of Hawk ac, in CAVOK conditions with a visibility of 10km+ out of the sun. A squawk of A1772 was selected with Mode C; TCAS is not fitted.

Flying at 440kt in a level cruise at FL270, in company with the No1 - Hawk (A) - out on his starboard quarter, he was vectored to intercept the C130 as a "target of opportunity" under "D School Control". Heading 250°, the C130 was visually identified at a range of 10nm and the intercept continued to a position 2nm astern and 1000ft vertically below the C130. Clearance to 'engage' was given by the 'D' School FC and he raised his Hawk's nose to "boresight" the C130 mock 'target'; a 'Fox 2' [missile engagement from astern] was reported to the FC and he immediately rolled L to separate from the 'target'. He reported the minimum separation as 2nm horizontally and 1000ft vertically, assessing the risk as "nil".

THE LACC SECTOR 6/9 TACTICAL CONTROLLER (S6/9TAC) an OJTI, reports that the C130 was westbound on UB40 when the 'D' School telephoned to coordinate 2 Hawks at FL270 or below against the C130 at FL280. Hawk (B), squawking A1772, was seen to fly in behind the C130 and once directly underneath the C130 the STCA triggered. The Track Data Block (TDB) [SSR labels] were ungarbled and Hawk (B) was then seen to climb rapidly above FL270. The C130 crew immediately called in and stated that they had a TCAS RA and were descending to FL270. He gave traffic information and informed the C130 crew about the coordination agreed. The C130 pilot

then reported he was visual with the Hawk that had gone straight through his level. As Hawk (B) turned away, the C130 pilot reported that he was returning to his assigned level of FL280.

UKAB Note (1): Following a change to established investigative practise, it has been decided conjointly by the RN and the RAF that the detailed analysis of fighter control aspects of Airprox will henceforth be conducted by HQ 3 Gp Safety Management & Investigation (SM&I). Therefore, Mil ATC Ops provided the following analysis of the RNSFC aspects of this Airprox.

MIL ATC OPS reports that the Yeovilton RNSFC RT recording timings were found to be 1min 30sec slow. Consequently, timings within this report have been adjusted to UTC.

The Hawk pair was carrying out an annual standards check sortie under the control of the RNSFC in an area to the NW of Hartland Point, conducting precision intercepts (PIs) over the sea and broadly within 25nm of MERLY. The briefed operating level block was FL150-350, which was passed to the Hawk pilots on handover together with the specific sortie details. As required by RNSFC SOPs and as a courtesy, both LACC Swanwick and LATCC (Mil) were informed that these Hawk ac would be penetrating the UAS/MRSA together with the expected duration and approximate geographical location of the sortie. At 1230, the Hawk formation was identified and placed under a RIS below FL245 and a RCS above FL245. At 1235:00, the FC passed traffic information to LACC Sector 6/9 (LACC) about the Hawk pair "in the upper air for the next hour in the MERLY area...1762, 1772 up to FL350." LACC reported "contact" and the FC advised they would "call for co-ordination". Similar traffic information was also passed to LATCC (Mil). At 1254, the FC called LATCC (Mil) Console 32 to request traffic information on "your traffic 3322 just south of Cardiff heading west." - the subject C130J. Console 32 Assistant informed the FC that it was a "C130 joining CAS at MERLY, in the climb to FL280, radar information" whereupon the FC requested to speak to "controller 32 (CON 32) for co-ordination." CON 32 reported the C130 as "not below FL220, not above FL280...he's climbing FL280." The FC asked if the C130 was "going to make 280 by MERLY" to which CON 32 replied "yep, affirm", so the FC declared "can I take 1000ft beneath his Mode C with my traffic which is west of MERLY by 10 and north west of MERLY by 20...". CON 32 confirmed the squawks, restated that FC would be taking 1000ft beneath the C130 and agreed to this co-ordination. At 1257:25, CON 32 rang the FC to inform him that the C130 had been transferred to LACC, would be changing squawk to A3251 in accordance with its GAT clearance and that the co-ordination agreement still applied.

Nearly 10min later FC rang LACC to ask "if you're happy I'm going to take my traffic in to ID him [the C130J] remaining not above FL270." LACC responded "yep, that'll be fine." At 1309:40, the FC's instructor informed the Hawks that he had "a military non-player for you to go and intercept" and instructed them to "fly as a pair not above FL270". A conversation then ensued between the FC and the Hawk pilots to ascertain which pilot had the lead in the formation for this PI. It transpired that Hawk (B) was the lead and the pilot of Hawk (A) was instructed to squawk standby. The Hawk pair was turned left onto a heading of 120° and instructed to "climb FL270" which was acknowledged by the pilot of Hawk (B) as the leader. Just after 1310:00, the FC reinforced "not above 270 against bogey BRAA (bearing, range, altitude, aspect) 130 range 10, heads west, 28000 mission ID", whereupon the pilot of Hawk (B) immediately reported "tally one". A succession of Target information including accurate range calls was passed by the FC over the next minute, which culminated with a report from the pilot of Hawk (B) at 1311:40, "kill 1 Albert this position". A conversation then commenced at 1311:58, between the FC and the Hawks regarding the model of C130 and why it was at FL280; this conversation terminated at 1312:10. LACC called the FC at 1312:45, to confirm if they are "...controlling the 1772" and "what level did you go up to then?" The FC responded with "270" to which LACC replied "right, no, he [the C130 pilot] said he's [Hawk (B)] gone straight through his level." The FC then retorted that the C130 was indicating FL275 to which LACC answered, "No he took avoiding action, his TCAS went off and your aircraft went through his level". Acknowledging this comment the FC stated, "Right OK. He took avoiding action, I didn't see that on my Mode C..he was briefed not above FL270 for co-ordination against that traffic." LACC reaffirmed the situation and also that a report would be filed.

[UKAB Note (2): The Burrington Radar recording shows the C130J tracking 260° some 11nm WSW of MERLY squawking A3251 and maintaining a level cruise at FL280. The Hawk pair is displayed in the C130's R 2o'clock at 19nm manoeuvring; Hawk (A) squawking A1762 at FL270, with Hawk (B) squawking A1772 at FL262. At 1309:36 the 2 Hawks turn onto a southerly heading with Hawk (B), indicating FL260, taking over the lead of the formation from Hawk (A) which is 1nm in trail indicating FL272. The C130 at this stage is in the Hawks' L 10 o'clock, 13½nm, indicating FL280. The Hawk formation continues on a southerly course. At a range of 3½nm Hawk (B) turns R and at 1311:37, steadies on a track of 260° indicating FL267 some 1.8nm astern of the C130 with Hawk (A) in Hawk (B)'s R 4 o'clock at 1nm. As the range between Hawk (B) and the target C130 reduces,

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Hawk (A) continues to turn R and opens to the NE of the C130 with Hawk (B) on a gently overtaking but divergent course. At 1312:07, Hawk (B) commences a climb indicating FL275 and then FL279 on the succeeding sweep at 1312:15, whereupon the CPA is achieved in the C130's 8 o'clock as the latter's Mode C is shown descending through the same level. Hawk (B) maintains a constant range of 0.5nm from the C130 during this period some 28nm W of MERLY. Whilst hauling off to port of the C130, Hawk (B) climbs to a maximum of FL282 as the C130 descends through FL 275 and the horizontal separation opens to 0.8nm. NMC is displayed by the C130 for two sweeps before the ac 'bottoms out' at FL273; Hawk (B) meanwhile maintained a left turn southerly, descending below the C130 once more. Thereafter the C130 climbs to regain FL280, after a maximum indicated excursion of 700ft below the flight's assigned level.]

There should have been no danger of a conflict in this incident as proper co-ordination had been agreed between the appropriate control agencies and which was acknowledged by the Hawk pilots. It would appear that during the final stages of the manoeuvre and the breakaway, the pilot of Hawk (B) has broken his assigned and co-ordinated level. The radar recording clearly shows Hawk (B)'s Mode C climbing through his allocated level although this information may have been garbled on the FC's display. Unless conducting air combat manoeuvring, it is SOP for all intercepts by RN operated Hawks during "D School" sorties to be conducted with a minimum 1000ft height separation at all times and aircraft must be in their pre-briefed height bands by a minimum range of 10nm.

HAWK (B) PILOT'S STATION comments that it is considered that the rules for intercepts/IDs are accepted and are well publicised. In this instance it would appear that the pilot allowed his ac to climb through the C130's level whilst breaking off the mission. That the C130 pilot did not appear to be aware of his embellishment, and his subsequent avoiding action, was a matter of some surprise. This incident highlights the need to ensure that all communication is clear and unequivocal, that all involved in aviation are fully aware of their responsibilities and of their role in ensuring safe operations.

ATSI reports that the C130 was westbound on UAR UB40 maintaining FL280 under the control of LACC S6/9TAC. The S6/9 PLANNER received a telephone call from the 'D' School FC requesting co-ordination against the C130. It was agreed that two Hawks, under the control of Yeovilton, would approach the C130 to identify it, but operate not above FL270. Only the lead Hawk was squawking and, at the time of the call, was 31nm NW of the C130, southbound at FL260. The Hawks continued to converge on the C130 and then turned in to position behind it. The Mode C readout from the jets was intermittent but STCA activated at 1311:28, as the TDBs garbled. The Mode C readouts then re-appeared at FL272 for Hawk (B) and FL280 for the C130. The crew of the C130 then reacted to a TCAS RA and descended.

During the encounter, S6/9TAC informed the C130 crew that the Hawks were co-ordinated 1000ft beneath and asked the pilot if he was visual with the traffic. Although there is no specific requirement to do so, with the benefit of hindsight, it would have been prudent for the S6/9TAC to have alerted the C130 crew to the intentions of the Hawks before they got into close proximity. It is debateable whether such manoeuvres should be approved within CAS without the prior consent of the 'target' aircraft. The controller later reported that passing accurate traffic information or effective avoiding action was difficult due to the unpredictable manoeuvres carried out by the Hawk.

HQ STC comments that all RAF Targets of Opportunity (TOO) are required to observe Training Instruction 4-84 (TI4-84). The C130J was not a valid target for TOO in that it is not a military fast jet and that TI4-84 expressly forbids intercepts of military transport aircraft "unless pre-briefed, or as [an] EMBELLISH target". [UKAB Note (3): EMBELLISH is an unclassified codeword added to item 18 of a FPL that indicates that the flight is prepared to be intercepted by AD ac for training purposes as a target of opportunity.] Both the FC and the Hawk pilots should have been aware of this as TI4-84 is distributed to RNAS Yeovilton and FRADU.

CinC FLEET comments that the non-adherence to the strict requirements of TI 4-84 is the key to this incident. One should either carry out a true interception (in which case formally requesting an embellishment and thereby gaining the consent and awareness (crucial point) of the intended target) or keep clear, without further manoeuvring, maintaining agreed separation/co-ordination if applicable. 'Taking aircraft in to ID' an aircraft 'whilst maintaining co-ordination' is neither one thing nor the other not all parties are automatically involved in the plan, nor were the actual intended movements of the Hawks passed. Fleet's view is that the FC's error in this episode was in not establishing a formal embellishment request and then further using R/T phraseology which included terms such as 'intercept' and 'engage' (although Fleet emphasise that none of these give the Hawk pilot permission to break pre-assigned sanctuaries or agreed co-ordination whatever the circumstances which radar recordings clearly show that he did without any instruction/approval from the FC).

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 and air defence controllers involved and reports from the appropriate ATC and ac operating authorities.

A civilian controller Member commented that in the current security climate it is not uncommon for GAT to be intercepted operationally by AD ac. Controllers are pre-briefed and the intercept is conducted under strict conditions with appropriate co-ordination agreed between the controllers involved. Here, in this non-operational training environment, although the LACC S6/9TAC had agreed co-ordination when the FC asked "if you're happy I'm going to take my traffic in to ID him [the C130J] remaining not above FL270", this clearly required the FC - under the prevailing RCS - to effect vertical separation of 1000ft based on Mode C with his traffic. It had been shown in the Mil ATC Ops report that this co-ordination had been passed onto the pilot of Hawk (B) as the formation leader for this particular PI. On two occasions he had been instructed not to fly above FL270 including the transmission some 2min before the Airprox, which occurred at 1310:00, when the FC reinforced to the formation leader - Hawk (B) - "not above 270..." against the C130J at a range of 10nm. This also included the other ac's level and which the pilot of Hawk (B) acknowledged immediately, reporting visual contact with "tally one".

The Board noted that the Mil ATC Ops analysis had also showed that RNSFC/FRADU SOPS required intercepting ac to be at the allocated levels/pre-briefed sanctuaries at a minimum of 10nm from the 'target' and the radar recording had clearly evinced that whilst Hawk (B) had complied with this initially, the pilot had climbed his ac above his assigned level in the latter stage of the encounter when inside a range of 1nm and thereby in contravention of this established procedure. Whereas the LACC controller had agreed to the co-ordination proposed by the FC, both controllers were clearly unaware that standard separation would subsequently be eroded by the Hawk pilot, indeed at these ranges in such close proximity this Airprox was a good example of how difficult "level busts" are to spot unless attention is called to it by such devices as STCA that was only available to the LACC controller. Here, the Board noted the FC was unaware of what had actually happened until the S6/9 TAC told him. It was clear that a fundamental factor within this Airprox was that the pilot of Hawk (B) had climbed above his co-ordinated and cleared level thereby breaching standard separation minima and inducing a TCAS RA in the reporting pilot's C130J. Although the pilot of Hawk (B) had reported that a minimum separation of 2nm horizontally and 1000ft vertically was maintained against the C130, he was mistaken. The radar recording clearly showed Hawk (B)'s Mode C indicating a maximum of 1200ft above his assigned and acknowledged level, with Mode C vertical separation reducing to zero as the C130 descended through FL279 whilst responding to the TCAS RA a mere 0.5nm ahead of Hawk (B) indicating the same level. It was evident that during the final stages of the manoeuvre and the breakaway, the pilot of Hawk (B) had indeed climbed above his cleared level toward the C130, thereby inducing the TCAS RA and in the Board's view, this was the cause of this Airprox.

Whilst the Board agreed with the ATSI report that it would have been helpful if the C130 crew had been appraised of what had been agreed between the two controllers, some Members were concerned as to whether the FC should have initiated the intercept on the C130J at all and considerable debate ensued on this topic. The NATS advisor was very concerned that such training evolutions could be conducted within CAS against GAT flights: in his view such practices should not be permitted. That they are not was confirmed in the HQ STC comment (above) and by the HQ STC Member who stated unequivocally that the FRADU pilots are subject to the restrictions of TI4-84. The C130J is patently not a fast jet and thus it was not a valid 'target of opportunity' and the HQ STC Member stressed that the intercepts of military transport ac (unless pre-briefed, or as an EMBELLISH target, neither of which was the case here) are expressly forbidden. Clearly TI4-84 had been written with the intention of preventing such incidents as had occurred here and the Board did not agree with the CinC Fleet view that such evolutions against military transport ac when flying as GAT were permitted under the established rules. The Hawk pilot's Station had contended that the rules for intercepts/IDs are "accepted and are well publicised", so both the Hawk pilot and the FC should have been well aware of this. That did not appear to be the case here and it seemed to the Board that the FC and the Hawk pilot had breached these rules and were not fully aware of their responsibilities under TI4-84. A military controller Member was of the opinion that as co-ordination had been effected it was still acceptable for intercepts to be conducted against military ac when standard separation was maintained. However, this was a solitary view. Other Members agreed by an overwhelming majority that a significant contributory factor to this Airprox was that the RNSFC FC had vectored the Hawk Pair onto an ac that was not a valid target of opportunity. The CinC Fleet Member did not demur from this view and explained that the RNSFC had already accepted this point.

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Turning to risk it was evident to the Members that the pilot of Hawk (B) had the C130 in sight at range and throughout the evolution. Whereas the Board understood that the C130J pilots were completely unprepared for this event and would have been extremely concerned throughout the RA crossing descent manoeuvre, there was nothing they could have done to prevent it and TCAS had clearly worked 'as advertised'. Pilots of high performance military ac should be in no doubt that a rapid climb, even at significant levels below a TCAS II equipped ac, can induce an RA if the machine detects that the established parameters could potentially be breached by an 'intruder'. This is what occurred here when the Hawk pilot raised his ac's nose and climbed. Even if the other pilot has every intention of stopping his manoeuvre well below the ac's level, TCAS II does not know that. Furthermore, where the other ac is not equipped with TCAS II - as the Hawk here - it will induce a more robust response, although uncoordinated, still aiming to achieve in the order of 600ft of vertical separation against the intruder. Nevertheless, whilst the Hawk pilot might have been caught momentarily unawares by the sudden descent of the C130, he was clearly always in a position to afford greater separation in his nimble jet if need be. Therefore the Members agreed unanimously that there was no risk of a collision during this encounter, despite the minimal separation. But a salutary lesson for fast jet pilots, worth repeating here, was that in a TCAS environment give GAT as wide a berth as feasible and never point the ac's nose at the other ac on a rapidly closing vector.

The HQ STC fast jet aircrew Member added that TI4-84 has recently been extensively revised and the draft revisions are currently being circulated for final comment prior to promulgation. The Board welcomed this and the Chairman asked that the Board be kept apprised of this work. Operational intercepts aside, a civilian controller Member was also concerned whether there was any advice readily available to civilian supervisors/controllers on this topic. The Chairman elected to research outwith the meeting and the Board agreed that, if warranted, a Safety Recommendation would be formulated to the relevant body.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The pilot of Hawk (B) climbed above his cleared level toward the C130, thereby inducing the TCAS RA.

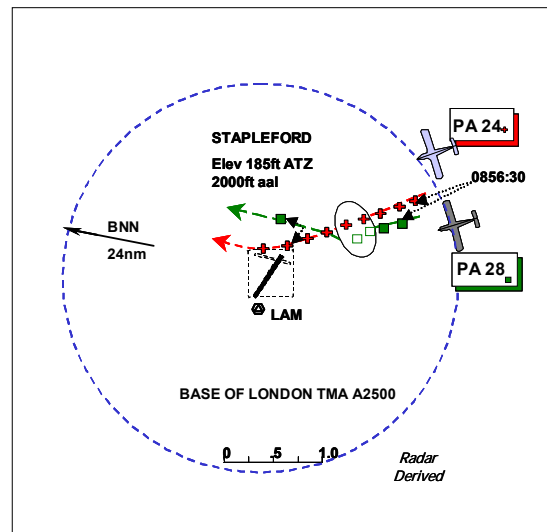
Degree of Risk: C.

Contributory Factors: The RNSFC FC vectored the Hawk Pair onto an ac that was not a valid target of opportunity.

[Post meeting note: In the course of the Chairman's researches, he was advised by Head of Air Traffic Standards Department (Hd ATSD), Safety Regulation Group, CAA, that a review of the policies and procedures associated with intercepts of aircraft operating as GAT and/or under the control of a civil ATSU is underway. It was therefore judged that a Safety Recommendation is not warranted. Hd ATSD undertook to advise Director UKAB on the outcome of the review. Action will be recorded.]

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Date/Time: 5 Sep 0856 (Sunday)
Position: 5140N 00005E(3nm W Stapleford)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: PA28 PA24
Operator: Civ Pte Civ Pte
Alt/FL: 2200ft 2400ft
(QNH 1028mb) (QNH 1028mb)
Weather VMC CLOC VMC CAVOK
Visibility: 15km >10km
Reported Separation:
0 V/12m H 0 V/NR H
Recorded Separation:
NR

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

THE PA28 PILOT reports flying a local pleasure flight from Denham with one front seat passenger in a white ac with blue stripes with anti-collision and landing lights selected on. He was flying straight and level at 2200ft, heading 280° outbound from LAM at 95kt, just to the W of Stapleford [see UKAB Note 2] and listening out on their Air/Ground frequency. He had seen many other ac in the well known busy airspace, when his previously briefed passenger alerted him to an ac on their right wing. He first saw the other ac at a distance of 50m at the same level and immediately initiated a level left turn to avoid it, since he thought the ac were on a collision course. The other ac did not appear to change its heading or altitude, as if the pilot had not seen them. He did not report the incident over the radio at the time due to his shock and reassuring his passenger; he did however call Stapleford on his return to Denham, but they had had no report from the other pilot. He assessed the risk as being very high.

THE PA24 PILOT reports flying a white green and gold ac on a VFR flight from Earlscolne to Plymouth with his strobe light selected on, in receipt of a FIS [he thought] from Stapleford and squawking 7000 with mode C selected off. While heading 233° at 140kt and at 2400ft inbound to LAM VOR, during his scan, having been advised by Stapleford A/G of another ac routeing to LAM he saw an ac in his 9 o'clock position some distance away, (too far away to be a threat to him). He transmitted to Stapleford "approaching LAM VOR, traffic in my 9 o'clock" and continued his scan for other traffic. On returning his scan to his left he saw the other ac turning towards him and it passed behind at a similar level. He did not alter his course as he was faster and was on the other ac's right (rule of the air - on right, is right) and in any case he had no other option, as the base of CAS was at 2500ft and there was a busy circuit below.

UKAB Note (1): AIS Mil ascertained from the PA28 pilot that his route had been CLN-LAM-BNN-Denham. Also he recalled part of the other ac's registration.

UKAB Note (2): The recording of the Stansted radar shows 8 low level contacts within a 3nm radius of Stapleford making it very difficult to determine accurately the circumstances of the incident. The recording shows the 2 ac thought to have been involved, close to one another for a period of about 2min from about 3nm NE of Stapleford to 3nm NW, (the position of the incident reported by the PA28 pilot) with both ac heading in a W'ly direction. There are 2 points when the geometry of the relative positions of the intermittent contacts could fit that reported by both pilots, one NE of Stapleford and the second 2min later and to the NW. Although not certain, it is thought that the reported incident occurs at the first CPA, just to the NE of Stapleford at 0856:37. In this occurrence, when the primary contact (thought to be the PA28) had temporarily disappeared from radar for a period of about 15sec, the ac tracks parallel to then behind the PA24, squawking 7000NMC, and also departs on a NW heading. This ac was traced back from Denham, where it was known to have landed at 0920. The recording however, clearly shows the PA24 tracking inbound LAM and turning just short of the beacon, passing over Stapleford Airfield to depart on a

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WNW track. The contact thought to be the PA28 tracks just to the N of the airfield and gradually drops behind the PA24 after their tracks cross.

On the last sweep when both ac show, just before the CPA is thought to occur, the ac are 2nm NE of Stapleford and about 150m apart, almost abeam but slowly increasing, with the PA24 is in the PA28's 0230 position and overtaking slowly.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board noted that this incident occurred in a very congested section of airspace, both laterally and vertically, and to exacerbate the traffic problem the LAM VOR, which is widely used by lower airspace traffic, lies in the middle of the 'letterbox'. It was not clear to the Board if the pilots of either ac were avoiding overflying the beacon deliberately to avoid other traffic, or if it was happenstance. In this incident however, it may have prevented their colliding.

Members noted the PA24 pilot's comment regarding the Rules of the Air (Rule 17 (2)) but thought that in this case Rule 17 (4) for overtaking ac was more pertinent. Taking this into consideration, the PA24 should have given way to the PA28. This is doubly important if overtaking on the right (as required by the Rule) since in most cases the pilot of the other ac will be seated on the port side and have a restricted view on his right. The Board expressed concern that the PA28 pilot had not switched on his Mode C. This was unfortunately, in the experience of a GA Member, a common but potentially hazardous practice within the GA community and was very poor airmanship. The Board was informed that there were many - often competing - demands on pilots on commercial pleasure flights and sometimes on these occasions lookout tended to suffer. However in this case the PA28 pilot could not reasonably have been expected to see and avoid the PA24 coming from his 5 o'clock position. The PA24 pilot had deemed the separation to be adequate but the PA28 pilot did not. Although the radar recording did not reveal the exact miss-distance, it did show that it was less than 150m. Members thought that it would have been good airmanship to offer the other ac a wider berth.

Nonetheless the PA24 pilot did see and avoid the PA 28, although its pilot did not see the other ac until it had almost passed him. This being the case there was no risk that the ac would have collided.

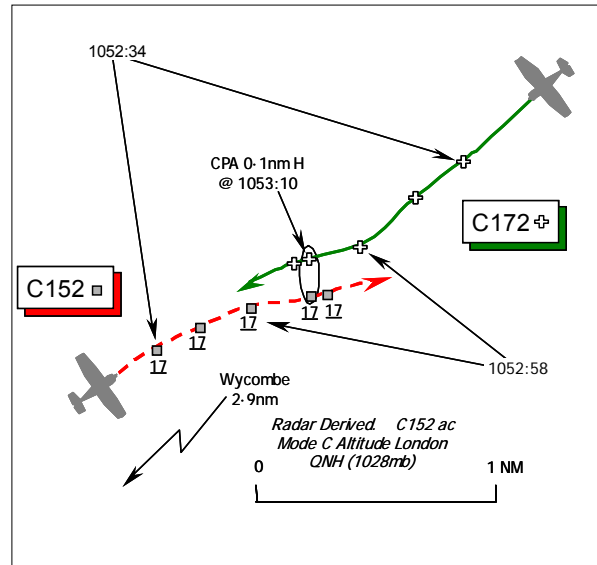
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: In an overtaking situation the PA24 pilot flew into conflict with the PA28.

Degree of Risk: C.

AIRPROX REPORT NO 165/04

Date/Time: 6 Sep 1053
Position: 5138N 00044W (2.9nm NE of Wycombe - elev 249 ft)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: C172 C152
Operator: Civ Trng Civ Trng
Alt/FL: 2100ft 2000ft
 QNH (1027mb) (QNH)
Weather VMC CLOC VMC HAZE
Visibility: 15km <8km
Reported Separation:
 150ft V Not seen
Recorded Separation:
 200yd H

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

THE CESSNA C172 PILOT, a flying instructor, reports he was instructing a student on a navigational exercise from Denham and was listening out with Denham A/G Station on 130.72MHz. The ac has a predominantly white colour-scheme and the HISL, landing and taxi lamps were all on. The conspicuity squawk of A7000 was selected, but Mode C was selected "off".

Whilst flying at an altitude of 2100ft QNH (1027mb) between Prestwood and High Wycombe, heading 205° (M) at 95kt, he spotted another ac about 5000m away directly ahead on a reciprocal course. He asked his student, the PF, what he should do to avoid it, who replied correctly to turn R which he did. The other ac – a blue & white C152 - then turned towards them converging from their port side quickly, so he took control of the ac himself and initiated a steep descent to avoid the other ac, which passed 150ft above with a "medium to high" risk of a collision. He did not believe the other pilot had seen his C172. Initially there was a small risk of collision as they had spotted the other ac fairly early, but this changed rapidly after the C152 had turned towards them.

THE C152 PILOT a flying instructor, reports his ac has a blue & white colour scheme, HISLs are not fitted. He was in receipt of a FIS from Wycombe TOWER, squawking A7000 with Mode C whilst flying in VMC at 90kt some 200ft below cloud; the visibility was 8km in Haze out of sun, but very poor into the sun. It was a very hazy hot summers day with fairly turbulent conditions beneath building cumulus clouds. Both he and the student were flying solely by external visual reference and he was not navigating with reference to radio aids.

The flight was a ½hour trial lesson for his student to whom he had shown the effects of the primary flying controls and trim. His student was working hard to maintain wings level but due to his inexperience he would not have been reacting instantly to wing drops in turbulence and hence would have appeared to have been making small turns to the L and R, though he was maintaining the attitude for level flight at about 2000ft Wycombe QNH and maintaining a straight course by reference to outside features.

He had briefed the student on the 'see & avoid' principle for ac separation in the open FIR, but at the time of the reported Airprox they were flying partly into sun with "very poor" forward visibility. Neither he nor his student recall seeing any other ac in the vicinity of Wycombe. He called Wycombe TOWER at Amersham for traffic information and the rejoin, whereupon they positioned into the Wycombe Cct and landed. Records show that the ac had its engine shut down on the apron at 1110UTC.

Given the poor visibility into the sun, he would have expected the pilot of the C172 to have given his ac a far wider berth than he apparently did when his ac was first spotted. He opined that it is good practice when flying in close proximity to a very busy airfield such as Wycombe, to call Wycombe TOWER in order to receive traffic information

AIRPROX REPORT No 165/04

as he had been told that the Airprox occurred just outside the Wycombe ATZ. Although he did not see the C172 he assessed the risk as “low since both his student and himself were looking out and did not see the other ac. Thus it cannot have been too close”. He added that this appears to be a very minor incident that the C172 pilot should have been able to totally avoid, as apparently he saw his C152 in good time.

UKAB Note (1): The Heathrow Radar Recording shows the C172 at 1052:34, squawking A7000 with no Mode C SW bound, with the C152 on a reciprocal course heading NE in the C172 pilot's 12 o'clock - 1½nm, indicating an altitude of 1700ft London QNH (1028mb). The ac continue to close steadily until at 1052:58, at a range of ½nm, both the C172 & C152 are shown making a slight alteration to starboard. The CPA of 0.1nm (200yd) occurs at 1053:10, as both ac pass port-port at a position 2.9nm NE of Wycombe.

UKAB Note (2): The UK AIP at AD2-EGTB-1-2, notifies the Wycombe ATZ as a radius of 2nm centred on RW06/24, extending from the surface to 2000ft above the aerodrome elevation of 520ft amsl, 0800-1630 in Summer. An aerodrome control service is available from Wycombe TOWER on 126.55MHz.

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 2.9nm NE of Wycombe – less than 1nm away from the Wycombe ATZ boundary. The STC Member, who was also a GA pilot, questioned the wisdom of the C172 pilot working Denham A/G Station when flying so close to Wycombe aerodrome. Accepting that there was only limited Class G airspace available beneath the LTMA, the Board concurred that it would have been more useful to have been in communication with Wycombe TOWER when operating this close to the ATZ and this busy GA aerodrome's arriving and departing traffic. Whilst it might not have been readily apparent to the C172 pilot at the time and there was no compunction on Wycombe TOWER to pass traffic information about traffic outside the ATZ, if the C172 pilot had made an advisory call to Wycombe TOWER announcing that he was passing close - on the same frequency as the C152 pilot – the latter might potentially have realised that the C172 was in close proximity to his ac. It was evident that the C172 pilot had detected the C152 over 2½nm away - well in time at these speeds to turn away and afford appropriate separation. But after he did so he had apparently counted on the C152 pilot also sighting his ac and turning to remain clear as well, which evidently had not been the case. Although the reporting C172 pilot had thought the C152 pilot had turned towards his ac, the radar recording did not reflect this. The C172 pilot's own avoidance R turn of 10-15° was shown, but whilst recognising the very limited airspace available beneath the TMA in which to manoeuvre, in the Board's view this turn was patently inadequate to ensure separation if the other pilot had not seen your ac. There was a good lesson here for others, worth repeating, that in the see and avoid environment of the 'Open FIR' never assume that the other pilot has seen your ac. Despite being only 200yd away at the CPA and down sun, the C152 instructor had not seen the C172 at all. Furthermore, in the Board's view the C172 could and should have given the C152 a wider berth - evinced by the need to take even more robust action when the other ac had flown into close quarters. Nevertheless, the C172 pilot's avoiding action had evidently resolved this conflict.

Turning to the inherent risk, the radar recording showed both ac passing abeam one another some 200yd apart and the C152 did not evidently fly directly above the C172. The latter pilot's avoiding action had removed the actual risk of a collision but he should not have been placed in this position in the first instance. The C152 pilot had reported that although he did not see the C172 he assessed the risk as “low since both his student and himself were looking out and did not see the other ac. Thus it cannot have been too close”. The Board was advised by an experienced GA pilot that this was a very complacent attitude and it was also patently wrong. For another ac to pass 200yd away without being seen at all when it was clearly there to be seen and thereby implicitly relying on other pilots to see and avoid your ac was most unsatisfactory. It was indeed fortunate that the C152 had been seen and avoided albeit by an uncomfortable margin. Thus the Board concluded that the C172 pilot's avoiding action whilst not wholly adequate had indeed removed any risk of a collision in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

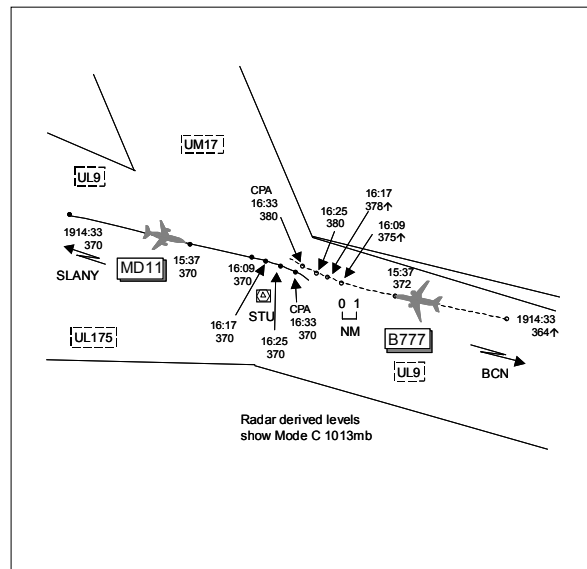
Cause: Conflict in the FIR resolved by the C172 pilot

Degree of Risk: C.

AIRPROX REPORT NO 166/04

Date/Time: TWILIGHT 2 Sep 1917
Position: 5202N 00459W
 (3nm NE STU)
Airspace: AWY UL9 (Class: B)
Reporting Ac *Reported Ac*
Type: B777 MD11
Operator: CAT CAT
Alt/FL: FL372↑ FL370

Weather VMC NR VMC NR
Visibility: NR
Reported Separation:
 200ft V 200m H NR V 1nm H
Recorded Separation:
 1000ft V 0.55nm H

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

THE B777 PILOT reports en route to the USA and in receipt of an ATS from London on 129.37Mhz. Climbing through FL372, the ac tried to regain speed so reduced ROC to 300fpm. A conflicting ac was seen on the TCAS display flying in the opposite direction at FL370 about 12-15nm ahead. On receipt of a TA alert, the crew tried to increase the ROC by reducing speed which was followed by ATC giving them an immediate R turn onto 340°. Soon thereafter, when separation had reduced to about 6nm and -600ft, an RA warning was received; the A/P was disconnected and the RA guidance was followed. He ass

THE MD11 PILOT reports that after passing STU at FL370 an opposite direction ac appeared on TCAS in their 12 o'clock at the same level. London ATC issued a 30° R turn to avoid conflict and the traffic was acquired visually with separation being maintained via the new assigned heading without climbing or descending. The other ac was seen to pass to their L within 1nm. This ac had caused both TA and RA alerts but was avoided by visual separation as well, TCAS being crucial in allowing him to 'see and avoid' the traffic. He did not assess the risk.

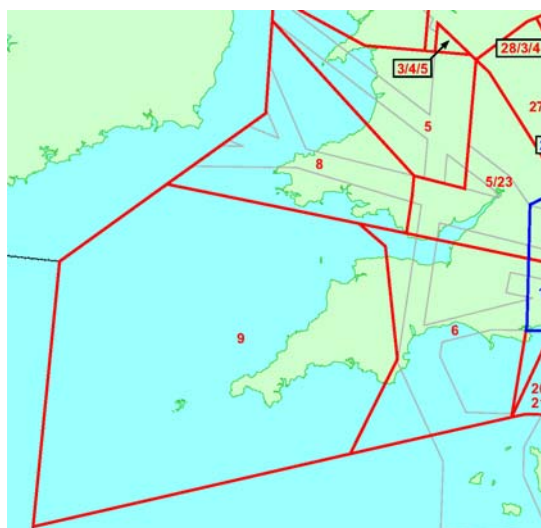
THE OFF-GOING SECTOR 6,8 & 9 TACTICAL (S6/8/9T) CONTROLLER reports having been busy for 1hr 20min before handing-over the position. He had pointed to all the traffic on the sector during the handover and advised the oncoming controller of cleared levels and routeings. The B777 had been climbed to FL380 on a radar heading to avoid other traffic and subsequently the MD11 crew called him when W of SLANY and was routed direct to DVR. He did not appreciate that these flights were in conflict as he expected the B777 to climb comfortably above the MD11. He returned to the sector, when called, to see the B777 above the MD11 with STCA having been activated with the S6/8/9T giving an avoiding action turn to another flight to avoid the MD11.

THE ONCOMING S6/8/9T reports taking over the sector at 1914 with the focus at handover mainly on S6&9 with 2 St Mawgan inbounds, not noticing anything unusual about S8. One minute later, he made his 1st transmission to one of the St Mawgan inbounds but he was surprised to see STCA activate at 1916 near to STU. He gave turns to both subject ac but omitted to use the phrase 'avoiding action' as he was in shock and did not get any warning. After passing limited TI to both flights he then had to give a further turn to a third ac to achieve 5nm separation.

ATSI reports that at the time of the Airprox both ac involved were under the control of the Sector 6, 8 & 9 Tactical (B) at LACC. The controller reported that he had been in position for only 2min before the Airprox occurred and described his workload and traffic loading as both being 'Medium'. Although this combination is not specified in the unit's MATS Part 2, it is a common combination to obtain a more even spread of traffic than if the split was Sectors 5, 8 & 23 or 6 & 9. Tactical (A) had been operating in the position for some 80min before he handed over responsibility to Tactical (B).

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The diagram below shows the relevant areas of responsibility for the sectors involved.



At 1906:50, the B777 crew established communications with the Tactical (A) and reported heading 280°, passing FL268 for FL300. At that time, the ac was approximately 10nm to the NE of BCN and tracking N of, but parallel to, the C/L of UL9. The normal method employed on these sectors is to vector westbound traffic on L9/UL9 to the N of the airway/Upper ATS route C/L, and eastbound traffic to the S, thus permitting simultaneous climbs and descents. The Tactical (A) coordinated with the S5T and then cleared the B777 crew to climb to FL380. At the time this clearance was issued, there were three eastbound flights, all cruising at FL370. The first two of these had been placed on headings so that they tracked to the S of the C/L. The first of these ac was midway between STU and BCN whilst the second was still W of the Shannon/London UIR boundary. The third ac, the subject MD11, was still W of the boundary overhead Southern Ireland.

The Tactical (A) reported that the upper winds had been a problem earlier in the shift. As westbound ac climbed higher, they were starting to drift to the L, i.e. S, of the required track. He had anticipated this and so, at 1908:15, he instructed the B777 crew to turn R onto 285°. The Tactical (A) advised that he had the relevant fpss for the flights and they had been placed in the appropriate bays in time order. Although he had received a strip on the MD11 some 5min before it reached the UIR boundary, he had not considered it to be a potential confliction with his westbound traffic, unlike the two eastbound ac ahead.

At 1911:00, the MD11 crew established communications with the Tactical (A) and reported routeing direct to STU at FL370. Its position was some 10nm W of the UIR boundary, whilst the B777 was passing FL316 20nm NW of BCN. The Tactical (A) instructed the crew of the MD11 to route direct to DVR VOR. Such a direct routeing was, according to the Tactical (A), quite normal at this time of the day and he recognised that it would take the flight N of the UL9 C/L. Very shortly after this transmission, the controller handed over the operational position to Tactical (B). At the time, there was a complex and unusual traffic situation in the southern part of the area of responsibility, as two ac were inbound to St Mawgan and likely to conflict with traffic outbound from Bristol International Airport. The Tactical (A) recalled that the handover took around 1min and this was confirmed by the Tactical (B). The Tactical (A), still unaware of the developing conflict between the MD11 and the westbound B777, had pointed out each ac individually to his colleague who, apparently, seemed to be concentrating on the St Mawgan traffic during the handover.

When the Tactical (B) made his first transmission on the frequency, the B777 and the MD11 were virtually head on to each other at a range of 33nm with the B777 passing FL364 for FL380. At 1915:40, STCA activated as the B777, still in the 12 o'clock position of the MD11 at a range of 15.6nm, was passing FL372. The Tactical (B) transmitted *"B777 c/s turn right immediately heading three four zero degrees"* to which the crew replied *"Right head three four zero he's on TCAS"*. The Tactical (B) then instructed the MD11 crew to turn R heading 140°, a turn of some 30° from its present track. In neither transmission did he use the words *"avoiding action"*. At 1916:00, the crew of the B777 reported a TCAS RA climb. The Tactical (B) then passed TI to both the B777 and the MD11 crews.

The radar recordings show that shortly after the B777 crew reported the TCAS climb, the two ac were 6.6nm apart, still opposite direction, with the B777 indicating FL375. Separation continued to reduce with the two ac being 4.4nm apart laterally and 800ft vertically, before, at 1916:26, vertical separation was restored with the ac 2.2nm apart. Later, the B777 crew reported clear of the TCAS confliction and was cleared to route direct to MASIT, their Oceanic Entry Point. Having acknowledged this instruction, the B777 crew advised that they would be filing an Airprox.

The Tactical (A) advised that, whilst accepting his technique of relying on ac performance without the use of headings was flawed, he had expected the B777 to continue with its apparent high climb rate and so be level at FL380 well before Strumble. He could not account for the fact that he had not detected the obvious confliction between the westbound B777 and the eastbound MD11.

The Tactical (B) reported that when he took over the position, Tactical (A) left quickly and had walked to the Local Area Supervisor's desk before being summoned back to the sector. He continued by stating that whenever he (Tactical (B)) handed over an operational position, he made a point of waiting around for a few minutes in case there was a need to answer any questions. MATS Part 1, Section 8, Chapter 1, Page 2, para 4 states '*The responsibility for the accuracy of a hand-over lies with the person vacating an operational position*'. '*Controllers taking-over should be alert to the possibility of errors and omissions in the information being provided and must verify the data transferred to them by a thorough check of the radar display, flight progress strips and any other relevant information. Only when they are completely satisfied that they have a total awareness of the situation, should they indicate to the controller handing-over that they are ready to accept responsibility for the operational position. On the occasions when controllers hand over a busy and complex situation, they should remain available adjacent to the position for a short period following the hand over. This will enable the accepting controller to seek immediate clarification of any points which may arise during this time*'. He had not seen the developing confliction between the MD11 and the B777 as he had concentrated on the traffic situation around St Mawgan. He was alerted to the problem by STCA activating and his colleague, the S5T, calling to him. He had not used the words 'avoiding action' as he had found himself in the situation without warning and therefore had had no time for planning. STCA activated but, in his opinion, too late to be of use. He added that the slow reaction to the turn instruction by the MD11 crew did not help the resolution of the problem which, he believed, was addressed by the correct functioning of TCAS. Subsequent investigation by the unit determined that STCA had operated in accordance with its designed parameters.

Subsequent to the Airprox, the report submitted by the crew of the B777 advised that they had seen the MD11 on TCAS and tried to regain speed by reducing their climb rate to approximately 300fpm. Whilst it is unlikely that such a reduction would have significantly affected the final outcome, the UK AIP, ENR 1-1-3-1, para 2.2 (*Minimum Rates of Climb and Descent*) requires crews to inform controllers if they anticipate or are unable to maintain a minimum rate of 500fpm.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Looking at the pilot aspects of the incident first, Members commented that the MD11 crew did not follow their TCAS RA guidance, which would have been a coordinated command to 'descend' in opposition to the B777's RA 'climb'. They had elected to maintain their level and turn R, in accordance with the ATC instruction, whilst they visually acquired and then monitored the B777's progress. These actions undoubtedly placed greater dynamic demands on the B777 flight as its TCAS tried to singularly resolve the confliction. Also, the B777's ROC had reduced to below 500fpm, albeit for a short period of time, before TCAS had given a TA alert and the ROC was increased. Members agreed that had the B777 crew informed the controller that the ROC had reduced, it may have prompted him into recognising the conflict earlier and allowed him to provide appropriate avoiding action earlier.

Moving to the ATC aspects, the off-going S6/8&9T (A) had planned his separation on ac performance, convinced that the B777 would be level at FL380 well before STU. Pilots reminded other Members that climb performance will 'taper off' as an ac climbs higher, particularly when heavy during its initial enroute climb, and this should be taken into account by ATCOs. The S6/8&9T (A) should have continuously monitored the B777's climb but he had assumed, erroneously, that separation would be maintained and he had routed the MD11 direct to DVR and into conflict which was a part-cause of the Airprox. A sector handover then took place: the on-coming S6/8&9T (B) did

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not notice the conflict which Members agreed was a second part-cause of the Airprox. After taking-over the sector, the S6/8&9T (B) was then surprised when, 2min later, STCA activated between the subject ac at which time immediate/positive avoiding action had to be taken to resolve the situation. He had issued R turns to both flights to resolve the 'head-on' aspect but did not use the 'avoiding action' phraseology which is intended to grab the crews' attention and promote a rapid response to ATC's instructions. The MD11 crew had seen the B777 on TCAS and visually monitored its passage as it passed clear to their L and above. The B777 crew had noted the MD11 12-15nm ahead and 200ft below on TCAS and reacted to the TA alert by increasing their ROC by reducing speed. After ATC gave a R turn onto 340°, an RA 'climb' command was received, separation had reduced to 6nm and 600ft, and the A/P was disconnected and the guidance was followed: 1000ft vertical separation was achieved by 2.2nm. These actions had rendered this potentially serious incident benign and, when combined with the other elements, were enough to lead the Board to conclude that safety had been assured during the encounter.

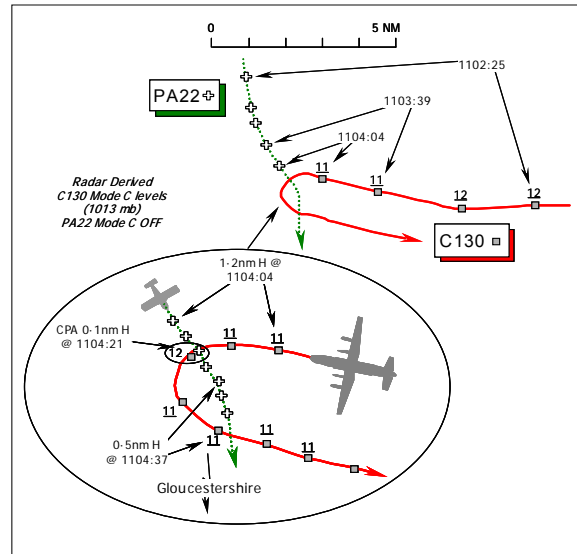
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The S6/8&9T (A) routed the MD11 into conflict with the B777 which the S6/8&9T (B) did not detect.

Degree of Risk: C.

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Date/Time: 15 Sep 1104
Position: 5202N 00210W (7.5nm N of Gloucestershire A/D elev: 95ft)
Airspace: FIR/UKDLFS (Class: G)
Reporting Ac Reported Ac
Type: PA22 C130K
Operator: Civ Pte HQ STC
Alt/FL: 2000ft 1000ft
 (QNH 1016mb) agl
Weather VMC CAVOK VMC CAVOK
Visibility: 25nm+ 10km+
Reported Separation:
 200ft VI < 200ft H 750ft V
Recorded Separation:
 0.1nm H

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

THE PIPER PA22 COLT PILOT reports that his ac has a Beige/blue colour-scheme and he was flying in CAVOK conditions with an in-flight visibility of 25nm+. He was in transit from Wolverhampton to Kemble VFR at 100kt and was just in the process of calling GLOSTER APPROACH for a FIS. A squawk of A7000 was selected but the Mode C was selected “off”. TCAS is not fitted.

Heading S, some 5nm W of Strensham Services on the M5 motorway, in level cruise at 2000ft QNH (1016mb) a grey C130 was spotted at 10 o'clock some 200-300ft away as it crossed from L-R ahead in a 60° banked L turn about 200ft below his ac. The minimum horizontal separation was 200ft, but there was no time to take avoiding action. He assessed the risk as “high”.

THE C130K PILOT reports his ac has a grey/green camouflage scheme but the HISLs were on whilst conducting a low-level instructional sortie under VFR in LFA4 at 230kt. He was not in receipt of an ATS but squawking A7001 with Mode C; neither TCAS nor any other form of CWS is fitted.

A student captain was occupying the left-hand seat (LHS) to whom he had delegated the lookout for this part of the sortie, whereas he, as the captain of the ac, was seated in the right hand seat flying the ac. He was demonstrating manoeuvres to his student that involved turning and tracking E – W in a racetrack at 1000ft agl (with the barometric altimeter set to the RPS); all the turns were to the L. At a position about 8-10nm N of Gloucestershire (Staverton) Aerodrome whilst he was just about to demonstrate various turn profiles to his student, the latter spotted a light ac in their 9:30 position about 1nm away some 750-1000ft above his Hercules. The student captain reported that he had “padlocked” the light ac to him, which he was advised was not a collision risk and which had passed 750ft above his ac. No avoiding action was taken as none was necessary as the light ac progressed S and posed no threat to them. They maintained their vigilance and posed no threat to the other ac. The risk was assessed as “low”.

UKAB Note (1): Meteorological Office archive data gives the Cotswold RPS for the period 1100 - 1200UTC as 1016mb.

UKAB Note (2): The Cleve Hill radar recording shows the C130 as it tracks due W at 1200ft Mode C (1013mb) at 1102:25, with the PA22 shown squawking A7000 southbound approaching the Airprox location with the Mode C reportedly switched off. The C130 turns R onto about 285° and descends to 1100ft Mode C – equating to about 1190ft Cotswold RPS (1016mb) as the ac close, until at 1104:04, at a range of 1.2nm, the C130 executes a L turn about. The C130 is shown on the radar sweep at 1104:21, at the minimum recorded horizontal separation of 0.1nm – about 200yds – in the PA22’s R 2 o’clock after crossing ahead of the PA22 from L to R as reported and

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after climbing 100ft to about 1290ft RPS. The C130 rolls out on a SSE'ly heading and crosses through the PA22's 12 o'clock again, just after 1104:37 where it is shown at a range of 0.5nm from the PA22. The PA22 pilot reports a transit altitude of 2000ft (1016mb) which would suggest in the order of 700ft of vertical separation when the C130's brief climb to about 1290ft (1016mb) is taken into account..

HQ STC comments that it would appear, from the C130 crew's description, that they saw the PA22 after they rolled out on a SE'ly heading and had not seen it at the CPA during the turn. This was when the C130 was 'belly up' to the PA22 and matches the civil pilot's description.

From the military perspective it is disappointing to see that the C130 had not asked Gloucester APPROACH for an ATS whilst operating in an area which is utilised by small ac for recovery to Gloucestershire. This Airprox highlights the need for such a service and also the fact that a thorough check ahead, prior to commencing a 180° turn, is essential.

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.

Although the Board recognised the legitimate right of civilian pilots to fly below 2000ft agl, it was worth pointing out here that military ac will be commonly encountered below this height whilst operating in the UK military low flying system - both by day & night. Whereas military ac can enter the low flying system by descending into it, or exit by climbing out from it, all things being equal, if civilian GA pilots flew above 2000ft agl where practicable and therefore outside the low flying system, it might reduce the potential for encounters with military ac, such as that related here. On another topic, notwithstanding that the PA22 pilot was not in receipt of a radar service and Gloucestershire Airport ATC, though equipped with a primary SRE, is not provisioned with SSR or Mode C data, members were astounded that the PA22 pilot was flying with Mode C selected off. The Board was in no doubt about the benefits that can ensue when controllers can give level information and thereby provide more accurate and comprehensive traffic information based on Mode C data. The GA Member stressed most convincingly that civilian pilots should always select Mode C 'on' with Mode A, in line with the advice contained in the UK AIP. Moreover, switching Mode C 'on' could have provided a more complete warning of the proximity of the PA22 to pilots flying ac equipped with TCAS. Whilst TCAS is not fitted to this particular C130K, Mode C will enhance significantly the 'electronic' conspicuity of ac to TCAS and within defined parameters will also facilitate conflict resolution.

The Members noted that the RHS C130 Captain had stressed within his report that it was the LHS pilot who had spotted the PA22 first in their 9:30 position and had 'padlocked' it out to port. It was explained to the Board that 'padlocked', in this context, meant that the LHS pilot had acquired the ac visually and would continue to keep his eyes on it and monitor it closely. However, it seemed plain to the Board that there was ample opportunity for the C130 pilots to spot the PA22 earlier than they did, but it was also evident that the small size of the ac as it approached on a fairly constant relative bearing toward them from the N had defeated the C130 pilots' lookout scan until a very late stage. Recognising that the PA22 is a very small aeroplane indeed and the ac's colour-scheme was probably not assisting visual acquisition when viewed from below, the radar recording had shown that the PA22 was there to be seen and that either the LHS or RHS pilot should have spotted it a lot sooner than they did. There was an implicit responsibility on pilots to spot other ac when operating under VFR in the 'see & avoid' environment of Class G airspace, regardless of whether in this case the RHS pilot had 'delegated' the lookout to the LHS student or not. To some pilot Members this seemed an odd turn of phrase, as the RHS pilot would probably have a better view to starboard where the other ac was. Whilst appreciating that training sorties generate a high-workload for instructors, nevertheless Members recognised that look-out was of primary importance and it seemed to the Board that the C130 pilots had unwittingly turned about and passed through the PA22's 12 o'clock once at close quarters without realising there was a small ac just above them until it was spotted to port, just as they were about to cross directly ahead of it again. In the Board's opinion, this was the first part of the cause – effectively a non-sighting on the part of the C130 pilots. The PA22 pilot had recounted seeing the C130 only 2-300ft away: this much larger multi-engine turbo-prop must have seemed very threatening at that range but similarly, it was there to be seen and the PA22 pilot had the opportunity to spot it much earlier than he did. Perhaps the C130s camouflage scheme had proved effective here, but it was certainly a late sighting by the PA22 pilot, which the Board determined was the other part of the cause.

Turning to risk it was reported that the PA22 pilot was flying at an altitude of 2000ft (1016mb) – the applicable RPS for the period. Whereas he had reported a vertical separation of about 200ft this did not jibe with the radar recording: this had revealed that although the C130's Mode C indicated the ac gained 100ft in the turn, it was flying no higher than about 1290ft RPS. Notwithstanding the applicable tolerances of Mode C – in the order of 200ft - this suggested that the PA22 pilot's estimation of the minimum vertical separation might have been somewhat less than actually occurred. The recording had also shown the actual horizontal separation was about 200yd. The lack of Mode C from the PA22 prevented accurate determination of the vertical separation that pertained here, but clearly the massive size of the four engine Hercules in a very tight L turn at 60° AoB suddenly appearing ahead when viewed from the cockpit of a light ac such as the PA22 could have a daunting effect. This might lead, potentially, to a significant under estimate of the minimum separation, which in the Board's view had probably been the case here. Assuming that the PA22 pilot was flying accurately at his reported altitude, with minimum vertical separation in the order of 700ft as the C130 turned, the Board concluded that no risk of a collision had existed in the actual circumstances that pertained here.

PART C: ASSESSMENT OF CAUSE AND RISK

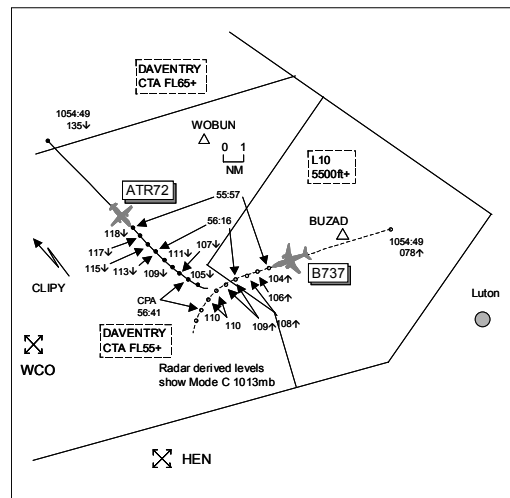
Cause: Effectively a non-sighting by the C130 pilots and a late sighting by the PA22 pilot.

Degree of Risk: C.

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AIRPROX REPORT NO 169/04

Date/Time: 16 Sep 1057
Position: 5154N 00045W (14nm W of Luton)
Airspace: Daventry CTA (Class: A)
Reporting Ac Reported Ac
Type: B737-800 ATR72
Operator: CAT CAT
Alt/FL: ↑ FL120 FL115↓
Weather VMC CLNC VMC CAVOK
Visibility: 100nm 50nm
Reported Separation:
200ft V 800m H Nil V 1.5nm H
Recorded Separation:
500ft V 1.6nm 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 119.77MHz squawking 2237 with Mode C. Having been cleared to FL120 heading 260° at 280kt, ATC requested, forcefully, for them to level at FL110, they were passing FL103 at the time, and to turn L heading 180°. FL110 was selected, as a TCAS RA annunciated, and the Capt, PF, took over manually and followed the avoiding action (momentary bank angle 35°). As the weather was excellent VMC (no cloud and 100nm visibility), the PNF visually acquired the other traffic, a high wing twin engine type, nose-on, in their 2 o'clock 800m away as they passed at the same level. Minimum lateral separation remained at 800m, crossing ahead of the other traffic, and as it passed to their R 200ft below, also turning away following ATC instructions. He assessed the risk as high. The Capt went on to say that the TCAS warning, directly to an RA, was received when taking the ATC avoiding action and thankfully they were in unison as it would have been very difficult to reverse the max rate turn.

THE ATR72 PILOT reports flying inbound to Luton IFR heading 110° at 260kt and in receipt of a RCS from London on 119.77MHz squawking 1411 with Mode C. Whilst descending through FL115 he first spotted a B737 in his 10 o'clock range 5-6nm about 2000ft lower and climbing. A few seconds later TCAS commanded "descend, crossing descend" demanding ROD -1500 to 2000fpm in a green arc. As they were already descending, following the command was quick and easy, and executed by the FO, PF, who disconnected the A/P. Simultaneously ATC issued a L turn onto 070° towards the B737 which was on their L. Having watched the B737 continuously in excellent VMC (CAVOK and 50nm visibility) and judging that it was not safe to turn immediately, the Captain replied "resolution advisory, descending" and only when they had cleared the traffic and the RA ceased did they resume the L turn. The B737 passed 1.5nm ahead at the same level in an apparent climbing L turn. He assessed the risk as 'low to medium' owing to the VMC weather and ease of evasive action.

THE TC NW DEPS SC reports operating the NW sector bandboxed with the traffic loading being busy and he had asked for the sector to be split. In the meantime he had descended the ATR72 ready for positioning to a downwind heading for Luton APR, he could not remember to what level, and the B737 was climbing to FL120 on a W'y heading. The N Coordinator pointed out the confliction so he turned the B737 L and the ATR hard L using the phrase 'avoiding action'. The ATR pilot did not acknowledge this so he called him again and the pilot appeared indecisive but he gave him TI and the avoiding turn again. The B737 turned quickly and kept the subject ac apart but the ATR72 never seemed to turn and standard separation was lost. The B737 crew reported they would be taking reporting action so he advised the ATR crew that he would too and could they also file a report.

THE TC N COORDINATOR reports that he was in the process of getting the BNN position open to ease the workload on the NW SC. He observed the SC had climbed the B737 to FL120 on a W'y heading which conflicted with the ATR72 being positioned downwind for RW26 at Luton. He thought the ATR was descending to FL100. Immediately he drew the SC's attention to this who then started to take remedial/avoiding action - SMF was activated. He was unaware whether TCAS had activated on either ac.

THE TC GROUP SUPERVISOR (GS) NORTH reports that leading up to the incident TC BNN and NW were bandboxed with adequate manpower available to split any part of TC N sectors if required. From the GS's viewpoint the traffic loading appeared moderate from the fps display in the bandboxed configuration although it was more difficult to judge the complexity of any situation at any one time. Everyone seemed calm and in control. The Coordinator had requested BNN be opened which was achieved immediately although the incident occurred probably during the splitting process and was highlighte

ATSI reports that the controller, who was operating the TC NW Sector in bandboxed mode, described his traffic loading as moderate at the time of the Airprox. He added that the workload was high due to the complexity of the traffic situation. He had been happy to take over the combined sector some 5min before but, because of the build-up of traffic, had requested the sector be split shortly afterwards. Although the Coordinator had instigated this process, the split had not taken place before the incident occurred.

When the controller took over the sector, the B737 was already on frequency, having departed from Stansted on a Compton 3R SID. The flight was on a radar heading of 265° and maintaining FL70. The ATR72 crew established communication with the sector at 1052, reporting heading 140° and descending, in accordance with the Standing Agreement with TC COWLY, to FL150 to be level abeam CLIPY. The flight was instructed to descend to FL110 and informed that it would be positioned RH downwind for RW26 at Luton.

At 1053, the TC NW SC cleared the B737 crew to climb to FL80 and shortly afterwards, the ATR72 crew to descend to FL100. The SC explained that there were 2 flights potentially affecting the descent/climb of the subject ac. Both were at FL90, one inbound to Biggin Hill from the W and the other tracking N to Edinburgh. Additionally, the presence of the northbound ac precluded him turning the ATR72 towards a downwind leg for Luton, as he would otherwise have done. At 1054:15, the B737 crew were given a tactical heading change to 255° and 40sec later, being clear of the traffic at FL90, were instructed to climb to FL120, in respect of a Stansted inbound which would be descended to FL130. This clearance did not take into account the presence of the ATR72, which was on a conflicting track, 17.2nm to the NW. The ATR72 was passing FL135 and the B737 was climbing through FL78 at the time. The SC could not readily explain why he had overlooked the presence of the ATR72. As far as he was aware the fps display was up to date and although the fps of the respective ac were not in the same bay, the confliction should have been apparent. The radar recording of the event shows that the ATR72's SSR label was overlapping with other ac at the time. It is probable that, having resolved any potential conflictions with the ac at FL90, the SC, not observing the ATR72 on the radar display, believed that there was nothing to conflict with the B737 and issued the climb clearance. He said that it was unfortunate that he had not been able to turn the ATR72 earlier as it would then have been tracking to the N of the B737 and, consequently, not in potential confliction.

The SC said that he first became aware of the situation when the N Coordinator drew his attention to the confliction. He immediately instructed the B737 crew (1056:00), who were passing FL104, to stop their climb at FL110 and to turn L heading 180°. In the heat of the moment he believed the ATR72 was descending to FL120. The ATR72, approximately 5nm away, was then given an 'avoiding action' L turn heading 070° as STCA activated (1056:13) with a high severity alert. The pilot acknowledged the heading change and transmitted "*we have er...*" the end of the transmission was not readable due to a simultaneous call. The pilot may well have been reporting a TCAS alert as an audible warning is heard in the background. As the ATR72 did not appear to turn, the SC transmitted "*It's avoiding action turn left now traffic about three miles ahead in your twelve o'clock crossing from left to right in the climb through your level*". The pilot replied receiving a TCAS RA. The SC said that this call did not register so he repeated the 'avoiding action' L turn. The radar recordings of the event show that minimum separation occurred at 1056:41, the B737 had just passed through the 12 o'clock of the ATR72 and was now 1.6nm away at FL110. The latter, which appears not to have deviated from a heading of 140°, was descending through FL105.

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 unfortunate that the incident had occurred during the splitting of the sector. ATCOs discussed the decision-making process and accountabilities although obviously timing was of the essence in this case. Members were conscious that although the number of fpss was a quick guide for indicating traffic levels on a sector, the Traffic Load Prediction Device (TLPD) was more accurate in breaking down the traffic numbers by sectors although

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neither gave a true picture of the complexity of the situation. The NW DEPS SC had a busy and complex traffic situation and, for whatever reason, he had not taken the ATR72 into account when he climbed the B737 into conflict which had caused the Airprox. The ATR's SSR label had been overlapping that of another ac at the time that the climb clearance was issued, although the confliction should have been apparent from the fpss. Having resolved the confliction between the B737 at FL80 and 2 transiting ac at FL90, he had, in the belief there was no traffic to conflict, climbed the B737 to FL120.

Members commended the N Coordinator for spotting the confliction and pointing this out to the SC who had stopped the B737's climb at FL110, in the erroneous belief that the ATR was descending to FL120, and turned the flight L onto heading 180°. As STCA activated, the SC then gave the ATR crew an avoiding action L turn onto heading 070° which apparently coincided with the crew receiving a TCAS RA. From the ATR cockpit, TCAS had given the crew a 'heads-up' on the B737 which was visually acquired in their 10 o'clock range 5-6nm 2000ft below but climbing. On receipt of an RA 'descend' warning the crew quickly and robustly followed the guidance but did not turn, as they perceived that this would exacerbate the situation. The B737 crew levelled at FL110, as instructed, and executed a steep L turn but did not climb: TCAS would have generated a coordinated RA 'climb' command, in opposition to the RA 'descend' of the ATR TCAS. With the B737 maintaining FL110, this would have required more positive action from the ATR crew, as their TCAS gave resolution guidance against the B737. Although these elements/actions were singularly untidy, when combined they were enough to persuade the Board that any risk of collision had been quickly and effectively removed.

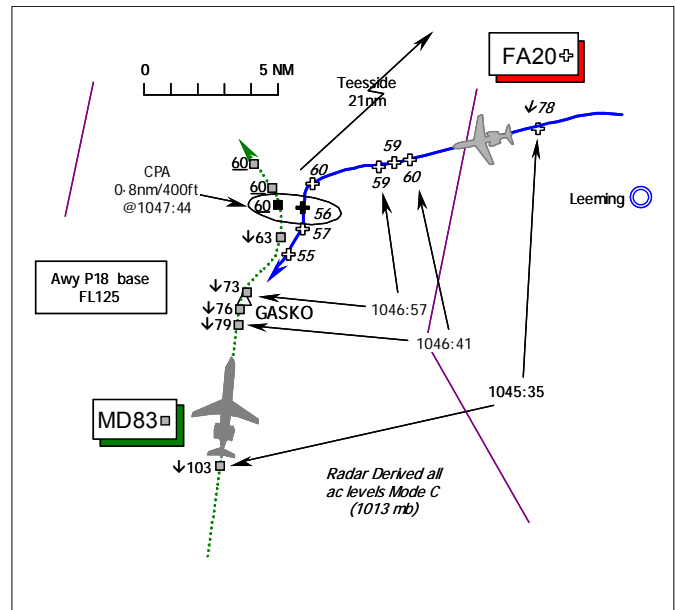
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The TC NW DEPS SC did not take the ATR72 into account when he climbed the B737.

Degree of Risk: C.

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Date/Time: 6 Sep 1040
Position: 5417N 00156W (4nm NNE of GASKO)
Airspace: London FIR (Class :G)
Reporter: Teesside APR
First Ac Second Ac
Type: MD83 Falcon 20
Operator: CAT Civ Comm
Alt/FL: FL60 6500ft
 SAS (QNH)
Weather VMC CLBL VMC CLAC
Visibility: >10km Unlimited
Reported Separation:
APR: 300ft V/1/4nm H
 Nil V/1nm H 500ft V/1nm H
Recorded Separation:
 400ft V/0.8nm H

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

THE TEESSIDE APPROACH RADAR CONTROLLER (APR) reports that MD83 was inbound to the airport and was squawking A5376 with Manchester and then allocated A7056 with Teesside RADAR. At about 1040 he informed Leeming about the inbound MD83, which was at that time approx 10nm W of the LBA, whereupon he was advised that Leeming had “nothing to affect”. When the MD83 crew called him on frequency he issued a descent to 4500ft Teesside QNH (1033mb) (in anticipation of a departure from Leeming which would be climbing to 3500ft). As the ac approached GASKO, Leeming ZONE called with traffic 20nm NW of Teesside maintaining FL55 and one track 5nm W of Leeming leaving FL60 descending to FL50, squawking A0402. He subsequently co-ordinated descent for the MD83 “to maintain FL60 until clear” so he immediately instructed the MD83 crew to “stop descent FL60”, under the RAS which he reports he was providing. This was not read back so he repeated the instruction whereupon it was then acknowledged by the MD83 pilot. As the MD83 was passing approx FL70 he observed the Mode C on Leeming’s A0402 squawk at FL55. He instructed the MD83 to “continue on your present heading” then stopped his descent at FL65. The A0402 then started a climb back to FL60 so he immediately turned the MD83 to the L onto a heading of 330° but the contact turned with him so he reversed the turn onto E. He called the traffic to the MD83 crew again but the contact again appeared to turn with him and the two ac passed within 1nm with a vertical separation of 300ft, he thought, on Mode C. The MD83 pilot advised he had the other ac on TCAS and was also visual with it but he did not seem unduly concerned as to its closeness. Standard separation was eroded down to 300ft vertically and 1/4nm horizontally. The MD83 was then positioned onto the ILS for RW05.

THE MD83 PILOT reports that he was inbound to Teesside from Rues and in receipt of “Radar Vectors” from Teesside APR. His ac has a white fuselage with grey wings and the HISLs were on. Turning R through 360° to intercept the localiser for RW05 some 30nm from Teesside Airport, descending to 6000ft at 230kt in VMC about 2000ft above cloud, a contact was first spotted on TCAS at a range of 2nm. A TA was enunciated and followed almost at the same time by an RA – he did not specify the nature of the advisory. Having visual contact with the traffic, he saw it was in a L turn so they turned L as well whilst following the RA to avoid the other ac, a dark coloured low wing twin engined jet. Minimum horizontal separation was about 1nm with the other ac at the same level. The risk was assessed as “medium” and he added that the cockpit workload was significant whilst turning onto the final approach for Teesside.

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THE FALCON 20 (FA20) PILOT reports his ac has a dark blue colour-scheme and the HISLs were on whilst in receipt of a FIS, he thought, from Leeming ZONE. A squawk of A0402 was selected with Mode C and, significantly, TCAS is fitted.

Operating VFR in VMC some 1500ft clear above cloud at 250kt in a level L turn at about 6500ft QNH, whilst waiting for another ac, traffic to the SW was called by ZONE following a turn onto W. The reported traffic was observed on TCAS about 5nm away and a turn to the L was initiated onto a S-SW'ly heading to go behind the traffic, which was spotted visually at a range of 2-3nm. There was no threat of a collision as the other ac – an MD83 – passed about 1nm away separated vertically by 500ft. TCAS only enunciated a TA.

ATSI reports that the MD83 was inbound to Teesside from the SW, routeing from the direction of the Pole Hill VOR. The Teesside APR had contacted Leeming about the traffic and was advised that there was “...*nothing to affect*”. At 1044:10, the MD83 reported on the APR's frequency, descending to FL70 on course for GASKO (25nm SW of Teesside Airport). The crew were instructed to continue on their heading and to report established on the localiser for RW05. Leeming then telephoned the Teesside APR regarding traffic about to depart from Leeming. It was agreed that the Leeming departure traffic would climb to 3500ft and the inbound MD83 would not descend below 4500ft Teesside QNH pending further co-ordination. Therefore, at 1045:50 the crew of the MD83 were instructed by the APR to descend to 4500ft.

Shortly afterwards, Leeming telephoned again to advise of further traffic, a westbound FA20 5nm W of Leeming, passing FL95 descending to FL50, some 24nm NE of the MD83. The Teesside APR agreed that he would stop the MD83's descent “*at six zero on top*” and revised the MD83's descent clearance accordingly. The MD83 was passing FL125 and about to descend below the base of airway P18. The APR did not advise the crew of this nor specify any change in service nor did the pilot request either a RIS or a RAS. However, from his report, the APR was evidently providing the flight with a RAS. The situation continued with the MD83 still tracking N towards GASKO and the FA20 following a westerly track. At 1046:30, the MD83 was passing FL84 with the FA20 in its 2 o'clock at a range of 10-9nm passing FL64. At that point the Teesside APR transmitted “[C/S] *just continue present heading for the moment please I'll take you through the localiser bring you on to the north (sic) against traffic you may see on TCAS currently in your 1 o'clock range of 5 miles working Leeming he's actually maintaining six at the moment he should be descending to five shortly*”.

The Mode C of the FA20 indicated FL60 at 1046:41 before dropping to FL59 at 1046:49, and then showed FL60 at 1047:29, as the MD83 descended through FL63. The Teesside APR, having passed traffic information, saw the conflict continuing to develop and so instructed the crew of the MD83 to turn L from their heading of 020° onto 330° and then, at 1047:00, to stop descent at FL65. Further traffic information was passed and the APR issued an avoiding action R turn onto 080°. The MD83 was, apparently, unable to arrest its descent at FL65 but continued down to FL60, still in the L turn as it passed the FA20, the MD83 crew having reported that they had “*passed the traffic*” at 1047:30. Meanwhile, the FA20 had turned L onto a south-westerly track and was now in the MD83's 1 o'clock position at a range of 1.3nm and 300ft below it. The two ac quickly passed and horizontal separation was restored.

Whilst coordination had been effected between Leeming and the Teesside APR, the MATS Part 1, Section1, Chapter 5, Page 10, para 9.3.1, clearly states when assessing the vertical position of a an ac transponding Mode C:

“An aircraft climbing or descending may be considered to have passed through a level when the Mode C readout indicates that the level has been passed by 400 feet or more and continuing in the required direction”.

It was unfortunate that the FA20 levelled for a short time at FL60 and, clearly, the Teesside APR could not have anticipated that. However, the MD83 should not have been cleared to descend to that level until it had been established that the FA20 had vacated it and, under the terms of a RAS, the APR was required to provide standard separation between the MD83 and other traffic.

MIL ATC OPS reports that the Leeming RT/landline recordings were found to be 2min 45sec fast; timings in this report have, therefore, been adjusted to UTC. The FA20 ac had been handed over to Leeming ZONE in the descent to FL130 under a RIS at 1040:45, with traffic information having been passed on “*traffic in his right 2 o'clock, 10miles, crossing right left has been called and he is visual*”. The FA20 called ZONE at 1041:28, and requested the Barnsley and Tyne RPS's. At 1042:26, the FA20 called “*ready for further descent the traffic is*

believed to be west". The FA20 was instructed by ZONE to "*descend report level FL70*" which was acknowledged by the crew. The FA20 crew passed their intentions once passing overhead Leeming and stated they would "*like to stay with you [ZONE] for an information service until such time as they get established*" low level. ZONE acknowledged this request and asked the crew to confirm "*you'll be maintaining clear of Teesside Zone?*" to which the FA20 crew responded with "*affirm*". At 1044:45 the FA20 crew were passed further descent to FL35 but the crew responded that they would "*hold it at FL50 to maintain Victor Mike up on top*". ZONE rang the Teesside APR, at 1045:35 with "*traffic information for you 2 tracks..west of Leeming, 5 miles, heading west..0402*" [- the FA20]. The APR reported contact and ZONE continued "*it's descending to FL50 and then maintaining FL50*". APR responded with "*OK I shall stop at 6 on top of that one then*", which ZONE acknowledged "*Roger*" whereupon the Leeming transcript reflects that the APR instructed an ac on his frequency to stop descent at FL60 [- the MD83]. ZONE continued to pass further traffic information on the second track mentioned and then the call was ended. At 1046:26 the FA20 crew reported "*maintaining FL60 to remain victor mike on top*". ZONE acknowledged this and passed traffic information on "*traffic left..10 o'clock 5 miles, crossing left right, descending FL70 inbound Teesside*" – the MD83. The FA20 crew called "*we have contact*". Some 30sec later the traffic information was updated to the FA20 crew that the previously reported traffic was now "*left 11 o'clock*".

The APR rang ZONE at 1047:51 and a conversation ensued regarding the traffic information which ZONE had passed to the APR earlier:

APR:*Can I speak to Approach please.*

ZONE:*Er no, Zone's on.*

APR:*I thought you said that guy was descending to 5*

ZONE:*He's descending to FL50 yeah.*

APR:*Yeah, well he's maintaining 6 at the moment that's why I stopped at (unreadable)*

ZONE:*Yeah, he was descending to FL er 50.*

APR:*Well, he's still maintaining 6.*

ZONE:*Yeah, he is maintaining 6 now yeah.*

APR*But he never went down to 5. He maintained 6 all the time, that's why I said I'll stop at 6 over the top.*

ZONE*Ah, hang on a second*

Break of 30 secs whilst both agencies talk to ac.

APR*Nah, I was just wondering cause I mean he's still maintaining 6 now.*

ZONE*He is maintaining 6 now yeah, he said he was descending to FL50.*

APR*Yeah well that's why I co-ordinated I dropped to 6 over the top. Eventually, only had 300ft between those 2.*

ZONE*I know, I thought you'd be saying like 1000ft on charlie until he was down.*

APR*Yeah*

ZONE*Cause he was descending but..*

APR*Yeah he was descending yeah but he went back up to 6 again.*

ZONE *..(unreadable)...he never. He didn't climb he*

APR*Well he...*

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ZONE Yeah

APR He never went down to 5

ZONE No he didn't go down to 5, no

APR No which was what I co-ordinated against. So it would have been nice if you'd come back and told me it was maintaining 6 or something

ZONE Yeah well he was still in the descent erm..yeah

APR OK.

[UKAB Note (1): The Great Dun Fell radar recording shows the FA20 3nm N of Leeming at 1044:56, squawking A0402 indicating FL94 Mode C, descending in a L turn, with the MD83 10½nm S of GASKO, tracking N, squawking A7056 indicating FL128 Mode C descending. The FA20 steadies onto a track of 250°, 3½nm NW of Leeming passing FL83 descending, with the MD83 in the FA20's R 2 o'clock 20nm, tracking N indicating FL113 descending. As the 2 ac continue to converge the rate of descent of both ac is similar with the MD83 maintaining 2000ft Mode C above the FA20. At 1046:49, the FA20's Mode C indicates levelling at FL59: the MD83 is in the FA20's L 10 o'clock - 7.75nm indicating FL76 Mode C. As the MD83 passes overhead GASKO at 1046:57, the ac initiates a R turn onto 030° whilst indicating FL73 Mode C with the FA20 in its R 2 o'clock at 6.8nm now indicating FL60 Mode C. The returns at 1047:36 shows the FA20 descending through FL58 Mode C and initiating a hard L turn onto a southerly heading with the MD83 1.3nm away, indicating FL61 Mode C commencing a hard L turn onto a track of 340°. At 1047:44, the ac pass 0.8nm apart with the FA20 indicating FL56 and the MD83 indicating FL60. The separation between the 2 ac increases from this point onwards.]

A significant factor in this Airprox was the misunderstanding between ZONE and the Teesside APR as to whether co-ordination had been effected between the 2 ATSU's. The APR clearly thought that an act of negotiation had taken place but ZONE was under the impression that no co-ordination had been agreed but he had merely passed traffic information to the APR. Military Regulations at JSP 552 230.115.2 state that when a radar controller seeking co-ordination is able to determine (eg from SSR data) which controller is controlling the ac against which co-ordination is required, the initiating controller is to:

a. Make verbal contact with the appropriate unit/console/controller and open the dialogue with the words "Request co-ordination".

The phrase "request co-ordination" was not used by the APR and as a result was not recognised as such by ZONE. [See Post Meeting Note at Pt B] It is evident from the tape transcript that ZONE assumed APR would take 1000ft Mode C indication above the FA20 as when traffic information was passed to the FA20 on the MD83 it was reported as "not below FL70" against the FA20, which had actually levelled at FL60. However, given an assumption that the APR would take 1000ft above the FA20 with the MD83, ZONE could have updated the traffic information passed to the APR when the FA20 crew reported levelling at FL60.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear from the reports submitted that in ATSI's view, co-ordination had been effected for the MD83 to descend to FL60 above the FA20 which the APR had been informed was descending to FL50. Mil ATC Ops contended on the other hand that no such coordination had existed because the words "request co-ordination" had not been used by ZONE who had merely passed "traffic information" about the FA20. [See Post meeting Note]. Controller Members were dismayed that such difficulties should ensue between such closely located aerodromes whose respective ATSU's needed to work closely with one another and whom would inevitably be co-ordinating their traffic with one another routinely. Members contended that co-ordination agreements are effected at ATSU's constantly with few problems. A very experienced controller Member opined that when ZONE said that the FA20 was "...descending to FL50 and then maintaining FL50" and the APR responded with "OK, I shall stop at 6 on top

of that one”, especially when the APR broke off the conversation momentarily to pass the descent restriction of FL60 to the MD83 crew on his frequency, it should have been quite plain what the APR was intending to do here: indeed, that was also ATSI’s view. In the Member’s opinion, this was a clear statement of intent following an act of negotiation. It was unfortunate that ZONE had not gone back to the APR when the FA20 crew had reported less than 1min later at 1046:26 that they were “*maintaining FL60 to remain victor mike on top*”. Thereafter when ZONE passed traffic information to the FA20 crew by saying that the MD83 was “*...descending FL70 inbound Teesside*” this was misleading as he should have been aware that this was not the APR’s intent. There appeared to be no room for misunderstanding of what the APR had said but ZONE had incorrectly assumed that the APR would take 1000ft Mode C separation above the descending FA20: this was clearly wrong and not what the APR had said that he would do. Whilst recognising that ZONE was providing a RIS to the FA20 crew, controller Members agreed with the Mil ATC Ops report that ZONE should have appraised the APR of the situation knowing that the MD83 was descending on top of it - which would have been sound professional practise - but ZONE appeared to be content to do nothing other than call the MD83 to the FA20 crew. That said it was clear to the Board that under the RAS being provided to the MD83 crew, the APR was seeking to achieve standard separation above the FA20. The momentary indications of the FA20 at FL59 might have misled him at that stage into believing that the FA20 was continuing its descent as advised. But after that it should then have been readily apparent that the other ac had stopped its descent above the previously notified level of FL50 about 1min before the CPA occurred; indeed he informed the MD83 crew of this. The Board therefore agreed with the ATSI view that the APR should then have stopped the MD83’s descent clear above the FA20 until it could be established what was happening. Although this all occurred over a short period of time, the Board agreed that this Airprox had resulted because the Teesside APR descended the MD83 to a level not yet vacated by the FA20.

A CAT pilot Member opined that the MD83 crew should have been able to arrest their descent at FL65 when the APR instructed them to do so - although this would not have afforded standard separation above the other ac - but it was not clear from the MD83 pilot’s report what his TCAS RA was commanding him to do to avoid the FA20. For his part the MD83 pilot had reported that he had spotted the FA20 and had turned L away from it – which was also in conformity with the APR’s earlier turn instruction. It was fortunate that having seen the FA20, by this stage inside a range of 2nm, he had not complied with the later avoiding action R turn onto 080° which would have decreased what horizontal separation there was. Evidently before this, however, the FA20 pilot had spotted the MD83 on TCAS from 5nm and had picked it up visually from 2-3nm thereby enabling him to turn to pass astern of the descending airliner. Therefore, in the Board’s view, the combined actions of the pilots following their visual acquisition of each other’s ac had entirely removed any risk of a collision in these circumstances.

[Post Meeting Note: Following the Board’s assessment of this Airprox, ATSI remarked that civilian controllers do not have ready access to JSP 552 230.115.2. Consequently, civilian controllers would not be aware of these stipulations as the MATS Pt 1 makes no mention of the use of the phrase “*request co-ordination*” when effecting co-ordination with military ATS/ADR Units. The topic of co-ordination was the subject of a UKAB Safety Recommendation following the Board’s assessment of Airprox 59/04 earlier this year: that the MOD and CAA should jointly review the terminology used by Air Defence and Air Traffic controllers when effecting co-ordination with other military and/or civilian ATSUs, the aim being usage of a standardised form of phraseology which minimises the potential for any misunderstanding. This UKAB Safety Recommendation was accepted: a CAA/MOD Working Group has been formed and is jointly reviewing the co-ordination process and terminology.]

PART C: ASSESSMENT OF CAUSE AND RISK

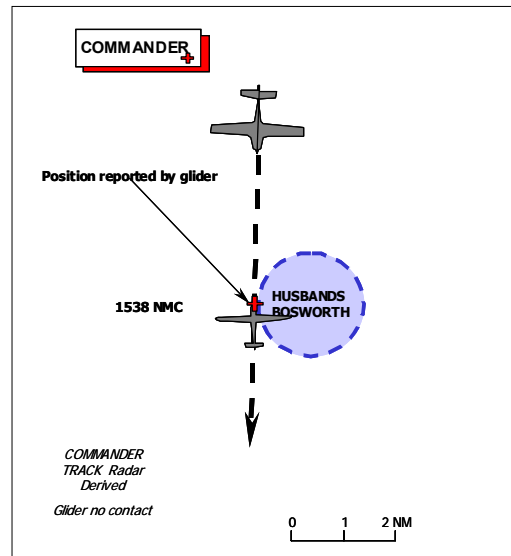
Cause: The Teesside APR descended the MD83 to a level not yet vacated by the FA20.

Degree of Risk: C.

AIRPROX REPORT No 171/04

AIRPROX REPORT NO 171/04

Date/Time: 19 Sep 1538 (Sunday)
Position: 5226N 00103W (1nm W of
Husbands Bosworth AF - elev 505ft)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Ask 21 Glider Rockwell Cmdr 112
Operator: Civ Club Civ Pte
Alt/FL: 1600ft agl 2000ft
(QFE) (N/K)
Weather VMC CAVOK VMC CLBC
Visibility: >10km >10km
Reported Separation:
0 V/15m H Not seen
Recorded Separation:
Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ASK 21 GLIDER PILOT reports flying a GH instructional flight with a student in the front cockpit, from Husbands Bosworth (HB) in a white glider with no lighting, but in communication with HB radio. The flight had involved turn practice and co-ordination using the control column only and satisfactory progress had been made and so the instructor considered that they should attempt use of the rudder. Although they had briefed on the importance of a good look out his forward view from the rear cockpit was restricted. Whilst the student's head was lowered in the front cockpit adjusting the rudders, the instructor observed a low wing monoplane approaching fast and head on. The ac's predicted path was very slightly lower and to the left of him so immediate avoiding action was necessary to avoid a collision. The instructor executed a tight right turn and whilst in this turn he felt the glider shudder in the wake of the other ac as it passed. He continued the turn for a full 180° and saw the ac continuing on its original heading and level. Even if the pilot had not seen him head on they must have seen the glider in plan form as he banked tightly. He estimated the closest proximity to be less than his wingspan of 15m. The incident occurred less than 2nm from the airfield which is marked on maps as an area of intense gliding.

UKAB Note (1): HB is marked on the CAA ½ mil VFR charts as a 'Glider Launch Site' operating up to 3600ft. No symbology exists on such charts to depict 'areas of intense gliding'.

THE ROCKWELL COMMANDER 112 PILOT reports that at the time of the incident he was 3nm W of HB heading 180° at 135kt and at about 2000ft in communication with Leicester Radio on a flight from Nottingham to the Isle of Wight. He was shocked as he did not see any other ac at the time of the incident and could not recall anything which would have distracted him from his normal lookout.

UKAB Note (2): The glider does not show on the recording of the Claxby Radar at any time. A 7000(NMC) squawk, presumed to be the Rockwell, can be seen heading S and tracks over the reported position (1nm W of HB) of the Airprox at 1538.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted solely of reports from the pilots of both ac and a radar recording.

This incident occurred in Class G airspace where the see and avoid principle is the prime means of collision avoidance. The Board considered that crossing gliding sites at 2000ft is almost invariably unwise as there is always a risk from cables and launching gliders; in this case the Rockwell was quite close to that height.

Furthermore, there is always a real risk of meeting gliders even above glider sites particularly in the height band between 2000ft and the cloud base of the day.

Rules of the Air only work if pilots see other ac in time to react: therefore if the (inexperienced) front seat student is engaged on a briefed head-in task, the instructor, albeit with his restricted vision from the back seat, is responsible for all lookout duties. In this case the instructor saw the other ac approaching, although at a very late stage, and he made a conscious effort to remedy the situation. Due to the high (head-on) closing rate and the lateness of the instructor's avoiding action, Members thought that this might not have had time to take effect before the ac had crossed.

A specialist familiar with the Rockwell Commander 112 informed Members that the forward visibility was poor. In addition, there had been little relative movement of the glider which would have appeared almost stationary in the windscreen (even if it were visible).

The Board noted that the glider pilot had a false perception that marking of the launch site on the CAA VFR map afforded him some protection from other traffic. This is not the case as the marking is a warning to other aviators that gliders launch from there and pose a danger to other ac during the launch sequence. Gliders operate all over the FIR and their pilots are subject to the same lookout obligations as those of other ac in Class G airspace.

In this case the Board considered that it had only been by good fortune that the flight vectors of the 2 ac had not come together. It was most likely that the avoidance action by the glider instructor had been too late to alter the outcome and therefore there had been a real risk that the ac may have collided.

Post Meeting UKAB Note: Some specialists on the Board considered the practise of adjusting the rudders in flight to be inadvisable; others said that it was routine for both powered ac and gliders. The Secretariat undertook to consult the BGA Advisor who was not able to attend the meeting and report his comment which is as follows. "Glider rudders are designed to be adjustable in the air. While it is better to adjust them on the ground and leave them at that position, there are often legitimate reasons to adjust them in the air for ac safety or occupant comfort. Particularly at the early stages of training this will be a head-in procedure for the occupant of the front seat thereby requiring the division of look out responsibility to be reallocated."

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the Rockwell Commander pilot and a very late sighting by the ASK21 pilot.

Degree of Risk: A.

AIRPROX REPORT No 172/04

AIRPROX REPORT NO 172/04

Date/Time: 17 Sep 1208

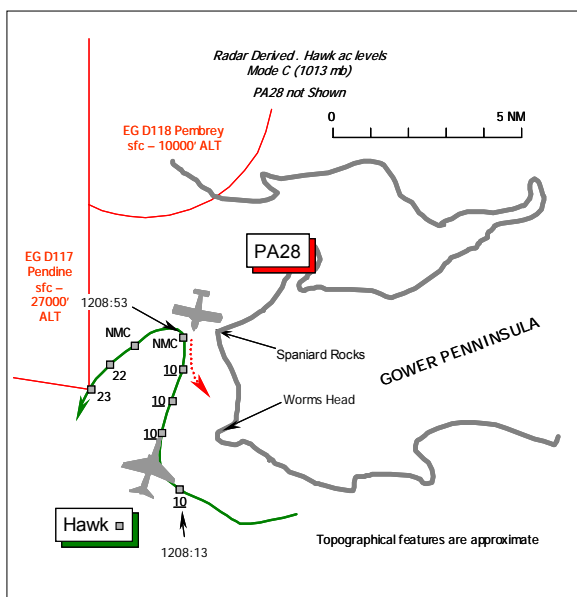
Position: 5136N 00420W (1nm SW of Spaniard Rocks)

Airspace: UKDLFS/London (Class: G)
FIR

	<u>Reporting Ac</u>	<u>Reported Ac</u>
<u>Type:</u>	Hawk T1	PA28
<u>Operator:</u>	HQ PTC	Civ Trng
<u>Alt/FL:</u>	1000ft (QFE 1014mb)	1700ft (QNH 1014mb)
<u>Weather</u>	VMC CLBL	VMC CLOC
<u>Visibility:</u>	"Good"	>10km

Reported Separation:
200ft V/200ft H 400ft V/1/4nm H

Recorded Separation:
Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK T1 PILOT, a QWI, reports his ac has a black colour-scheme and the HISLs were on whilst flying an instructional range sortie with a student at Pembrey Air Weapons Range (AWR). Flying in VMC, some 1000ft clear below cloud, in between layers where the visibility was "good", he was in contact with Pembrey on UHF 'Range Primary' and operating under a FIS, whilst squawking A7002 [the Danger Areas' general conspicuity squawk] with Mode C. Neither TCAS nor any other form of CWS is fitted.

As the PF he had positioned the inbound run to the range to leave Worms Head at 400kt on a heading of 350°(T) at 1000ft, Pembrey Range QFE (1014mb), to demonstrate a range join to his student. Between Worms Head and Spaniard Rocks his student spotted a light ac (LA) in their 12:30 position 1/2nm away and told him about it. Upon looking he saw a small ac "blossom in the canopy" about 200ft above his jet and on a heading that would apparently take the LA to starboard. He broke L to avoid the single engine LA, which passed about 200ft above and 200ft away to starboard, with a "fair" risk of a collision. The Pembrey Range Control Officer (RCO) was informed about the incident details on RT, adding that the LA was a Cherokee type painted white and beige. He stressed candidly, that they had not seen the other ac until very late and consequently had passed uncomfortable close to it.

THE PA28 PILOT reports he was conducting a training flight from Swansea around the Western Gower in his brown and cream coloured ac, returning back to Swansea. He was flying about 1500ft clear below and 10km horizontally clear of cloud where the visibility was >10km and in communication with Swansea APPROACH who were affording a "full ATC" service, he thought. A squawk of A7000 was selected with Mode C on. No TCAS is fitted.

Heading S at 110kt, in a level cruise at an altitude of 1700ft QNH (1014mb), he spotted the black Hawk trainer jet about 1 1/2nm away, approaching his ac on a reciprocal heading. In case the jet climbed, he elected to turn L away from the Hawk's flightpath, which subsequently passed 400ft below and 1/4nm away to starboard with a "low" risk of a collision.

UKAB Note (1): The Pembrey Sands AWR RCO thoughtfully provided a brief report and RT transcript, which reiterated the Hawk pilot's initial RT Airprox report that was timed at 1209:24. The Hawk pilot reported "...we've got a light ac between Worms and Spanish [he probably meant Spaniard Rocks] at 1000 feet and we're going to break this one off...". The LA was subsequently reported to have been "...halfway between Worms and Spanish [sic] one eighty out from our track at 1000 feet". The RCO contacted Swansea ATC who confirmed the identity of the PA28 that was flying anti-clockwise around the Gower Peninsula.

UKAB Note (2): The Meteorological Office do not record the Swansea aerodrome data within their archives, but their analysis of the relevant charts indicates the Swansea QNH would have been about 1014mb.

UKAB Note (3): The UK AIP at ENR 5-1-3-7 notifies EG D118 Pembrey, as extending from the surface to an altitude of 10000ft amsl within the promulgated co-ordinates and active 0900–1400 on Fridays. A DAAIS is available from PEMBREY RANGE on 122.75MHz. The reference also includes at *Remarks*: “*Caution: Associated aircraft operations outside area boundary*”. Furthermore, the AIP entry notes that ac operating in these areas are unable to comply with Rule 17 of the Rules of the Air.

UKAB Note (4): The Airprox itself is not shown on radar recordings as the PA28 is not shown at all. However, the Burrington Radar recording does show the Hawk at the extremities of coverage, turning inbound toward the range some 2nm off Worms Head indicating 1000ft Mode C (1013mb). The Hawk maintains level flight until a sharp L turn is evident at 1208:53, which is probably just after the Airprox has occurred. From this point the Hawk’s Mode C is then lost for several sweeps before being shown climbing through 2200ft (1013mb) as the jet turns outbound to set up for another run.

HQ 1 Gp, the authority responsible for AWRs, comments that there is little that can be added from their perspective. The Hawk pilot was positioning to enter the Pembrey Sands AWR and was operating in Class G airspace. Although in RT contact with the AWR, the range operates with no radar and therefore could not offer the Hawk a radar service. The conflicting ac was not in contact with the AWR and, therefore, the AWR had no knowledge of it. This was a classic case of ‘see and avoid’. The RCO correctly noted the Airprox call from the Hawk pilot and attempted to trace the conflicting ac through Swansea.

HQ PTC comments that both this & Airprox 221/04 involved the same Hawk pilot flying the same ac types and occurred, in each case, while the Hawk was positioning to join Pembrey Range. In the case of this Airprox - 172/04 - each pilot took appropriate avoiding action away from the other ac. Whereas, in a later case – 221/04 – the Hawk student pilot took control to take avoiding action but the PA28 pilot did not deem it necessary. Both were seen as bearing a significant risk. Whilst these are strictly VFR encounters in Class G airspace, a student pilot’s workload at this stage of a weapons sortie is such that he does not need such an unsettling complication. We are pleased that Valley has agreed to visit Swansea Flying Club to brief them and seek their co-operation in remaining clear of the area.

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 AWR and ac operating authorities. Two Airprox had occurred in this locale within the space of several months: this and 221/04. Fortunately circumstances permitted their assessment concurrently by the Board, consequently much of the discussion was relevant to both incidents and has therefore been included in both reports.

It was evident from his report that the PA28 pilot had spotted the black Hawk jet 1½nm away. Sensibly, the PA28 pilot had turned L at that point to effect some separation against the jet; this was a sound decision and evidently before the Hawk student had spotted the LA at a reported range of ½nm, wisely telling his instructor about it. Members were in no doubt that there was a good lesson here for others – in the see and avoid environment of the ‘Open FIR’ never assume that the other pilot has seen your ac – because here the Hawk crew had not seen the LA until a little later. Moreover, it would appear that from the PA28 pilot’s perspective, his L turn might have helped to increase the horizontal separation between the two ac at the critical moment. Although the PA28 pilot had reported that Swansea ATC was providing a “full ATC service”, Members recognised that here in a non-radar environment Swansea APPROACH was able to offer little more than a FIS to this VFR flight in Class G airspace. In all probability this would not have resulted in any form of specific warning to the PA28 pilot about the Pembrey Range traffic. Indeed Swansea ATSU has recently (from 5 Jan 2005) been downgraded from an Aerodrome Control service to an Air/Ground Station and the Approach Control service withdrawn. Conversely, radio contact with Pembrey Range DAAIS might have elicited some earlier warning for the PA28 pilot about the Hawk ac operating into, and in the vicinity of, the AWR thereby enabling the RCO to potentially warn the Hawk pilots of the presence of the PA28.

The Board welcomed the proactive stance taken by Valley to visit the local GA flying community at Swansea - anything that can be done to improve the general awareness of each other’s flying activities might engender

AIRPROX REPORT No 172/04

improved flight safety in the congested lower airspace and was to be welcomed. The PTC Member explained that the Swansea flying club was already aware of the activities at Pembrey. Nevertheless, a civilian Member questioned how other non-Swansea-based civilian pilots could find out about the range patterns commonly in use at Pembrey. Whilst he recognised that general warnings had been included in the AIP about the military pilots' inability to comply with the normal requirement of the Rules of the Air when operating in the vicinity of the AWR, he was concerned that this information was not readily available to the rest of the GA community. Military aircrew Members pointed out that although the range patterns are rigidly adhered to (and similar in some respects to aerodrome ccts) the actual patterns flown were specific to each ac type, the nature of the munitions in use, the delivery technique being practiced and the speed of the ac, so it was difficult to be precise about the whole gamut of possible permutations - far better to obtain information from the DAAIS itself who can then also pass on information to those pilots operating on the range. It was stressed that most AWR patterns will extend outside the actual Range co-ordinates but another GA Member said that, in his opinion, the information in the relevant AIPs was sufficient. Nevertheless, he also echoed the importance of calling the DAAIS itself and the usefulness of the information, which was provided solely for the benefit of non-participating pilots transiting the vicinity. The PTC Member briefed the Board that from the Hawks pilot's perspective this was a very close encounter indeed: it was emphasised that the Hawk instructor pilot had not seen the PA28 until his student alerted him to its presence. Then when he suddenly saw the PA28 "blossom in the canopy", he took robust avoiding action by breaking L. This coupled with the PA28's earlier turn led the Board to conclude unanimously that this Airprox had resulted from a conflict in Class G airspace resolved by the actions of both pilots.

Turning to risk, the PA28 had not been shown on the radar recording and without the benefit of radar data it was difficult to arrive at a consensus - more so because the two estimates of the minimum horizontal separation were significantly different. The PA28 pilot's account of $\frac{1}{4}$ nm was somewhat more than the Hawk pilot's reported 200ft, whilst the reported vertical separation was a little closer - between 200-400ft being quoted. Notwithstanding these variations the overarching geometry was not in dispute, so by a narrow majority, the Members decided that the safety of the ac involved had been compromised.

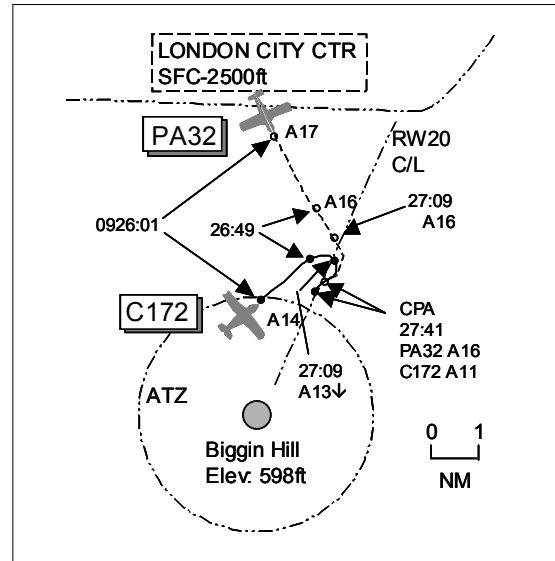
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: B.

AIRPROX REPORT NO 173/04

Date/Time: 16 Sep 0927
Position: 5123N 00005E (3.5nm FIN APP
 RW21 Biggin Hill - elev 598ft)
Airspace: FIR (Class: G)
Reporting Ac Reported Ac
Type: PA32 C172
Operator: Civ Pte Civ Trg
Alt/FL: 1200ft↓ 1000ft↓
 (QFE 999mb) (QFE)
Weather VMC CLNC VMC CLBC
Visibility: 30km >10km
Reported Separation:
 200ft V Nil H not seen
Recorded Separation:
 500ft V 0.3nm H

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

THE PA32 PILOT reports flying VFR to Biggin Hill from Wellesbourne Mountford routing inbound from the N planning to arrive via a direct approach onto RW21. The visibility was >10km in VMC and the ac was coloured white/red/blue with wing-tip strobe and pulse lights switched on. He was working Thames RADAR on 132.7MHz for a zone crossing clearance of London City airspace whilst a second pilot onboard (P2) contacted Biggin APPROACH on VHF COM Box 2 to establish joining and landing instructions having previously obtained the latest information on the Biggin ATIS. Thames Radar had told him that a C172, not the subject reported ac, was on an ILS approach for RW21 at Biggin Hill at 7 DME. When P2 rejoined him on the Thames frequency, it was agreed that they would commence a RH orbit on the BIG 010° RAD and change frequency to Biggin Hill on 129.4MHz to request further instructions. Biggin ATC told them that they were working 4 ac, the first to land being the previously mentioned C172 from its ILS approach to be followed by a PA38 in the cct. ATC asked whether they had completed the orbit and if they had the PA38 in sight. After confirming they were visual with the PA38 and that they were halfway around the orbit (turning through heading 310°), they were told to complete the orbit and proceed via a R base leg to final approach. ATC also informed them that a fourth ac, a Cessna (the subject ac) would be positioning No 4 in traffic behind them and its pilot had been instructed to orbit LH on the downwind leg (RW21 is a RH cct) and to join final approach behind their ac. As they closed onto RW21 final approach at 120kt the controller asked them to verify that they were on final approach but this request had to be made 3 times as another ac's pilot was responding to the RT calls. During his descending R turn at 4.2DME BIG at 1200ft QFE 999mb, the onboard Skywatch system gave a TA alert on traffic 300m away and showing 300ft below. The descent was stopped with 200ft vertical separation and nil horizontal separation indicated. After he opened the radius of the R turn and commenced a climb, he saw the other ac, a white coloured high winged type, in a 15° R banked descending turn onto final approach. Biggin ATC told him that the other ac should have been orbiting on the downwind leg. He reported that he would be filing an Airprox and assessed the risk as medium, owing to the Skywatch warning, otherwise he believed it would have been high.

THE C172 PILOT reports flying an instructional dual cct check flight as P1 with a PPL holder from Biggin Hill and in receipt of a FIS from Biggin on 129.4MHz squawking 7000 with Mode C. The visibility was >10km 3000ft below cloud in VMC and the ac was coloured white with blue, green and yellow stripes; strobe lights were switched on. When she, the PPL holder, called downwind she was told she was No 4 in traffic. After completing a LH orbit, both he and the PPL holder checked that both base leg and final approach were clear, called orbit complete and then turned onto final at 1000ft QFE and 80kt, approximately 4 DME. Another pilot then called to say that they had cut in front, twice referring to their ac as a C152. They had not seen another ac during their turn from downwind onto final and they had continued their approach and made a safe landing.

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THE BIGGIN HILL ADC/APP reports that the PA32 pilot had been told to expect a R base join onto RW21 but to remain W of the FAT owing to ILS traffic. After the flight had been released by Thames Radar, the pilot called when about 5nm N of Biggin Hill in a RH orbit to remain clear of the ILS traffic. The controller told the PA32 pilot to position R base No 3 following a PA38 on R base at about 3nm. The PA32 pilot did not have the PA38 in sight but he was still completing his orbit and was well placed to fit in behind. The C172 was carrying out a dual cct training sortie and when early downwind, was told to take up LH orbits in order to fit in behind the PA32. The ADC/APP's attention was diverted by ac and vehicles on the ground and then the controller returned to the PA32 and asked its pilot if he was established on final approach. He advised that he was but there was a Cessna on final ahead and beneath him and that he would be filing an Airprox.

The Biggin Hill METAR shows EGKB0920Z 22008KT 30KM FEW020 13/07 Q1025.

ATSI reports that at the time of the Airprox both ac were in receipt of a combined Aerodrome / Approach Control service from the Biggin Hill ATCO. A Field Investigation was not carried out; however, the controller stated in her CA1261 that there were no equipment unserviceabilities. Although an Air Traffic Monitor (ATM) is provided at the aerodrome it was not approved for operational use until some 6 weeks after this Airprox.

The PA32 pilot contacted the Biggin controller at 0919 and reported inbound from Wellesbourne Mountford, currently overhead the Isle of Dogs at 2400ft and still working Thames Radar. The pilot requested, and was given, the aerodrome information and was told to expect to join on a R base for RW21. The controller advised the pilot to remain to the W of the final approach owing to inbound ILS traffic and to report when released by Thames Radar. Meanwhile, the C172 was carrying out RH ccts to RW21 at Biggin.

At 0922:30, the pilot of the PA32 called the Biggin controller again and reported released by Thames Radar and carrying out a RH orbit to remain clear of the ILS traffic. The PA32 was 4nm N of Biggin Hill aerodrome and was instructed to continue in the orbit for the time being. At 0924:00, the Biggin controller transmitted "*PA32 c/s you'll be number three in traffic you're following a Tomahawk which is just under three miles on right base do you have that in sight*". The pilot of the PA32 responded "*Negative, PA32 c/s number three*". At that time the PA32 was still in a RH orbit 5nm N of the aerodrome and the Tomahawk was approximately 2nm S of the PA32 having turned onto a R base.

The C172 pilot then reported late downwind and was instructed to report before turning onto base leg as he was number 4 in the overall sequence. The pilot acknowledged her position in the sequence and almost immediately afterwards the Biggin controller told the pilot of the C172 to carry out one LH orbit, which the pilot read back.

The controller then turned her attention once again to the PA32 and asked the pilot if he was established on a R base. He replied that they were passing NW in the orbit to join R base. The controller transmitted "*Roger then that you're number three you're following a Tomahawk which is just over two and a half miles on final approach and you may see Cessna One Seven Two traffic in a left hand orbit late downwind to position behind you*". The pilot responded "*Traffic copied PA32 c/s*".

At 0926:25, the pilot of the C172 reported orbit complete but received no reply from the controller. Analysis of the radar recordings shows that the C172 then continued downwind but on a converging track to final approach. The correct track was 030° but the pilot made good a track of 055°. Similarly, the track for a R base was 120° but the radar shows that the PA32 was following a track of closer to 145°. Both of these tracks converge on the FAT for RW21 at a range of approximately 3-5nm from the aerodrome.

The next report was from the pilot of the C172 who reported turning onto long final. The controller replied, in the belief that two ac had transmitted together, by asking the PA32 pilot whether he had established on final. The pilot of the C172 responded to this by transmitting "*Just establishing in the turn C172 c/s*". [UKAB Note (1): The abbreviated c/ss of the C172 and PA32 were similar, the penultimate letter from each c/s being different]. Immediately afterwards the pilot of the PA32 said "*...to a One Seven Two or One Five Two that's below us turning final so I'll have to make a right hand orbit*". The controller again asked the pilot of the PA32 whether he was established on final and the reply was "*We are but above and behind a One Five Two at about four miles*".

The controller responded with "*Oh okay I'm sorry about that that's the one that was supposed to be orbiting late downwind if you could do another orbit then report established on finals number two now*". The pilot of the PA32 replied that he would and shortly afterwards advised that he would be filing an Airprox.

MATS Part 1, Section 3, Chapter 4, Page 1 para 3 states '*Although in Class D, E, F and G airspace separation standards are not applied, ATC has a responsibility to prevent collisions between known flights and to maintain a safe, orderly and expeditious flow of traffic. This objective is met by passing sufficient traffic information and instructions to assist pilot's to see and avoid each other*'. Additionally, there is the following entry in MATS Part 1 at Section 1, Chapter 4, Page 4 para 6 (Amendments to Clearances) '*When an amendment is made to a clearance the new clearance shall be read in full to the pilot and shall automatically cancel any previous clearance. Controllers must be aware, therefore, that if the original clearance included a restriction then the issue of a revised clearance automatically cancels the earlier restriction, unless it is reiterated with the revised clearance*'.

In this Airprox, the pilot of the C172 was instructed to report before turning onto base leg. Shortly afterwards this was amended to carry out one L hand orbit. As no restriction was placed on this it was reasonable for the pilot to assume that there was no longer any need to report before turning base leg. Furthermore, when the pilot of the C172 reported the orbit complete there was no response from the controller. The pilot then continued tracking downwind and eventually turned onto final approach albeit in front of the PA32, which she did not see.

UKAB Note (2): Analysis of the Heathrow Radar recording at 0926:01 shows the PA32 5.9nm N of Biggin Hill tracking 150° indicating altitude 1700ft QNH 1025mb with a 7000 squawk, believed to be the C172, 3.4nm to its S on a track of 055° indicating altitude 1400ft QNH. The subject ac continue to converge on steady tracks until 0926:49 when the C172 is seen to commence a R turn still indicating altitude 1400ft with the PA32 1.1nm to its N now showing altitude 1600ft, 200ft above. Twenty seconds later the C172 is turning through a SE'ly heading and descending through 1300ft altitude 0.5nm S of the faster PA32, which is still indicating 1600ft altitude and which is maintained thereafter. The CPA occurs at 0927:41, the C172 now steady on the FAT at 1100ft altitude with the PA32 now 0.25nm behind and 500ft above it, but turning through a SW track and diverging.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were familiar with this type of scenario whereby arriving ac are sequenced by ATC so that overhead joins are not necessary for safe integration into the cct, with ac joining directly onto base-leg not being unusual. The Biggin Hill ADC/APP had planned a sequence and had given information and instructions to facilitate an orderly flow. The PA32 was told that he was to position No3 behind a PA38 which the pilot had not visually acquired initially. When the C172 pilot reported downwind, he was told to report before turning base leg as he was No4 in the traffic pattern. Shortly thereafter, the flight was given a LH orbit - the RT transcript did not support the ADC/APP's recollection of giving orbits – and the controller had then ensured that the PA32 pilot was given updated TI both on the position of the PA38 and on the C172 in a LH orbit late downwind positioning behind him. The C172 pilot had reported orbit complete but this transmission was not acknowledged by the ADC/APP. Members were clear that the C172 pilot should have either called again, to get an acknowledgement, or report when he was ready to turn onto base-leg, as previously requested, as he was still No4 in traffic. However, the C172 pilot had then turned onto final approach into conflict with the PA32 which he did not see and had caused the Airprox. This turn onto final was done without ATC clearance, the lack of response from ATC to the C172 pilot's 'orbit complete' transmission not being a clearance to proceed onto final approach. Members felt that the C172 pilot should have been aware of the other ac on frequency from RT transmissions and gained a better situational awareness of their positions in the cct and the traffic sequence. It was also noted that the tracks flown by the subject ac had not helped the situation. The C172 was converging towards the FAT, not flying parallel to it downwind, and the PA32 was also converging on a closing heading instead of 90° to the FAT on a base-leg join. Flying a visual cct by adhering to the correct cct pattern was essential. During this period of high workload, pilots are required to build a mental picture of ac cct positions and then visually acquire the traffic to safely integrate into the sequence, this being made more difficult when ac are not conforming to the correct cct pattern.

The C172 pilot had not seen the PA32 approaching from his L and above and had turned towards final approach when he was just over 1nm to the S of the converging ac. The ADC/APP have given TI to the PA32 pilot on the C172 holding downwind, but he had not seen it turning in ahead and to his R until alerted to its presence by a TA alert from his Skywatch equipment. After he had stopped his descent and widened his turn, he saw the C172 below and had commenced a climb. The ADC/APP had not seen the C172 turn onto final approach and was alerted to the conflict by the PA32 pilot. Although the PA32 pilot's actions had meant that the subject ac were not

AIRPROX REPORT No 173/04

going to collide, the non-sighting by the C172 pilot combined with the geometry of the encounter were enough to persuade the Board that safety had not been assured during the encounter.

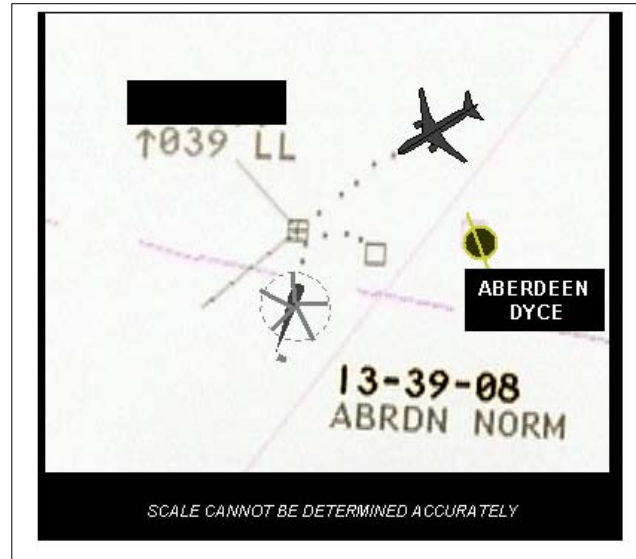
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: In the Biggin Hill cct, the C172 pilot flew into conflict with the PA32 which he did not see.

Degree of Risk: B.

AIRPROX REPORT NO 174/04

Date/Time: 20 Sep 1954 Night
Position: 5713N 00215W (2nm NW Aberdeen Airport)
Airspace: Aberdeen CTR (Class: D)
Reporting Ac Reported Ac
Type: AS332 A320
Operator: Civ Trg CAT
Alt/FL: 2500ft 3000ft
(QNH 988 mb) (QNH)
Weather VMC (RAIN) IMC
Visibility: 10km >10km
Reported Separation:
0 V/c ¼nm H 500ft V/c ¾nm H
Recorded Separation:
Approximately ½nm H

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

THE AS332 PILOT reports flying a local training sortie from Aberdeen with all his lights selected on but with his SSR to standby. They were orbiting at 100kt in a wide downwind position in the circuit, awaiting clearance to conduct an autorotation, when he saw an ac take off from RW34 and turn left into conflict with them. Being night and raining its range was hard to determine. Having seen the other ac he manoeuvred to clear it: had they had not done so they would have come very close to it. Neither he nor the crew of the departing ac had been warned of each other's presence. He assessed the risk of collision as being medium.

THE A320 PILOT reports flying an IFR scheduled passenger flight from Aberdeen to London. At the time he was in contact with Aberdeen TWR, squawking as directed, and had all his lights selected on. While passing 280° at 250kt in a left turn just after takeoff he first saw the landing light of the opposing traffic. Since there was no TCAS paint, he maintained visual contact with the traffic. Since there was no collision risk, avoiding action was not required. TCAS would have provided a warning if the opposing traffic had it been squawking. He thought that all traffic in the Aberdeen zone should be allocated a squawk so that TCAS might aid in deconfliction.

THE ABERDEEN CONTROLLER reports that an AS332 training flight departed at 1919 into the circuit, special VFR. For their fourth circuit, and they requested an altitude of 2500ft for an autorotation. This was co-ordinated with APR (INT) and a revised clearance was issued. After the ac turned crosswind left, he advised them of "*one to vacate, one to depart, report ready to commence the autorotation*", which was acknowledged. Shortly afterwards the pilot advised "*orbiting right*". He acknowledged and observed the ac at the mid-downwind position. He felt there was no conflict between the helicopter and the next departure, an A320. The A320 pilot was given an after departure instruction of "*turn left direct GLESK*" and cleared for take off. He watched the A320 turn crosswind left (ATM showing 1600ft amsl) and checked on the helicopter which he saw at the start of downwind leg, further to the N than he expected based on their transmissions. He still felt there would be no conflict based on A320 performance and that he had both ac in sight and could apply reduced separation in the vicinity of the aerodrome. The crew of the AS332 then reported they felt they had been too close, which he acknowledged. Based on the ATM tracks he estimated closest point to be c1nm/400ft apart but at that stage separation was increasing so he took no other action.

ATSI reports that at the time of the Airprox, the subject ac were under the control of the Aberdeen ADC who reported his workload as 'light but complex' and the traffic loading as 'light'. The weather reported at Aberdeen at 1950 was:

Surface wind 290° at 14kt, varying between 250° and 310° and gusting to 24kt, visibility 35km, nil weather, few at 2500ft, scattered at 4000ft, temperature +13°, dew point +8°, QNH 988mb.

AIRPROX REPORT No 174/04

The AS332 was crew training in the circuit and operating under a Special VFR clearance and was typical of many such training flights which occur at Aberdeen. At 1944:10, the pilot advised that he wished to climb to 2500ft to carry out an autorotation from the downwind leg and the ADC acknowledged this and coordinated the use of 2500ft with APR. At 1947:00, the ADC cleared the AS332 pilot for take off from RW34 for a left hand circuit. One minute later he transmitted "*XXXX cleared Special VFR not above altitude two thousand five hundred feet QNH nine eight seven*".

Meanwhile, the A320 pilot had requested taxi clearance for a departure from RW34 and the ADC issued a clearance to holding point Whiskey One. At 1949:20 the ADC passed the following clearance "*YYYY is clear to London Heathrow via Papa Six Hundred climb to maintain flight level eight zero climb when instructed by radar flight level three seven zero squawk five four seven six*". The pilot read back the clearance correctly and was instructed to hold at holding point Whiskey One.

The ADC passed TI to the helicopter pilot advising "*...there's one to land and one to depart, report ready to commence the autorotation*", but he did not specify the departure's direction of turn. The pilot acknowledged and advised that he wished to make a low approach and go-around from the autorotation. At 1951:50, the ADC instructed the A320 pilot to turn left after departure direct to GLESK and, having obtained a correct readback, cleared him for take off. Shortly afterwards, the helicopter pilot reported that he was in a right hand orbit in his present position, so the ADC cleared him to commence his autorotation and after the low approach to make another left hand circuit. Having acknowledged this, the pilot subsequently advised that the departing traffic had come quite close to him "*....in the downwind position at this height*" and later he telephoned to state that he would be filing an Airprox.

MATS Part 1, Section 1, Chapter 3, page 1, requires that standard separation is provided between IFR flights and Special VFR flights; the subject ac were operating within Class D airspace and therefore, standard separation had to be applied between them. The ADC said that when he cleared the A320 pilot for take off he believed that the performance of the A320, together with the given weather conditions (surface wind passed at take off was 300° at 14kt) would result in it climbing quickly, to the extent that it would soon be above the AS332 and pose no problem with regard to separation.

The ADC was planning to use reduced separation in the vicinity of an aerodrome as the A320 departed as permitted in MATS Part 1; it does however specify: '*In the vicinity of aerodromes, the standard separation minima may be reduced if adequate separation can be provided by the aerodrome controller when each ac is continuously visible to this controller*'. The control tower at Aberdeen is located to the W of RW 34 and the ADC faces E. The unit's MATS Part 2, Section 1, Page 23, Para 5.1.2 (Noise Abatement – Circuit Procedures) states: '*Whenever possible, weather conditions and traffic permitting, circuits should be carried out away from the built up areas to the east and south-east*'. Thus AS332 was conducting LH circuits from RW 34, resulting in the helicopter being behind the ADC on the downwind leg.

The ADC advised that he had been confident that he would be able to visually confirm adequate separation between the ac on departure, even though the helicopter would be behind him, and only visible if he turned around and looked over his shoulder. He added that he had not passed TI to the departing A320 pilot because he saw no reason to do so as he would be monitoring the situation throughout. The noise abatement procedures required the crew of the A320 to climb straight ahead to 1000ft before turning left on track for GLESK (approximately 225°).

The AS332 was not squawking at the time and so was not showing any height readout. The ADC admitted that he had forgotten that the helicopter had been cleared to operate up to 2500ft, even though his flight progress strip was appropriately marked. He wrongly assumed that it was not above 1700ft, which is the standard height for circuit operations, due to noise abatement considerations, and also high terrain to the W of the airport. When the A320 had departed the ADC looked for the AS332, both visually and using the ATM, and then realised that it was not where he was expecting it to be. As the A320 passed 1600ft it commenced a left turn onto the track for GLESK and passed approximately ½ nm N of the AS332 and 200ft above it. (*Note: The exact alt of the helicopter at the time of the Airprox could not be positively established, as it was not squawking. However, the unit reports that when the pilot telephoned ATC after the incident, he specified that his altitude had been 2300ft*).

Although there is no specific requirement in MATS Part 1 to pass TI to IFR flights on Special VFR flights, because separation should be provided by ATC, in cases such as this, it would be prudent to do so. Since the AS332 was not squawking, the A320 crew would not have been alerted to its presence by TCAS. The Aerodrome controller stated that the ATM does not always show traffic that is operating close to the aerodrome, particularly non-

squawking returns. MATS Part 1, Section 1, Chapter 5, Page 7 Para 4.7 (Conspicuity Code) states: 'The Conspicuity code, 7000, together with Mode C should be displayed by all suitably equipped ac unless:

- a. They have been assigned a discrete code.
- b. They are flying in an aerodrome traffic pattern below 3000 feet; or
- c. They are transponding on one of the special purpose codes or on one of the other specific Conspicuity codes assigned in accordance with the UK SSR Code Allotment Plan.

Subsequent to this Airprox, a Supplementary Instruction (SI 29/04 EGPD) was issued instructing controllers to include a squawk of 2617 as part of the clearance for ac that are remaining in the circuit.

The A320 was operating under IFR and the AS332 under Special VFR in Class D airspace. There was therefore, a requirement for standard separation to be provided between the ac. The ADC intended to use 'reduced separation in the vicinity of the airfield', however, this required the subject ac to be continuously visible to him. Subsequent events indicate that this was not the case and he was assuming that a rapid climb by the A320 would mean that it passed well clear of the AS332. Accordingly, it is questionable as to whether this was a valid technique to employ in these circumstances.

Although the AS332 pilot reported carrying out a right hand orbit, he actually flew a racetrack pattern and so was not in the position that the ADC expected. As the ADC was not continuously monitoring the position of the AS332, as he should have been and he was not aware of the developing conflict until too late. His lack of awareness was compounded by the fact that he had forgotten that AS332 was operating up to 2500ft. The climb performance of the A320, assisted by the wind, resulted in a rapid climb through 1000ft and so the A320 turned earlier than the controller expected and into conflict with the AS332.

UKAB Note (1): The Radar recording provided by Scottish ACC was of poor quality and although the separation could not be assessed accurately, the figure of approximately ½nm was considered reasonable.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

In the Board's view neither pilot had contributed directly to the circumstances of this incident. The Board considered that the weather had been adequate for the training exercise planned to be undertaken SVFR by the AS332 and agreed with the pilot that distances would have been very difficult to estimate from the air (and virtually impossible from the ground).

The Aberdeen ADC did not have a clear and uninterrupted view of the AS332, as witnessed by it not being in the position or height that he expected when he released the A320. He thought, mistakenly, that the A320's performance would have ensured adequate reduced separation; regardless that he did not actually have the helicopter in sight. The strength and direction of the wind, possibly exacerbated by the ac loading (unknown to the Board) may have combined to this less than ideal separation. In addition, Members thought it likely that the ADC had made a simple error and either forgotten or not assimilated that the AS332 was at 2500ft rather than the usual circuit height of 1700ft.

Despite lack of accurate TI, the AS332 pilot was aware of the situation, was visual with the A320 throughout and this resulted in his taking suitable and effective avoiding action by continuing his right turn. Further, before the actual conflict point the A320 pilot also saw the helicopter (lights) and this being the case the Board considered that there had not been any risk that the ac would have collided.

The Board noted the various comments on the advisability of squawking in the visual circuit and commended the speedy follow-up action.

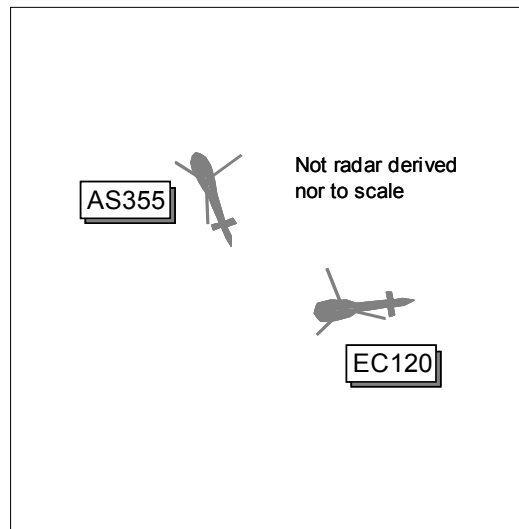
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Aberdeen ADC did not provide adequate separation between the AS332 and the A320.

Degree of Risk: C.

AIRPROX REPORT NO 175/04

Date/Time: NIGHT15 Sep 1900
Position: 5131N 00316W (3nm W Cardiff City)
Airspace: LFIR (Class: G)
Reporting Ac Reported Ac
Type: AS355 EC120
Operator: Civ Comm Civ Comm
Alt/FL: 500ft 600ft
 (agl) (QNH 1025mb)
Weather VMC NK VMC NK
Visibility: 10km 10km
Reported Separation:
 Nil V 100m H 100m H
Recorded Separation:
 NR

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

THE AS355 PILOT reports heading 340° at 5kt in a hover at Radyr near Cardiff City at 500ft agl and in receipt of a FIS from Cardiff APPROACH on 126.62MHz squawking a discrete code with Mode C. The visibility was 10km in VMC and the helicopter was coloured dark blue/yellow with nav, strobe and night-sun spotlight all switched on. ATC gave him TI on unknown traffic not working the ATSU but displayed on the Cardiff radar heading in his direction. This traffic was displayed on his TCAS equipment about 5nm away but it was not sighted at the time. TCAS gave a warning alert and nothing was seen immediately until he looked over his R shoulder through the rear R window and saw a red coloured EC120 helicopter passing 100m behind at the same level in a descent to a private landing site. He assessed the risk as high.

THE EC120 PILOT reports flying inbound to Miskin Manor heliport VFR squawking 7000 with Mode C. Heading 270° at 80kt descending from 2000ft QNH 1025mb for landing he saw a blue and yellow AS355 2nm ahead and below in a hover at about 500ft agl. His first intention was to pass to the N of the helicopter but seeing it was operating a search with a nite-sun floodlight, he decided not to get in their way. He changed his plan and elected to pass S of it, which he did by 100m, as he descended through 600ft QNH 1025mb. He assessed the risk of collision as none as he was visual with it throughout.

ATSI comments that no apparent ATC implications were disclosed – the RT transcript largely supports the reported accounts of events. The AS355 crew established communication with Cardiff at 1843 and reported getting airborne from the Cardiff Heliport, to operate over the city not above 1500ft, requesting a FIS. The FIS was agreed by ATC. At 1858, the Cardiff controller alerted the AS355 crew to "... unknown traffic to the east of you routeing westbound no height information." The pilot reported operating not above 1000ft. The controller subsequently updated the TI, advising that the unknown traffic was mile on the AS355's LHS and, a short time later, half a mile behind. The pilot advised "... TCAS just picked that thing up it was an EC One Twenty westbound ... he was very very low and it was very very close." The controller confirmed that the traffic was unknown. A few seconds later, what proved to be, the EC120 pilot came on the frequency advising "EC One Twenty is on er the way for landing and I had contact with you tried to talk with you but I had er the switch on the wrong I'm very sorry." Subsequent communications confirmed that the EC120 was inbound to the Miskin Manor Hotel not above 1000ft. No mention was made on RT that an Airprox would be filed which would explain why the Cardiff controller did not submit a report. The Airprox occurred outside CAS and does not show on recorded radars.

Miskin Manor Hotel helipad is adjacent to J34 of the M4 Motorway and is listed in the Pooleys Flight Guide which states the following: "All flights to contact Cardiff App 124-10 (VFR), 125-85 (IFR) due close proximity of Cardiff CTR/CTA."

UKAB Note (1): Sunset at Cardiff Airport was 1826Z with the end of civil twilight being 1900Z.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts of the relevant RT frequencies and reports from the appropriate ATC authorities.

It was clear that 'see and avoid' had worked during this encounter in Class G airspace to the N of Cardiff Airport but with differing viewpoints from each cockpit. The EC120 pilot had seen the AS355 2nm ahead and below and had planned to fly to the N of it. He had then changed his mind as he approached the hovering helicopter, turning L and electing to pass 100m behind (S of) the AS355 without any apparent problem. However, the AS355 pilot's perspective of the incident was different. After being given TI by ATC on the EC120, he had noticed its approach on TCAS. Following a TA alert, he was somewhat surprised when he visually acquired the EC120 as it passed close behind his helicopter by 100m. Clearly the separation distance chosen by the EC120 pilot had caused concern to the AS355 pilot which had led to the Airprox being filed. Moving onto risk, the EC120 pilot had maintained visual contact with the AS355 throughout and was always in a position to manoeuvre his helicopter further, should the need have arisen, which led the Board to conclude that safety had been assured during the encounter.

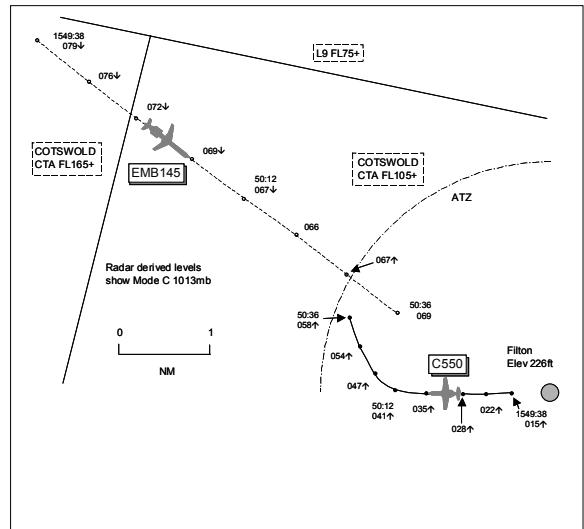
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The EC120 pilot flew close enough to the AS355 to cause its pilot concern.

Degree of Risk: C.

AIRPROX REPORT NO 176/04

Date/Time: 22 Sep 1550
Position: 5132N 00238W (2nm WNW Filton -
Airspace: LFIR (Class: G)
Reporter: Bristol APR
First Ac Second Ac
Type: EMB145 C550 Citation
Operator: CAT Civ Exec
Alt/FL: FL66↓ ↑FL70
Weather VMC CLAC IMC CLAC
Visibility:
Reported Separation:
 NR 1200ft V 0.25-0.5nm H
Recorded Separation:
 1100ft V 0.5nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BRISTOL APR reports that the EMB145 was inbound from BCN VOR and its descent was coordinated with Filton Radar through their overhead to FL60. Filton advised that they had a northbound departure and this was coordinated to climb not above FL50 until both ac were no longer in conflict. The EMB145 crew were given TI on the pending departure. The Filton departure was observed airborne but as it climbed through FL47 the EMB145 crew reported “TCAS climb” (descending through FL64) and commenced a climb; the radar blips were head-on and about 0.5nm apart. The radar blips and SSR labels merged but once they de-merged, the EMB145 was at FL68 whilst the Filton departure was seen to have climbed through the originally coordinated level.

THE FILTON APR reports working solo (no ATSA support) with Bristol inbound traffic from the NW coordinated to descend to FL60 until S of Filton against his outbound Citation routeing to RADNO climbing to FL50 until the 2 ac had passed. When the Citation pilot made his initial call, it seemed that if the ac climbed continuously there would not be a conflict with the Bristol inbound traffic owing to their relative positions and levels. As he did not want the Citation to level-off unnecessarily whilst he coordinated further climb with Cardiff, he instructed the flight to climb to FL70 before it had passed the Bristol inbound. Very shortly afterwards, the Citation pilot said that he had TCAS information on traffic descending from above below FL70. The APR confirmed that he was aware of the ac and told the pilot of his reasons for giving him climb as well as indicating that he could level at FL50 if he was concerned about separation. As far as he could tell, the Citation pilot continued his climb to FL70 and then further through airway L9 to FL140 after coordination with Cardiff. Whilst he immediately regretted his decision not to allow the Citation to level at FL50, he did not think that standard separation had been lost. Ten minutes later the Bristol APR telephoned, informing him that the Bristol inbound ac had had a TCAS advisory and had climbed to FL67 from FL60 as a result. The Filton APR had been unaware of this until he had been told by the Bristol APR who could not confirm whether separation had been lost although the Filton controller indicated that he did not think it had. Owing to other workload and his initial confidence that a conflict could not occur, he did not continuously monitor the relative levels of the subject ac during the encounter.

THE EMB145 PILOT reports inbound to Bristol IFR at 240kt and in receipt of a RCS, he thought, from Bristol on 136.07MHz squawking 4371 with Mode C. Having been cleared for descent to FL60, strong tailwinds and being high against the desired profile had necessitated a high ROD. TCAS gave a TA alert on traffic 7nm ahead so the ROD was reduced to 2000fpm, the other ac seeming to have a high ROC. Descending through FL66 an RA ‘climb’ command was received which was followed until ‘clear of conflict’ was received at approximately FL70. At the time the ac was VMC on top of cloud, the other ac was not visually acquired and he was unable to note separation distances owing to cockpit workload. He assessed the risk as medium.

THE C550 PILOT reports heading 330° at 220kt outbound from Filton IFR and in receipt of a RIS, he thought, from Filton on 122.72MHz squawking 5475 with Mode C. Earlier he had been given an initial clearance (by the ADC)

AIRPROX REPORT No 176/04

to fly on track to RADNO climbing to FL130 and to request higher from radar. After being held on the RW for a short period, he was given an amended clearance to maintain RW heading to 3000ft before turning R towards RADNO and to stop climb at FL50. After departure he changed to APP and checked in on the frequency and was identified and given a radar service. He then advised ATC of a TA alert on traffic indicating +4600ft, he thought, and was told that there was no conflict, clearing him direct to RADNO or possibly onto a NW'ly heading, he was unsure, and to climb to FL70: at the time he was in IMC. Shortly thereafter, a TCAS RA command to reduce ROC was received, the other ac showing +2500ft, so he followed the guidance, as per the TCAS VSI, to approximately 1700fpm but there was still an RA. He told ATC that he was levelling-off owing to the RA and at that point he became VMC and saw an EMB145 in his 12 o'clock 0.25-0.5nm away crossing L-R, appearing to be in level flight. He looked at the TCAS display which was still giving an RA showing +1200ft. He then asked ATC about the other ac and was told that there was no conflict and to climb to FL70, which he did visually, as the EMB145 was now clear to his R and some distance away owing to their respective speeds. He did not assess the actual risk but opined that without TCAS there would have been a high risk of collision.

ATSI reports that at the time of the Airprox, the EMB145 flight was in communication with the Bristol International APR and the C550 flight was operating under the control of the Filton APR. The Filton APR advised that his workload and traffic loading was 'light'. The Filton APR was working without an ATSA and he was content with this situation as traffic was very light and so the ATSA had been released to obtain the navigation warnings for the following day.

The EMB145 was inbound to Bristol International, its crew establishing communications with the Bristol APR at 1546:43. The pilot reported passing FL130 descending to FL80 and heading 150°. At 1546:50, the Bristol Approach ATSA telephoned the Filton APR to pass details on the EMB145 which was routing from the vicinity of the Brecon VOR, SE'ly towards the Filton overhead, on its way to Bristol International. It was agreed by the Filton APR that the EMB145 could descend to FL60 inbound to the BRI. At 1546:55, the Bristol APR instructed the EMB145 crew to descend to FL60 at which time the ac was 25nm NW of Filton.

Meanwhile, the C550 pilot had requested start up clearance and, at 1545:30, the Filton ADC advised the Filton APR that the Citation had started. An airways joining clearance was obtained and, shortly afterwards, there was a change of controller in the Filton APR position. At 1548:40, the Filton APR advised that the C550 was released for departure, on its own navigation, to join at RADNO and to maintain FL50. The Filton APR then telephoned Cardiff Radar and advised them that the C550 was about to depart and would be stopping its climb at FL50.

[UKAB Note (1): The Clee Hill radar recording at 1549:38 shows the C550 appearing on radar 0.4nm W of Filton tracking 270° indicating FL015 climbing (ROC c5000fpm) with the EMB145 6.4nm to its NW tracking 130°, indicating FL079 and descending (ROD c2500fpm). By 1550:12, the C550 is seen commencing a R turn climbing through FL041 with EMB145 2.6nm to its NW descending through FL067.]

At 1550:19, the C550 contacted the Filton APR and the pilot reported passing 3000ft and turning R to RADNO. The Filton APR responded *"C550 c/s Filton good afternoon radar advisory service climb to flight level seven zero"*.

The Bristol APR had advised the EMB145 of *"...traffic about to depart runway two seven at Filton, will be climbing to straight ahead in fact turning right to the north and climbing to one thousand feet below your cleared level"*. [UKAB Note (2): After the EMB145 crew acknowledge this transmission the Bristol APR transmits *"and EMB145 c/s leaving controlled airspace radar advisory service"* which is read back at 1549:30.] At 1550:16, the crew of the EMB145 reported a TCAS climb. The Bristol APR replied *"EMB145 c/s roger the traffic in your half past one correction half past twelve range of one and a half miles from left to right is levelling five zero on my screen"*. Shortly afterwards the pilot of the EMB145 reported that he was clear of the traffic and descending to FL60.

[UKAB Note (3): The radar recording at 1550:20 shows the EMB145 arresting its descent at FL066 before commencing its TCAS climb 8sec later. The CPA occurs just before the radar sweep at 1550:36 as the C550 was turning R on track for RADNO and the ac passed 0.5nm apart, starboard-to-starboard, with the EMB145 at FL69 and the C550 at FL58. Once the ac had passed each other, the EMB145 continued its descent and the C550 its climb.]

The Filton APR, having instructed the C550 flight to climb to FL70, was informed by the pilot that he had received a TCAS *"...two thousand eight hundred feet above me"*. The Filton APR explained that he had assessed the relative positions of the subject ac when the C550 took off and he believed that there was no possible confliction

between them and so it would be safe to climb the C550 above the coordinated level of FL50. However, when he was shown prints from the radar recording, he was unable to explain why he had made such a flawed decision and he could only suggest that the C550 climbed much faster than a 'typical' Citation departing from Filton.

He was fully aware of the level restriction although the unit practice is not to produce a 'blocking strip' in respect of such traffic inbound to Bristol. The controller explained that, when time permitted, it was his common practice to input the details of the Bristol inbound traffic into the Filton computer so that the code c/s display on the radar indicated that it was Bristol traffic. However, when traffic increased there was frequently little time to do this. In such circumstances the normal practice was to make a note on his scrap pad of the squawk and the coordinated level to which it was descending.

When asked why he had not gone back to the Bristol APR to inform him that the C550 would be climbing, the Filton APR advised that he saw no reason to do this as the two ac would not be in conflict. He had not expected the C550 to climb so quickly and this reaffirmed his belief that the two ac would not conflict. Although the Filton APR believed he was on the telephone when the C550 flight called him, an analysis of the transcripts does not support this. The C550 pilot called at 1550:19, and at 1550:56, a call is received from the LACC Sector 5 Planner giving details of further inbound traffic. At 1551:28, the Filton APR initiated a telephone call to Cardiff and coordinated a climb for the C550 into airway L9. Accordingly, it is assessed that the lack of an ATSA requiring the Filton APR to initiate and answer the necessary telephone calls was not a contributory factor.

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 noted that whilst the Bristol and Filton APRs had both specified the provision of a RAS to both flights, the crews were apparently unsure as to the type of service when completing their reports. Members questioned the Filton APRs actions when he issued climb clearance to FL70 as soon as the C550 pilot called on his frequency. This was contrary to the agreed coordination and climbing the C550 had brought the subject ac into conflict which had caused the Airprox. Leaving the cause to one side, the technique employed was based on ac performance but, in this case, the application by the Filton APR was flawed. He had had no time to assess the C550's ROC to ensure that in climbing above FL50, separation would be maintained and he had not monitored the traffic situation.

Turning to risk, the Bristol APR had no reason to doubt that, following agreed coordination, the potential confliction had been safely resolved and he had informed the EMB145 crew of the departing C550 climbing to 1000ft below their cleared level. Consequently he was surprised when the EMB145 crew reported a TCAS climb and had responded with TI on the C550's relative position and indicated level. The C550 pilot had promptly told the Filton APR about the TCAS TA alert on the EMB145 when he had been cleared to FL70 and was surprised when the controller told him that there was no confliction. Unbeknown to the C550 pilot, the Filton APR had not assimilated the high ROC of his ac. The EMB145 crew had first received a TA alert and reduced their ROD and then an RA climb command - which was promptly followed - resulting in the flight climbing briefly to about FL70 until 'clear of conflict' was announced. Meanwhile, the C550 pilot had seen the potential confliction from the outset and, after informing ATC, had monitored the situation. On receipt of an RA command, he had started to follow the guidance by reducing his ROC before he then broke cloud and visually acquired the EMB145 as it was passing 1200ft above. The combined actions taken by both crews in response to their coordinated TCAS warnings and the visual sighting by the C550 pilot led the Board to conclude that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

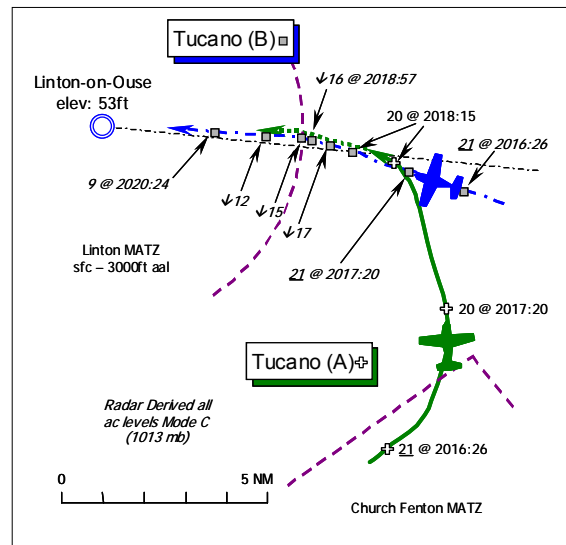
Cause: The Filton APR broke the agreed coordination and climbed the C550 into conflict with the EMB145.

Degree of Risk: C.

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Date/Time: 22 Sep 2019 NIGHT
Position: 5402N 00103W (5nm finals RW28 at Linton-on-Ouse - elev: 53ft)
Airspace: MATZ (Class: G)
Reporting Ac Reported Ac
Type: Tucano Tucano
Operator: HQ PTC HQ PTC
Alt/FL: 1800ft 1500ft
(QFE 1009mb) (QFE 1009mb)
Weather VMC CLBC VMC CLBC
Visibility: >10km >10km
Reported Separation:
33ftV/50m H 50ft V/50ft H
Recorded Separation:
Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PILOT OF TUCANO (A), a QFI, provided a laudably frank and comprehensive account reporting that his ac has a black colour scheme, but the navigation lights, anti-collision beacons and the HISLs were all on during a night VFR visual recovery from Church Fenton into Linton-on-Ouse Cct. The ac captain – the PNF - occupied the front seat and the handling pilot – also a QFI - was in the rear seat, whilst flying in VMC clear below cloud with an in-flight visibility of >10km. They were in receipt of a FIS from Linton APPROACH (APP) and squawking the assigned code of A4576 with Mode C. Neither TCAS nor any other form of CWS is fitted.

Whilst northbound to pick up the extended centre-line during a visual recovery to RW28 at Linton at 200kt, APP advised them of radar traffic at 9nm from touchdown on an instrument recovery. They immediately acquired the reported traffic visually, some 7nm to the N at about 9nm finals to RW28 crossing from R to L and so reported this to APP. The other ac [Tucano (B)] was reasonably well lit from its port beam, but he stressed that the aspect started to change from beam to astern as they crossed through the extended centre-line to offset to the N to overtake it and join the Cct for RW28. Another call was received from APP just before they crossed the centre-line of “previously reported traffic NW at 2nm” and this correlated with the same ac that they had spotted earlier, so with the instrument traffic in sight they changed to Linton TOWER to request a cct join. Both the front-seat captain and the rear-seat handling pilot had to momentarily look inside the cockpit to change radio frequency to TOWER, select the SSR transponder to standby and check their altimeter settings. Shortly, afterwards whilst heading 280°, in a slight descent through 1800ft Linton QFE (1009mb) at 5nm from the aerodrome just slightly to the R of the RW28 centre-line he [front-seat captain] “picked-up” a poorly lit ac at very close range. He immediately took control and used a “high G” pitching manoeuvre to avoid it passing some 50m to starboard and about 33ft (10m) above the other ac – Tucano (B) – with a “high” risk of collision. It would appear that after the rear-seat PF momentarily looked inside the cockpit, they had re-acquired another light source along the same line of sight (an ac going around the visual cct) instead of the poorly lit stern light of the reported radar traffic. He added that significantly the HISLs of the radar traffic – Tucano (B) - were found to be unserviceable upon landing.

THE PILOT OF TUCANO (B) a QFI, reports that his student was flying his ac, which has a colour-scheme of black with yellow flashes. The navigation lights, taxi light and the HISLs were all selected ‘on’ whilst executing a surveillance radar approach (SRA) to RW28 and in receipt of a RIS from Linton TALKDOWN on 358.525MHz. A squawk of A4572 was selected with Mode C, but neither TCAS nor any other form of CWS is fitted

Heading 300° at 115kt at six miles from touchdown descending through 1500ft Linton QFE (1009mb), TALKDOWN informed them about Tucano (A) joining visually and that the ac would pass down his right hand side. Spotting the navigation lights and HISLs of Tucano (A) some 2000m away in their 5 o’clock and slightly high, he was completely content until he saw Tucano (A) execute an emergency break at the last moment, as it passed some 50ft away to

starboard and 50ft above his ac with a “high” risk of a collision. Up until that point he had assumed that the crew of Tucano (A) was still visual with his ac.

THE TUCANO PILOTS’ STATION comments that the prime reason for this Airprox was that the principle of ‘see and avoid’ did not work for the crew of Tucano (A) joining the Linton-on-Ouse cct visually. This occurred after the crew of Tucano (A) had been ‘heads-in’ and subsequently misidentified an ac in the visual cct for Tucano (B) - the one they had previously seen on the SRA - and therefore, believed they had adequate separation. The failure of the wing-tip HISLs on Tucano (B) is an additional factor in that it made visual acquisition of that ac difficult.

Mixed IFR/VFR day and night recovery procedures are well practised at 1 Flying Training School and crews have been reminded of the need for extra vigilance during night flying and that when joining the cct visually they must ensure that all ac are positively identified and that adequate separation must be maintained

MIL ATC OPS reports that on the evening of this Airprox, scheduled night flying training had commenced in acceptable meteorological conditions which, however, began to deteriorate with patchy cloud cover as low as 500ft agl. At 2015:34, the crew of Tucano (A) called Linton APP requesting “*visual recovery from Fenton with charlie*”. APP responded with details “*charlie correct, runway 28 left hand, Linton QFE 1009*”, which the crew readback. At 2016:04, APP prenoted Linton GROUND with details of Tucano (A)’s visual recovery. Some 20sec later, at 2016:24 the crew of Tucano (A) was passed a warning of “*...radar traffic at 9 miles*” – Tucano (B) - that was acknowledged. At 2018:12, APP was contacted by Linton TALKDOWN who was providing an SRA to Tucano (B), requesting traffic information about “*..traffic south of the centreline at 7 miles by 3 miles tracking north indicating 2100ft*” – Tucano (A). APP did not immediately respond to this but informed Tucano (A)’s crew “*...radar traffic is now north west by 2 miles indicating similar level.*” The crew of Tucano (A) responded “*visual*” and APP informed TALKDOWN “*visual with you...*” - meaning Tucano (B). At 2018:46, the crew of Tucano (A) reported “[C/S] *field in sight squawking standby to TOWER*”. Tucano (A) crew called Linton TOWER at 2019:00, who responded “*join runway 28 left hand, QFE 1009, surface wind 300-5 knots, 3 in, radar traffic 5½ miles*”. Tucano (A)’s crew readback the QFE and reported visual with the radar traffic. No reference was made to an Airprox until after the ac had landed.

[UKAB Note (1): Analysis of the Claxby SSR recording shows Tucano (A) outbound from Church Fenton squawking A4576 [a Vale of York conspicuity squawk] indicating 2100ft Mode C. Tucano (B) is also shown ESE of Linton-on-Ouse inbound for the SRA to RW28 squawking A4503 indicating 2100ft Mode C. Tucano (A) commences a slow L turn onto a track of 340° steadying at 2017:20, with Tucano (B) 100ft above them in the reporting crew’s L 11 o’clock at 3½nm tracking 290°. Tucano (A) then converges from Tucano (B)’s port quarter. At 2018:15, whilst in (B)’s 6 o’clock at a range of 1nm Tucano (A) turned L and crossed the RW28 centre-line onto a track of 290° indicating the same level – 2000ft (1013mb) – but overtaking at a faster speed. At this point Tucano (A) disappears from secondary radar coverage as the crew switch their transponder to ‘standby’, Tucano (A) is not shown thereafter, consequently, the minimum separation cannot be ascertained. Tucano (B) continues inbound on the SRA descending through 1600ft Mode C – in the order of 1500ft QFE (1009mb) – as the ac enters the MATZ and when the pilot reports that he saw Tucano (A) breaking to starboard just as the Airprox occurred.]

The crew of Tucano (A) called APP to carry out a visual transit and recovery from Church Fenton to Linton-on-Ouse. This procedure is covered within No1 FTS Flying Orders at B311 which requires crews to transit at 2000ft Linton QFE and to squawk A4576 with Mode C selected. Flying Orders further stipulate that a FIS will automatically be applied to VFR recoveries without statement on RT, and that the pilot may be given proximity warnings of other traffic but remains responsible for separation from all other ac. The crew of Tucano (A) was initially warned of the proximity of Tucano (B) at 2016:28 as “*radar traffic at 9 miles*”. Traffic information was passed to Tucano (A)’s crew at 2018:19, when Tucano (B) was reported as “*north west by two miles indicating similar level*”. Tucano (A) crew immediately reported visual with Tucano (B) and subsequently reported squawking standby and transferring to TOWER. APP controlled Tucano (A) in conformity with the recovery procedure laid down in Flying Orders. The traffic information passed to the crew of Tucano (A) was timely and accurate although the information passed at a range of 2 nm should have been passed in a different format as Tucano (A) had not been formally identified. However, this phraseology lapse does not have any bearing on any factors affecting this Airprox.

HQ PTC comments that this incident could easily have been dismissed as a routine occurrence and resolved “in house” without the analysis that it deserved and, thankfully, received by the Station. We are satisfied that reports of imperfect weather elsewhere did not affect the area of the Airprox and that the strobes had been checked and

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found serviceable before flight. Many nighttime spatial awareness factors may also have been in play, not least caused by the lead aircraft's reduced lighting, but these would be largely speculative. In the end, lookout worked but a bit too late for comfort and there are lessons here deserving of wider dissemination. For the time being, we applaud the candour of the reports and are satisfied that the hazard has been well-analysed by the Station and aired amongst its pilots.

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 Board agreed that APP had provided the crew of Tucano (A) with a good service and sound traffic information on Tucano (B) which had enabled them to sight the IFR traffic first of all and take due account of it whilst running in to join the aerodrome Cct. It was evident from the comprehensive report provided by the pilot of Tucano (A) that the PF had lost sight of Tucano (B) at the critical moment, not helped - he reported - by the unserviceable HISLs of the radar traffic. The HQ PTC Member briefed the Board on the location of the Tucano's HISLs - 2 within the wingtips and one under the tail. Apparently these HISLs work off the same switch and there was some confusion over whether all three HISLs of Tucano (B) were unserviceable or just the starboard wing-tip and tail units. It seemed inconceivable that the crew of Tucano (B) would not have detected themselves that the wingtip HISLs of their ac were not working. The PTC Member explained, however, that together with the tail HISL, they are well shielded and there is no independent cockpit indication if one or two of the three lights had failed. Subsequent investigation had revealed that the engineers had apparently just logged the "HISLs" as being u/s and fixed them without noting specifically which light was not working. Thus it could not be proved conclusively exactly which lights were being displayed to the crew of Tucano (A) at the time and whether the tail HISL was on or not. It seemed to the PTC Member that on the balance of probabilities neither the tail nor starboard wing HISL of Tucano (B) were working at all during the ac's final approach. Consequently, the crew of Tucano (A) would probably only have had a view of the other ac's normal tail light as they flew abaft (B)'s port beam and thereby out of the sector from which the port navigation lights and the wingtip HISLs were visible through to its port quarter, then crossing astern to overtake on the starboard side of Tucano (B) where the green navigation light would have been visible once more. The Board understood how the crew of Tucano (A) could have lost sight of (B) against the background of the aerodrome lights and the three circuiting ac at Linton, whilst crossing through the extended centre-line of the RW, confusing the location of (B) and consequently misjudging their visual separation underneath a 2900ft overcast cloudbase.

From this laudably frank account, here was a salutary lesson over the difficulties of mixing IFR and VFR traffic at night and the safe maintenance of visual separation based on ac lights. From the cockpit of Tucano (B), the QFI was understandably not concerned by the proximity of (A) given the advance warning provided within the traffic information from TALKDOWN. Thus whilst distracted by internal cockpit tasks as they switched to TOWER, and unaware of their proximity to the other ac, having lost visual contact because of the lack of HISLs on Tucano (B), the crew of Tucano (A) flew into conflict with Tucano (B). The Board agreed unanimously that this was the fundamental cause of this Airprox, with the lack of HISLs being a significant contributory factor.

The reporting pilot's account made it clear that as the front-seat PNF, he "picked-up" the poorly lit Tucano (B) at very close range. Fortunately, he recognised the situation and immediately took control to fly away from the other Tucano, thereby resolving the conflict. Unfortunately, the absence of recorded radar data after the crew of Tucano (A) switched off their transponder did not allow the minimum separation to be determined independently. Although this sighting at the last moment had allowed him to avoid the other ac, the minimal separation reported of not less than 33ft vertically and 50m horizontally was certainly very close. Indeed, the pilot of Tucano (B) - who might have been better placed to judge this distance - estimated that (A) was only 50ft away horizontally. However, believing that the crew of Tucano (A) would maintain appropriate separation, (B)'s pilot had not apparently felt it necessary to take action himself. Whereas the robust avoiding action taken by one of the crews involved had removed the actual risk of a collision, the Board agreed that the safety of these two ac was certainly compromised in the circumstances related here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Having lost visual contact, the crew of Tucano (A) flew into conflict with Tucano (B).

Degree of Risk: B.

Contributory Factors: Lack of HISLs on Tucano (B).

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AIRPROX REPORT NO 180/04

Date/Time: 28 Sep 1112

Position: 5147N 00045W (1.2nm SW of Halton - elev 370 ft)

Airspace: Halton ATZ/FIR (Class: G)

Reporting Ac Reported Ac

Type: PA25 C150

Operator: Civ Group Civ Pte

Alt/FL: 1700ft 2500ft

QFE (1008mb) (Luton QNH)

Weather VMC CLBL VMC NR

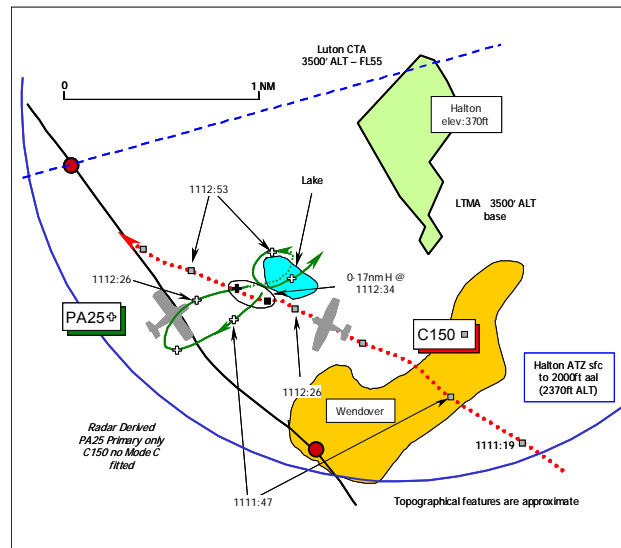
Visibility: 8km+ NR

Reported Separation:

200ft V/100ft H 200ft V/ 6-800ft H

Recorded Separation:

<0.17nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PA25 PILOT reports his ac has a blue colour-scheme and the HILS were on whilst conducting aerotows at Halton for the purposes of launching gliders at the Joint Services Adventurous Training establishment [JSAT (G)] at Halton. He was in communication with HALTON RADIO A/G Station on 130.42MHz; SSR is not fitted. At the time of the Airprox he was flying about 1300ft clear below cloud but in between layers with an in flight visibility of 8km+.

Descending at 100kt in the Halton ATZ for recovery to the aerodrome from an aerotow glider launch with the cable in trail, he received a broken radio call from the A/G operator advising of unknown traffic within the Halton ATZ. Whilst passing a height of 1700ft Halton QFE (1008mb), heading 020°, he immediately spotted a red/white high-wing single engine 'tail-dragger' ac at 2 o'clock crossing from R – L below his PA25. As he was on a descent into the Cct at Halton to avoid a collision, he had to apply full power and climb. The minimum horizontal separation was 100ft as he passed 200ft above the other ac, that was at least 500ft below the upper vertical limit of the Halton ATZ (2000ft aal), on the edge of Wendover Village. He assessed the risk of a collision as "very high".

THE CESSNA FRA150K TAIL WHEEL CONVERSION (T/W) PILOT reports his ac has a red & white colour-scheme and the fin mounted anti-collision beacon was on whilst in transit from Elstree to Shobdon in VMC at about 95kt. He was "listening" to Luton APPROACH on 129.55MHz but not in receipt of any ATS; a squawk of A7000 was selected but Mode C is not fitted.

Flying in level cruise at "approximately 2500ft" Luton QNH heading about 300° (M), out of the sun, he first saw the PA25 at a range of about 800m. The other ac was flying on a reciprocal heading in a shallow descent, whilst executing a large radius turn, he thought to port. [UKAB Note (1): This might have been the glider which was released at about this point and turned left.] He felt the other ac's flight path would bring it close to his Cessna and the PA25 pilot appeared not to have seen his ac. Therefore, to avoid the PA25 he banked steeply to port to attract the PA25 pilot's attention and then made a medium level turn to the W to increase separation as the PA25 crossed ahead from L – R some 200ft above his ac before passing 6-800ft to starboard with a tow-rope attached. The PA25 was in view at all times and he assessed there was "no" risk of collision.

UKAB Note (2): The UK AIP at ENR 2-2-2-2 notifies that the Government aerodrome at Halton has an ATZ of 2nm radius centred on RW02/20, extending from the surface to 2000ft above the aerodrome elevation of 370ft amsl. An A/G Station callsign HALTON RADIO operates on 130.425MHz between 0700-1900 or SS (1hr earlier in Summer).

UKAB Note (3): The UK AIP at ENR 5-5-1-2, promulgates that Halton Glider launching site is active during daylight hours for winch and aerotow launches, which may attain a height of 2000ft agl. This activity is also the subject of a current AIC – 71/2004 (Yellow 143) –, which was issued on 19 Aug over one month before the Airprox occurred. This AIC promulgated the increase in activities subsequent to the move of the JSAT (G) to RAF Halton for the benefit of other airspace users.

THE HALTON DUTY INSTRUCTOR & AIR/GROUND STATION OPERATOR reports that he was also acting as the Supervisor during JSAT (G) gliding operations at Halton. At about 1110 UTC he heard an ac and then saw it approaching the aerodrome from the ESE, estimating that if it was not already inside the Halton ATZ then it was about to enter the Zone below a height of 2000ft aal. He passed an 'all stations broadcast' on the frequency saying:

"All Halton aircraft Halton unannounced traffic from the south east passing to south west of airfield" or words to that effect.

Immediately after his transmission, the unknown ac – a C150 - was observed to roll L through some 30° and appeared to be converging with the returning glider-tug in the vicinity of Wendover. The PA25 tug was on the DOWNWIND leg and just to the left of the extended centreline for RW20 just about over 'The Lake' so he transmitted to the tug pilot "[C/S] Halton did you copy my last?" But the PA25 tug pilot had not and replied, "say again, you're broken". He could not recall if he gave a second warning at this juncture, but in any case the PA25 tug was seen to pitch up and the engine was heard as the pilot applied power whereupon the PA25 pilot reported he was visual with the other ac.

UKAB Note (4): The Heathrow radar recording shows an A7000 squawk that has been identified as the C150 in transit approaching the lateral boundary of the Halton ATZ to the SE of Wendover. The C150 – no Mode C fitted - crossed the ATZ boundary at about 1111:19, and overflies Wendover at 1111:47 as it reportedly flies above the SW sector of the ATZ approaching the PA25 which is shown as a primary contact only. It appears that whilst on a southwesterly heading the PA25 tug releases a glider (which then turns L – the glider is omitted from the diagram for clarity) before the tug breaks into a R about turn back toward Halton. At 1112:26, the PA25 is tracking NE with the C150 maintaining a generally NW'ly track in the PA25 pilots R 1 – o'clock at ½nm and probably just after the PA25 tug pilot saw the C150. The latter then makes a L turn to the west before resuming course to pass astern of the PA25 as reported. At 1112:34, the PA25 crosses through the C150 pilot's 12 o'clock at range of about 340yd (0.17nm), but the primary contact is then lost for some time as the PA25 pilot initiates a L turn into an orbit and is next shown passing through W at 1112:53 as the C150 continues NW'ly.

UKAB Note (5): It has not been possible to resolve the vertical geometry of this encounter. The PA25 pilot reports he was descending through 1700ft QFE (1008mb) within the ATZ when he spotted the other ac and climbed above the C150. Whereas the C150 pilot reported, and reaffirmed in a telephone conversation with UKAB staff, that he was flying at an altitude of "approximately 2500ft" Luton QNH which would theoretically place the C150 above the ATZ. (Met Office archive data gives the Luton QNH as 1018mb). A height of 1700ft QFE (1008mb) would equate to an altitude of 2070ft, therefore, it is not feasible that the C150 could have underflown the PA25 at an altitude of 2500ft (1018mb).

HQ PTC comments that the JSAT (G), although a service-sponsored organization, operates under the aegis of the CAA and BGA but from a Government aerodrome on PTC land. The operation of aerotows normally involves a rapid descent after the glider is released which, using a low-winged aircraft like the PA25, can leave the pilot unsighted beneath him unless vigorous clearing turns are employed. Whether the 2 ac were within the ATZ cannot be established and is largely irrelevant to the proper exercise of airmanship. We are pleased that the A/G Operator was able (although well outside his TORs) to give the PA25 pilot sufficient warning for him to get no closer to the Cessna. However, the latter had had already to take stringent avoiding action.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, radar video recordings, a report from the Air/Ground Station operator involved and comment from the aerodrome operating authority.

The assessment of this Airprox by the Board was somewhat inconclusive as it could not be shown by any independent means that the C150 had actually entered the Halton ATZ - as had been alleged by both the PA25

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tug pilot and the A/G Operator in their reports. The C150 pilot had reported that he was flying at an altitude of "approximately 2500ft" Luton QNH (1018mb), which would theoretically place the C150 above the ATZ by approximately 130ft. The Board recognised that it was entirely feasible that the Airprox could have occurred at a height greater than that recounted by the PA25 pilot, but it was equally feasible that the C150 pilot was flying lower than his reported altitude. Without the benefit of Mode C data, this could not be resolved. The STC Member suggested that the CAA 1:500,000 VFR chart is quite cluttered in this vicinity and the shading for the Luton Class D CAS might have masked the presence of the ATZ to the C150 pilot during his pre-flight route planning. However, the Board was briefed that in a telephone conversation with UKAB staff the C150 pilot had advised that he was a tug and glider pilot himself and is familiar with the airspace on this route, which he flies most weekends. Whereas he was aware of winch launching from this aerodrome and would thus not consciously overfly it for that reason, he was not aware before this Airprox that aerotows took place from Halton. Nevertheless, the Board was surprised that he had chosen to fly this close to the aerodrome without calling as it is indeed notified in the UK AIP for winch and aerotow launches, and the increased activity had been promulgated in the AIC. The Board was briefed that the PA25 pilot had reaffirmed that he had not climbed above a height of 2500ft above Halton to release the gliders that morning, nor was there indeed any necessity to do so, and he was descending back towards Halton for another aerotow when the Airprox occurred. A GA advisor had commented that whilst there was no incontrovertible proof that the C150 had entered the ATZ, in his opinion the C150 pilot had flown unnecessarily close to this notified gliding site. Flying a mere 1.2nm upwind of a glider launch site at these altitudes was questionable airmanship, a point with which many other Members concurred. Several Airprox have been reported in this vicinity in recent years and a GA Member reminded the Board of the publicity given to these encounters to promote awareness of Halton ATZ. Nonetheless the Board remained very concerned at the number of occurrences brought to light in this vicinity. A controller Member who is validated to provide an ATS in this locale commented on the frequent warnings that he has personally given to GA pilots in the past reminding them of Halton and Panshanger. Unfortunately, here the C150 pilot was merely listening out with Luton APPROACH and not under an ATS. Some Members thought it would have been more helpful if the C150 pilot had called HALTON RADIO, which potentially could have alerted the tug pilot to the C150's presence earlier and might well have given the C150 pilot some greater insight as to what was happening in the vicinity. It was evident that both pilots' reports had agreed that the Cessna had underflown the PA25 by 200ft, therefore the geometry of the encounter was not in question, only whether it was inside or outside of regulated airspace. Regardless of this aspect, there was a responsibility for both pilots to sight each other's ac in time to remain sufficiently clear. Here the PA25 pilot had reported he had seen the C150 only after the warning from the alert A/G Operator, and then climbed at full power to avoid it; he later said to a maximum of 2300ft Halton QFE. Whereas the C150 pilot had seen the PA25 from 800m away, when it had then turned - he thought L. The radar recording had reflected the C150 pilot's turn W to increase the separation, but clearly the PA25 had turned R inbound toward the aerodrome and away from the other ac, so he would not have had an opportunity to sight the C150 easily until he was rolling out of the turn toward Halton, whence he spotted it and took action himself to avoid the Cessna. Weighing all these factors carefully for relevance, the Board could only conclude, rather unsatisfactorily, that this Airprox had resulted from a conflict in the vicinity of the Halton ATZ resolved by both pilots.

Turning to the aspect of risk, a Member opined that it was indeed fortunate that each pilot had seen the other ac when they did. Arguably, when converging at about the same level outside the ATZ then the PA25 was required to give way in this crossing situation. The C150 pilot was wise to turn when he did but it would have been prudent to have given the other ac a wider berth. Perhaps unbeknown to the C150 pilot until the latter stages of the encounter, the PA25 had a towline under tow which, if streamed at a length of some 5-600ft behind the tug, also posed a very significant hazard to the C150. This coupled with the recorded horizontal radar separation of 340yd between the two ac as the tug crossed ahead of the C150 with some 200yd of towline behind it, led the Board to conclude that whilst both pilots had done just enough to avert an actual collision, the safety of the ac involved had not been assured in these circumstances.

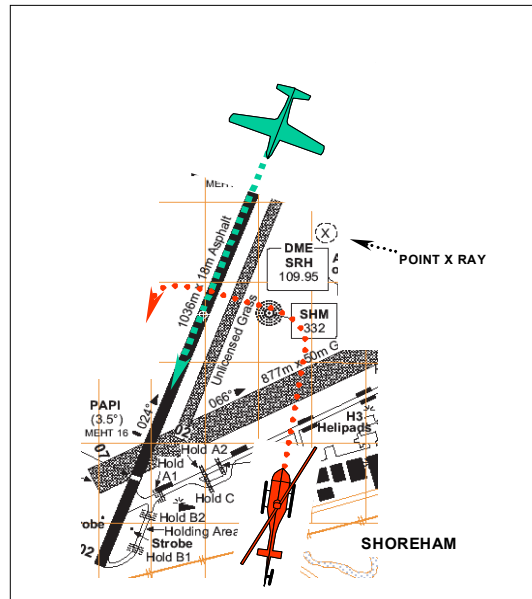
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the vicinity of the Halton ATZ resolved by both pilots.

Degree of Risk: B.

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Date/Time: 1 Oct 1116
Position: 5050N 00017W (RW20 Shoreham
 Airport - elev 7ft)
Airspace: Shoreham ATZ (Class: G)
Reporting Ac Reported Ac
Type: Chipmunk Bell 206 Jet
 Ranger
Operator: Civ Trg Civ Pte
Alt/FL: 20ft agl 100ft
 (QFE 1017 mb) (QFE)
Weather VMC CLBC VMC CAVOK
Visibility: >10km Good
Reported Separation:
 100ft V/O H 50m
Recorded Separation:
 Not recorded

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

THE CHIPMUNK PILOT reports flying a circuit training flight with an experienced ATPL student in a red white and grey ac with the taxi light on but with no strobes or anti-collision beacon fitted. He was in communication with Shoreham APP; an SSR transponder was fitted to the ac but he was not squawking. He had been cleared by APR to perform a touch and go landing on RW20. Shortly before, he had heard the controller clear a Jet Ranger to lift and hold to the E of RW20, i.e. to his left. He then saw the Jet Ranger lift 500m away but momentarily lost sight of it as his attention became focussed on the touchdown point. They performed a successful 'wheeler' landing and he instructed the student to lower the tail before accelerating to take off speed. They had just got airborne at 50kt in the last third of the RW when he became aware of the Jet Ranger above and to his left and it then headed across the RW at approx 90° to his heading. It passed directly over his ac at an estimated height of approx 100ft. He was about to instruct the student to hold the ac in level flight when he (the student) commented on the proximity of the helicopter and unilaterally took the required avoiding action. After crossing the centre line the Jet Ranger then took up RW heading displaced by approx 100m horizontally to the right. Due to their simultaneous sighting of the Jet Ranger and the fact that their ac had not pitched up into the climb immediately he assessed the collision risk as medium.

THE B206 PILOT reports that on the day of the Airprox he was due to fly the white and green Jet Ranger to Biggin Hill for maintenance on a 'collective' control problem. The airfield was busy and he was in the hover waiting for clearance to depart from Shoreham ATC. He had requested an 'into wind' departure i.e. via RW20 which was active. After a period of waiting he was cleared to hover taxi to Point X-ray which is a grass area adjacent to the main RW. He was distracted by his problem with the 'stiff' collective lever that made the helicopter difficult to hover. ATC offered him a clearance/departure to the NE which he accepted; however he continued with his original 'into wind' departure via RW20. Shortly after entering the climb he noticed a Chipmunk on his left side overtaking him just as ATC instructed him to do a left turn behind the Chipmunk that had now passed. He reported that the Airprox was largely his fault, however it would have been better if ATC had kept his departure clearance into wind with the traffic flow, not against it. Also his control problem and time waiting for departure were factors contributing to the Airprox. He assessed the risk of collision as being medium.

SHOREHAM ATS UNIT reports that the Chipmunk was on a circuit detail and at 1116 was getting airborne from a touch and go at the far end of RW20. At approximately 1114 the Jet Ranger pilot had called for departure for a flight to Biggin Hill. The helicopter was located at the SW corner of the airfield, to the E of RW 20. He initially cleared the Jet Ranger to Helicopter Training Area X and at 1116 he asked the pilot if he was happy to accept a NE departure remaining E of RW20; the pilot agreed and was so cleared. However the Jet Ranger then made a left turn, entered RW20 and directly overflew the departing Chipmunk, which had to reduce its climb rate. The

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Chipmunk pilot requested to file an Airprox. The Jet Ranger pilot apologised saying he thought the Chipmunk was making a full-stop landing.

ATSI reports that the Chipmunk was carrying out a LH circuit detail on RW20. At 1114:30, the B206 pilot reported on the apron located at the SW corner of the aerodrome requesting to lift and depart to Biggin Hill. Although the pilot's subsequent written report states that he requested 'an into-wind departure' the RTF recording does not substantiate this.

The ADC [Bandboxed with APP] instructed the B206 to hover taxi to 'X-ray', a helicopter spot located near the centre of the aerodrome to the E of RW02/20. Shortly after this the Chipmunk was cleared for a touch and go on RW20 and given a wind check which was 240/6kts. The controller then asked the B206 pilot whether he could accept a departure to the NE remaining clear of RW20, to which the pilot replied that he could.

The controller then transmitted "*C/S roger in that case you're clear take off northeast bound the surface wind Two Two Zero degrees Eight knots*". The pilot acknowledged this and was seen to depart and flew overhead the Chipmunk which was just climbing away from a touch and go. The pilot of the B206 then transmitted "*Apologies for that C/S that's my fault I thought you were on a full stop landing there*".

It would have been prudent for the Aerodrome Controller to have passed TI to the B206 regarding the Chipmunk. However, as the B206 had been cleared to depart '*northeast bound*' and to remain clear of RW20, the controller clearly believed that this would keep the flight paths of the two ac apart.

The pilot of the Chipmunk subsequently stated that the B206 had crossed overhead his ac as they pitched up and he wished to file an Airprox.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Of the 3 parties involved in this incident, the Board determined that the Chipmunk pilot had not played any part and Shoreham ATC had not contributed to the Airprox in any significant way.

A number of airmanship issues arise from the incident. The B206 pilot chose to fly to Biggin Hill with a defective collective control, rather than having it rectified in situ, which was considered by the Board to be ill advised. Such faults are, at best, a distraction and by the pilot's own admission, in this case, it had become just such. Further, the Chipmunk pilot had on 2 occasions stated in RT transmissions that his intention was to conduct a roller landing and both had gone unnoticed by the B206 pilot who believed that the Chipmunk was intending to land – in the view of the Board a further indication of distraction. The result had been that the B206 pilot had not adhered to the clearance passed to him by ATC. Even allowing for the B206 pilot's belief that the Chipmunk was conducting a full-stop landing, Members unanimously considered that choosing to overfly it, directly above at a low height, was poor practise that could result in severe buffeting when the other ac was at low speed. In addition, Members emphasised that helicopter pilots should always conduct a thorough lookout before crossing an active RW and avoid all traffic by a good margin.

Members also considered the prudence of downwind departures in helicopters. Civil and military helicopter specialists alike considered that, in general, they were not good practise and should be avoided. This being the case, Members considered that when the Shoreham Controller offered a downwind departure, the B206 pilot should have declined and conducted a normal into-wind transition from the hover (particularly when hovering was already causing him some difficulty). If this had meant waiting for the Chipmunk to clear, then so be it.

Although it would have been wise for the Shoreham Controller to pass TI to the helicopter pilot on the Chipmunk, Members accepted that in these circumstances he had deemed it not to be significant since he anticipated that the B206 pilot would remain clear to the E of the RW as directed. That the B206 pilot did not adhere to his ATC clearance and flew into conflict with the Chipmunk was considered to be the cause of the Airprox. Since he saw the Chipmunk throughout there had been no risk that the ac would have collided.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The B206 pilot did not adhere to his ATC clearance and flew into conflict with the Chipmunk.

Degree of Risk: C.

[coincident with the NW corner of the Yeovilton AIAA] in order to dispense flares over the Bristol Channel before flying a reciprocal course back to Lyneham to pick up an IFR FPL to Akrotiri. They were operating in VMC between cloud layers and under a RIS from Bristol APPROACH in Class G airspace. A squawk of A6335 was selected with Mode C; TCAS is not fitted.

Between RADSTOCK and position 51°17'N 003°03'W in a level cruise at FL40, they had accepted several heading changes to the SW from Bristol ATC in order to help the controller with his co-ordination. This eventually took them to a point about 14 NM S of Bristol before they eventually resumed their own navigation heading NW towards the Bristol Channel to carry out their task. At a position about 7nm SSE of Bristol flying at 220kt, they were just about to change heading onto 270° when Bristol asked if they could accept a L turn onto a heading of 230°. This would once again have taken them away from the Bristol Channel so they advised that they could accept a heading of 270°. Whilst in the L turn they heard the EMB145 crew report a 'TCAS Climb' to ATC but the other ac was not seen so the minimum separation could not be assessed. The risk, however, was assessed as "nil". Some time after this Bristol reminded them of their proximity to Cardiff's Airspace so they continued their detail to the N, to operate between Bristol and Cardiff. When complete they were handed back to Lyneham to pick-up their IFR flight plan.

THE C130 PILOT'S STATION comments that the C130 pilot remained outside Bristol's Class D Airspace throughout his manoeuvres and whilst in receipt of a RIS from Bristol. The ac Captain displayed good airmanship in requesting a radar service from Bristol due to their close proximity to the Class D Airspace, however, he at no time penetrated the airspace without authority; he could have done no more on this occasion. The C130 crew had been in receipt of an ATS from Bristol ATC for some time and, under the terms of a RIS, the crew should have been informed of any conflicting traffic. This appears to be an unfortunate incident where the controller did not spot a conflict until the last minute.

ATSI reports that at the time of the Airprox, both flights were in receipt of an Air Traffic Control Service from the Bristol APR. The EMB145 crew was being vectored towards the ILS for RW27 under a RAS and the C130 crew was being provided with a RIS whilst carrying out an air-test. The controller's workload and traffic loading were described as "low to moderate" and the relevant ATC equipment was all reported to have been serviceable. The controller believed that he had been fit to work; however, he later advised that with the benefit of hindsight, he had been pre-occupied with personal matters which may have distracted him from concentrating fully on his ATC duties. Additionally, there had been visitors to ATC who were present in the Approach Control Room when the Airprox occurred. The controller also stated that during the previous weeks he had been actively engaged in OJTI duties and some 80% of his rostered time had been as a mentor rather than operating on his own.

The EMB145 crew established communication with the Bristol APR at 1603:33, heading S and passing FL103 in descent to FL80. The ac was 9nm NNW of the airport and the controller informed the crew that he would position the ac for the RW27 ILS but, due to the ac's level, this would require the EMB145 being taken through the extended centreline for a left hand circuit. The crew were also told that they were number 2 in the approach sequence, as there was a B737 5nm NE of the airport. Shortly afterwards, at 1604:00, the C130 crew established contact with the APR. The controller reported that details on this flight had been passed to Bristol ATC and that he had been given a handover on this ac by Lyneham ATC. The controller was aware that the C130 crew wanted to carry out an air-test prior to obtaining an airways clearance: however that was all he knew. The pilot of the C130, having been identified and placed under a RIS, told him that it was his intention to route W into the Bristol Channel before turning back towards Lyneham for an airways join.

The controller turned his attention to the relative positions of the B737 - now 3½nm ENE of Bristol heading S - and the C130 that was maintaining FL40, 16nm ESE of Bristol heading SW. As a means of resolving this perceived conflict, the controller asked the pilot of the C130 whether he could accept a heading of 190° for a short time to keep them clear of the B737 inbound to Bristol. The pilot agreed and turned onto the heading requested. At 1605:40, the controller transmitted "[C130 C/S] *thank you your position is one four miles to the south east of Bristol resume your own navigation again thank you*". The controller explained that he had recognised the potential conflict between the B737 and the C130 but did not think that one existed between the EMB145 and the C130. He added that he had expected the C130 to turn R onto a southwesterly heading and continue towards the Bristol Channel; however, the crew executed a R turn onto a north-westerly track. The controller then instructed the EMB145 crew to turn L onto 095° and descend to FL40. When this instruction was given, the EMB145 was 5nm SW of Bristol Airport and the APR's intention was for the ac to track downwind left hand for RW27, just on the edge

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of Bristol's CAS. However, by the time that the EMB145 had turned and steadied on the heading given, it was approximately 1nm S of the southern boundary of the CTR/CTA outside CAS in Class G airspace.

The UKAIP, page ENR 1-6-1-3, states that at certain aerodromes the associated CAS does not encompass the Radar Vectoring Area (RVA), and accordingly ac may be vectored outside the notified airspace for approaches to certain runways: RW27 at Bristol is one of the listed locations. There is a note with this entry advising that whilst the ac is outside CAS a RAS will be provided: however, to reduce RTF loading, pilots will not be advised of the change of ATC service in these circumstances.

As the EMB145 was passing FL66, clearance to descend to 3000ft QNH was issued. Meanwhile, the C130 pilot had established his ac on the northwesterly track, still maintaining FL40, with the EMB145 [unbeknownst to the C130 crew] at 11 o'clock – 9½nm. The controller recognised the developing situation between the two ac and asked the crew of the C130 whether they could accept a L turn onto 230° which would keep them outside CAS. He then added, "...traffic [the EMB145] 4 miles south of Bristol descending inbound". The crew replied "[C130 C/S] we'd like to take up a track of 270° that should still keep us clear of your zone". The controller did not respond to this but, at 1607:26, he transmitted "[EMB145 C/S] turn left heading 050° to keep you inside controlled airspace Charlie One Thirty traffic 10 miles southeast of Bristol to pass down your...starboard side". At that point, there was also the option of stopping the descent on the EMB145, thereby providing vertical separation until it had passed the C130; however, this method was not employed. Analysis of the radar recording shows that the C130 continued tracking NW [until the CPA]. The EMB145 had been passing FL49 – actually 6nm S of Bristol - not 4nm as reported by the controller, and in the 11 o'clock position of the C130 at a range of 7.1nm.

The G/S of the EMB145 was 280kt and several seconds elapsed before the L turn onto 050° started to take effect. At 1607:45, the controller transmitted "[C130 C/S] turn left heading 230° traffic passing down your starboard side range of two and a half miles inside controlled airspace" [which it was not]. A few seconds later, the EMB145 pilot reported a TCAS climb. At that stage, the EMB145 was 2-4nm NW of the C130 at FL42 and outside the Class D CTR/CTA. Minimum separation occurred at 1607:54 as the subject ac passed starboard-to-starboard, 1.7nm apart with 400ft vertical separation; thereafter horizontal separation was quickly restored.

The controller explained later that he had thought the EMB145 was just on the southern edge of the CTR/CTA and therefore, in his opinion, "deemed" to be separated from the C130 which was operating outside CAS. MATS Part 1 Section 1, Chapter 5, Page 11 para 12.1.4 states:

"Although traffic operating in controlled airspace are deemed to be separated from unknown aircraft flying in adjoining uncontrolled airspace, the radar controller should aim to keep the aircraft under his control at least two miles within the boundary where possible".

In this particular case the above is not applicable as, firstly, the C130 was known traffic working the APR himself and secondly, the EMB145 was also flying [the APR's radar vectors] outside CAS. When asked what he regarded as his responsibilities for separating RIS and RAS traffic, the controller advised that he understood that he must endeavour to provide RAS traffic with standard separation from traffic in receipt of a RIS. The controller could not explain why he had not issued avoiding action instructions to the EMB145 crew to achieve this. The unit provides both RIS and RAS to traffic in Class G airspace and in this environment the passing of such instructions is not uncommon. The controller did not recognise the conflict developing between the two ac until a late stage. When the turn instruction was issued to the EMB145 crew the APR did not prefix it with the prowords 'avoiding action', possibly contributing to a non-urgent response by the crew. When the conflict was eventually recognised it would have still been possible to stop the descent of EMB145 and maintain vertical separation until the two ac were separated horizontally; however, this option was not followed.

This Airprox also highlights the need for controllers to ensure their fitness for duty as even partial unfitness can result in less than 100% attention to the job in hand. Unless local management have been advised, the responsibility for determining both physical and mental fitness for duty rests with individual controllers. Furthermore, although there is no firm evidence to indicate that the visitors present in the ACR were a major distraction, MATS Part 1, Section 8, page 2, para 5 does make it clear that any such visit must not be allowed to interfere with the smooth running of the watch.

HQ STC comments that the C130 crew had, wisely, requested a RIS whilst close to the Bristol CTR/CTA. However, having no knowledge of the position of the EMB145, now outside the lateral confines of CAS, the crew

unwittingly turned into conflict when released to their own navigation. A combination of TCAS and the EMB145's turn provided sufficient separation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was evident to the Members that the C130 crew was legitimately routeing through the 'Open FIR' to complete their task in the Bristol Channel area and had no desire to enter the Bristol CTA/CTR whatsoever. Controller Members agreed that the C130 crew had exercised good airmanship in obtaining a radar service from Bristol, even though they were not compelled to do so when operating in Class G airspace, as they had evidently appreciated that this ATSU would be able to afford them the most useful ATS whilst passing this busy airport. For their part, the C130 crew had willingly accepted the APR's vectors to assist him with his task whilst he was directing the preceding B737 downwind in the instrument pattern. A controller Member opined that it was unfortunate that when the C130 crew was released under their own navigation they had turned onto a track that perhaps the APR had not anticipated. Though they were still heading toward the Bristol Channel this brought the C130 onto a conflicting heading with the EMB145 of which they were unaware because at that stage the APR had not warned them of the presence of the EMB145 when 'releasing' the C130 crew to 'own navigation'. It was evident that the C130 crew had readily complied with the APR's requests and if the controller had directed the C130 onto a suitable westerly heading earlier, it is probable that the subsequent conflict would not have materialised.

From the EMB145 pilot's perspective, he had reported that he was endeavouring to bring his airliner's speed back, descending with the speed brake open. However, the ATSI report had shown that the EMB145's G/S was still in the order of 280kt and with the light wind reported at Bristol it seemed to CAT pilot Members that this was still a little too fast, a controller Member observing that the general speed restriction of 250kt below FL100 applied identically within Class D CAS. Some Members thought this slightly higher speed might have compounded the problem for the APR whose plan was to run the EMB145 down the CAS boundary behind the B737 and it was suggested that the higher speed and resulting larger radius of turn might not have helped here. Nevertheless, the radar recording had shown that both the preceding B737 and the subject EMB145 had been outside CAS during their sequencing for RW27. Members noted the caveat that had been promulgated in the UKAIP, at ENR 1-6-1-3, in that the RVA was not wholly encompassed within CAS. Civilian controller Members were disturbed at the note in the AIP where, to reduce RTF loading, pilots are not advised of the change of ATC service in these circumstances when they had crossed the CAS boundaries into Class G airspace, as here. It is one of the fundamental guiding principles of ATC – both military and civilian - that pilots must be informed of changes to ATSs when GAT is directed outside CAS. Military and civilian controller Members alike were thus very concerned and doubted the wisdom of this policy. Moreover, this information was only included in the ENR volume and not the AD1 entry for Bristol so it was feasible that many CAT pilots who operate into this airport were unaware of this stipulation. It was clear from his report that the EMB145 pilot thought that he was still in CAS when this Airprox occurred, which was evidently not the case, and the APR's transmissions could be interpreted as being misleading (albeit unintentionally) on this point, which illustrated Members' concerns. However, the Board as a whole was not moved to make a Safety Recommendation in this instance. During considerable debate some controller Members contended that the MATS Part 1 clearly permitted traffic operating outside CAS to be "deemed" separated from GAT within CAS. But as had been explained in their comprehensive report, the ATSI advisor reinforced the view that here both ac were in receipt of an ATS from the APR who had vectored the EMB145 outside the southern boundary of CAS. Evidently, keeping traffic 2nm inside CAS was not a factor. Consequently, under the RAS that pertained outside CAS (not a RCS which only applied inside the Class D CTR/CTA), the APR was responsible for effecting standard separation between these two flights. As the C130 was both known to the controller, in communication with him and under a radar service, regardless of whether the EMB145 was inside or outside CAS in this instance standard separation should have been effected. The Members agreed unanimously, therefore, that this Airprox had been caused when the Bristol APR vectored the EMB145 into conflict with the C130.

Turning to risk, the Board agreed with the ATSI analysis that the APR might not have recognised this confliction until a late stage. It had also been shown that vertical separation was an option but for whatever reason had not been attempted. Nonetheless, when the APR recognised the confliction he turned both the EMB145 and the C130 away from one another in an attempt to correct the situation which ensured that horizontal separation was only eroded to a minimum of 1.7nm at the closest point - slightly more than the EMB145 pilot had reported. Although

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the C130 crew had been passed traffic information they had not spotted the airliner passing to starboard above them. But once established on divergent headings this had effectively removed any risk of the ac colliding. Moreover, the EMB145 crew's compliance with the TCAS RA had ensured that they had climbed their airliner no less than 400ft above the C130 at the CPA. Weighing all these factors carefully the Board concluded unanimously that no risk of a collision had existed between the EMB145 and the C130.

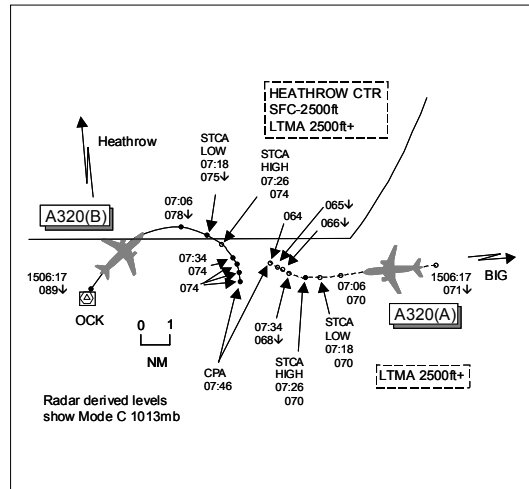
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Bristol APR vectored the EMB145 into conflict with the C130.

Degree of Risk: C.

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Date/Time: 29 Sep 1508
Position: 5119N 00018W (6nm E OCK)
Airspace: LTMA (Class: A)
Reporting Ac Reported Ac
Type: A320 (A) A320 (B)
Operator: CAT CAT
Alt/FL: FL70 ↓FL70
Weather IMC IICL IMC CLBL
Visibility: 2-3nm NK
Reported Separation:
 400ft V 3nm H NR
Recorded Separation:
 1000ft V 1.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A320(A) PILOT reports inbound to Heathrow having completed a radar vectored arrival via BIG VOR and in receipt of a RCS from Heathrow DIRECTOR on 134.97MHz. The flight was instructed to expedite descent to FL70 and leave BIG on radar heading 275° at 220kt. After levelling at FL70, TCAS detected 'proximate traffic' in their 2 o'clock range 5nm 600ft above and descending at >500fpm. Visual acquisition was attempted but was unsuccessful owing to poor visibility in cloud and haze. ATC then issued an instruction to turn R onto an E'ly heading but this was queried owing to the position of the proximate traffic and that compliance would appear to reduce separation even further. The Director then issued an "avoiding action expedite right turn" instruction which the Capt, PF, complied with by disengaging the A/P and commencing the turn. Almost immediately TCAS gave an amber TA alert then an RA 'descend, descend' command which was followed and resulting in a descending R turn; separation had reduced to 400ft. ATC were informed and the ac was levelled at FL65, passing through heading N when 'clear of conflict' was received; another ac was seen above and apparently turning S during the avoidance manoeuvre about 3nm away. The A/P was re-engaged and the turn continued onto an E'ly heading and, after being given further descent to altitude 4000ft, the flight was completed without further incident. The Captain assessed the risk as 'high' as in his opinion the subject ac should not have been placed in opposition to each other at the same level, opining that 1000ft separation should have been applied during this phase.

THE A320(B) PILOT provided a brief report stating Heathrow APPROACH instructed him to carry out a 360° turn to the R at OCK and then leave OCK heading 075° and to descend to FL70. An ACAS resolution 'maintain' was executed and notified and after a few seconds 'clear of conflict' was received. The other traffic was not seen visually owing to IMC between layers: TCAS indicated the other traffic passed about 2.5nm clear to their L.

THE TC HEATHROW INTERMEDIATE DIRECTOR S (LL INT DIR S) reports vectoring A320(A) from BIG on heading 275° descending to FL70. The A320(B) crew called on frequency: this flight was given an orbit onto heading 075° then another flight called approaching BIG and was also given an orbit. He then 'dropped' A320(B) to FL70 to avoid a conflict with the second ac at BIG. Meanwhile A320(A) was level at FL70 and approaching the point for a downwind turn onto an E'ly heading. The INT N shouted "watch the XXXX (A320(B) company)" and as he went to give avoiding action to A320(A), he thought, his transmission crossed with that ac's crew telling him that they had traffic. He re-transmitted and gave TI, the A320(A) crew reporting a 'TCAS descent' and eventually 'visual'. The A320(B) flight was given TI and told to climb to FL80 and to continue their R turn onto N for avoiding action. Both acs' crews reported 'clear of conflict'.

LTCC ATCI reports that this event occurred 7nm E of OCK VOR and involved the Heathrow Intermediate Director South (LL INT DIR S) with traffic loading, sector workload, and complexity all reported as low.

Both ac were inbound to land RW27R at Heathrow: A320(A) had departed from Venice while A320(B) was inbound from Santiago.

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The A320(A) crew established contact with LL INT DIR S at 1503 reporting descending to FL080 inbound to the BIG VOR. In reply the flight was instructed to continue its descent to FL070 and to leave BIG on a heading of 275°. The A320(B) crew established contact approximately 1min later, reporting descending to FL080 inbound to the OCK VOR. The flight was instructed to make 1 RH orbit on reaching OCK and then leave on a heading of 075° which was clearly acknowledged by the crew.

At 1505:30 the A320(B) crew were cleared to descend further to FL070. At the time the ac was descending through FL095 and had 4nm to run to OCK. Meanwhile A320(A) had left BIG on its assigned heading of 275° and was descending through FL075. A320(B) crossed the OCK VOR at 1506:17, descending through FL089 for FL070 and commenced the RH orbit as instructed. At 1507:05 the A320(A) crew were instructed to turn R on to a down wind heading of 085° whilst the A320(B) was 5.5nm NW of A320(A) and had commenced its R turn as instructed.

Almost immediately, as A320(A) commenced its turn, the crew reported '*we have traffic, 500ft above coming towards us*'. This transmission was entirely simultaneous with the instructions from LL INT DIR S, alerted to the potential conflict by his colleague on INT N, and he endeavoured to instruct the A320(B) crew to stop its descent. It is likely that these transmissions cancelled each other out, but LL INT DIR S then instructed the A320(A) crew (1507:20) to turn R, to expedite for avoiding action, and passed TI on the other Airbus. In reply the A320(A) crew reported a TCAS descent. The LL INT DIR S then instructed the A320(B) crew (1507:30) to climb to FL080 for avoiding action, the flight reaching FL074 before arresting its descent and climbing back to FL080. Vertical separation reduced to a minimum of 600ft at 1507:34 with the subject ac 1.8nm apart horizontally. Standard vertical separation was obtained at 1507:46 at the CPA, as each ac climbed or descended, passing port to port with 1.2nm lateral separation.

The Watch reported that the controller became momentarily distracted, intending to vector A320(B) off OCK at FL080. In planning ahead the controller then cleared A320(B) down to FL070, with the intention of taking the next act off BIG at FL080, overlooking the presence of A320(A).

ATSI had no further comment to make on the ATCI report.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members could add little to the ATCI unit report. The LL INT DIR S had planned a course of action in taking the lowest ac, A320(A), from the BIG hold at minimum stack level (MSL) and then to vector the next ac, A320(B), from the OCK stack to follow it, initially separated by 1000ft. However, when another ac arrived at BIG at FL80, he then planned to reverse the 'level shuffle' at the stacks and take this ac behind A320(B): he thus descended A320(B) to FL70, forgetting that he had A320(A) heading W'ly from BIG at that level. Members therefore agreed that the cause of the Airprox was that the INT DIR S had vectored A320(B) into conflict with A320(A).

The A320(A) crew were given the 'heads up' to the potential confliction from their TCAS equipment before the INT DIR S gave the crew a R turn onto a downwind heading. When the crew queried this, owing to the TCAS observed traffic, their transmission coincided with that of the controller who, alerted to the situation by his N colleague, was attempting to give the flight an 'avoiding action' R turn. Almost simultaneously with the commencement of turn, TCAS gave a TA alert then an RA 'descend' command which was quickly followed, leading to the ac descending to FL64, visually acquiring the other A320 above and turning away to their L, 3nm distant. The A320(B) crew had received a coordinated TCAS warning - which had led the crew to level their ac at FL74 - as well as being issued an avoiding action climb by the controller, to FL80. The Board agreed that although the initial positioning by the INT DIR S had placed the 2 A320s on converging tracks, the avoiding turns given, when combined with the TCAS manoeuvres flown by both crews, had been effective in quickly removing any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LL INT DIR S vectored A320(B) into conflict with A320(A).

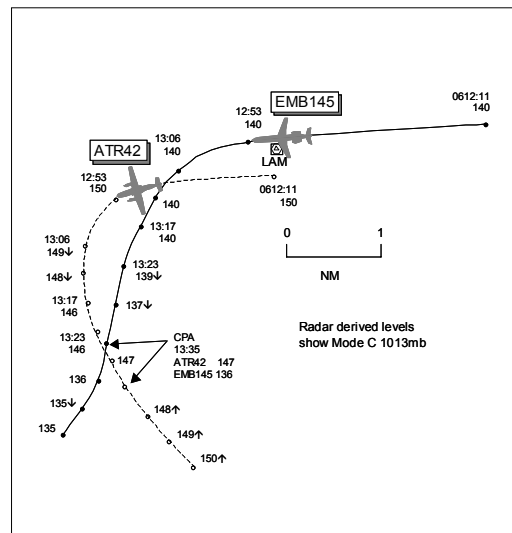
Degree of Risk: C.

AIRPROX REPORT No 184/04

AIRPROX REPORT NO 184/04

Date/Time: 15 Sep 0614
Position: 5137N 00005E (3nm SW LAM)
Airspace: LTMA (Class: A)
Reporting Ac Reporting Ac
Type: ATR42 EMB145
Operator: CAT CAT
Alt/FL: ↓FL120 FL140

Weather VMC NK VMC CLNC
Visibility: NK 35km
Reported Separation:
NR 600ft V 2nm
Recorded Separation:
1100ft V 0.5nm H



BOTH PILOTS FILED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ATR42 PILOT reports holding at LAM inbound to Heathrow at 170kt and FL150 and in communication with London on 123.9MHz. ATC cleared them to descend to FL120 with a high ROD (1500fpm selected) but there was an EMB145 below them, also holding, at FL140. TCAS gave an RA 'climb' warning, which was followed, and ATC were informed.

THE EMB145 PILOT reports holding at LAM inbound to Heathrow at 210kt and FL140 and in communication with London. Another ac in the hold above them, an ATR, was given clearance to descend through their level so ATC were informed of the confliction. However, the ATR's descent caused a TCAS TA alert then an RA 'descend' warning, which was followed, whilst the ATR was seen to descend to within 600ft vertically and 2nm horizontally ahead of their track. The controller appeared not to know which ac were at which location and at what level.

THE TC LAM SECTOR CONTROLLER reports working the sector during a period when EAT operations were in force. For some reason, maybe the fpss were in the wrong order, he descended the ATR from FL150 to FL120 through the EMB145 at FL140. He was aware straight away that something was not right (all the c/ss were garbling). The EMB145 crew were also aware and when he saw the ATR label showing FL148 he realised his mistake and climbed the ATR back to FL150. The EMB145 crew had executed a TCAS descent down to FL135 and he vectored the ac clear of the holding stack.

ATSI reports that the TC LAM SC described his workload as moderate. Although Heathrow was operating on EAT's, due to an earlier problem with one of the ILSs precluding the use of the designated departure RW for landing ac, the SC commented that the traffic situation was fairly straightforward with all ac on frequency inbound to Heathrow.

The ATR42 crew established communication with the LAM sector, at 0555, reporting inbound to SABER to hold at FL160 and were issued with an EAT of 0627. Some 3min later, the EMB145 crew made their initial call on the frequency, reporting passing FL190 for FL180, towards LAM. This flight was given an EAT of 0625 i.e. 2min ahead of ATR42. Shortly afterwards, the ATR42 crew reported approaching SABER and was cleared direct to LAM. Because of its earlier EAT, the SC said that his intention was to endeavour to assign the EMB145 a lower level at LAM.

As levels became available at LAM, the SC progressively cleared EMB145 to descend to FL140, by which time it had entered the hold at LAM. This resulted in the flight being descended safely through the level of ATR42, which

was, in turn, instructed to descend, on top, to FL150. The SC said that he could see from the CCTV link to Heathrow Approach that the ac directly below the subject ac had vacated FL120. He looked at his radar display and could see the ATR42's SSR label clear of the other overlapping labels at LAM. For an inexplicable reason, he believed that the ATR42 was the next ac in the sequence, rather than EMB145, and cleared the flight (0612:50) to descend to FL120, to expedite through FL130. He recalled that, having realised the flight was at FL150, he had felt somewhat remiss for leaving what he thought were several vacant levels in the hold at LAM. However, having issued this descent clearance he thought that something was not quite right but, before he could resolve the problem in his own mind, the pilot of the EMB145 reported "...XXXXX (ATR company prefix) is above us and we're at one four zero". Realising the situation straight away, the SC initially instructed the ATR42 crew to maintain FL150 but seeing its Mode C readout as FL147, he changed the instruction, in the same transmission, to "...climb back up flight level one five zero...". He then issued the EMB145 crew an 'avoiding action' R turn onto heading 270°. The pilot responded saying that he was "...also descending TCAS alert".

UKAB Note (1): The radar recording of the event shows the ATR42 commencing descent at 0613:06 2.25nm SW of LAM indicating FL149, with the EMB145 1.25nm to its NE at FL140. Minimum vertical separation of 600ft occurs at 0613:17, 1.1nm horizontal and 600ft vertical, with both ac in a L turn SW of LAM. Six seconds later, the EMB145 commences descent in reaction to its TCAS RA whilst lateral separation decreases until the CPA occurs at 0613:35, the EMB145 having just commenced its avoiding action R turn at FL136, 1100ft below and 0.5nm behind the ATR42 climbing through FL147.]

The SC could offer no definitive reason for issuing the unsafe descent clearance to the ATR42. His initial reaction was that the fpss may have been in the wrong order. This could have some credence in that the EMB145 started off above the ATR42 but was subsequently descended through its level. However, after further consideration, the SC doubted whether the fpss had been incorrectly displayed but there is no information to confirm either way. Although he had not realised it at the time, in subsequent conversation about the Airprox, he was surprised to note that the c/ss of the subject ac could have been prone to confusion. Although there are only minor similarities, he still thought that it might be a possible explanation for his error.

[UKAB Note (2): The ATR42 c/s was ABC3382 and the EMB145 c/s was XYZ5512.]

Also, the SC mentioned that he usually operates the LAM Sector with 'stack windows' displayed. He added that, on this occasion, he had not selected this facility but did not know why. He thought that, being early in the morning, he must have opened the sector but had just not got around to selecting it. He commented that its use may well have alerted him to the traffic situation over LAM. NB 'Stack windows' functionality allows controllers to select areas of particularly high traffic density in an expandable window on the radar display. By using smaller ranges within the expanded window, it lessens the incidence of label overlap in the selected area. This is particularly useful in busy stacks. Trials are on going, prior to the implementation of a tabular form of 'stack windows' using SSR Mode S. This new system would, the SC believed, have prevented this type of event occurring as it would have clearly shown that the EMB145 was holding below the ATR42.

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 offer no additional comment or explanation as to the TC LAM SC's actions. Having ensured that the EMB145 was below the ATR42 in the correct stack and EAT order, he had, for whatever reason, descended the ATR42 into conflict with the EMB145 which had caused the Airprox.

After the controller had given the descent clearance to the ATR crew, the EMB145 crew had shown good situational awareness and told him of the confliction. This call had clarified the situation in the controller's mind such that he issued the ATR crew with an avoiding action climb back up to FL150. This had been reinforced by the receipt of a TCAS RA 'climb' command in the ATR cockpit, resulting in the ATR stopping its descent at FL146 before climbing. However, the ATR's descent profile, with an increased ROD, had quickly caused a TCAS TA alert then an RA 'descend' warning in the EMB145 cockpit. The EMB145 crew had reacted promptly and followed the TCAS command whilst ATC also gave an avoiding action R turn. Also, the EMB145 crew had visually acquired the ATR ahead and monitored its flight path during their manoeuvring. These combined elements were enough to allow the Board to conclude that any risk of collision had quickly and effectively been removed.

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The NATS advisor informed Members that the trials mentioned of Mode S SSR tabular stack windows had shown strong benefits in detecting/displaying possible conflicts in this type of scenario. However, the full benefits would not be reached until all mandated aircraft carried a Mode S compliant transponder.

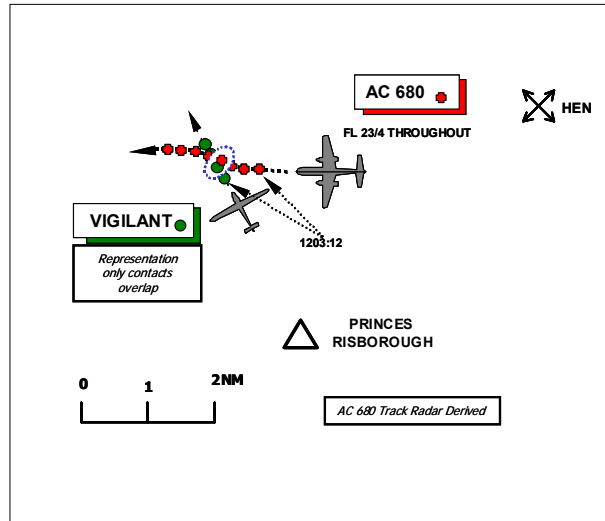
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The TC LAM SC descended the ATR42 into conflict with the EMB145.

Degree of Risk: C.

AIRPROX REPORT NO 185/04

Date/Time: 2 Oct 1202 (Saturday)
Position: 5144N 00052W (6nm SW Halton)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Vigilant Mk 1 AC680
Operator: HQ PTC Civ Pte
Alt/FL: 2000ft NR
 (QFE 1005)
Weather VMC CLBC VMC
Visibility: 25km 10km
Reported Separation:
 100ft V/NR H 0m V/100m H
Recorded Separation:
 Not recorded V/~200m H

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

THE VIGILANT MK 1 MOTOR GLIDER PILOT reports flying a local training sortie from RAF Halton in a white motor glider with nav and landing lights switched on, squawking 7000 [he thought] but Mode C was not fitted. While flying straight and level at 2000ft heading 310° at 60kt an ac came from behind, appearing from beneath and on the left of his nose. He clearly heard the engine noise above the normal ambient noise in the cockpit. The other ac passed from right behind to left front, tracking about 10° to the left of their track, with about 100ft vertical separation, and it banked to the left and climbed shortly after passing below them.

THE AC680 PILOT reports flying from Elstree to Cork in receipt of a FIS from Brize Norton. He was contacted by AIS Mil 2 weeks after the incident and although he had a vivid recollection of the incident, he did not make any notes as to the time, exact position, height etc. He was advised by ATC of an ac crossing ahead from left to right, height unknown, which he quickly spotted at a lower level. [Not the ac involved in the Airprox]. The visibility was good, and while looking for this ac he saw in the distance, exactly on the horizon and directly ahead of him, the silhouette of another ac, either directly head or stern-on. If the latter had been the case, immediate action would have been needed, but he soon noted that it was going away. Then suddenly he saw details of the ac and realised it was very much closer than he had estimated and that he was overtaking it at an alarming rate. He made an immediate steep turn to the right and passed it about 100m away to his left and at the same level as himself. If he had not made this turn, there would almost certainly have been a collision.

He reported to ATC that he had come rather close to another ac and that it's pilot might file an Airprox but they reminded him that he was receiving a FIS and not a RIS, with which he fully agreed. He did not file an Airprox himself as he regarded it as a 'See and be Seen' incident in the open FIR.

UKAB Note (1): The recording of the Heathrow radar shows the AC680 at 1159:10 heading W and at 59:52 it changes to 3717 (a Brize Norton code). At 1201:32 a non-squawking contact pops up in its 11:30 position, initially manoeuvring then steadying on a NW track. The AC680 continues its heading and height and overtakes the Vigilant from its 4 o'clock and departs to its 10.30 and commences a climb.

UKAB Note (2): The incident occurred in the open FIR under the London TMA where the base is 3500ft but about 1nm before it increases to 4500ft. The Halton ATZ and Thame glider site are to the N of the AC680's track and the Benson MATZ to the S.

HQ PTC comments that by all accounts, this was a fairly close encounter in Class G airspace. The Vigilant was disadvantaged from being approached from his blind quarter but by good fortune, the

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AC680 pilot's lookout had been pointed in his direction by Brize, despite being under a FIS. His robust avoiding action was able to diminish the risk in accordance with the VFR.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were informed that RAF Halton is now a very busy airfield routinely operating a considerable number of light ac and gliders on a daily basis. There has been a threefold increase in traffic density over the last year or so.

This incident occurred in the open FIR some distance outside the Halton ATZ and where the see and avoid principle is the prime means of collision avoidance. Being on a steady NW heading at slow speed the Vigilant pilot could not reasonably have been expected to see the AC680 approaching from his 5 o'clock with a significant rate of overtake. These factors had combined to place almost the entire avoidance onus on the AC680 pilot. By a fortunate coincidence the AC680 pilot's eyes had been directed by the Brize Norton Controller in the area of the glider to look for another ac and this had revealed, rather belatedly, the glider. The difficulty of discerning ac on the horizon is well known but, as he was overtaking it, the responsibility for avoidance was with the AC680 pilot and this he did, albeit at a late stage. Although he was constrained by the CAS above, the AC680 succeeded in generating a 200m lateral miss-distance that, although it was as much as could be done in the time available, was uncomfortably close. Having seen the glider, albeit late, there was never any risk that the ac would have collided. However, Members thought that the separation had been too little and too late to ensure positively the safety of the respective ac.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A very late sighting by the AC680 pilot.

Degree of Risk: B.

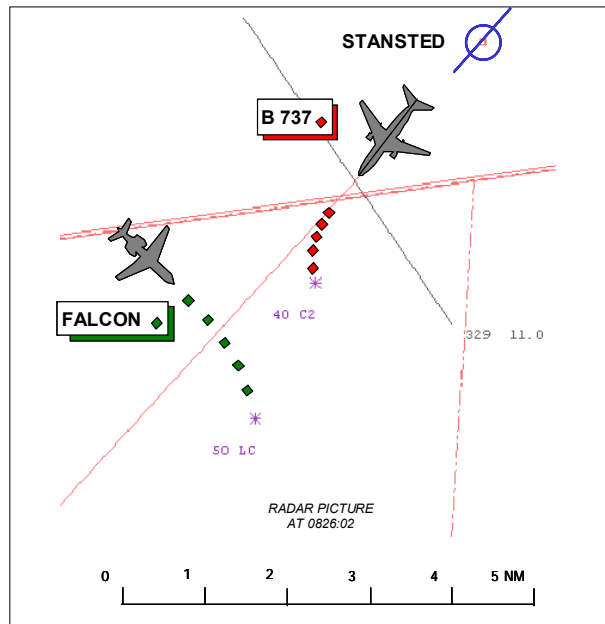
AIRPROX REPORT NO 186/04

Date/Time: 5 Oct 0826
Position: 5151N 00013E (3nm S Stansted)
Airspace: London TMA (Class: A)
Reporter: ATCO Stansted

	<u>First Ac</u>	<u>Second Ac</u>
<u>Type:</u>	B737	Falcon 900
<u>Operator:</u>	CAT	Civ Exec
<u>Alt/FL:</u>	2500ft	5000ft (QNH 1009 mb)
<u>Weather</u>	VMC CLOC	VMC CLOC
<u>Visibility:</u>	10km	10nm

Reported Separation:
 >2000ft V/~5nm H Not seen

Recorded Separation:
 As 1000ft vertical separation lost,
 1.95nm H (ac diverging)
 CPA 800ft V/1.7nm (ac diverging)

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

THE STANSTED ADC reports that a B737 was departing Stansted on a CLN 8R departure. It was transferred to TC on frequency 118.825MHz when it was passing an altitude of 2000ft. The pilot recalled Stansted when he was passing an altitude of 4800ft and turning left for CLN. A Falcon 900 inbound London City was approximately 2nm SW of the B737 at 5000ft. As the tracks of the ac were diverging at this point, no TI was passed but the ac was told to descend to an altitude of 4000ft as required by the CLN 8R departure. The B737 pilot queried this and was told again to descend to 4000ft. He called LTCC NE and told them that the B737 had returned to his frequency. The B737 was later transferred to LTCC NE having descended back to 4000ft.

THE LTCC NE DEPARTURES CONTROLLER reports that he was working with a U/T controller when the Falcon was descended to 5000ft and was then told to route direct LAM and leave heading 180°. The ac did not turn for a few miles and continued heading 095° and asked for the routing again, so he gave a radar heading of 180° and noticed the B737 getting airborne from Stansted. The B737 was subsequently seen approaching 4000ft climbing, then 4200ft and then when it was at 4500ft he turned the Falcon right onto 215°. No STCA was observed and the B737 was on the Stansted Tower frequency throughout the event. He assessed the risk as 'Light'.

THE B737 PILOT reports flying a scheduled passenger flight from Stansted to Warsaw. On departure he received a TCAS TA and a SID altitude restriction. Before passing 4000ft the conflicting traffic had passed behind and departed. They then followed instructions from the controller and informed him that they were descending to 4000ft. They were instructed to contact departure and they then cleared them further to above 5000ft. At no time did ATC report to them that an Airprox was being filed. On landing he filed a report with his company about the altitude deviation.

THE FALCON 900 PILOT reports flying an executive flight from USA to London City. He was given an Initial Approach Clearance of an Alkin 2A followed by radar vectoring by London and Thames Radar to London City. Abeam Stansted on a radar heading 180° he was cleared to 5000ft. During descent they had TCAS TA for about 2sec but no RA. Thereafter they changed to Thames Radar but they were given no warning of the traffic by London.

ATSI reports that an ATC clearance was issued to the B737 crew by the GMC who advised that it would be a CLN8R SID. This is detailed in the UK AIP and requires the ac to make a left turn after departure and track inbound to the Clacton VOR on the 269° radial. The initial level in this SID is 4000ft which must be reached by 21 DME

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from CLN, with a requirement to be 3000ft or above by 28nm. It is then a stepped climb to 6000ft, which must be attained by 13nm from CLN.

At 0822:15, the B737 crew advised the Stansted ADC that they were ready for take off and were cleared for take off at 0823:55. At 0825:20, the controller transmitted "C/S *contact London Control One One Eight decimal Eights (sic) Two bye bye*". Analysis of the RTF recording shows that this transmission was rushed and indistinct. However, the crew replied with "*One Eight Two bye*". The ADC did not detect this incorrect readback.

At 0826:10, the B737 crew called again and asked for confirmation of the frequency. Again the ADC responded with a fast and indistinct reply but having seen the level of the B737 on the ATM, asked the crew to confirm that they were maintaining 4000ft. The radar recording indicates that the B737 had commenced its left turn, in accordance with the SID, but continued climbing through 4400ft. In its 3 o'clock, at a range of 1.7nm, was an F900 inbound to London City maintaining 5000ft. The TC NE Deps Controller saw the B737 had climbed above the SID level and so turned the F900 right from a heading of 180° onto 215°.

In the meantime, the B737 crew asked the STANSTED ADC to confirm the cleared level was only 4000ft, which he did, and then reported descending from 5000 to 4000ft. At 0826:40, when both ac were at 5000ft, they were laterally separated by 3.1nm, which increased as both ac made their turns. Finally, at 0827:15, the B737 crew asked again for confirmation of the next sector frequency which was given clearly and deliberately by the Stansted Aerodrome controller.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board considered this to be a straightforward 'altitude bust' by the B737 crew. Although the RT from the Stansted ADC may have been rushed and not as clear as desirable, the onus was clearly on the B737 crew to fly the SID accurately. Members considered that any difficulty comprehending the instructions or frequencies passed by a controller should lead to a request for clarification rather than read back and action incorrectly. Although the ADC did not spot the incorrect readback in this Airprox, the crew had not understood the frequency change and later returned to question it. This had provided an unwelcome distraction while flying the ac manually at a very busy time.

Both the Stansted ADC and the NE Deps Controller spotted the B737 deviation from the SID quickly and took appropriate action to ensure that there was no compromise to the safety of either ac. Members observed that the Deps Controller had not used the prefix 'Avoiding Action' in his message to the F900 pilot which may have been a factor in the slightly slow reaction observed.

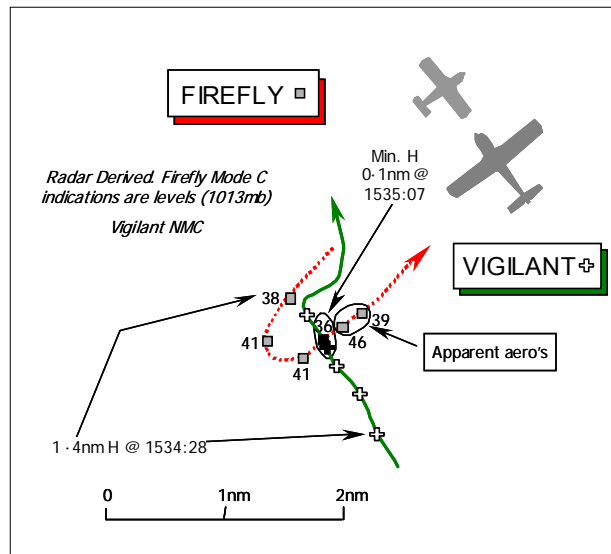
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The B737 pilot climbed above his SID altitude into conflict with the Falcon 900.

Degree of Risk: C.

AIRPROX REPORT NO 187/04

Date/Time: 9 Oct 1535 (Saturday)
Position: 5409N 00115W (2½nm N of Tholthorpe disused A/D)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Vigilant TMk1 Firefly
Operator: HQ PTC Civ Trg
Alt/FL: 2500ft 2000-4000ft
 (QFE 1020mb) (QNH)
Weather VMC CLOC NR
Visibility: 25km 10km
Reported Separation:
 50-100ft V/nil H 1000ft V
Recorded Separation:
 0.1nm H (200yd)

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

THE VIGILANT TMk1 MOTOR GLIDER (MG) PILOT, a civilian instructor pilot, reports that the HISSL was on whilst conducting a VFR general handling sortie in the Linton-on-Ouse local area clear below cloud with an in-flight visibility of 25km. Linton ATC was closed on this Saturday, but he was listening out with Linton RADIO A/G Station on 129.15MHz. A squawk of A7000 was selected but Mode C was “not available”.

Heading 310° just to the N of Tholthorpe disused aerodrome flying straight and level at 90kt, at a height of 2500ft Linton QFE (1020mb), he saw the other ac approaching from his 10 o'clock (from the W) approximately 50-100ft above his MG. When the other ac - a Slingsby Firefly - was directly above him, the Slingsby pilot pulled up into a loop with a “high” risk of a collision. To avoid the Firefly ac, he turned 90° to the R, cleared the area and then returned to Linton.

THE SLINGSBY FIREFLY PILOT provided a very brief account reporting that he was conducting aerobatic training overhead Tholthorpe disused aerodrome at 40-160kt, whilst squawking A7004 he thought [conspicuity aerobatics & display] with Mode C on, but he was not in communication with an ATSU. He was operating in a block between 2-4000ft QNH when he spotted the white MG passing 1000ft below his ac and flying away on a NE'ly heading. No avoiding action was taken and he assessed that there was “no risk”.

UKAB Note (1): The Claxby radar recording shows the Vigilant MG squawking A7000 with no Mode C (NMC) tracking NNW at 1534:28, as the Slingsby Firefly – squawking A7000 [not 7004] – heads SW and crosses from R – L through the MG's 12 o'clock at a range of 1.4nm indicating 3800ft (1013mb) unverified Mode C. The Firefly turns L toward the MG and crosses ahead again - this time from the Vigilant pilot's L - R - at a range of 0.1nm (200yd) indicating 3600ft unverified Mode C, about 2½nm N of Tholthorpe disused A/D. However, the Firefly's indicated level of 3600ft (1013mb) compared to the Vigilant pilots reported height of 2500ft (1020mb) would suggest that vertical separation was in the order of 1310ft at this point. Thereafter, as the range increases and the Vigilant turns R, the Firefly appears to climb and descend over a short distance whilst reversing back along its previous track, suggesting that the ac has performed a loop or other aerobatic manoeuvre.

HQ AIR CADETS comments that this was an entirely avoidable incident if only the Firefly pilot had adhered to the most basic of airmanship principles, that of a good lookout and 'HASELL' checks prior to any aerobatic manoeuvre. This is not the first time that this ac has been seen conducting what appear to be impromptu aerobatics in the Linton-on-Ouse locality, an area renowned for its intense flying activity from at least 7 airfields within a 10nm radius of the Linton-Topcliffe-Leeming clutch, including 3 busy gliding clubs. The Duty Supervisors at the Volunteer Glider School (VGS) do all they can to warn their crews when they see this ac appear locally, however this is obviously not an ideal solution. The Linton APPROACH frequency may be closed most weekends but Linton RADIO is not,

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and a courtesy call advising of intentions coupled with sound airmanship would reduce the potential for a recurrence.

HQ PTC endorsed the comments by HQ Air Cadets.

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.

The gliding Advisor to the Board agreed fully with the comments expressed by HQ ACs, adding that while they are already aware of the potential of encountering this manoeuvring ac and brief their pilots accordingly, other airspace users are not and may not see the Firefly until much too late. He pointed out that this is not a good area to perform aerobatics, certainly not without first liaising with local units, then at least other users could be warned and on the lookout. Nevertheless, the Board was briefed that anecdotal evidence suggested that the Firefly pilot has previously liaised with Leeming prior to conducting such evolutions. Members also noted that the Firefly pilot had not actually reset his transponder to A7004 whilst performing aerobatics in the middle of the Vale of York even though he reported he had done so, which in one pilot Member's view was indicative of questionable airmanship. However, it was pointed out that Linton ATC was closed on this particular Saturday afternoon. Whilst recognising the congested nature of the airspace and the legitimate right of each pilot to be operating in this locale, one pilot thought the levels chosen here for aerobatics seemed to engender a possible risk to gliders and MGs whose pilots are already working hard to avoid other ac in this very busy area. Whilst this risk applies equally to almost all other types of transiting ac, some of which have particularly poor visibility upward and are vulnerable to any looping aeroplane, there is an implicit and equal responsibility in the see and avoid environment of Class G airspace for both the pilot executing his aerobatics and the transiting pilot to spot each other's ac in time to take appropriate steps to remain clear. In this incident, both ac were there to be seen by each other's pilot at an earlier stage; indeed the Firefly was only 200ft higher when their tracks had crossed as it flew from R – L ahead of the Vigilant for the first time. It was surprising to some Members that the Vigilant pilot had not detected the other aeroplane at that stage: this was therefore a salutary lesson to all of the difficulties of visual acquisition of small ac even at close range. Members noted that the MG pilot had reported that he had been flying at a height of 2500ft Linton QFE (1020mb). If that was the case, the radar recording suggested that the Vigilant pilot was somewhat mistaken when he assessed the vertical proximity of the Firefly, which he reported he saw for the first time as it had approached from the W and passed 50-100ft above his MG. Notwithstanding the applicable tolerances of Mode C, the Firefly indicated some 3600ft unverified Mode C (1013mb) when it crossed 0.1nm (200yd) from L - R ahead of the Vigilant and therefore some 1310ft above the MG pilots reported height. In the PTC Member's view it was possible that the Vigilant pilot had indeed misjudged the vertical separation and did not disagree with this evaluation from the radar recording. It was also clear that his R turn in avoidance had contributed little to maximising the horizontal separation as it occurred after the tracks had crossed. Nevertheless it did allow him to keep the Firefly in sight, which was very wise. From his perspective, the Firefly pilot had reported that he had indeed sighted the MG passing 1000ft below his ac and then flying away on a NE'ly heading, but here again he had not apparently seen it as he crossed less than 1½nm ahead on the first occasion and before he turned L to fly above and just slightly astern of the MG. The Board was content that on the information available the separation was probably significantly more than the Vigilant pilot had thought at the time and concluded that this was a sighting report where no risk of a collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

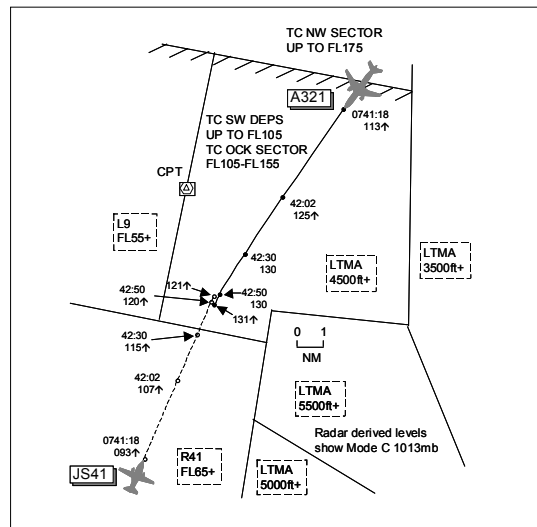
Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT NO 188/04

Date/Time: 6 Oct 0743
Position: 5125N 00111W (5nm S CPT)
Airspace: LTMA (Class: A)
Reporting Ac Reported Ac
Type: JS41 A321
Operator: CAT CAT
Alt/FL: FL121↑ ↑FL150

Weather VMC CLOC NK
Visibility: >10km NK
Reported Separation:
500-600ft V <1nm H not seen
Recorded Separation:
1000ft V 0.15nm H

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

THE JS41 PILOT reports on radar heading 020° at 180kt climbing to FL140 and in receipt of a RCS from London 121.27MHz squawking 5146 with Mode C. TCAS was not fitted to the ac. Near to NORRY an ac, believed to be an A320 type, was sighted in their 12 o'clock range 1nm, slightly higher, flying in the opposite direction which passed almost overhead them, <1nm away, about 500-600ft above and was seen to initiate a L turn. At the time they were climbing through FL121 and they were concerned that if they had been climbing at 170kt at a higher ROC, they would have been even closer. When they reported the Airprox, the controller said "...he should have been below". They assessed the risk as medium.

THE A321 PILOT reports that apart from confirming that he was the Capt of the flight, he was unaware of any incident. No comment had been made on the RT and nothing untoward occurred on TCAS so he was therefore unable to add any substance to the investigation.

THE TC SW DEPS SC reports that the A321 was on a CPT SID from Luton towards SAM and after he had climbed the flight to FL100 he transferred it to TC OCK Sector on 134.12MHz. The JS41 crew called him on transfer from Solent on radar heading 020°. When the A321 was seen above FL100 and being known traffic, he climbed the JS41 to FL100 and transferred the flight to TC NW DEPS Sector on 121.27MHz.

THE TC OCK SC reports the A321 crew called climbing to FL100 so he climbed the flight to FL150 as per the standing agreement between OCK Sector and LACC S20, only once stopping-off its climb under other traffic. He then transferred the flight to S20. The JS41 was working SW DEPS and was transferred to NW DEPS so, as the sector was not bandboxed (OCK/SW DEPS), he had not worked it.

THE TC BNN/NW DEPS (BANDBOXED) SC reports the JS41 crew called on radar heading 020° climbing to FL100. He checked the COWLY bay of his fps board for conflicting traffic and then climbed the flight to FL140. About 5 min later the JS41 crew called saying that an A321 had passed overhead their ac by about 500ft, the A321 was seen on radar to the S of the JS41 above its level. As his fps bay represented the A321 was underneath the JS41, he was surprised to see the A321 above it. The JS41 crew reported that they would be filing a report.

ATSI reports that at the time of the Airprox, the A321 was in receipt of an Area Control Service from the TC Ockham Sector Controller (OCK SC) whilst the JS41 was in receipt of the same service from the TC Bovingdon/North West Departures controller (BNN/NW Deps). Also involved was the TC South West Departures (SW Deps) controller who had handled both flights prior to the Airprox. He described both his workload and traffic loading as 'Light'.

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The BNN/NW Deps was operating in a bandboxed mode. Although there was a complex traffic situation taking place in the NE of his airspace, he was content to continue in a bandboxed mode, describing his workload as complex and the traffic loading as 'Medium' at the time of the Airprox. The two flights involved were opposite direction to each other and, on this occasion, they both worked the SW Deps and BNN/NW Deps controllers albeit in reverse order. The southbound A321 established communications with the BNN/NW Deps before being transferred to the SW Deps who, in turn, transferred it to the OCK SC. The northbound JS41 was handed from the SW Deps to the BNN/NW Deps.

The A321 departed Luton following a CPT3B SID, climbing to an altitude of 5000ft. The crew established contact with the BNN/NW Deps at 0734:00, and at 0737:00, were instructed to climb to FL80. This was the minimum stack level at the time and the agreed level specified in the Standing Agreement for the transfer of such flights to SW Deps. At 0738:40, the controller instructed the crew to contact the SW Deps. At that time, the A321 was 21nm NE of CPT passing FL70. Meanwhile, the JS41 crew had established contact with the SW Deps, on transfer from Southampton Approach, and reported level at FL80 on a radar heading of 020°. The ac's position was 28nm S of CPT and the SW Deps instructed the crew to climb to FL90.

At 0738:55, the SW Deps instructed the crew of the A321 to climb to FL100 on a heading of 220°. When this clearance was issued, the two ac were 38nm apart. As the A321 was passing FL85, the SW Deps transferred the flight to the TC OCK SC. At that time, the JS41 was in the A321's 12 o'clock position at a range of 31nm with the JS41 maintaining FL90. On first contact with the TC OCK SC (0740:00), the crew of the A321 were instructed to climb to FL120. Further clearances were issued [climb to FL130 at 0740:40] and the A321 was cleared to FL150 and turned L onto heading 215° at 0742:30 before being transferred to the next sector just over 30 sec later.

Meanwhile, the JS41 continued northbound and, at 0740:45, the SW Deps, having seen that the opposite direction A321 had climbed through FL105, instructed the crew of the JS41 to climb to FL100. This climb clearance was immediately followed by an instruction for the crew to change frequency to the BNN/NW Deps. The two subject ac were now 17.5nm apart. The crew of the JS41 established contact with the BNN/NW Deps at 0741:10, and were instructed to continue on their assigned heading of 020° and climb to FL140. The two ac were now 15nm apart, opposite direction with the A321 passing FL113 and the JS41 passing FL93.

There were no further transmissions from the crew of the JS41 until 0744:00, when they asked for the level of the A321 that had just over flown them. The controller asked them to repeat their request, which they duly did. [UKAB Note (1): Analysis of the radar shows that the A321 passed the opposite direction the JS41 between radar sweeps at 0742:50 and 0742:54 with lateral separation of 0.15nm, with the A321 climbing through FL131 and the JS41 climbing through FL121]. The controller expressed surprise as to what had happened and informed the crew that he would look into it.

It became apparent that the BNN/NW Deps and the SW Deps had differing interpretations of the relevant handover procedures. The BNN/NW Deps advised that when he transferred the A321 to the SW Deps, he was aware that the ac was 'released for climb', even though it was still within his sector airspace. He added that his normal practice was to discard the fps on such flights once they had left his frequency even if they remained within his sector. He had been aware of other traffic, a northbound flight proceeding to Coventry at FL90, in the vicinity of CPT and so had believed that this ac would restrict further climb on the A321, meaning that it would remain at FL80. His strips had been arranged in level order with the A321 strip located below that of the JS41.

The SW Deps controller stated that he also understood that when ac were transferred to and from the subject sectors, in such circumstances, they were released for climb. However, his operating practice was to retain the strips until the ac concerned had crossed the lateral or vertical confines of his sector. The question arises how this Airprox occurred. Both controllers knew and evidently understood that the subject ac, when handed from one sector to the other, were released for climb without further reference to the sector controllers within whose airspace the flights were at the time. It is noted that there is little guidance in the unit MATS Part 2, which would alert controllers to this scenario when there is the possibility of two ac, both released for climb in accordance with a standing agreement, being climbed into conflict with each other. Neither is there guidance on how long strips should be retained in the flight progress board display when traffic is transferred prior to exiting the sector. Accordingly, it is recommended that the unit's MATS Part 2 be reviewed with a view to addressing these issues.

The unit's MATS Part 2, page SWE 2.2, para 2.2.2.1 (Outbound Standing Agreements Within TC Sectors) states that Solent departures, which will enter TC Midlands' airspace, when being transferred from TC SW Deps to TC

BNN must be FL100 level by the TC North/South boundary. There is a note which requires coordination with TC OCK to be effected prior to transferring such traffic to TC BNN. LTCC Ops advise that the purpose of this coordination is to ensure that there are no ac routeing eastbound on airway L9 which could conflict. The SW Deps controller stated that he had not coordinated with the TC OCK SC as, at the time, he could see the controller was on the telephone and, additionally, there was no observed traffic to affect the JS41. The unit investigation indicates that the OCK controller would have agreed to the coordination, had it been requested, but would have made the transfer *'subject to the A321'*. As the SW Deps had ensured vertical separation existed between the A321 and the JS41 before he transferred the latter to BNN/NW Deps, it is reasoned that any condition that might have been specified by the TC OCK had been complied with. The SW Deps was asked whether he would have operated differently had the sector (SW Deps and TC OCK) been bandboxed. He advised that in those circumstances he would have coordinated further climb for the JS41 with TC Capital and kept the A321 underneath it. Enquiries have indicated that this is the 'normal' way around the flights are transferred, i.e. with the Solent departure above the Luton outbound.

The BNN/NW Deps position was bandboxed; however, this information was not known to the SW Deps. Analysis of the radar recording in the 'slave' mode, shows that when the default settings for the NW Deps position are selected, the SW limit of cover is approximately 5nm S of CPT. The standard position for operating the combined BNN/NW Deps sector is the NW Deps position. When the default settings for BNN sector are used, it is possible to see 20nm S of CPT. There is no obvious rationale for having a smaller area displayed when the sectors are bandboxed than when they are operated separately. That said, it is up to the individual controller how he or she has the radar set up.

When the JS41 crew contacted the BNN/NW Deps controller at 0741:10, the ac was outside of the controller's displayed radar cover, some 10-5nm S of CPT. The controller momentarily changed his displayed range from 40nm to 60nm and then instructed the crew of the JS41 to climb to FL140. At 0741:30, he returned his displayed range to 40nm and so the JS41 was, once again, outside his displayed radar coverage. The ac did not reappear until 0742:30, when it was passing FL115 with the A321 in its 12 o'clock at a range of 3-5nm and passing FL130. When the pilot of the JS41 queried the ac that had passed overhead, the controller, who was in the process of handing over the position, thought that the request was for a higher level. However, when the pilot repeated his request, it came as a great surprise to him as he still believed that the A321 would be underneath, and not above, the JS41 as the two flights passed.

The unit's MATS Part 2, page GEN 2.9, para 2.9.1, details the conditions for silent handovers which were applicable in this case. These are that the ac must be displaying discrete SSR codes and that they are within the anticipated displayed radar cover of the receiving sector. The investigation of this Airprox indicates that it may not always be possible to anticipate the range set by adjacent sectors. The MATS Part 2 entry then adds: *'Before giving an executive instruction to an ac which has been transferred by silent handover, the receiving controller shall ensure that the ac is identified'*. The SW Deps was not aware that BNN/NW Deps was bandboxed, however, he would have been aware that typically, the displayed range shown at the BNN sector included traffic operating to the S of CPT which is where the JS41 was displayed, and so it was reasonable for him to transfer the flight when he did. The MATS Part 2 does not require the accepting controller to ensure that the transferred ac, having been given any executive instruction, should remain within that controller's displayed radar coverage.

The BNN/NW Deps had previously controlled the A321 through his airspace. It was therefore 'known traffic' to him which is defined in MATS Part 1 as: *'Traffic, the current flight details and intentions of which are known to the controller concerned through direct communication or coordination'*. The BNN/NW Deps knew the route of the A321 and was expecting the SW Deps controller to climb the ac. It is therefore considered that it remained 'known traffic' even though the BNN/NW Deps did not know the exact level to which it was climbing. In such circumstances it would have been prudent to retain the fps on the A321 until it was clear of the BNN/NW Deps airspace and/or no longer a potential confliction to ac under, or which might come under, his control. Anecdotal information received indicates that, in the past, there was an entry in the unit's MATS Part 2 describing 'known traffic' and how it should be regarded when crossing sectors. Examination of the current MATS Part 2 shows that this entry has been removed. Accordingly, it is recommended that the MATS Part 2 be reviewed with a view to providing guidance on the existence and effect of 'known traffic' on sector operations.

The BNN/NW Deps, on receiving the initial call from the pilot of the JS41, increased his displayed range to determine its position. The A321 was clearly displayed at that time; however, the controller still instructed the crew of the JS41 to climb to FL140 taking it into conflict with the other subject ac. The BNN/NW Deps did not then

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monitor the relative positions of the two ac as they headed toward each other. Although the controller should have been providing a RCS to the JS41, and providing radar separation against other traffic, it was not possible for him to do so unless he had the ac displayed on his radar.

ATSI Recommendations:-

The unit should review the content of the MATS Part 2 with regard to the following areas:

Description of and guidance to controllers in respect of 'known traffic';

Guidance as to the retention of fpps when traffic is not on the controller's frequency but still within his sector airspace; and

The conditions relating to Standing Agreements to ensure that ac cannot be released to another controller with the potential to be climbed or descended into direct conflict with each other.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members commended ATSI for their comprehensive report on what was a technically complicated scenario. It was clear that both of the subject flights were given climb clearances by controllers whilst the ac were flying in the airspace of an adjacent sector. However, both controllers were aware that the subject ac were released for climb (RFC) on being transferred to the next sector. The TC BNN/NW Deps had transferred the S'bound A321 to the SW Deps RFC and, 2.5min later, had received the N'bound JS41 RFC from TC SW Deps, the latter having ensured that the ac were vertically separated prior to transfer. After the BNN/NW Deps had transferred the flight, he had discarded the fps on the A321 even though it was still within his airspace with the potential to conflict with ac in his sector i.e. 'known traffic'. He had assumed that the A321 would be below the JS41, owing to another ac in the sector at FL90, so that when the JS41 crew called on his frequency, he had checked the ac's position by changing his radar displayed range and then cleared the flight to climb to FL140 even though the A321 was known traffic, had been RFC and would have been clearly displayed on radar ahead of the JS41. He had then returned to a 'reduced' display range and had not monitored the JS41's progress whilst the flight was under a RCS. Members agreed that the cause of the Airprox was that the TC BNN/NW Deps had not taken the A321 into account when he climbed the JS41. ATCO Members familiar with TC operations were aware that, even though the 'bandboxed' NW Deps position default radar settings were at a reduced range, the adjacent BNN sector radar display is available for reference by the controller and would have displayed the subject ac without the need to alter the display settings.

Turning to risk, the TC BNN/NW Deps had transferred the A321 to the TC SW Deps, who had cleared the flight to FL100, above the JS41 at FL90, and then transferred it to TC OCK. The TC OCK SC had then given the A321 crew a 'stepped' climb which had resulted in the A321 continuing to climb above the JS41 before the flight was then transferred to LACC S20 whilst climbing to FL150.

At the time, the TC OCK SC was not separating the A321 from the JS41 as, from his viewpoint, the A321 was known traffic to the BNN/NW Deps SC and would be climbing the JS41 subject to A321. Meanwhile, the TC SW Deps had seen that the TC OCK SC had climbed A321 and, as it had vacated FL100, he had climbed the JS41 to that level before transferring it to BNN/NW Deps. However, the TC BNN/NW Deps, after having climbed the JS41, had been unaware of the incident until the JS41 crew queried the A321's level after the subject ac had passed, and the controller had been surprised to see that the A321 was above, not below, the JS41. The JS41 crew had seen the approaching A321 about 1nm ahead and had estimated that it had passed 500-600ft above whilst the A321 crew were not aware of any incident. The radar recording shows the subject ac passing with 1000ft vertical separation with both ac climbing, and horizontally separated by 0.15nm. The NATS advisor informed Members that an analysis of the incident was carried out and it was confirmed that the flight profiles flown were outside the parameters to trigger STCA and TCAS warnings. It was agreed that, although this had had the potential to be a more serious incident, at the end of the day, the flight paths flown by the A321 and JS41 had resulted in the subject ac passing with no erosion of standard separation and this was enough to persuade the Board that there had been no risk of collision during this encounter.

The NATS advisor informed Members that with respect to the ATSI Recommendations a letter of reply had been sent recently to SRG and their response is awaited.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The TC BNN/NW Deps did not take the A321 into account when he climbed the JS41.

Degree of Risk: C.

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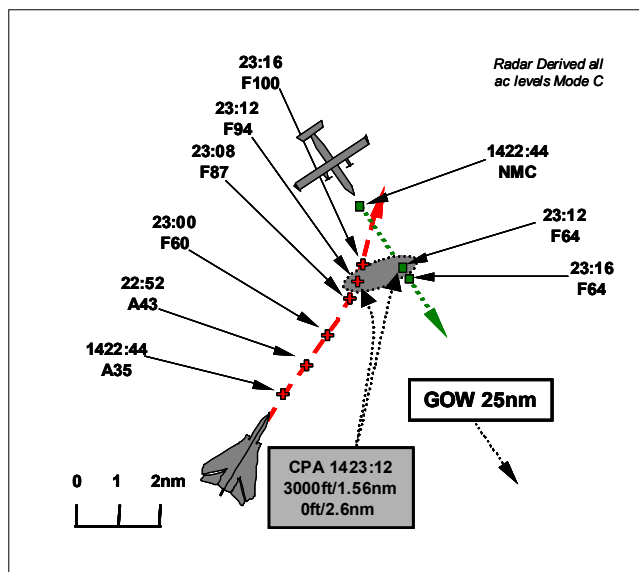
Date/Time: 7 Oct 1423

Position: 5608N 00510W (25nm NW Glasgow)

Airspace: Scottish FIR (Class: G)

Reporter: Glasgow ATC

	<u>First Ac</u>	<u>Second Ac</u>
<u>Type:</u>	BN2P	Tornado GR4
<u>Operator:</u>	Civ Com	HQ STC
<u>Alt/FL:</u>	6400ft (QNH)	3000ft (RPS 1015 mb)
<u>Weather</u>	IMC	VMC CLBC
<u>Visibility:</u>	In cloud	30km
<u>Reported Separation:</u>	Not seen.	Not seen
<u>Recorded Separation:</u>	3000ft V/ 1.56nm H (0V /2.6nm H)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

GLASGOW APR reports that she was on duty as Radar 1. The APR was a trainee supervised by a mentor. They had been informed that an inbound air ambulance ac was a CAT A flight (very urgent, on a direct routing). The frequency and landlines were quite busy and the Mentor took the initial call from the Islander. She terminated her phone call so that she could inform the Islander pilot that he was on a RAS, that there was a good chance of a visual approach at Glasgow and to give initial descent from FL75 to 5000ft alt. She then called TLA(T) back to accept 3 radar handovers. As the first ac called her, the APC mentor pointed out a 7001 squawk which was approximately 8nm SW of the Islander, at 3000ft and climbing at high speed and tracking NE. She passed TI to the Islander pilot who replied that he was IMC so she told him to turn left heading 110° (from a track of 140°) and stop his descent (he was at 6500ft). There was no way that the Islander could avoid the military traffic – the GR4 was clear before the turn registered on radar. She updated the TI and told the Islander pilot that it appeared that the military traffic would pass behind him, albeit very close. When the ac squawking 7001 was 2nm from the BN2P its squawk changed to 4646 [Scottish Military] and as it passed behind the Islander it was climbing steeply from 6200ft through FL100. She informed the Islander pilot that he was clear of the traffic and he asked to resume his own navigation, which she approved and descended the ac, which went visual shortly afterward and landed without further incident.

THE BN2P PILOT reports flying an air ambulance flight from Benbecula to Glasgow heading 130° at 150kt during descent into Glasgow working Glasgow APR about 25 miles on the 321 radial from GOW and cleared descent to 5000ft when he was advised of a 7001 squawk on his right and given avoiding turn left to 110° and told to stop descent. He was advised that the ac was fast moving and soon cleared from the area. Nothing was seen of the Tornado as they were IMC. He did not wish to file but agreed to respond to the ATC reported Airprox.

THE TORNADO GR4 PILOT reports that they were flying a singleton tactical sortie routing low-level up the West Coast of Scotland and around the Scottish TMA. Upon entering Loch Fyne around 1425 they pulled up to 3000ft VMC to remain below the base of ADR N573D. Once clear of the ADR they attempted to contact Scottish (Mil) but were unable to do so due to the surrounding high ground so they pulled up through a 2000ft cloud layer and made contact with Scottish (Mil) at 6000ft. They were identified and then cleared to climb to FL170. They did not see, nor were they ever made aware of, another ac at any stage.

NATS, ATSI and the Tornado Station provided reports but did not add further significant information.

HQ STC comments that it was not surprising that the GR4 had difficulty in achieving 2-way R/T with Scottish (Mil) at approximately 3000ft. There are several large mountains in excess of 2500ft in the vicinity and achieving line-of-sight at that altitude would have been difficult. Furthermore, with a peak of 3112ft and a safety altitude of 5300ft in the very near vicinity the crew would have been reluctant to stay below this altitude as the weather deteriorated in the climb.

The Tornado pilot had little option but to expedite his climb to a safe altitude where it could be seen and heard by ATC. The safety altitude for this part of Scotland is 6500ft and by the time they had reached this altitude they were in 2-way communication with the ATCRU. It is fortunate that they did not level off as this would have put them in direct conflict with the Islander. It is unfortunate that as they cleared cloud (at their reported 5000ft) they would have been in a high nose-up attitude and unable to see the Islander even if it was VMC (which it was reported they were not). Furthermore, the crew had sensibly climbed in Class 'G' airspace and headed away from the ADR N573D in an attempt to avoid any IMC/IFR civil traffic that they expected to be routing along it.

The newly revived GR4 Collision Warning System (CWS) program will provide crews with warning of any such occurrences developing in the future; however, rollout of the CWS is not expected until 2008/9.

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 accepted that on flights such as this Emergency Air Ambulance, direct routing through the open FIR, outside CAS or ADRs, in IMC might be justified. In such cases however, pilots should be aware of the increased risks involved of encountering other, mainly military, traffic.

In this incident the position and timing of the Tornado's abort from low level, necessitated by bad weather, could not have been more unfortunate. The pilot had taken reasonable precautions to avoid likely areas of traffic but nonetheless had unexpectedly encountered the Islander.

Although both controllers had reacted quickly to the developing situation, neither had time to provide effective avoiding action. Fortunately the flightpaths of the ac were such that they would miss each other by about 1.5nm. However, since neither pilot had seen the other ac, the Board concluded that the safety of the respective ac had not been assured. This would not have been so if the Islander had been able to route along Class F Airspace since Military ac are required to either avoid it or be in receipt of a radar service if they penetrate it.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in IMC in Class G Airspace.

Degree of Risk: B.

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Date/Time: 11 Oct 0847

Position: 5306N 00010W (Coningsby - elev 25ft)

Airspace: Coningsby MATZ (Class: G)

Reporting Ac Reported Ac

Type: B200 Mirage 2000 pr

Operator: HQ PTC Foreign Mil

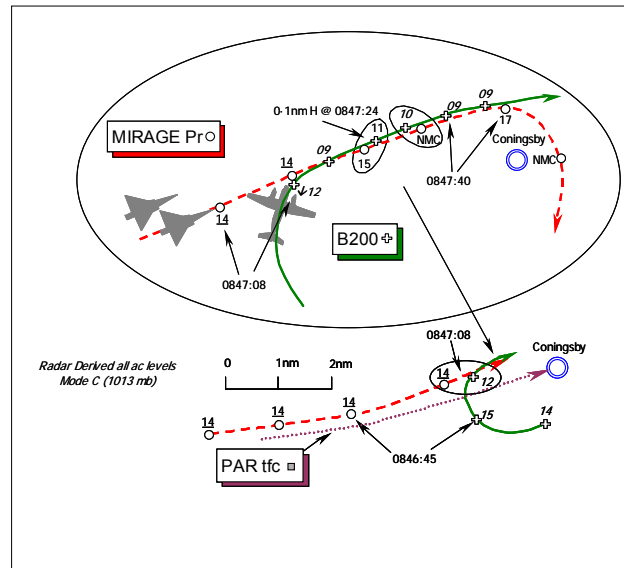
Alt/FL: 1500ft ↑1800ft
(QFE 1018mb) (QFE 1018mb)

Weather VMC CLOC VMC nil cloud

Visibility: 20km >10km

Reported Separation:
200ft V 800ft V/40m H

Recorded Separation:
400ft V @ 0847:24



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BEECHCRAFT KINGAIR B200 PILOT reports his ac has a white and blue colour-scheme and the HISLs were on whilst flying in the visual cct at Coningsby and in communication with Coningsby TOWER on 275.875MHz. The assigned squawk was still selected with Mode C: significantly, TCAS II is fitted.

Whilst in the cct to RW07 RHC he was instructed to orbit at 1500ft QFE (1018mb) to de-conflict with a Mirage formation that was joining. He was also informed of radar traffic at 4nm from touchdown. Whilst turning R from the LIVESIDE to the DEADSIDE he was visual with the radar traffic but not the visual joiners. When fully established on the DEADSIDE passing the RW07 threshold heading 70°(T) at 150kt he received a TCAS TA. "Whilst ascertaining the threat imposed from the TA" he received a TCAS RA to descend which he did. Shortly afterwards two ac – a pair of Mirage jets -overflew about 200ft above his Kingair, one to port and the other to starboard. At no time before this occurred had he observed the joining ac. During subsequent RT exchanges, the Mirage leader confirmed his formation was flying at 1500ft. He added that if the Kingair had not been fitted with TCAS the risk of collision could have been much higher.

THE MIRAGE 2000 PILOT reports that he was leading a pair of camouflaged grey/blue Mirage ac flying in close echelon port (the No2 swept back off the leader's port quarter astern) returning to join the Coningsby cct for RW07RHC. They were in communication with Coningsby TOWER on 275.875MHz. HISLs were on but SSR was not selected, he thought, though both Mode A & C were available; TCAS is not fitted.

Joining the cct on a heading of 070° at 300kt he first spotted the other ac - the Kingair - from the IP at 1 o'clock at a range of 3nm on an "opposite track" turning towards his formation– level at his formation's height of 1500ft QFE. The Kingair continued turning R into their 12 o'clock position about 2nm away but this traffic was not "announced" by ATC, he thought, and he had no indication of the Kingair pilot's intentions. It appeared to him that the Kingair was turning right and diving slightly, so to avoid it's "trajectory" he climbed his formation slightly to 1800ft QFE as the Kingair descended, eventually passing some 800ft above the latter and some 40m away horizontally and overhead the aerodrome. He assessed the risk as "nil" because he was visual with the Kingair throughout the encounter but he stressed that it was a busy cct, the work load "medium" and his avoidance manoeuvres were executed "gently" because of his wing man.

THE BEECHCRAFT KINGAIR B200 PILOT'S UNIT comments that the quick reaction of this experienced multi-engine QFI to the TCAS RA averted a possible mid-air collision by the closest of margins. Although TCAS is fitted to relatively few of the ac in the RAF's inventory, it is already proving to be a very effective system in providing pilots with increased situational awareness of other ac as well as giving them those vital few seconds warning of a potential collision. It is of interest to note that if the incident had taken place in RAF Cranwell's cct, TCAS would

not have given the QFI any information because of the current policy of squawking standby in the visual cct. He opined that maybe it is time to reassess that policy in order to prevent a similar incident occurring in our increasingly busy a/d circuits.

THE BEECHCRAFT KINGAIR B200 PILOT'S STATION (RAF Cranwell) comments that the use of TCAS/SSR in the visual circuit has been the topic of much debate. In a quiet visual circuit its use perhaps should be recommended. However, at a busy airfield with both visual and radar patterns active the benefits are much less clear. The resulting clutter caused by SSR data blocks on ATC radar displays combined with persistent alerts from close proximity traffic that the pilot might have spotted may outweigh the benefits. Nevertheless, it would be prudent to revisit the use of TCAS/IFF at RAF Cranwell and ATC have been tasked with conducting a trial to assess the situation. The outcome of this trial would then determine the way ahead.

MIL ATC OPS reports that the RAF Coningsby RT recording time base was found to be 58sec ahead of the radar recording time base which is accurate. Therefore, all timings within this report have been correlated to that of the radar recording and adjusted to UTC; appropriate corrective action has been taken.

The Beech 200 Kingair was operating in the visual cct to RW07RHC at Coningsby but just prior to the Airprox was orbiting at 1500ft QFE (1018mb) for separation from the normal visual circuit of 1000ft QFE, following instructions from Coningsby TOWER (TWR). Coningsby DIRECTOR (DIR) was controlling the pair of Mirage 2000 ac on a radar to visual approach to RW07RHC at Coningsby. DIR was also controlling a busy Radar Training Circuit (RTC) with 4 speaking units on frequency. The Mirage pair had been identified, placed under a RIS and positioned left downwind for RW07RHC in the RTC at 1500ft QFE; at 0843:18 DIR informed the Mirage leader *"...there's radar traffic 8 miles, one in the visual circuit and further radar [traffic] at 15 miles."* At 0844:17, DIR turned the Mirages *"...left heading 180"* for a base leg and then just under one min later at 0845:15 DIR instructed them to turn *"...left heading 090"* for the aerodrome. The Mirage leader acknowledged the turn and reported *"...visual one aircraft at 2 o'clock, higher."* DIR acknowledged this report and then at 0846:00 told the pilots *"...aerodrome 12 o'clock, 8 miles, report visual."* The Mirage pilots quickly responded that they were visual with the aerodrome and DIR instructed them to contact TWR: at 0846:12 they reported doing so. Some 11 sec later at 0846:23, the Mirage leader contacted TWR who instructed them to *"...join RW07 right hand pitch, QFE 1018, one in, in the overhead at 1500ft, radar traffic 2 miles finals to land."* The Mirage leader acknowledged this information with *"[C/S] copies"* and at 0846:47 reported *"visual"* but did not state with which ac. Shortly afterwards TWR informed them of another Mirage ac at *"7 miles to land"* and the leader responded that he was looking before he then said at 0846:59, *"...tally behind one ac on the nose."* Three sec later the B200 reported *"...descending TCAS alert."*

[UKAB Note (1): Subsequently TWR ensured that the ac remained separated from each other. The controller confirmed the acs' respective heights at *"one point five"* for the Mirage pair whereupon the B200 Kingair reported at 1000ft. At 0847:18, TWR instructed the Mirage leader to *"...break level at 1500ft to avoid the twin prop"*. Later the Kingair pilot confirmed his intention to file an Airprox on RT.]

[UKAB Note (2): The Claxby radar recording shows the Mirage pair 10nm W of Coningsby tracking S indicating 1400ft Mode C (1013mb). There is a return 3.2nm SSW of the Mirages indicating 1900ft Mode C (1013mb) and tracking SE, which is likely to be the ac that the Mirage pilots reported visual with. At the same time the Kingair is shown 1.5nm NE of Coningsby, indicating 1500ft Mode C and executing a R turn from the dead side onto the live side. At 0846:00, when DIR called the airfield location to the Mirages, they are 8nm WSW of Coningsby, tracking directly towards the overhead and indicating 1400ft Mode C with PAR traffic 3.9nm ahead of them indicating 600ft Mode C descending. At the same time the B200 is 0.9nm SE of the overhead, also indicating 1400ft Mode C and continuing in its right-hand orbit. At 0846:28, just after the Mirage leader has called TWR, the ac are 5nm apart with the Mirages indicating 1400ft Mode C and the B200 indicating 1500ft Mode C. At 0847:00 the B200 is 1nm directly ahead of the Mirages with both Mode Cs indicating the same level at 1400ft Mode C. At 0847:08, the B200's Mode C indication suddenly descends to 1200ft then 900ft. The Mirage pair are shown at 0847:24 indicating 1500ft (1013mb) just about to overfly the B200 which is 0.1nm ahead indicating 1100ft Mode C (1013mb); the Mirages' Mode C indicates NMC as the Mirages pull ahead in the visual circuit and indicate 1700ft Mode C for a short period before they turn and position for finals, whilst the B200 maintains 900ft (1013mb).]

The visiting foreign Mirage crews were all briefed on local ATC procedures by SATCO and an experienced Supervisor. Part of the briefing included radar to visual joining procedures and visual circuit heights and directions. DIR reported that he had passed the visual circuit state to the Mirage pilots when they were downwind in the RTC; the information he passed was correct. Since the traffic information

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was passed early it might normally be reasonable to expect him to update the information before transferring the pilots to TWR but he had a high workload and there was no additional visual cct traffic by that time. DIR also reported that he expected the Mirages to descend from 1500ft QFE to the normal visual cct height of 1000ft QFE by the time they reached the INITIAL POINT (IP) in accordance with the standard cct joining procedures. When the Mirage leader contacted TWR, he was passed joining instructions and details of the visual cct traffic in the correct format and included the height of the B200 in the overhead, but TWR was unable to give an exact position as the B200 was blocked from his sight. It would not be possible for the TWR controller to be certain that the Mirages were at the correct joining height and when the pilots reported “visual” the controller will have assumed that they were capable of taking their own separation from the other traffic. Following the report of the Airprox the TWR controller took steps to confirm the relative heights of the ac following the TCAS RA and passed instructions to ensure that the ac remained separated.

THE STATION conducted its own analysis after the event which has been particularly helpful. The SFSO comments that the Mirage 2000s were on detachment to Coningsby for ACMI (Air Combat Manoeuvring Instrumented) range combat training. Eight Mirage 2000 were on recovery to RW07RHC following an ACMI range slot. The Kingair was on a practice diversion in the visual circuit. ATC instructed the Kingair to hold in the overhead at 1500ft QFE while the fast jets were recovered. The Kingair pilot climbed in compliance to a height of 1500ft and turned R from the downwind leg to establish on the dead side. The subject Mirage pair was in close formation recovering radar to visual. At about 6nm the leader called the field in sight and was switched to TOWER. At that stage they were at 1500ft QFE, the lowest height allowed by the radar vector chart (RVC) and did not descend to the promulgated cct height of 1000ft QFE. At about 4nm from the aerodrome the Mirage leader was in RT contact with TOWER, and cleared to join, when he was informed that there was radar traffic on short finals and also an ac holding in the overhead at 1500ft – the Kingair. Although this transmission is clearly heard on the recording system of the formation leader’s ac, it did not register with the pilot as he states in his narrative that he was not informed of the traffic. When he became visual with the Kingair at 3nm, the other ac was on an opposing heading on the downwind leg, but the Mirage pilot stated that at this time he was not sure of the intentions of the Kingair pilot which was now turning R towards the Mirage formation to cross to the deadside. The Kingair is clearly visible on the Mirage HUD video recording at about 1nm, turning R, ‘belly up’ to the Mirage pair. At no time did the Mirage pilot think there was any danger of collision and no violent avoidance manoeuvres were required (the 2 Mirage were in close formation).

Although the foreign detachment pilots were comprehensively briefed that the Coningsby visual cct height is 1000ft QFE, the norm in France is 1500ft so conflicting traffic would be held at a lower height than that of fast jets joining. The Mirage leader appears not to have understood the information that the traffic would hold in the overhead and was unused to this procedure; he did not descend to 1000ft as expected. Although the TWR controller reported the confliction correctly, it would have clarified the situation if he had instructed the Mirage formation to “join at 1000ft with an ac holding in the overhead at 1500ft.” In hindsight, with 8 foreign ac rejoining, it would possibly have been better to instruct the Kingair to hold at a higher level or to leave the area until the Mirage had landed.

Unfamiliarity and a misunderstanding between the Mirage pilot and ATC appear to be key to this Airprox.

HQ PTC comments that it was unfortunate that the Mirages were allowed to run in at the same height that the Kingair pilot had been instructed to orbit at - in order to remain clear of them. We agree with the Unit and Station’s views on the utility of TCAS in this case, but acknowledge the difficulties that this might cause if unfettered use were made of it in the cct area. Cranwell have therefore run a trial in which all ac in the visual circuit continued to squawk for the benefit of the TCAS-equipped Kingairs. Unfortunately, it was found that ATC could not then easily discriminate between the visual traffic and the instrument traffic that they were required to keep separated. However, the Kingair crews’ have found since, that - where they were likely to conflict with instrument traffic - occasional use of the TCAS picture is an advantage.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear that the Kingair pilot had responded to the TCAS RA and had descended from his assigned orbit height of 1500ft QFE toward the visual cct height because he had not seen the Mirage formation before he turned R onto the deadside. For entirely understandable reasons he was concerned when TCAS enunciated an RA to descend against the Mirage jets approaching at close quarters with a closing speed of around 150kt from astern at the same height, which was the crux of his report. For their part, the Coningsby local procedures required that the Mirage pair, inbound to the cct from a radar to visual recovery to RW07RHC, should be level at the specified height of 1000ft QFE at INITIALS – the IP being situated at 3nm from the RW07 threshold – but it was evident that the Mirage leader had kept his formation high and remained at 1500ft QFE as they approached the cct area. Military controller Members were well aware of the issues that can arise with visiting detachments and opined that it was unfortunate that DIR had not reminded the Mirage leader to descend to 1000ft after he reported visual with the aerodrome and before he switched them to TWR, for this might have forestalled this Airprox. However, the Mil ATC report had made it plain that DIR had his hands full directing a busy RTC and there was an entirely reasonable assumption on his part that the Mirage leader would comply with the briefed procedures.

The Mirage leader reports that he first spotted the Kingair 3nm away whilst it was downwind on an “opposite track” turning towards his formation – level at his ac’s height of 1500ft QFE. The Kingair continued turning R ahead of them but although he had said that ATC had not prewarned him about the Kingair’s presence this was not the case: furthermore he was not aware of the Kingair pilot’s intentions. The RT recording had clearly revealed that DIR had advised “...one in the visual circuit...” which was the Kingair. However, when the Mirage leader contacted TWR the controller advised “...1 in, in the overhead at 1500ft...”, this might have been confusing to the Mirage leader as strictly the “1in” referred to the number of ac in the 1000ft visual cct, whereas the Kingair was actually orbiting above the visual cct height. Clearly the TWR controller was doing his best to help the Mirage pilots - for whom English was not their native tongue - and there might have been an element of confusion on their part as alluded to in the Mil ATC Ops report. Nevertheless, having flown into the cct area at the wrong height after spotting the Kingair from 3nm away, there was probably little else that the formation leader could do when he saw the Kingair starting to descend in response to the RA. The Board viewed his climb to avoid the Kingair as not unreasonable in the circumstances, but it was evidently the formation leader’s error that kept them at 1500ft in the first place for if they had descended in compliance with the briefed procedure they would have been 500ft beneath the Kingair – as the ADC had fully intended – with priority given to them in the circuit ahead of the visiting Kingair. Had that separation been maintained it is unlikely that an RA would have resulted for the Kingair pilot, but in the confines of this fast-jet aerodrome cct this was not clear-cut by any means.

Issues over the use of TCAS and squawking in the visual cct prompted much debate. On the one hand some Members thought that the Mirage formation pilots and the Kingair pilot should have stopped squawk 3/A as soon as they switched to TOWER as part of their pre-joining checks. Other Members thought that this potentially rendered an important and highly effective safety net blind to the presence of another ac so why turn it off in Class G airspace! Moreover, TCAS is designed so that, in general, at a height of 1000ft agl [+/-100ft] all RAs are inhibited. The Board was briefed that the Kingair pilot’s Unit SOPs advised that when operating in a [visual aerodrome] circuit pattern consideration should be given to selecting the TCAS to ‘TA only’ thereby inhibiting RAs and perhaps that might have been worthwhile here in good VMC. An experienced CAT airline pilot Member added that under certain ac parameters a pilot might consider inhibiting RAs. It was explained that the local trial conducted at Cranwell had not been advantageous as far as ATC was concerned, but a civilian licensed ATS provider has taken a different view, insofar as the company has reinforced to its controllers NOT to tell crews to switch off SSR as this might – in extremis – deny SSR data to an ac equipped with TCAS that might render the latter ineffective in a genuine conflict situation. The HQ STC Member explained that the Command was currently gathering data on this topic so that a consensus could be reached, so it was clear that work was in hand to resolve this difficult issue. In lieu of formulating a Safety Recommendation on this topic, the Chairman brought this debate to a close by requesting that the HQ STC Member keep the Board apprised of the Command’s findings. In the Board’s opinion, if the Mirage formation leader had entered the cct at the correct height and had descended to 1000ft QFE by the IP this Airprox could have been prevented. Therefore, the Members concluded that this Airprox had been caused because the Mirage formation leader had joined the Coningsby cct at the same height as the orbiting Kingair.

Whilst this had resulted in a descent for the Kingair pilot who followed the RA whilst unsighted, the Mirage leader reports he had the Kingair in view all the time and was able to manoeuvre his formation slightly to a height of 1800ft QFE, above the descending Kingair. Whilst the Mirage leader thought that 800ft of vertical separation existed and the Kingair pilot 200ft, the radar recording clearly evinced 400ft vertical separation at this point. With this in mind, the Board concluded, therefore, that no risk of a collision had existed in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

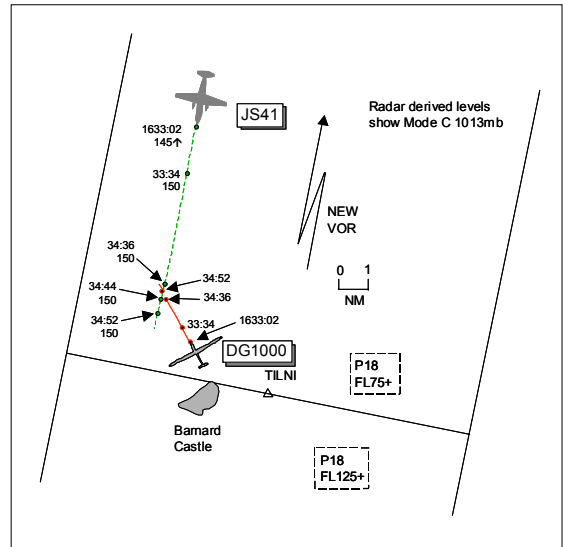
Cause: The Mirage formation leader joined the Coningsby circuit at the same height as the orbiting Kingair.

Degree of Risk: C.

AIRPROX REPORT NO 191/04

Date/Time: 4 Oct 1635
Position: 5436N 00158W (4nm NW Barnard Castle)
Airspace: AWY P18 (Class: A)
Reporting Ac Reported Ac
Type: JS41 DG1000 Glider
Operator: CAT Civ Pte
Alt/FL: FL150 FL100

Weather VMC CLAC VMC CLNC
Visibility: >40nm 'good'
Reported Separation:
 200ft V 100-150ft V/600m H
Recorded Separation:
 c0-2nm



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JS41 PILOT reports heading 205° at 280kt en route from Newcastle to Birmingham and in receipt of a RCS from MACC on 125-95MHz squawking an assigned code with Mode C. TCAS was not fitted to the ac. The visibility was >40nm, 5000ft above cloud in VMC, and the ac was coloured white/blue/red with nav and strobe lights switched on. After the ac had just been levelled at FL150 to cruise, he first saw a glider, a high performance type with winglets coloured white, as it passed 200ft below from L to R in level flight. He assessed the risk as 'moderate to high' although the risk had disappeared by the time he had sighted it. He tried to report the incident on the RT, in order to ascertain whether the glider pilot was on the controller's frequency, but he was unable to transmit owing to a high volume of transmissions, concluding that the controller was too busy to interrupt. His position at the time of the Airprox was on the NEW VOR 205R at 26d within CAS.

THE DG1000 GLIDER PILOT reports heading WNW at 45kt and FL100, he thought, to the W of Barnard Castle in the cruise on a local flight from Sutton Bank and in communication with other gliders on 130-4MHz. The visibility was 'good' in VMC with no cloud in the vicinity and the glider was coloured white and carried neither lights nor a transponder. Both he and his co-pilot saw a twin engined ac, coloured silver, in their 0130 position range 2nm crossing R to L slightly above and altered course slightly to the R, whilst carefully monitoring its course. It was seen to pass 600m ahead and 100-150ft above with a low risk of collision.

UKAB Note (1): During a subsequent telephone conversation with the DG1000 pilot, he had not noted his level at the time of the incident and on reflection thought that his originally reported level of FL100 may have been in error. At the time he had been flying in excellent wave conditions, climbing at 8kt vertically, and could well have been closer to FL150. He had been cognisant of the airway and he had thought that he was further W of Barnard Castle, well clear of the airway.

ATSI reports that the Airprox occurred at approximately 1635 within Class A airspace. The DG1000 glider was displayed on the Great Dun Fell radar as a primary return but it is not certain whether the MACC N Upper controller could see it on his display. Class A airspace requires an ATC clearance to enter which had not been issued to the glider pilot. The controller was therefore entitled to believe that any unknown returns were operating outside CAS, the base of which at the location of the Airprox is FL75. The JS41 was cruising at FL150 at the time and the crew made no comment on the RT regarding an Airprox. No ATC causal factors were disclosed.

UKAB Note (2): Met Office archive data for Teesside METAR shows EGNV 1620Z 21014KT 9999 SCT040 14/06 Q1003=

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UKAB Note (3): The Gt Dun Fell radar recording at 1633:02 shows the JS41 9.3nm NNW of Barnard Castle tracking 190° indicating FL145 climbing. At the same time a primary only radar return is seen, believed to be the subject DG1000 glider, 2nm NW of Barnard Castle tracking 330° on a converging course. Just over 30sec later, the JS41 levels at FL150 with the DG1000 in its 1130 position range 5.3nm; thereafter the subject ac close with a constant relative bearing. The radar sweep at 1634:36 shows the DG1000 in the JS41's 1130 position range 0.55nm but the DG1000 is not seen on the next sweep at 1634:44 but reappears 8sec later 0.8nm in the JS41's 6 o'clock position tracking 340°, having turned slightly R. Taking into account the subject ac's flight paths prior to and post radar fade, it is estimated that the CPA occurs just before the 1634:44 sweep when the JS41 passes ahead, and then to the L, of the DG1000 with about 0.2nm horizontal separation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The gliding advisor commented that all Sutton Bank pilots are fully aware of the CAS in the area and use Barnard Castle as a reference point. Furthermore, about 95% of gliders carry GPS with certainly all being fitted at this performance level with most being coupled to a moving map display to confirm position. However, the DG1000 is a fairly new glider so the equipment fit and its serviceability of this particular ac, at the time, was unknown. From his report, the DG1000 pilot had believed that he was further to the W of Barnard Castle so he had probably been navigating using a topographical chart with visual confirmation. When flying at higher levels, it can be difficult for a pilot to judge his exact position over the ground so an extra margin should be applied to ensure that the ac remains clear of CAS.

[Post Meeting Note: After further investigation, the Gliding Advisor found that the DG1000 pilots were not on oxygen, normally used above FL80, with flight above FL120 not allowed without it. The pilots would certainly have been hypoxic at FL150 – the gps data log confirms the ac close to this level at the time of the Airprox – with the associated feelings of euphoria, lack of awareness and poor judgement. Gps moving map equipment was fitted to the DG1000 glider but was not being used on the subject flight. The Gliding Club responsible for the DG1000 will be taking appropriate action. The BGA will ensure that all glider pilots are reminded of use of oxygen criteria, and the need to remain clear of CAS, unless authorised to penetrate, and ensure that maps and moving map airspace files are kept up to date.]

An ATCO Member said that glider pilots occasionally called his ATSU to request clearance into CAS but this was usually to transit a Class D CTR/CTA. In this case, for whatever reason, the DG1000 pilot penetrated Class A airspace without clearance and this had caused the Airprox.

Turning to risk, the JS41 crew were undoubtedly surprised to see a glider, albeit late, pass 200ft below, without warning, whilst cruising at FL150 in CAS. The DG1000 pilot had visually acquired the JS41 in his 0130 position at range 2nm, slightly above, and he turned slightly R to increase separation, estimating it passed 600m ahead and 150-200ft above. Members were clear that the actions taken by the DG1000 pilot had ensured that the subject ac were not going to collide but could not unanimously agree the level of risk. Some Members believed that the visual sighting and manoeuvre executed by the DG1000 pilot had been effective in removing any collision risk. Other Members noted that most safety nets had been ineffective during the incident. TCAS was not carried by the JS41 at the time and the DG1000 did not carry a transponder rendering STCA, and the MACC controller, 'blind' to the deteriorating situation. Also, the JS41 was accelerating up to cruise speed whilst the slow moving DG1000 was crossing/converging on its track with a positive upward vector of 8kt (+800fpm). The radar recording had shown the subject ac passing horizontally by about 0.2nm. Without agreement a vote was taken by Members. This led to the Board to conclude, by a slim majority, that the relative flight paths flown by the subject ac had led the subject ac to pass in very close proximity to such an extent that safety had not been assured during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Unauthorised penetration of Class A airspace by the DG1000 pilot.

Degree of Risk: B.

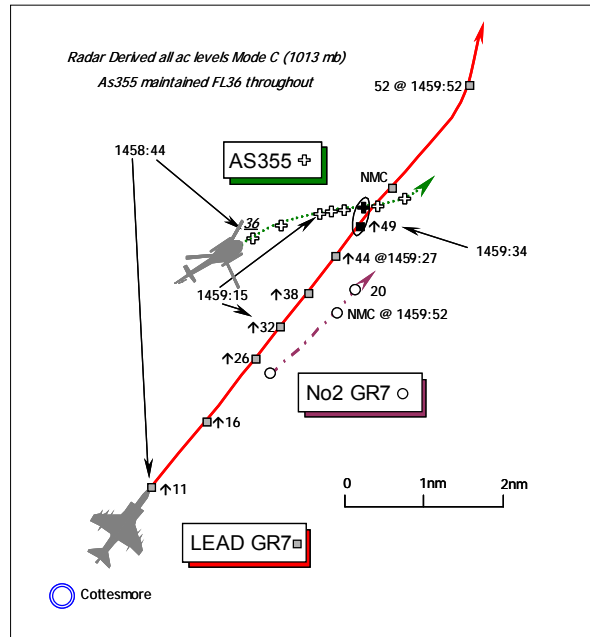
AIRPROX REPORT NO 192/04

Date/Time: 12 Oct 1459
Position: 5250N 00037W (6¼nm NE Cottesmore - elev 461ft)
Airspace: FIR/MATZ (Class: G)
Reporter: ATC Cottesmore

<u>First Ac</u>	<u>Second Ac</u>
<u>Type:</u> AS 355	Harrier GR7
<u>Operator:</u> Civ Pte	HQ STC
<u>Alt/FL:</u> FL35	FL45↑
SAS	
<u>Weather</u> IMC In cloud	IMC IBCL
<u>Visibility:</u> Nil	2000m

Reported Separation:
 By ZONE Nil V as contacts merged
 Not seen 500ft V/200yd

Recorded Separation:
 1300ft @ 0-2nm H

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

THE COTTESMORE ZONE CONTROLLER (ZONE) reports that he was working three ac. Two were under a RIS southbound with the AS355 helicopter under a RAS northbound squawking A3722 with Mode C. The Cottesmore DEPARTURES (DEPS) controller co-ordinated the Harrier formation's departure with his AS355 traffic – initially he [ZONE] accepted incorrect co-ordination for the Harriers but this was later amended for him by the APPROACH (APP) Controller who informed both DEPS and TOWER of a climbout restriction of 1500ft QFE for the Harriers. He was in the process of co-ordinating his traffic with Cranwell when the co-ordinated Harriers got airborne. At a range of about 2nm he noticed the lead Harrier was passing 3000ft Mode C. He attempted to pass avoiding action to the AS355 pilot of a L turn onto a northerly heading (the AS355 had previously been on a northerly heading just prior to the incident and its pilot had turned onto an easterly heading without notifying him). The next radar sweep showed his ac to be separated by about 1nm horizontally and 200ft vertically: the blips then merged and the next sweep showed the lead Harrier to be just NE of the AS355 and 100ft above the helicopter. He then had to avoid the No2 of the Harrier formation as it was not displaying a squawk. Subsequently, he co-ordinated with Cranwell and handed the AS355 over to Waddington ZONE. At the time of the incident he expected the Harrier to collide with his traffic as the blips and Mode C read-outs merged on his display.

THE AS355 F1 TWIN SQUIRREL PILOT reports that she was flying her helicopter single pilot from Cranfield to Sheffield whilst ferrying the maroon coloured helicopter to its new owner. Cottesmore ZONE was providing a RIS at the time, she thought, on 130.2MHz so the assigned squawk was selected with Mode C on. Tracking 005°(M), she thought, at 110kt, just to the N of Cottesmore in level cruise at FL35, IMC in cloud, with nil forward visibility she followed ZONE's instructions but the other ac was not seen at all. Indeed, she was unaware of the Airprox until advised by AIS (Mil). The HISLs were on.

THE COTTESMORE DEPARTURES CONTROLLER (DEPS) reports that the Harrier pair departed Cottesmore on a streamed climb-out, the leader squawking A6442 with Mode C. A climb-out restriction of 1500ft QFE had been imposed against a co-ordinated track under the control of ZONE – the AS355. The weather was such [a/d colour code AMBER] that a RAS was to be imposed once passing the Sector Safety Altitude. However, the No2 Harrier climbed out more quickly than expected and had not squawked as instructed [A3735], although a 'rolling' warning call had been passed by ground for the 30sec stream departure. When the Harrier leader called airborne, he reported passing 2000ft QFE, so he [DEPS] asked if he was MARSAs [a military term meaning Military Accepts Responsibility for Separation of Ac within the formation]. He called the co-ordinated traffic – the AS355 - to the leader but the lead Harrier's Mode C was already indicating a similar level to the helicopter. Leader replied that

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he was visual with the helicopter and by this time he was through the level of the co-ordinated traffic so he allowed the leader to continue the climb to achieve separation. The No2 remained at 1500ft QFE in compliance with the imposed restriction. Once clear of the AS355, he climbed and joined both jets before handing them over to Swanwick (Mil). He opined that at the time of the incident the lead jet's and helicopter's Mode C indications were only 100ft different with less than 1nm horizontal separation.

THE HARRIER GR7 PILOT provided a very frank and comprehensive account reporting he was leading a pair of Harrier GR7s during a 30sec stream take-off from RW04 at Cottesmore, followed by a snake climb IFR departure for a L turn for a crossing of CAS via DENBY-FLEETWOOD with LJAO CENTRAL. The take-off weather was a cloud ceiling at a height of 300-400ft with 2-3km visibility. He was given a climb-out restriction (COR) of 1500ft QFE for a MATZ Crosser [the AS355] when he received his take off clearance from TOWER. But shortly after takeoff he got an "*aft bay*" caution, indicating an overheat in the rear avionics bay. This is not a "pressing" caution but can possibly lead to a fire if ignored or in the event of further problems so he continued with his after takeoff checks. On completion of these checks he established a positive instrument climb and proceeded to remedy the "*aft bay*" caution: this requires heads down in the cockpit to reset a switch located at the rear right console panel towards the back of the cockpit. The fault cleared and he proceeded to contact Coningsby DEPARTURES (DEPS). During the period from resetting the 'caution' and contacting DEPS he climbed through the 1500ft climbout restriction. When he checked-in with DEPS he was reminded of the COR and whilst heading 040° at 300kt he simultaneously broke through the cloud into a thin gap of "moderate VMC" [but still IMC between layers] and spotted the MATZ crosser [the AS355] in his left 11 o'clock, about 1 mile away slightly below him as he climbed up through FL45. As there was no immediate collision risk, he continued his climb passing, he estimated, at least 200yd clear and 500ft above the helicopter. In his view the cause for the Airprox was clear – he had become distracted by a relatively minor caution shortly after take-off and mis-prioritised correcting the fault over flying the required departure profile. When he viewed the cockpit HUD video recording he estimates that he passed slightly to starboard of the helicopter and some 500ft above it.

THE HARRIER GR7 PILOT'S STATION comments that this Airprox occurred because of a classic flight safety problem - *Distraction*. Creditably, the Harrier pilot has analysed the situation candidly in his report and seeks to make no excuses. Dealing with minor emergencies will probably always carry some risk of distraction; that an experienced pilot is as vulnerable as anyone else is part of the lesson for all to learn from this Airprox that, thankfully, only resulted in minor bruising to a pilot's ego.

MIL ATC OPS reports that Cottesmore ZONE was controlling the AS355 to the E of the aerodrome transiting northbound on a RIS. The AS355 pilot was instructed to report level at FL35 and at 1441:37 she reported "*...levelling at three thousand...*" (although this was probably an error since there were no further level changes reported and the Mode C of the ac indicates FL36 throughout the period of the recording.) At 1443:48, in response to traffic information passed by ZONE, the AS355 pilot reported flying in IMC so ZONE offered an upgrade to a RAS which the pilot accepted and ZONE confirmed at 1443:54. At 1451:37, the pair of Harriers taxied for a 30sec stream departure; consequently the Ground Controller (GND) informed DEPS of the Harriers leader's requested departure profile. DEPS called ZONE at 1454:35 to request co-ordination between the AS355 and the Harriers. ZONE advised that the civilian AS355 was maintaining FL35 under a RAS: DEPS co-ordinated the Harriers initially as "*...not above 2500 feet QFE...*" which ZONE erroneously agreed to. Since the QFE was 992mb this co-ordination did not provide 1000ft separation: however, this was resolved when DEPS requested that a COR be imposed by the APPROACH controller (APP) who subsequently identified the AS355 to the TOWER (TWR) controller and agreed a COR of 1500ft QFE. At 1457:04, TWR transmitted the COR to the Harriers with their take-off clearance "*...climb out restriction 1500 feet, clear take off...*". The lead Harrier pilot read this back to TWR - "*climb out restriction 1500 feet, take off...[C/S]*". Leading up to this point the No2 Harrier pilot requested a separate squawk as he required a stream take off and there was also a change of squawk passed to the lead pilot just before the COR/take off clearance was transmitted. GND made a "*rolling...*" call to DEPS when the lead Harrier commenced take off at 1458:02. Just over one min later at 1459:07, the lead Harrier pilot contacted DEPS and reported "*...airborne passing 2000 feet.*" DEPS responded with "*...confirm MARSA?*" Meanwhile, ZONE had been co-ordinating with an adjacent ATSU and interrupted the call at 1459:12, to transmit to the AS355 pilot, "*...avoiding action, turn left heading 360, traffic south 1 mile, converging, same height...*". At 1459:16, the lead Harrier pilot confirmed that he was applying MARSA and 2sec later at 1459:18, DEPS transmitted to the Harrier leader "*...roger, radar advisory, not above 1500 feet, co-ordinated traffic north 1 mile, left-right, indicating similar height.*" The Harrier leader responded at 1459:27, "*...tally that traffic, helicopter at about 4000 feet*" whereupon DEPS reminded him that he had been subject to a COR of 1500ft which the Harrier leader acknowledged. Shortly

afterwards ZONE passed further avoiding action to the AS355 pilot against the second Harrier, whose squawk was not displayed initially, but as the No2 pilot had complied with the COR he was safely separated from the helicopter.

Analysis of the Debden Radar shows the lead Harrier 1.7nm NE of the aerodrome at 1458:44, tracking NE, indicating 1100ft Mode C (1013mb) and at the same time the AS355 can be seen 5nm NE of the aerodrome, also tracking NE indicating 3600ft Mode C (1013mb). At this point the ac are 3.4nm apart. The lead Harrier closed to a range of 2.7nm, at 1458:56 converging rapidly, indicating it was climbing through 1600ft (1013mb). The lead jet continues a rapid but steady climb of 500ft per radar sweep until at 1459:15, the ac are 1.5nm apart with the Harrier indicating 3200ft (1013mb) and the AS355 indicating 3600ft (1013mb). Subsequently, the Mode A & C from the AS355 is not shown for two sweeps but when it is shown again it is still indicating 3600ft (1013mb) and continues to do so. Meanwhile, as the lead Harrier climbs it indicates 3800ft (1013mb) when the ac are 1.1nm apart, 4400ft (1013mb) at 0.6nm and 4900ft (1013mb) at 0.2nm, just before the lead ac overflies the helicopter whereupon the tracks crossed and then diverged. The No2's Mode C is first shown at 2000ft (1013mb) at 1459:58.

During initial co-ordination ZONE and DEPS erroneously agreed co-ordination which did not afford standard separation between the subject ac. However, this was resolved before any COR was arranged with TWR and the incorrect COR was never mentioned to the Harrier pilots and was in any event irrelevant to the outcome of this Airprox.

TWR passed the COR to the Harrier pilots accurately, correctly prioritising the passing of the COR ahead of the take-off clearance; the lead Harrier pilot read back the COR accurately. Human factors may have affected the pilot here, since he received several numeric messages shortly before the COR was transmitted. Once the jets were airborne, ZONE observed the lead ac breaking through the co-ordinated level and passed avoiding action to the AS355. Unfortunately, due to the large speed differential and the time available the avoiding action did not have a great effect but it was, nevertheless, the most effective action available. Since ZONE was able to observe the events and pass avoiding action, the level bust must have been displayed on the radar screen: however, when the Harrier pilot called "...*passing 2000ft...*" DEPS did not pass avoiding action immediately. It is likely that his decision was affected by the speed with which the Harrier pilot breached the agreed COR. Considering the speed differential involved and the fact that the Harrier first indicated breaking through the COR just 2.7nm from the AS355, it is unlikely that any avoiding action given would have generated any positive effect. DEPS did, however, pass the position of the helicopter and recognised that, with the turn radius of a fast jet, the safest course of action was to let the Harrier continue its rapid climb.

HQ STC comments that a full and honest report by the Harrier pilot has explained how this Airprox occurred. The first action with any emergency is to fly the ac. In this case, the Harrier pilot became distracted by the emergency, climbed through his cleared height and into conflict with the AS355.

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 commended the GR7 pilot for his full and frank account of the circumstances surrounding this Airprox. It was clear from the GR7 pilot's account that the "*aft bay*" caution on the caution warning panel (CWP), indicating a potential problem in the rear avionics bay, had distracted him at a critical moment. Some Members were not sure that this particular problem could be classified as a minor emergency but the STC Member reaffirmed that it was and could certainly lead to more dire consequences if not resolved. Whilst the GR7 pilot himself had stated that the CWP indication had prompted the distraction, some Members noted the amount of digital information which had been transmitted to the pilots just before take-off - as had been alluded to in the Mil ATC Ops report. Whilst the Members did not conclude that this stream of information was necessarily contributory to the cause in this instance, indeed the HQ's account had shown that the ADC had correctly prioritised the passing of the COR ahead of the take-off clearance, it was important that controllers recognised the potential for confusion when transmitting numeric data, a point worth repeating here. The Board agreed with the Harrier pilot's unit that this Airprox was a salutary example of what can go wrong very quickly if assigned levels are breached on departure. It was readily apparent to the Members that this Airprox had resulted because whilst distracted, the Harrier GR7 leader climbed above his cleared height and into conflict with the AS355.

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This Airprox also demonstrated the wisdom of obtaining a radar service when flying in the close vicinity of busy fast jet aerodromes just above the MATZ and through the climb-out. For her part it was evident that the AS355 pilot could have done nothing to prevent this Airprox: flying in cloud with the jet approaching rapidly from astern all she could do was follow the advisory avoiding action proffered by ZONE under the RAS that pertained. Despite ZONE's prompt instruction, as it was the avoiding action turn had no appreciable effect on the outcome. The helicopter pilot did not see the jet at all, unlike the GR7 pilot, who caught sight of the AS355 about 1nm away and slightly below him through an extremely fortunate break in the cloud as he climbed up through FL45 he said. The radar recording showed that the jet was just passing through FL44 at a range of 0.6nm, so the GR7 pilot probably saw it a little earlier, but it was indeed fortunate that the clouds broke just here and that the GR7 pilot spotted the helicopter when he did and was able to climb above it. Moreover, DEPS showed sound appreciation of the situation when he allowed the GR7 leader to carry on climbing, a wise tack to take in the circumstances. Nevertheless, this was a close call and whilst the GR7 leader's sighting of the helicopter had forestalled an actual collision, the Board concluded that safety was not assured by any means.

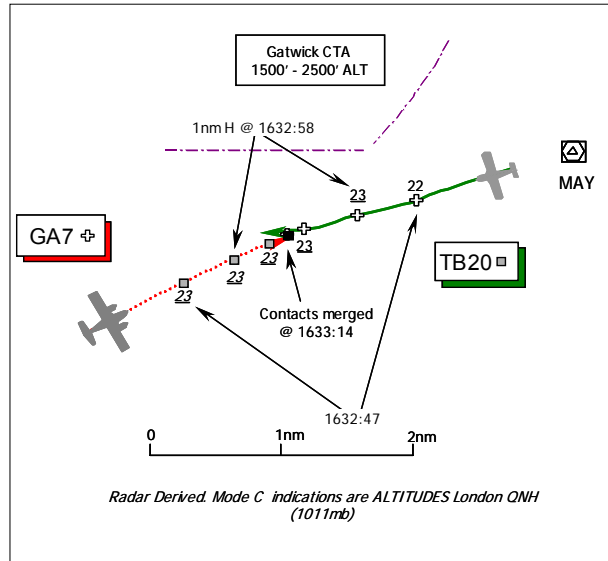
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Whilst distracted, the Harrier GR7 leader climbed above his cleared height and into conflict with the AS355.

Degree of Risk: B.

AIRPROX REPORT NO 195/04

Date/Time: 26 Oct 1633
Position: 5100N 00004E (2¼nm WSW MAY VOR)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: TB20 GA7 Cougar
Operator: Civ Pte Civ Pte
Alt/FL: 2300ft 2300ft
(QNH 1012mb) (QNH)
Weather VMC CAVOK VMC NR
Visibility: 10km >10km
Reported Separation:
10 metres Not Seen
Recorded Separation:
Contacts merged with nil V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TB20 PILOT reports that he was flying from Norwich to Goodwood and listening out with Goodwood INFORMATION on 122.45MHz after switching from Southend, although had not yet contacted the Goodwood FISO. A squawk of A7000 was selected with Mode C. Flying under VFR, he thought between DET VOR and MAY VOR, on a heading of 229° at 150kt in CAVOK, but flying directly into sun, he was maintaining his altitude level at 2300ft QNH (1012mb) with his autopilot on in the 'Nav' Mode. Some 5nm SW of MAY VOR, he thought, he suddenly spotted a white low wing twin at the very last moment heading out of sun directly for them on a reciprocal heading at the same altitude about 300m away. To avoid the other ac he immediately made a sharp 60° R turn as the other ac passed about 10m to port at the same altitude with a "very high" risk of a collision. The pilot of the white low wing twin took no avoiding action and he could not understand why he had not seen his TB20 since they would have been highlighted by sun. He added that he was maintaining a good scan in the cruise and opined that if he had not taken avoiding action he has no doubt they would have collided. His TB20 has a predominantly white upper works with a blue underside.

THE GA7 COUGAR PILOT reports that his ac has a white & blue colour-scheme. Inbound to Stapleford, VFR, he was in receipt of a FIS from Shoreham and squawking A7000 with Mode C selected on. He flew this part of his route from Sandown on the IOW, North of Shoreham Airfield via MAY VOR on a heading of about 070° (M) at 130kt in a level cruise at an altitude of about 2300ft QNH, but he did not see the ac flown by the reporting pilot. It was not until he was contacted by AIS (Mil) that he was aware of any possible involvement in an Airprox. He stressed that he had not noticed any other ac in close proximity to his during the flight.

UKAB Note (1): The Gatwick 10cm radar recording illustrates this Airprox clearly and reflects the reporting pilots account quite accurately. The location of the Airprox was 2¼nm WSW of MAY VOR where the SSR contacts of both ac are shown merging at 2300ft London QNH (1011mb) at 1633:14, after closing on reciprocal courses for some distance.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The circumstances of this Airprox in the 'see and avoid' environment of the congested Class G airspace below the London TMA seemed relatively straightforward. The overlying CAS had the effect of funnelling VFR flights down below the 2500ft base altitude of the LTMA which resulted in these two predominantly white-coloured ac, of relatively small cross-sectional areas, closing on reciprocal headings at a head-on aspect at 2300ft - as evinced

AIRPROX REPORT No 195/04

by the radar recording. Thus with no relative motion to draw attention to each other's ac, visual detection by the pilots was difficult, even in the prevailing CAVOK conditions: add to this the obscuring effect on the reporting pilot of the sun's glare and here were all the facets of this Airprox. With the stark clarity of hindsight and recognising the difficulties of westbound flight in the late autumn afternoon with the sun low on the horizon, some Members questioned the wisdom of flying directly into the sun for extended periods of time. Better to change heading occasionally to clear the flight path ahead - a salutary lesson worth repeating here. An LTCC controller Member who was also an experienced GA pilot observed that there was little assistance that could be obtained from Goodwood INFORMATION in this vicinity for VFR traffic: the same applied equally to the GA7 Cougar pilot who was under a FIS from Shoreham. The Member explained that he regularly provides a FIS to VFR GA traffic S of Gatwick but there was no ATSU in the vicinity able to offer a LARS to assist pilots to supplement their lookout with a radar service in such conditions. With the closure of Dunsfold ATC and the demise of the LARS in this area, no other ATSU had taken on this role which left a distinct "black hole" in the provision of radar services at the lower altitudes. The Board concluded that that this Airprox was the result of a non-sighting by the GA7 pilot and a very late sighting by the TB20 pilot.

Turning to risk, it was apparent from the reporting TB20 pilot's report that he had fortuitously spotted the GA7 at the very last moment some 300m away and turned to avoid it. Thus there was but a moment for the TB20 pilot to turn out of the way as the GA7 passed, its pilot oblivious to the TB20 at close quarters to port at the time. Notwithstanding the inherent tolerances applicable to unverified Mode C, the radar recording evinced the closeness of this encounter as the contacts merged in azimuth at exactly the same indicated altitude. This coupled with the TB20 pilot's own report of 10m horizontal separation convinced the Members that an actual risk of collision had clearly existed in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the GA7 pilot and a very late sighting by the TB20 pilot.

Degree of Risk: A.

AIRPROX REPORT NO 196/04

Date/Time: 24 Oct 1640 (Sunday)

Position: 5505N 00652W (8nm RW26 Londonderry)

Airspace: Scottish FIR (Class: G)

	<u>Reporting Ac</u>	<u>Reported Ac</u>	<u>2nd Reported Ac</u>
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<u>Type:</u>	SF340B	Discus B Glider	Grob Astir Glider
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<u>Operator:</u>	CAT	Civ Club	Civ Club
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<u>Alt/FL:</u>	2500ft	3400ft	3600ftv
	(QNH 986mb)	(QFE)	(QFE)

<u>Weather</u>	IMC CLBL	VMC	VMC
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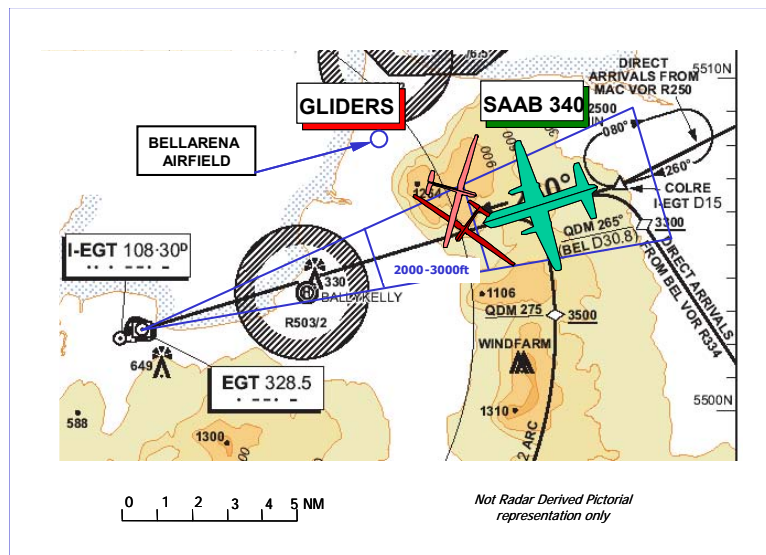
<u>Visibility:</u>	>10km	10-15nm	15-20nm
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Reported Separation:

2-300ft V/3-400m H	700ft V/100m H	1100ft V/300m H
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Recorded Separation:

Not recorded.

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

THE SF340B PILOT reports flying a scheduled passenger flight from Glasgow to Londonderry. While established on an automatic approach to RW26 at 2,500ft, he thought, and 190kt with landing lights switched on, he saw a glider ahead at a distance of 3-400m and some 2-300ft above. Turning and descending to avoid this ac, he saw another glider to his starboard which was assessed to be closer than the one ahead. A (ground) frequency for the glider operation had been proffered to him by Eglinton Tower but was not used as in the past it had proved to be indistinct, intermittently manned and not able to give any more than generalities about the position of the fleet.

UKAB Note (1): The radar replay shows the SF340 making an approach as described by the pilot and verifies the ATSI report below. Shortly before the Airprox was reported, the SF340 was indicating FL43. This equates to an altitude of 3510ftamsl, the cleared and reported altitude.

THE DISCUS B GLIDER PILOT reports that he had been present at the morning briefing where local regulations concerning the ILS approach into Eglinton Airport were covered. He understood that glider pilots should keep a listening watch on Eglinton APP frequency whilst in the Restricted Area and if operating between 2-3000ft they should vacate the box when traffic is inbound to Eglinton [See UKAB Note 6]. At 1522 he launched and was released about 6min later in a position approximately 4nm NE of Limavady at 3000ft amsl. On release he switched

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to Eglinton APP frequency of 123.625MHz and shortly after was climbing in wave lift at between 1-200ft per minute. Some minutes later he heard a conversation between APP and a third party saying that he was unsure whether the gliding club at Bellarena was active and advising the third party to make contact with the club directly on 130.1MHz. He continued to climb in wave lift and was joined by another glider. At 1541 he saw a twin-engined ac approaching from the E some distance below him inbound to Eglinton on the ILS. He noted his altitude at the time was 3400ft amsl and that the other glider was approximately 2-300ft above him and about ½ mile away. The data logger, which he provided, supported this information.

THE GROB ASTIR GLIDER PILOT reports that he launched from Bellarena at 1526 to a height of 3500ft for a wave soaring flight and immediately after release he set his radio to 123.625MHz [Eglinton APP]. After flying near another glider for a few minutes, he was moving to the N and the other glider went to the SE. There was some chatter on the APP frequency and he was well clear of the ILS at 3600ft. He saw an airliner pass in front and well below him, and about as far in front of him as below him (about 45° angle); the subject ac flew on towards Eglinton. Immediately he heard the pilot report an Airmiss (sic) in which he stated the separation between him and 2 gliders was 400ft [he thought]. The controller replied that he acknowledged the report and would route traffic away from the area. He considered what to do and decided, as he was well clear of the ILS and gaining height slowly, that it was safe to continue but that if he started to lose altitude he would fly towards Bellarena airfield so as to clear the edge of the ILS with a safe margin. He considered that he had not at any time come close to the ILS approach path.

THE GLIDING CLUB CFI reports that as a consequence of this incident, the parameters of the “ILS box” have been changed in agreement with the management of Eglinton. The lower limit has been reduced to 1500ft QFE and the upper level has been raised to 4000ft QFE at and around this particular area where gliders are likely to be hill soaring. When advised by Eglinton that the ILS box is about to become active any glider operating in the box will vacate the area and only re-enter when advised by Eglinton that the inbound ILS traffic has cleared the area.

UKAB Note (2): The data logger provided accurate information regarding the position, altitude (amsl), heading and speed of the Discus glider. At the time the Airprox was reported, the data logger showed that the ac was at position 5505.76N 00652.00W (¼nm N of the centreline for Eglinton RW26 at a range of 10.6nm) and at an altitude of 3466ft amsl.

UKAB Note (3): The Eglinton METAR for 1650 UTC was:

EGAE 241650z 13005KT 9999 SCT023 BKN035 13/10 Q986=

UKAB Note (4): The ILS procedure for Eglinton RW commences from the IAF which is the EGT NDB (on the airfield). The direct arrival procedure commences at COLRE (RW26 centreline at 15 DME) and at an altitude not below MSA (2500ft in that sector).

ATSI reports that at 1523:00, the SF340 pilot contacted Eglinton APP controller and requested the weather. This was passed and APP advised that the crew should expect to route via COLRE for an ILS approach to RW26. The pilot called again at 1531:40, and reported descending to FL60 and at a range of 40nm. The controller instructed the crew to descend to FL50 and report at 25 DME.

The pilot reported at 25 DME and was cleared to descend to 3500 feet QNH (986mb), as well as being told to report established on the localiser and at COLRE (located at 15nm final for RW26 at Eglinton). Almost immediately afterwards the controller transmitted “*C/S we haven't been informed of any activity at Bellarena today but you might wanna give them a quick call on your number two box frequency One Three Zero decimal One*”.

The crew subsequently reported established on the localiser at COLRE and were cleared for the ILS approach to report at 4 DME. At 1539:10, the crew reported having had an Airmiss with two gliders at 10nm on the localiser.

UKAB Note (5): At 10nm the ILS glidepath is 3180ft above the threshold that equates to 3190ft amsl.

Although efforts were taking place to establish a LoA between City of Derry Airport (Eglinton) and the Ulster Gliding Club, these had not been successful and, accordingly, the old procedures [1 Mar 2003] in the MATS Part 2 were in place at the time of the Airprox. The Gliding Club was notified as being active during daylight hours on Saturday and Sunday (the Airprox occurred on a Sunday). The Gliding Club is located at Bellarena, 9nm NE of City of Derry

Airport and there is a ridge that is frequently used to the S of the site. The ILS centreline for R/W 26 passes within 3.5nm of this ridge.

In the unit's MATS Part 2, there is a requirement that the duty ATCO will telephone the Gliding Club at the commencement of the watch and establish its operating state. On the day of the Airprox, this was not done. Furthermore, [also in the Eglinton MATS Part 2] the Gliding Club are required to telephone ATC at the start of operations and the tug pilot must call Eglinton approach at the commencement of flying. Neither of these actions took place. Once ATC have been notified that glider activity is present a strip will be placed on the strip display and crews of inbound ac advised. In addition, gliders are requested to contact Eglinton APP when operating within 2nm of the ILS centreline, in the interests of flight safety.

On the day of the Airprox no contact with Eglinton ATC was made by the Gliding Club. Although the controller suggested that the SF340 crew might wish to contact the Gliding Club directly, they did not do so. Additionally, the pilots of both gliders involved stated that they were listening out on the Eglinton frequency and at least one of them heard the controller advise the inbound ac that he was unaware if there was any gliding activity. However, he did not call on the frequency to inform the controller that gliders were operating in the area.

UKAB Note (6): Following Airprox 225/02 (Risk C) between a SF34 and a glider on 28 Oct 2002 and in the same area, the UKAB made the following Safety Recommendation:

'That the City of Derry and the Ulster Flying Club review jointly their operating procedures'.

Acting on information provided in February 2005, this Safety Recommendation was closed, quoting the City of Derry Airport as follows:

'Agreement regarding the co-ordination of instrument approach traffic and gliding traffic in the vicinity of the ILS approach area has been reached with the Ulster Gliding Club. A Letter of Agreement detailing this co-ordination has been signed by City of Derry Airport/ Ulster Gliding Club'.

It would seem however that although the LoA was drafted and the procedures therein were incorporated into the Eglinton MATS Part 2 in March 2003, it had not been agreed nor signed by the Ulster Gliding Club at the time of the Airprox. In any case, it would appear that in this Airprox the MATS Part 2 procedures were not fully adhered to by either Eglinton ATC or the Ulster Gliding Club (including the glider pilots involved). It has not been possible to determine why, at the time of the Airprox, the Gliding Club procedures apparently differed from those in the MATS Part 2.

UKAB Note (7): Currently there are 6 scheduled arrivals/departures per day at Eglinton.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted the similarity between this incident and Airprox 225/02, the report on which had said: "In this respect members thought suggestions made by the Ulster Gliding Club Chairman were constructive and offered a practical way ahead. This led to a recommendation that previous arrangements agreed in 1999, by City of Derry Airport and the Ulster Gliding Club, would benefit from a review." Members observed that, had the resulting UKAB Safety Recommendation been implemented in an effective and timely manner, this latest incident would most probably not have occurred. Further, Members opined that it might only have been this second incident that precipitated action by the respective parties to agree and implement revised and unified procedures. Two Members with considerable knowledge of operations in the area considered that perhaps local consultation had not been as comprehensive as normal prior to the implementation of the instrument procedures at Eglinton. Notwithstanding, the procedures are now in place and must be made to function safely.

Despite extensive investigation by both the CAA and UKAB no explanation as to why the procedures in the Eglinton MATS Part 2 were apparently not the same as those being employed by the Gliding Club could be found. Both parties should have agreed these procedures **before** they were inserted in the MATS Part 2 in the Mar 2003

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amendment. In any case, in this incident they had not been complied with by the controller and had apparently been misunderstood by the Gliding Club.

In common with Airprox 225/02, Members again noted that neither the gliders nor the airliner had any more right than the other to operate in this portion of Class G airspace. In the interests of the safety of all concerned however, it would seem sensible that gliders vacate the immediate area of the approach when an airliner is known to be about to operate there. Further, a flight safety expert commented that any procedure implemented should be positive and fail-safe regardless of when gliders or approaching ac first come onto the APP frequency. In this case, both gliders had launched after the SF340 had first reported on APP and its pilot had made his second call at 1531:40 so the glider pilots would not have been aware of the presence of the SF340 until the controller made the ineffective call regarding glider activity. It was surprising, however, that neither glider pilot, having heard that exchange, called on the frequency to give their position. In mitigation, they thought that they were complying with the agreed procedures and were well clear vertically of the top of the 'ILS Box'.

A Member noted during this and several other recent incidents, reluctance among glider pilots to communicate with ATC units. Members considered that good practise was to inform units of their area of operations if there was any risk whatsoever of their interacting with local traffic. In order to do this they should familiarise themselves with RT procedures.

An airline specialist Member observed that it was not good practise to request pilots to call another unit when they are on the final approach; such requests potentially serve to distract one or other crew member from monitoring flight progress. It was noted that the SF340 pilot called established on the localiser at COLRE which is well beyond the protected range of the ILS (and therefore commencement of the instrument procedure); this however had not had any bearing on the incident. This instrument procedure like several others lies entirely in Class G airspace and offers none of the protection of CAS. That being the case, 'see and avoid' and the normal rules of the air pertain and, in this case, the powered ac should give way to the glider regardless of any instrument approach procedures. The SF340 pilot did see the gliders and, quite rightly, took avoiding action. He did not however, see the first glider until it was 3-400m away and Members considered this to be later than desirable in order to execute his obligation to avoid them (less than 4 sec at 190k). In the event he had seen and avoided both gliders and Members therefore considered that there had not been a risk that the ac would have collided; it follows that this incident had been a conflict in the FIR.

Since there was no radar recording showing the actual event, Members were not able to determine positively the actual miss-distances. There was little doubt that there had been some horizontal separation between the airliner and both gliders - the glider data logger of the closer one showed it to be $\frac{1}{4}$ nm (463m) N of the ILS centreline. Taking into account that the SF340 reported the incident as occurring at 10nm on the ILS (3190ft amsl) and that the data logger showed the glider to be at 3466ft, the vertical separation between the airliner and the lower of the two gliders had probably been close to the 300ft reported by the SF340 pilot.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict on the ILS approach to City of Derry (Eglinton) in Class G airspace.

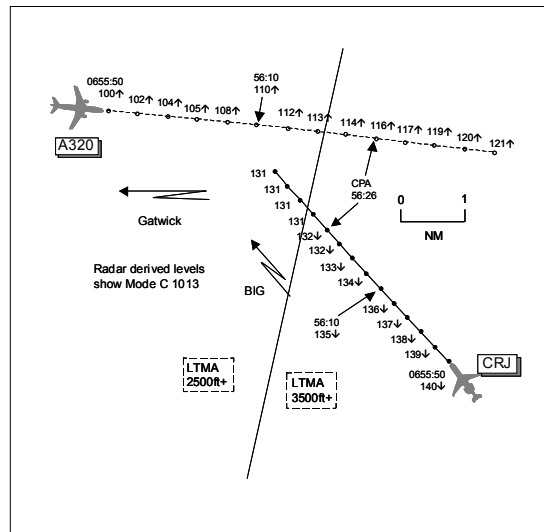
Degree of Risk: C.

Contributory Factors: A breakdown in communication and understanding of agreed procedures between City of Derry (Eglinton) and the Ulster Gliding Club.

AIRPROX REPORT NO 197/04

Date/Time: 22 Oct 0656
Position: 5108N 00019E (15nm SE BIG)
Airspace: LTMA (Class: A)
Reporting Ac Reported Ac
Type: A320 CRJ
Operator: CAT CAT
Alt/FL: ↑FL130 ↓FL140

Weather VMC CAVOK NK
Visibility: 10km NK
Reported Separation:
 900ft V 2nm H NR
Recorded Separation:
 1600ft V 1.6nm H

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

THE A320 PILOT reports outbound from Heathrow following a DVR4G SID at 340kt and in receipt of a RCS from London on 120.52MHz. During their climb to FL130 a TCAS TA alert was received on traffic in their 0130 position range 6nm indicating +2800ft. The ROC was reduced and the traffic passed, at the CPA, 900ft above and 2nm clear to their R. The ac was levelled at FL130 and ATC was heard to inform the other flight that its cleared level had been FL140.

THE CRJ PILOT reports inbound to Heathrow via BIG and descending to FL140. Approaching FL140, he, the Capt PNF, recognised that the FO, PF, had selected FL130. He told the FO that they were only cleared to FL140 who then immediately selected altitude hold on the AP but as this takes time to take effect the ac levelled off at FL135. During this, he told ATC about the situation and the controller replied *"this is not a problem, you can continue to FL130"*. The descent was continued to FL130 and he did not generate a paper report of the incident as it was his impression that no action would be taken by ATC. He went on to say that before, during and after the event, no TA alerts nor RA warnings were received on TCAS.

ATSI reports that both aircraft were under the control of the BIG SC. He cleared the A320, on a DVR SID from Heathrow, to climb to FL130. The CRJ, inbound to Heathrow via BIG, was instructed to descend to FL140. Although the pilot read back the clearance correctly, he, subsequently, descended through this level. STCA did not activate and the SC, who was busy elsewhere in the sector, did not notice the 'level bust' straight away.

UKAB Note (1): The TC BIG RT transcript reveals the following the SC clearing the A320 to climb to FL170 at 0656:40, he transmits 10sec later *"CRJ c/s confirm your cleared level was one four zero"*. The CRJ crew replies *"Sorry er we'll maintain one three zero er CRJ c/s"* which the controller acknowledges.

UKAB Note (2): Analysis of the Heathrow radar recording at 0655:50 shows the A320 approximately 12nm SE of BIG tracking 095° climbing through FL100 (ROC 3000fpm) with the CRJ in its 1 o'clock range 6.5nm tracking 320° descending through FL140 (ROD 1500fpm). Twenty seconds later, as the A320 climbs through FL110 it passes through the CRJ's 12 o'clock range 3.1nm as it descends through FL135. The CPA occurs at 0656:26 as the CRJ indicates FL132 with the A320 in its 0230 position range 1.6nm climbing through FL116, 1600ft below, with their tracks diverging. The next radar sweep shows the CRJ levelling at FL131 and thereafter the A320's ROC reduces to 2000fpm as lateral separation increases. Vertical separation of 1000ft occurs at 0656:38 by which time the A320 is climbing through FL121 3.4nm E of the CRJ.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Pilot Members agreed that the A320 crew's actions, effectively manoeuvring their ac (reducing the ROC) on the receipt of a TCAS TA alert, had turned a potential conflict into a benign situation. Although the CRJ had descended below its cleared level, the geometry of the incident revealed by the radar recording had shown the A320 crossing through the CRJ's 12 o'clock 3.1nm ahead and 2500ft below. The radar shows the A320's reduction in climb rate thereafter with 1600ft and 1.6nm separation pertaining at the CPA, with standard separation never being eroded. The radar data and RT transcript did not support the CRJ crew's viewpoint regarding the extent of the deviation from the cleared level – the ac had descended straight to FL130 and only then were the crew challenged by ATC about their 'level bust'. Members agreed that although in previous incidents a 'level bust' had invariably caused an Airprox, on this occasion the actions taken by the A320 crew had quickly ensured that safety would not be compromised. This encounter had therefore been little more than a sighting report (TCAS).

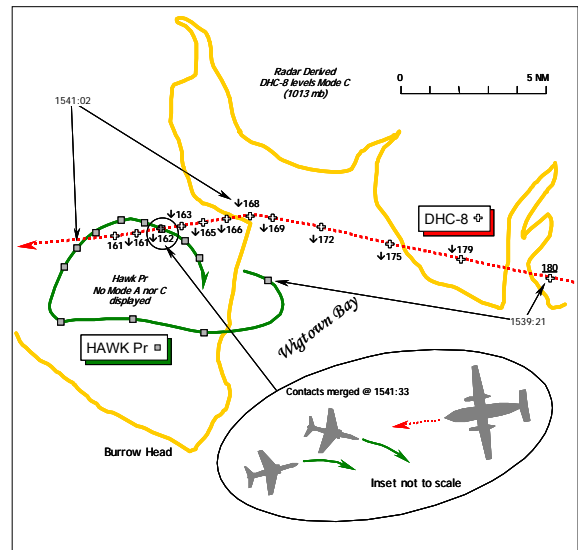
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report (TCAS).

Degree of Risk: C.

AIRPROX REPORT NO 198/04

Date/Time: 27 Oct 1541
Position: 5449N 00425W (8nm N of Burrow Head)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Hawk x2 DHC8
Operator: HQ PTC CAT
Alt/FL: 15000ft ↓FL160
 RPS (979mb)
Weather VMC CLBL IMC IICL
Visibility: >10km 10km when CLOC
Reported Separation:
 2-300ft V/nil H Not seen
Recorded Separation:
 Contacts merged in azimuth

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

THE HAWK PILOT, a QFI, provided a very comprehensive and frank account reporting that he was leading a flight of two Hawk jets flying a close formation training sortie in Class G airspace N of the IOM, which was the only reported area of suitable medium level weather for the sortie. His student was flying solo as the No2; a student pilot also occupied the rear seat of the QFI's ac as a passenger. Both ac have a black colour-scheme; the landing light, anti-collision beacons and HISLs were all on during the sortie.

After transiting north from base at FL150 with LJAO SWANWICK MILITARY, they left the frequency squawking A7000 with Mode C selected on, he thought. Once established in clear airspace in VMC they were operating on a quiet frequency and were thus not in receipt of any ATS at the time of the Airprox. Flying in the vicinity of Burrow Head during a practice formation re-join, the lead ac was established in a level R turn at 300kt IAS, level at 15000ft RPS (979mb), some 2000ft above and 2-3000ft below cloud. The No2 ac was closing on the leader from the inside of the turn, from slightly below in the lead QFI's 4:30 position, so during the turn he was working hard with his (the instructor's) lookout concentrated on his student flying the No2 ac to ensure that his overtake and joining parameters were correct whilst clearing the airspace into the turn and checking that his own ac's parameters were accurate.

As he turned through E, both the No2 student pilot and the student in his rear seat simultaneously called a "Tally" at 12 o'clock. As he looked forward, the canopy was filled with the underside of a light blue and white civilian ac, a twin with a high wing and T tail configuration – the DHC8 – about 200-300ft away horizontally flying towards them about 200-300ft above the formation. He was unable to take avoiding action - there was insufficient time – as the other ac overflew the formation almost directly above them on a reciprocal course with a "high" risk of a collision.

After the No2 ac had safely re-joined, he immediately called Swanwick to inform them of the Airprox and that he was visual with the ac concerned, whilst also confirming the identity of the other ac involved. Thereafter, the sortie continued uneventfully.

THE DHC8 SERIES 400 PILOT reports that his ac is painted white with blue stripes and the wingtip/tail HISLs were all on whilst in transit from Newcastle to Belfast Aldergrove on an IFR FPL. Flying in IMC between layers, westbound at 360kt they were in receipt of a RIS from ScACC on 123.775Mhz, squawking the assigned code with Mode C. TCAS is fitted but neither a TA nor RA was enunciated during the period of the Airprox.

Whilst levelling at FL160, just after exiting a layer of cloud about 5nm NE of Burrow Head and waiting for clearance to join CAS, the controller passed traffic information on a primary contact at 12 o'clock [no range specified] but no height [sic] information was given. They looked up but saw nothing, to be told immediately thereafter that the traffic

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was behind them. No avoiding action was taken and no other ac was seen: he added that they had been told “no known traffic to affect descent”. He was informed of the Airprox by telephone after landing.

ScACC ANTRIM SECTOR CONTROLLER (ANTRIM SC) reports that the DHC8 crew was flying IFR under a RIS. When the flight was about 20nm E of BLACA he saw a primary ‘pop-up’ contact 1nm due W of the DHC8 - the Hawk pair. He immediately passed traffic information on the primary contact to the DHC8 crew but by this time the Hawks had passed and were now to the East of his traffic. The DHC8 crew acknowledged the traffic information but did not report sighting the other ac, the Hawk pair.

THE HAWK PILOT’S UNIT comments that this was a deeply disturbing incident as a result of which the Squadron has invested considerable time and effort in determining the exact chain of events that led to the incident; the report below highlights the key issues.

The 2 Hawk ac were conducting a routine formation training exercise in the Class G airspace to the North of the Isle Of Man - a GPS fix just prior to the incident places the lead ac almost directly over Burrow Head. The DHC8 was on a scheduled flight from Newcastle to Belfast (Aldergrove), taking a direct track through the Class G airspace – a routine practice. The Hawk ac had entered the airspace using a radar service from SWANWICK MILITARY but were operating on a private RT frequency (although they had advised Swanwick of their intended operating area and levels). Upon leaving the LJAO Swanwick frequency the formation leader selected his SSR transponder to A7000, he thought.

The incident revealed several issues over the congestion of Class G airspace and the provision of services to ac operating in this particular area:

It was not widely appreciated that civilian traffic would be in receipt of a service from Scottish Centre; the area is within the London FIR and military ac routinely operate with SWANWICK MILITARY in that area for transit and for pick ups from low level for recovery to Valley. However, the Antrim sector ends below the Isle Of Man and is controlled (for civilian traffic) by Scottish Centre. There is no necessity for SWANWICK MILITARY to pass on traffic information to Scottish for ac operating in the Class G airspace.

The civilian ac was receiving an ATS that was apparently dependant on SSR transponder signals being effectively seen, processed and reported. The ac in question did have a fully serviceable transponder and the Hawk leader is adamant that he was squawking at all times. [UKAB Note (1): Though the radar recording shows this was not the case at the time of the Airprox.] ATC supervisors have noted that squawks do “drop out” from time to time and that dynamic high energy manoeuvring may make height readouts (in particular) unreliable.

There is no doubt that all the acs’ crews were operating legitimately in the area. However RAF Valley frequently operates multiple ac (often formations) in that area, when the weather in the North Wales area is unfit. These ac are small, highly manoeuvrable, difficult to see and conduct high energy, dynamic manoeuvres with large changes in height and speed.

At RAF Valley steps have been taken to try to minimise risk in future operations in the area. All crews have been briefed on the airspace issues and ATSs in that area and ac captains will be advised to obtain an ATS from ScATCC (Mil) when operating VFR in this area, whenever RT frequency allocation and operational training requirements allow.

[UKAB Note (2): The LTCC Great Dun Fell radar recording shows the Hawk pair approaching the area of Burrow Head from the S whilst displaying their LJAO assigned squawk. The SSR Mode A & C data is then lost from about 1527:02, in all probability the time that the QFI elected to terminate the ATS and continue VFR for his formation training. Thereafter the Hawks are displayed as a single primary contact, thus no Mode C data is displayed at all suggesting the transponder either failed or was switched off from this point.

The DHC8 is shown approaching the vicinity from the E level at FL180, before commencing a descent and crossing Wigtown Bay. A 30° L turn onto a track of about 260° is shown at 1541:02, as the ac crosses the coast descending through FL168: at this point the Hawk pair are crossing from L – R in their R turn through the DHC8 crew’s 12 o’clock at a range of 6nm. The contacts merge broadly as reported by the Hawk QFI at 1541:33, though the Hawks appear to be crossing obliquely from R – L in a R turn as the DHC-8 descends through FL162 Mode

C. The Hawk QFI's reported altitude of 15000ft RPS (979mb) would equate to a level of about FL160, suggesting that as the DHC8 overflew the jets the vertical separation was broadly in the order of 200ft.]

ATSI reports that the DHC8 was flying westbound from Newcastle to Belfast City at FL180. Having crossed the airways system N of DEAN CROSS, the ScACC ANTRIM SC placed the flight under a RIS. At 1539:25, the DHC8 pilot requested initial descent to FL160 to which the controller replied "...no observed traffic to affect your descent to flight level 160". At that time, there were several 'primary only' targets in the vicinity but no obvious conflicting traffic. As the DHC8 commenced its descent, a primary return can be seen manoeuvring just to the N of Burrow Head, which was in the DHC8's 11 o'clock at a range of 9nm. No Mode A or C was visible from the Hawks and so the controller assumed that this traffic was below FL100, whilst the DHC8 was passing FL168 for FL160. As this primary traffic rolled out on a steady easterly track the controller transmitted just before 1541:30, "[C/S] I've got a primary contact 12 o'clock 2 miles opposite direction no Mode Charlie" which the crew acknowledged. Under the terms of a RIS, the controller is required to pass the range and bearing of any conflicting traffic, but not to pass avoiding action. The UK AIP requires that all ac operating at and above FL100 shall display an SSR code with Mode C. [UKAB Note (3): Mandated in the UK Mil AIP at GEN1-5-1 for all "flights" by military ac in UK airspace.] Therefore, the controller's assumption that the primary target was below FL100, i.e. 6000ft below his traffic, was not unreasonable.

HQ PTC comments that this is a disturbing event which would have been avoided safely had the Hawks been equipped with a CWS or, at least, a serviceable transponder of their own. We cannot account for its malfunction. We are satisfied that Valley have taken such action as they may to minimize the risk of a recurrence. However, we must recognize that receiving a formal ATC service, as presently constituted, can be a hindrance to training in such complex multi-ac manoeuvring.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was readily apparent to the Board that the Hawks had been operating legitimately in Class G airspace, where 'see & avoid' prevails, as had the DHC8 crew whilst flying their direct route to Belfast. Some discussion revolved around the routing of this IFR CAT flight through Class G airspace but in the Board's view, the DHC8 and the Hawk pair were equally entitled to be flying where they were.

The Hawk leader's comprehensive account revealed that he had not seen the DHC8 until his attention had been drawn to it by his rear-seat passenger's and No2 student pilot's warnings. The DHC8 crew did not see the Hawks nor, more importantly, did their TCAS provide either a TA or RA. During the period of this Airprox the Great Dun Fell radar recording showed that neither ac of the Hawk pair had been displaying Mode A or C, the ac appearing as a single primary-only contact. This indicated to Members that the lead Hawk's transponder might have failed or been inadvertently switched off or left at 'standby' after the Hawk leader had dispensed with the radar service from LJAO to continue their sortie VFR from this point on a quiet frequency. The Unit had confirmed through the Command that when checked after the event, both Hawks had fully serviceable transponders and no mention had been made of a lack of displayed Mode A/C data during or after their recovery to Valley on completion of the sortie. Those Members familiar with the Hawk ac advised that there was no 'self-evident' indication on the ac's Caution Warning Panel (CWP) that the SSR had either malfunctioned or was selected to 'off' or 'standby'. Thus a positive check of the actual selector panel, located out of the pilot's 'line of sight', is necessary to determine the status of the SSR. It was possible that an intermittent fault could have rendered the transponder inoperative or the Hawk leader could feasibly have been mistaken when he thought he had selected the transponder to transmit A7000 with Mode C after he had changed from the LJAO code setting. It was also unfortunate that the No2 Hawk had not been squawking either for even if the lead ac had been subject to a transponder malfunction, the No2's displayed squawk could still have 'advertised' their presence - and more importantly the level of the jets - to other ac and to the Antrim SC thereby allowing him to pass more complete traffic information. [Post Meeting Note: The UK Military AIP stipulated just "flights" outside CAS, which was not necessarily all individual ac. HQ PTC are currently reviewing the policy of whether all elements of a formation in a 'close formation' training sortie should squawk separately. The Command will keep the Board apprised of the outcome of their review.] Whatever the cause of the Hawk leader's ac transponder not displaying Mode A/C, the result was the same insofar as it had rendered his formation less conspicuous, both to ATC misleading controllers into believing that the ac shown only

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as a primary contact was operating below FL100, and invisible to other acs' TCAS. ATSI had included within their report [from the ATSU's own investigation report] that as no Mode A or C was visible from the Hawks the ANTRIM SC had assumed that this traffic was below FL100. The ATSI advisor considered that this assumption that the primary target representing the Hawks was probably 6000ft below his traffic was not unreasonable. However, some military controller Members thought that this was flawed and from the military controllers' perspective did not think it was reasonable to 'assume' that the unknown ac were below FL100. Nonetheless, whilst recognising that the DHC8 was in receipt of a RIS where no separation is proffered against other ac, the Antrim SC had conscientiously passed traffic information to the DHC8 crew about the unknown ac, albeit at a relatively late stage.

Some controller Members were concerned that the DHC8 was only in receipt of a RIS as it transited the 'see & avoid' environment of Class G airspace and thought a RAS would have been more appropriate for this IFR CAT flight. However, it was pointed out that the extant strict company policy of the civilian ATS provider is that they will not provide a RAS in Class G airspace whatsoever, thus a RIS was all that was available from the ANTRIM SC even if the crew had asked for a RAS. The STC Member observed that a radar service might also have been of benefit to the Hawk leader whilst conducting his workload intensive close formation-training sortie, which could have given him an earlier 'heads-up' about the DHC8. Military controller Members echoed this view and it was evident that the Hawk pilots' unit had taken a pragmatic stance when recommending to their pilots that such an ATS be obtained whenever the nature of the sortie allowed. An area controller Member opined that such services were provided on a routine basis at LATCC (Mil) whenever traffic priorities and workload permitted within their area of responsibility. The STC Member also added that even if a military ATCRU did not have the capacity, Air Defence Radar Units could sometimes help with a service for military pilots. As it was, both the DHC8 and the Hawk leader were equally responsible for seeing and avoiding each other's ac, with or without the assistance of an ATS. Members noted that the DHC8 crew did not see the pair of Hawks throughout the encounter. Although the Antrim SC had reported that he saw the primary-only contact at a range of 1nm, the RT transcript reveals that he had in fact called it a little earlier – he transmitted a range of 2nm within the traffic information call to the DHC8 crew. Nevertheless, at a closing speed in the order of 660kt with a near head-on aspect, the small jets would have been very difficult to detect sooner even though they were painted 'high conspicuity' black. The Board was briefed that it was the Hawk leader's responsibility to maintain a lookout for the formation as a whole and though the DHC8 was seen, it was not spotted in time for the Hawk leader to take avoiding action. Consequently, the Board agreed that this Airprox had resulted from a non-sighting by the DHC8 pilots and effectively, a non-sighting by the Hawk leader.

In this Airprox the Hawk QFI had reported that there was insufficient time for him to take avoiding action. The DHC8 crew were unable to fulfil their obligations under 'see & avoid' because they did not see the Hawks before the jets passed beneath their airliner. The radar recording had shown that the respective acs' radar contacts had merged as the Hawks crossed through the track of the DHC8, supporting the QFI's view that the horizontal separation was nil. The Hawk leader's contention that the vertical separation was 2-300ft was probably not too far wide of the mark and in the Board's view any separation that existed had not been engineered and was purely fortuitous. In their assessment of the risk inherent within this particular Airprox the Board recognised that the absence of Mode A/C data had effectively rendered STCA blind and more importantly the essential safety net of TCAS was powerless to intervene. Hence, with only the Antrim SC's transmission of traffic information just moments before the CPA, the DHC8 pilots were denied any earlier alert that they could have made use of to prevent this occurrence. The Board concluded, unanimously, that as none of the various safety barriers had worked successfully here an actual risk of collision had existed in the circumstances reported.

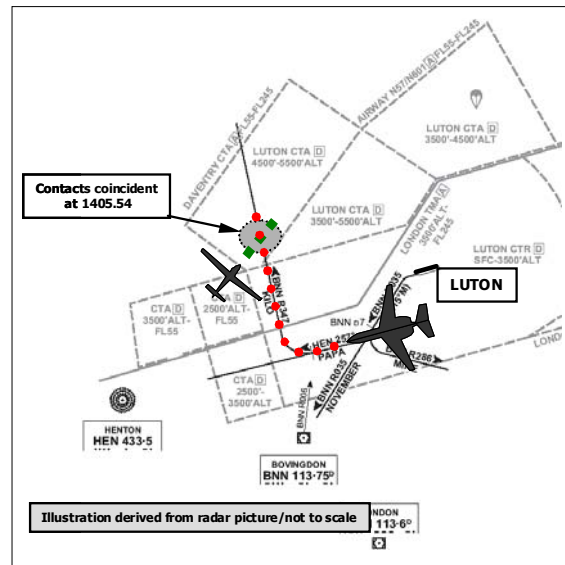
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the DHC8 pilots and effectively, a non-sighting by the Hawk leader.

Degree of Risk: A.

AIRPROX REPORT NO 200/04

Date/Time: 3 Nov 1406
Position: 5153N 00035W (10nm W Luton Airport)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: ASK21 Hawker 800
Operator: Civ Trg Civ Pte
Alt/FL: 2900ft 3000ft
 (QNH) (QNH)
Weather VMC CAVOK VMC CAVOK
Visibility: NR NR
Reported Separation:
 100ft V/O H 5-600ft on the diagonal
Recorded Separation:
 Contacts merge

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

THE ASK21 PILOT reports flying a white glider in contact with Dunstable Radio in a straight and level glide heading 030° at 45kt when an HS125 overtook him very quickly from his blind spot in the starboard quarter behind the wing root. He assessed the risk of collision as being high.

THE HAWKER 800 PILOT reports flying a private flight from Luton to Aberdeen IFR. He departed on KILO departure climbing to 3000ft, which is the height for the PAPA departure. On passing 1800ft they contacted Luton Departures and informed them they were on the KILO departure climbing to 3000ft. They followed the departure track at 3000ft and were later told they were on a RIS. While established on the 347°R from BNN they were given TI regarding a contact in their 10 o'clock at an unknown height. They advised they were looking and eventually saw the traffic 200ft below and 200m to their left in their 8 o'clock position. A few moments later they were instructed to climb to FL100.

LTCC reports that he was under training as TC Luton Int Controller mentored by an experienced controller. A Hawker 800 was released on a Standard Departure Route (SDR) to the NE. The SDR initially goes to 3000ft then up to 4000ft before turning N to avoid the Dunstable gliding site. The pilot initially called climbing to 3000ft: both he and his mentor assumed the pilot would continue to follow the SDR and climb to 4000ft before turning N but he did not. They both became distracted by contacting NW Deps for a further climb to FL100 for the Hawker 800, coordinating the level with Essex Radar and discussing London Mil handover procedures. As the ac left CAS it was placed on a RIS and TI was passed on a primary contact to the W of Dunstable. The Hawker pilot reported visual, they thought saying it was 500ft below. On reflection he was not fully aware of the altitudes of this SDR departure and felt that he should have briefed himself better before commencing training.

ATSI reports that at the time of the Airprox, the Hawker pilot was in communication with the TC Luton Intermediate Controller (LUT INT). An experienced controller, who was training under the supervision of a qualified Mentor, manned the position. Both the workload and traffic loading were described as 'light'.

Amongst other duties, LUT INT is responsible for monitoring Luton departures to ensure that radar and/or vertical separation is provided against Luton inbound aircraft and other aircraft operating in Luton's CAS. A LoA exists between Luton Airport and the Dunstable Gliding Club whereby when RW26 is in use at Luton a portion of the Luton CTR and CTA, from the surface to 3500ft, is delegated to Dunstable (provided Low Visibility Procedures are not in force).

The Hawker pilot established communications with LUT INT Trainee at 1402:25, advising he was following a "...Kilo Departure climbing three thousand (sic)". The controller responded by requesting the pilot to squawk

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ident. At 1403:35 the controller transmitted "*C/S outside controlled airspace it'll be a Radar Information Service*" and this was acknowledged. At that time, the Hawker was 6nm WSW of Luton Airport, tracking W at 3000ft. A primary return can be seen in its 2 o'clock position at a range of 5nm tracking NW. At 1404:40, LUT INT had coordinated a climb for the Hawker pilot to FL100 with the TC NW Deps controller. Shortly after this, the Hawker pilot made a right turn onto a N'y heading, still maintaining 3000ft. LUT INT passed TI on the previously mentioned primary contact as being in its 12 o'clock at a range of 3 miles.

At 1405:35, the Hawker pilot was cleared to climb to FL100. At that time, the primary contact was in his 12 o'clock at a range of 1½nm crossing from left to right ahead. Shortly afterwards, the controller instructed the Hawker pilot to turn onto a heading of 360°. Almost immediately afterwards the pilot reported that he "*... had contact with the traffic it was a glider about three hundred feet below us*". The controller acknowledged this and advised that there was "*...no further traffic at the moment*". The ac was subsequently transferred from the LUT INT's frequency at 1410:00, but at 1430, the TC Group Supervisor N received a telephone call from the glider pilot advising that he wished to file an Airprox.

The Mentor reported he had arrived on duty and was not expecting to be training anyone. He had been rostered to occupy the Stansted Radar position but was changed to the LUT INT position with a trainee. He described the environment as very noisy with staff arriving and departing. Due to the location of the position in the Ops Room, a number of staff pass by on their way to their duty sector. This he found a distraction, coupled with other controllers stopping to talk to him. Added to this was the fact that the Trainee was an experienced controller who was extending onto the LUT INT position and the Mentor candidly admitted that he was not paying as close attention as he should have been to all of the Trainee's actions.

In order to standardise the procedures for IFR departures from Luton that are routeing off airways, a series of SDRs has been devised. The Hawker pilot had been cleared on SDR Kilo. The UK AIP AD 2-EGGW-6-7 describes the Kilo Departure from RW26 as follows: '*As soon as practical after passing the end of the runway but not below 500'AAL, turn left onto BNN VOR R035. At BNN D7 turn right onto HEN NDB QDM 257°. At BNN VOR R006 turn right onto BNN VOR R347 until clear of controlled airspace*' and the altitude associated with this procedure is 4000ft.

The Mentor recalled that they did discuss the departure of the Hawker but could not recall whether this took place before or after the ac had departed. He advised that Luton Tower simply clear the aircraft on the departure route with no level specified. Although the tracks are displayed on an overhead transparency above the radar position, no levels are shown. For RW26 there are four routes: two have an associated altitude of 2400ft, another of 3000ft and the Kilo departure which is 4000ft. He went on to say that such departures are not commonplace.

Investigations indicate that, on this occasion, there was a degree of confusion associated with this departure. The pilot of the Hawker submitted a written report in which he states: '*Departed on a Kilo departure climbing to 3000 feet, which is the height for the Papa Departure*'. The Trainee LUT INT controller stated in his report '*The SDR initially goes to 3000 feet then up to 4000 feet before turning North avoiding the Gliding site*'. The MATS Part 2, page LTN 8.2 Para 8.2.7.3 (Use of SDR Juliet and SDR Kilo) states: '*Due to the close proximity of the Dunstable gliding site, SDR Juliet or SDR Kilo departures must not be given an altitude restriction below 4000 feet prior to departure. Similarly, such departures cannot be vectored off the SDR routeing until level at altitude 4000 feet*'.

When the pilot of the Hawker established contact with LUT INT he clearly stated that he was climbing to 3000 feet. The Trainee believed this to be normal for such a departure, however, as discussed previously it is not. The Mentor was distracted and did not hear this call. Both Mentor and Trainee were aware that Dunstable gliding site was active as they had a strip placed in their 'active bay'. When the crew were first passed TI on the primary contact, reference to the radar would have shown that the Hawker was maintaining 3000ft and was within the Dunstable designated airspace. The Trainee did not pick this up and again the Mentor was distracted by other staff members and did not react to the situation.

As the Hawker followed the SDR, it penetrated the Dunstable designated airspace and, on crossing the northern boundary, entered Class G airspace. The Trainee did not inform the pilot that they had left CAS, as is required in MATS Part 1, but, apparently, provided a RIS to the ac. After the initial passing of TI no further details were passed to the Hawker pilot as the ac was cleared to climb. The crew made no mention of an Airprox on the LUT INT controller's frequency and so no reporting action was taken at that time.

It is evident that the crew of the Hawker only climbed to 3000ft instead of 4000ft as promulgated in the Kilo SDR from Luton Airport. This took the aircraft through the Dunstable designated airspace and, as it crossed its N edge, the ac came into conflict with the glider. Although the Hawker crew had stated that they were only climbing to 3000 feet, and not 4000 as required, the LUT INT Trainee did not pick this up. At the time, his Mentor was not closely monitoring his actions and neither heard this transmission nor noticed that the Hawker pilot had levelled off below the correct level.

The Mentor, aware that the Trainee was an experienced controller, did not monitor his actions as closely as required. Furthermore, the Mentor permitted himself to become involved in discussions with other members of staff at the expense of his primary duty, that of monitoring his Trainee.

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 air traffic controllers involved and reports from the appropriate ATC authority.

The BGA advisor was not able to attend the meeting but submitted a written report which is summarised as follows. The long-standing arrangements between Dunstable and Luton work very well as long as the correct procedures are followed. In this case however, neither the Hawker pilots nor the controllers noticed the altitude deviation at the time. The report given to the BGA indicated that the miss-distance had been very close.

It was pointed out to Members that despite the thorough and comprehensive report on the ATC aspects of this incident, the actual occurrence took place in Class G Airspace where the 'see and avoid' principle is the prime means of collision avoidance. It took place below the base of the TMA and just outside the Northern boundary of the area of the Luton CTR allocated to Dunstable for gliding operations. It follows logically, therefore, that this incident was in essence a sighting issue.

The glider was on a steady NE'ly heading and the Hawker approached it with a high rate of overtake from its 4-5 o'clock where it would have been obscured to the glider pilot by his ac's wing and fuselage. Although this does not absolve him from looking into the blanked areas by conducting clearing turns, Members considered that the occurrence had evolved so quickly that the glider pilot could not reasonably have been expected to see the Hawker. In any case, under Rule 17.2 of the Rules of the Air it was the responsibility of the Hawker pilot to avoid the glider. Despite being at the incorrect altitude for the Kilo departure, the SDR actually ended a couple of miles prior to the point of incident and although the controller did not notice the incorrect altitude, he had given timely and accurate TI on the glider to the Hawker pilot. Members noted that the visibility from a Hawker 800 cockpit is not good, particularly in a climbing attitude; further the glider would have been almost tail-on, presenting a very small target to acquire. However, having been given lateral TI that indicated that there was an ac presenting a hazard, acquiring and nullifying the hazard should have been a priority to the Hawker crew. That they did not before it was too late to do anything about it was of concern to the Board who therefore determined that the safety of the respective ac had not been assured.

The part played by the Hawker pilot's deviation from the SDR was the topic of debate by Members. Some considered that even if the Hawker had been at the correct departure altitude and the Airprox did not actually occur, the pilot could still have expected to encounter gliders in that position and altitude. The other point of view was that the incident should be viewed as it occurred and that being at the wrong altitude for the departure had directly contributed to the incident. This discussion led to Members agreeing that, although this had not been a direct cause of the Airprox, it had been a contributory factor and that the same applied to the controller not noticing the altitude deviation.

A Member with expert knowledge referred to other deficiencies in the way ATC had handled the Hawker. The Board agreed that these had not been significant factors in this Airprox.

The Board commended the open and honest reporting by both the Hawker pilot and the Luton Int controllers.

The NATS Advisor informed members that, as a result of this incident, the SDR plate has been modified slightly to clarify the procedure. In addition, action is in place to improve the safety nets to detect incidents such as this one at an early stage.

PART C: ASSESSMENT OF CAUSE AND RISK

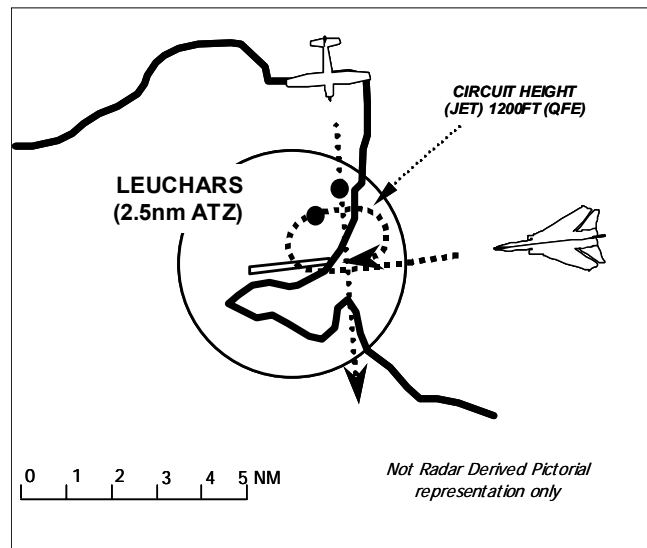
Cause: An effective non-sighting of the glider by the Hawker 800 pilot.

Degree of Risk: B.

Contributory Factors: The Hawker 800 pilot did not fly the SDR correctly, which went undetected by the Luton Int Controller.

AIRPROX REPORT NO 201/04

Date/Time: 4 Nov 1525
Position: 5622N 00252W (Downwind Leg 27
 Circuit Leuchars - elev 38 ft)
Airspace: Leuchars ATZ (Class: G)
Reporting Ac Reported Ac
Type: Tornado F3 C172
Operator: HQ STC Civ Pte
Alt/FL: 1200ft 2000ft
 (QFE 1010 mb) (not known)
Weather VMC CAVOK VMC HAZE
Visibility: 50km 15km
Reported Separation:
 0 V/50ft H 0 V/<0.5nm H
Recorded Separation:
 Not Recorded

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

THE TORNADO F3 PILOT reports flying downwind in the RAF Leuchars visual circuit at 1200ft QFE [1010mb], heading 090° at 185kt in a grey ac with his gear lowering and all lights selected on (including landing lights when the gear had lowered). He looked up from his downwind checks and immediately saw a Cessna at the same height in his 9 o'clock position about 50-100ft away, heading directly towards him. By the time he reacted, the other ac had gone behind them so no avoiding action was possible and he saw no avoiding action from the other ac.

UKAB Note (1): The circuit direction for RW 27 is RH and the height is 1200ft QFE for noise abatement. The elev is 38ft amsl.

THE C172 PILOT reports flying a white ac with all lights switched on a VFR flight from Dundee Airport to Glenrothes Aerodrome via numerous waypoints around the Aberdeen area. He was routing S at 105kt towards the Leuchars MATZ and prior to reaching the N boundary he called Leuchars [ZONE] and requested a MATZ penetration. He was granted a zone transit at 2000ft on the QFE of 1008mb [he thought] under a FIS and with a squawk of 0220.

He set what he believed to be 1008mb on the altimeter and adjusted his height to fly at 2000ft. He was asked if he could fly to the E of Leuchars by 2nm to which he replied "Wilco". Whilst maintaining a 2nm separation on a hdg of 190° he was concentrating on downward visibility to ensure that he would not infringe the 2nm range. The forward slant visibility was significantly reduced as a result of the position of the sun and this was already the case prior to commencing his MATZ transit.

With hindsight he believes that he may have set an incorrect altimeter setting due to glimpsing at the panel quickly and then looking back outside to remain orientated to the hazy horizon.

As he was approaching a position to the E of the upwind of RW 27 he noticed a Tornado jet about 1nm away which crossed R to L about 200yd ahead at approximately the same altitude as himself. His immediate action was to descend slightly to avoid flying through any jet-wash. Although his descent was initially from an altimeter reading of 2000ft down to 1800ft, he concedes that he did actually descend down further to gain better visibility to about 1700ft on the altimeter reading. Leuchars ATC asked him if he had maintained 2000ft throughout his transit and he stated that he had descended down to approx 1700ft.

On approaching Glenrothes Aerodrome he asked for an advisory QFE and was given 998mb. On setting 998mb he noticed that his indicated altitude had changed drastically from 2000ft QNH to 1400ft QFE which led him to believe that he may have set 1018mb instead of 1008mb on his zone transit.

AIRPROX REPORT No 201/04

The sun had also played a very significant part when making the overflight very hard as he was flying from the RH seat and was getting the sun from his 2 o'clock position. Also the altimeter is situated on the LH side of the instrument panel, which gave him a parallax view of the subscale.

UKAB Note (2): The METARs for Leuchars for 1450 & 1550 UTC on 4 November 2004 were:

1450Z 04/11/04 EGQL 041450Z 25015KT 9999 FEW025 10/04 Q1011 BLU NOSIG=

1550Z 04/11/04 EGQL 041550Z 26013KT 9999 FEW025 09/05 Q1011 BLU NOSIG=

The Tyne RPS for 1500-1600 UTC was 1007mb.

MIL ATC OPS reports that a C172 ac was routing from Dundee to Glenrothes under a FIS with Leuchars Zone (ZON) at a alt of 2000ft RPS. At 1505:30 ZON asked the C172 pilot "C/S..do you wish to route via the Leuchars overhead". The C172 confirmed this and was passed "Leuchars QFE 1010, fly at 2000ft". The C172 pilot readback "1010 and fly at 2000ft". ZON then instructed the C172 pilot to route "2 miles to the east of Leuchars to avoid the climbout lane" which he acknowledged. At 1514:36 ZON contacted Leuchars Aerodrome Controller (ADC) to pass details on the C172's MATZ crossing "North to South, 2 miles East, 2000ft QFE. Circuit restriction 1500ft". ADC readback the details and was asked by ZON if he wanted to work the track but stated "if he's staying in the approach lane I'm happy for you to keep it". The C172 pilot was informed at 1515:25 "your MATZ crossing is approved north to south, 2 miles east, at 2000ft QFE 1010" and the pilot readback the height and pressure. Simultaneously, a Tornado F3 joined the Leuchars visual circuit for RW 27RH at 1517 under the control of ADC, operating not above 1200ft on the Leuchars QFE of 1010. The F3 requested a low break (500ft QFE) and subsequently reported "on the break to land" at 1519:06. Thirty seconds later the F3 pilot reported "C/S...had ... light ac ...traffic transit through the stub at about 1000 ft, maybe you know about it?" ADC reiterated that the MATZ crosser should be at 2000 ft but the F3 pilot said that the C172 was at 1100ft and subsequently reported that he would be filing an Airprox. ZON confirmed with the C172 that the ac had maintained 2000ft whilst transiting the MATZ and received the response "negative, at one stage I think we went down to 1600ft."

ZON passed TI to ADC regarding the C172's MATZ crossing and ADC declined to work the C172 as the ac was to route through the inbound lane, 2nm E, at 2000ft QFE, which would pose no conflict to his circuit traffic. No MATZ crossing TI was passed on the ADC frequency as per SOPs. As the F3 transited downwind the pilot reported having seen "a light ac at about 1000ft." The pilot was advised of the C172 's MATZ crossing "not below 2000ft". The F3 pilot reported the C172 was flying at "1100ft". ADC liaised with ZON to confirm the level of the C172 and ZON confirmed the C172 was crossing at 2000ft.

ADC and ZON both followed SOPs correctly apart from omitting a MATZ crossing TI call on the ADC frequency. The inclusion of this call by ADC would have brought to the F3 pilot's attention that there was a light ac in the vicinity albeit at a different height than that reported.

Due to the altitude at which the Airprox occurred, it did not appear on any recorded radars.

HQ STC comments that this Airprox highlights the need for attention to detail. The Cessna pilot, by his own admission, had probably set the wrong QFE and did not notice his error. Acceptance of a level, height or altitude at which to fly by any aviator requires the instruction to be carried out implicitly. Unfortunately, with no Mode 'C' there was no safeguard for the ATCO to check the Cessna's adherence to the instruction.

From the Tornado crew's perspective there are a few lessons to be learned. As a 2-seat ac, an increased level of CRM between the pilot and navigator may have enabled the crew to detect the Cessna. Only one person should be 'heads in' at any time if at all possible. Secondly, it is wise to always expect the unexpected. All military aircrew should be aware that the MATZ does not offer them sanitised airspace from civil traffic (they only need to voluntarily observe its existence). The 2.5nm ATZ (for >1850m runways) and 2nm ATZ (for <1850m runways) should guarantee a higher level of safety, however, this does not absolve all aircrew from 'see and avoid'. Both ATZ and MATZ lie within Class 'G' airspace and other ac can, and do, mistakenly enter both of them. Therefore, in this case, when flying downwind it is always prudent for the crewmember not involved in the downwind checks to have their 'heads out' of the cockpit.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear to the Board that this was a very serious incident and, although there was little to support the Tornado F3 pilot's reported separation, that the actual miss-distance had been small.

In addressing the roles played by the 3 participants in turn, Members determined that there had been some minor ways that Leuchars ATC could have improved their handling of the MATZ crossing and that the F3 pilot had not contributed to the circumstances of the Airprox. For his part, the C172 pilot had sensibly called Leuchars ATC in good time and advised them accurately of his intentions. Although there is no requirement for civil ac to recognise a MATZ, the Board unanimously agreed that, due to the very busy nature of military flying stations, it is always good practise either to call the military ATSU or to avoid a MATZ by a reasonable distance. The C172 pilot having initially displayed sound airmanship in making the call, events started to deteriorate.

Having been given a clear, albeit amended, MATZ crossing clearance which the C172 pilot appeared fully to understand it was imperative that this clearance was adhered to implicitly since to deviate from it would potentially put him in conflict with other ac. If, for any reason, he was not subsequently able to comply with the clearance, perhaps due to deteriorating conditions, Members considered that he should have informed ATC immediately. Leuchars would have given him heading and height instructions to ensure that he did not conflict with other ac.

Although they could not be certain due to the lack of supporting information, the Board thought the C172 pilot had both set the wrong QFE and also flown well below his cleared altitude of 2000ft (QFE). A 10mb QFE error would have resulted in a 300ft height deviation; this alone however, would not explain his apparently flying at the circuit height of 1200ft. Either the error in setting the QFE was greater or it had been combined with a gradual reduction in his height of another 500ft (down to an altimeter reading of 1500 or thereabouts) to bring him into conflict with the F3 which the Board assumed to have been at the correct downwind height. The Board also noted that the heights given in his report did not agree with these taken from the RT transcript which were probably more accurate.

The Board considered the STC comments regarding the F3 crew's performance a little harsh. Ac in the circuit in an ATZ are entitled to expect protection; that is why such zones exist. For the F3 pilot, the break into the downwind position is a busy time and the navigator is also busy monitoring checks: flap, gear and wingsweep selections, speed and alpha. Members accepted however that when the ac was wings level, a glance to the left (away from the runway) may have revealed the C172 earlier; whether it would have been in time to take any effective action was doubtful. Also, had the ADC passed TI on the C172, this may have prompted the F3 crew to look for the other ac.

From the information available the Board determined that because of the lateness of the F3 pilot's sighting of the Cessna and that his ac would not have changed its flightpath by any significant amount, that there had been an actual risk that the ac would have collided.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The C172 descended in the area of the Leuchars circuit below its cleared height and into conflict with the Tornado.

Degree of Risk: A.

AIRPROX REPORT No 202/04

AIRPROX REPORT NO 202/04

Date/Time: 4 Nov 1542

Position: 5112N 00258W (2nm SW Burnham-on-Sea)

Airspace: London FIR (Class: G)

Reporting Ac Reported Ac

Type: Lynx HMA8 Falke SF25C MG

Operator: COMNA Civ Club

Alt/FL: 1500ft 1000-2000ft
(RPS 1019mb) (QNH 1023mb)

Weather VMC CLOC NK CLBC

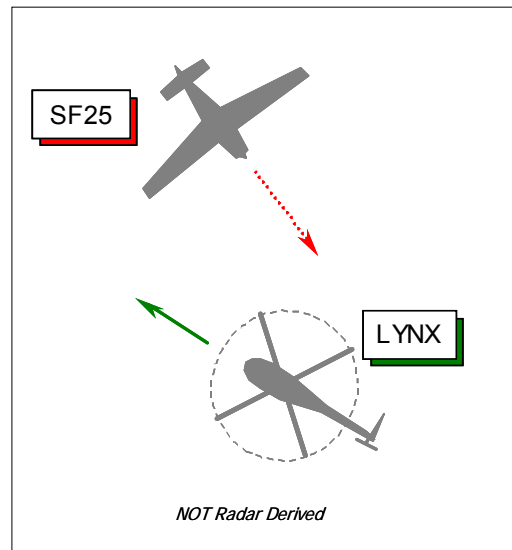
Visibility: 30km 10km

Reported Separation:

50-75ftV/100-125yd H Not seen

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LYNX HMA8 PILOT provided a very extensive account by signal, reporting that he was conducting a 'Track and Vibro'/Rad Alt Check Test Flight (CTF) on a NW'y course to coast out over the Bristol Channel just S of Burnham-on-Sea. He was in receipt of a FIS from YEOVIL RADAR (situated at Yeovilton) on 369.875MHz and a squawk of A0215 was selected: neither Mode C, TCAS nor any other form of CWS is fitted. The ac has a grey camouflage scheme, HISLs are not fitted.

After completion of the final 140kt IAS 'Track and Vibro' run, he turned R onto a heading of 300°(T) as once "feet wet" over the sea it was intended to descend to 180ft asl in order to complete the Rad Alt portion of the CTF. The sun was low in the W and this reduced visibility into the Lynx's 10 o'clock position: however, elsewhere visibility was good with the Welsh coast clearly visible to the NW. He had been flying straight and level for 2-3 min, at 1500ft Portland RPS (1019mb), when an extremely 'good spot' across the cockpit by his L seat observer caught a fleeting glimpse of another ac as it appeared in the extreme top RH corner of the R seat pilot's windscreen. The conflicting ac had emerged from behind the RH windscreen upper cross member and disappeared again behind the junction of the same cross member and the pilot's forward door pillar. Upon being warned by his observer, whilst leaning right forward looking R and up through the curved portion of his windscreen he spotted the other ac in their 2 o'clock position less than a ¼nm away, heading about 160°(T) very slightly above his helicopter [50-75ftV]. The other ac was apparently obscured until the point of sighting because it was on a virtually constant relative bearing which placed it out of sight behind his pilot's windscreen upper cross member. He immediately reduced the collective lever to about 20% torque to initiate a rapid descent and increase the separation whilst reducing speed to approximately 60kt IAS. He then rolled R in order to maintain visual contact with the other ac – a motor glider (MG) - which, due to the rapid descent of the Lynx was now clearly visible through the pilot's upper quarter light. Continuing the R turn, he was now positioned ½nm directly astern and about 200ft below it and eventually rolled out on to his initial heading having executed a complete 360° turn. Both he and his observer assessed that the MG had passed about 50-75ft vertically above the Lynx, at the instance of the first sighting of the other ac, and this distance then increased due to the descent of the Lynx. The minimum horizontal separation occurred when the MG was in his 3 o'clock at about 100-125yd away.

In both his and his observer's opinion, a collision would not have occurred had both ac remained unsighted and in the straight and level cruise that existed before the Lynx crew spotted the MG. However, due to the proximity of the ac that would have resulted, the safety of neither could have been assured should one of them have inadvertently manoeuvred toward the other. Furthermore, the Lynx probably remained unseen by the MG pilot throughout the period of the Airprox as he did not appear to alter his course, speed or altitude during the occurrence. Neither Lynx aircrew could see any form of navigation lights nor HISL on the other ac [possibly because it is fin mounted] and both believed that the MG may have had a side-by-side seating configuration for

two pilots [as does the SF25]. From the initial relative attitudes of the ac the MG pilots would have had to be looking slightly down and R, through the propeller to have seen his Lynx.

An Airprox report was transmitted to APP on RT and the sortie was continued without further incident.

THE FALKE SF25C MOTOR GLIDER (MG) PILOT reports that his ac is coloured white with a red nose & wingtips and a strobe on top of the fin. SSR is fitted and he had selected A7000 with Mode C selected 'on' but he was not in communication with any ATSU. After departing from Halesland Glider site, he flew down the Mendip Hills towards the coast and Weston-Super-Mare at an altitude of 1000ft. At Weston he turned S towards Burnham and climbed to 2000ft before turning eastbound [SE] towards Glastonbury and then returning to Halesland. At no time was he aware of being close to another ac. [The SF25C is a two seat side-by-side MG.]

UKAB Note (1): This Airprox occurred outwith the coverage of recorded radar. Despite both pilot's reporting that they were transponding, neither the Lynx's nor the SF25's SSR is shown at all.

MIL ATC OPS reports that the tape timings from RNAS Yeovilton were found to be 1hr 10min fast; consequently, the timings in this report have been adjusted to UTC.

A Lynx crew contacted Yeovilton APPROACH (APP) at 1457:59, departing for a "*check test flight over the [Somerset] levels not above 3000ft, request flight information service*". APP applied a FIS and allocated a squawk of A0215 at 1458:07 [no Mode C fitted] and passed the Portland RPS (1018mb) at 1458:51. At 1532:33, traffic information was passed on 2 unrelated ac and later updated. Nearly 10min later at 1542:13, the Lynx crew reported an Airprox to APP "*...approximate position is N5112.5W 002 57.98 [about 2nm SE of Burnham-on-Sea] what appears to be a power glider. We are at 1000ft cleared to 1200ft, 1019, continuing and we will make the report when I get back*". The Lynx crew were asked to reconfirm the RPS that they had set and the position of the Airprox. At 1554:51, the Lynx crew advised the ac would be routeing over sea; no further RT contact was made until the crew called for recovery.

Analysis of the Burrington Radar recording reveals that the Airprox is not shown. It is apparent from the RT tape transcript that, whilst the Lynx was under a FIS, it was actually in receipt of a more enhanced service more akin to a RIS. APP did not see a return from the MG displayed on the radar, at any stage around the time of the reported Airprox. Given the nature of the ATS being provided, it is likely that conflicting traffic would have been called if it had been displayed to APP on radar. There are no apparent ATC causal factors.

Royal Naval Air Stations generally operate in local time and although the incident occurred when recordings should be in UTC, it is apparent that the system was not adjusted on completion of British Summer Time. This has been addressed with the Unit's engineering staff and the need for accurate timed recordings stressed.

CinC FLEET comments that despite a good lookout by the pilot and observer (taking into account the complex nature of the Check Test Flight) it was unfortunate that the constant relative bearing of the Motor Glider effectively placed it in a blind spot resulting in a very late sighting by the L seat observer. The R windscreen upper cross member and pilots forward door pillar of the Lynx HMA 8 do not normally present visibility problems, which indicates that the small cross section of the white MG against a light background may have compounded the visibility issue. The observer is to be commended for his sharp awareness and ability to communicate accurately with his pilot enabling some form of avoiding action to be taken.

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 Mil ATC Ops Advisor briefed the Board that widespread technical difficulties with the RT/landline recording equipment's time synchronisation had lead to the acquisition of an improved time reference for installation at military ATSUs which was being trialled at a number of locations. This trial commenced on 16 May for a period of 4 weeks with the aim of improving the overall reliability and accuracy of the synchronisation of time injects within speech recording equipment. It was anticipated that fitment 'service-wide' would occur from 1 Aug 2005. An accurate recording time reference for recordings was essential to the investigation of Airprox incidents and the

AIRPROX REPORT No 202/04

Members welcomed this helpful development: the Chairman requested that the Board be kept apprised of the outcome of this trial and the progress of the acceptance of the equipment into service.

The Lynx pilot's report had provided a very comprehensive account of the encounter for the Board's assessment. It was clear that this Airprox - in the 'see and avoid' environment of the Open FIR - was fundamentally a lookout issue but there were mitigating factors. Although the SF25 was probably in the field of view of the helicopter crew at some stage, the predominantly white-coloured MG had probably approached at a head on aspect to the Lynx, at a constant relative bearing whilst closing with virtually no relative motion to draw attention to it until at close quarters, thereby defeating early visual detection by the Lynx crew. Moreover it had been masked from the pilot's view by the ac structure, and was not detected until the last moment when it was suddenly spotted by the observer from the left seat. The Board echoed the comment from the C-in-C Fleet Member that this was indeed a good spot by the observer and it was fortunate that he had seen the MG when he did and drawn his pilot's attention to it. Having seen the other ac about ¼nm away, the helicopter pilot then took prompt and effective action to stay clear of it. From the other cockpit the MG pilot had to contend with similar geometry but from his perspective the Members noted that he would have to have been looking down at the helicopter from slightly above. The grey camouflage scheme of this maritime helicopter, against the background terrain, may have been a factor here. Moreover, the absence of HISLs on the helicopter may have detracted from the helicopter's overall conspicuity and confounded earlier detection of the helicopter by the MG pilot. Nevertheless, the helicopter was there to be seen but it was clear from the MG pilot's report that he had not detected the Lynx's presence at all whilst flying just above it, according to the latter's pilot. The Board concluded unanimously that the non-sighting by the SF25C motor-glider pilot and a very late sighting by the Lynx crew had caused this Airprox.

Turning to the risk inherent within this encounter. Unfortunately it was not feasible to verify independently the Lynx pilot's assessment of the vertical separation, because the Airprox occurred below recorded SSR coverage: moreover, the Lynx is not fitted with altitude encoding. Nevertheless, the Board had no reason whatsoever to doubt the accuracy of the Lynx pilot's assessment of the separation against the MG at the critical moment. But from the Lynx pilot's own account it was evident that when he saw it ¼nm away the MG was passing some 50-75ft clear above his helicopter. Whilst this was fortuitous and a very small margin indeed - certainly a lot less than one would normally plan to avoid another ac in the Open FIR - nonetheless it was enough to forestall an actual collision here. Moreover, the avoiding action taken by the Lynx pilot effectively and expeditiously increased what separation there was and prevented the SF25 from getting any closer. Consequently the Board agreed unanimously with the helicopter pilot's view that in the circumstances reported here, the safety of the ac involved had certainly not been assured.

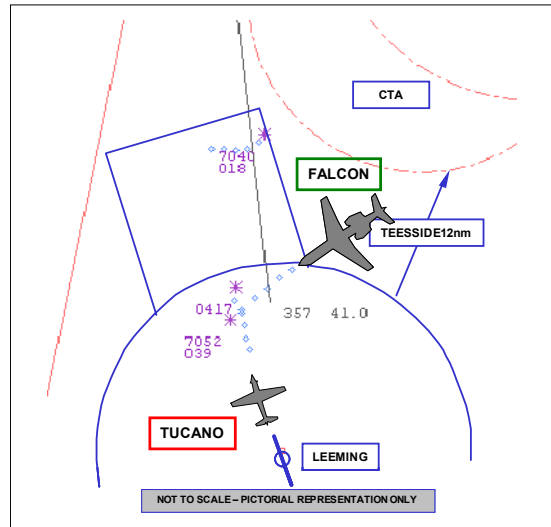
PART C: ASSESSMENT OF CAUSE AND RISK

Cause A non-sighting by the SF25C motor-glider pilot and a very late sighting by the Lynx crew.

Degree of Risk: B.

AIRPROX REPORT NO 203/04

Date/Time: 8 Nov 1005
Position: 5421N 00103W(3nm NE Leeming)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: FA20 Tucano
Operator: Civ Comm HQ PTC
Alt/FL: 3500ft 2500ft-3000ft
 (QNH 1019 mb) (QFE 1014mb)
Weather IMC in layers IMC in layers
Visibility: 2-5km Good
Reported Separation:
 200ft V/300yd H 2-300ft V/>1nm H
Recorded Separation:
 600ft V/ 0.5 nm H

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

THE FA20 PILOT reports that he was the Captain, but not the handling pilot, in the right hand seat and that they were recovering to Teesside from a training sortie on which he was conducting an Operator Proficiency Check on the handling pilot. They were under Radar Control (he thought) from Teesside Radar, while conducting a simulated single-engined IFR approach, with the left hand IFR screen up and the right hand seat Multi function display in 'Plan'. In this mode there is no TCAS display until a TA is received. While level at 3500ft downwind RH in the radar pattern heading 230° at 200kt they first noted the other ac at 3nm when they received a TCAS TA. The HP visually acquired a black and yellow RAF Tucano, that had not been called by ATC, 1-2nm away in their 10.30, initially below their level but appearing to pull up to co-altitude and then bunt down. The initial TA indication quickly changed to an RA and the HP climbed the ac on single engine max power until he received an 'increase climb' command, when he (the captain) instructed the HP to use both engines. TCAS then gave a 'descent' which the HP (with IFR screen still obscuring view) commenced but he overruled this because he saw the Tucano bunt down and pass 300yd in front and 200ft below. He assessed the risk as being high.

THE TUCANO PILOT reports that he was a student flying an instructor-training sortie from Linton-on-Ouse. Following a SID from Linton, a radar handover to Leeming was completed at FL40 and they were given a RAS and radar vectors to a PAR to RW34 to roll and depart to the E, climbing to a VMC level on top. There was cloud between 1-3500ft with more above so the majority of the approach was flown in IMC. ATC could only offer an SRA and, he thought, told them that the Zone was IFR and, due to the high level of stranger traffic, considerable avoidance should be expected during the recovery. ATC passed their departure clearance as 'Straight ahead to 1nm DME, not below 1000ft in the MATZ and expect a climb on E when cleared by APR. Following the roller, they commenced a climb straight ahead and they changed frequency from Talkdown to APR. (He thought that this was a different frequency to the one that was initially briefed). Having made contact, APR asked if they could remain VMC below but as the ac was climbing into cloud at the time, he replied 'negative'. APR then informed them of traffic climbing out of Teesside in their right 1 or 2 o'clock at around 5nm but no instructions were passed. He was aware that the published missed approach for RW34 is to climb on RW heading to 3500ft and call Approach, so a climb straight ahead was continued and at about 2000ft they emerged from the cloud. Leeming APR informed them of the Teesside traffic again and they became visual with, and recognised it. The instructor then took control of the ac and took visual avoiding action. It was estimated that they were at 2500ft-3000ft and the FA20 appeared to be climbing (the underside of the fuselage of the FA20 was visible) in their 1-2 o'clock around 1-2nm away. Their descending left turn ensured safe separation between them and the FA20 and he informed APR that they had visual contact and that they were taking visual avoiding action. They then descended to about 2000ft and commenced a hard right turn towards the S but APR warned them about the proximity of Teesside so they continued the turn onto 230°. Shortly after, APR instructed them to turn onto 180° to avoid a stranger that was close to their nose on a similar heading. This was the FA20 that they had just avoided and with which they were

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still visual. Following the turn into S and once they were well clear of the FA20, control of the ac was returned to the student to continue the climb to VMC and complete the sortie.

UKAB Note (1): The Leeming METAR for 0950 was;

0950Z 08/11/04 EGXE 080950Z 36008KT 9999 FEW008 SCT016 BKN050 11/10 Q1019 WHT TEMPO SCT012 GRN=

TEESSIDE APPROACH CONTROLLER reports that her assistant passed TI and intentions on the FA20 to Leeming, including that it intended to conduct 2 approaches at about 0954.

At about 1000 the assistant gave TI to Leeming on a B737 inbound from Dublin, 10nm SW of GASKO. Leeming passed TI on a SID A departure and an Easterly departure [the Tucano] squawking 0417, stating that it should be ahead of the FA20 which was number 2 in the Teesside traffic pattern.

At approximately 1003 the FA20 was told to turn right on to 320° but he replied, 'climbing due to TCAS on nose at' (transmission not completed) and the pilot did not take the heading change. The ac was 1½nm outside CAS but no change of service was given. TI was given on the Tucano but the FA20 pilot said he had just missed it as it dived underneath him and that he was resuming his descent back to 3500ft and asked what heading he should take up.

Since the situation had now changed, the FA20 pilot was told to continue heading 235°. The FA20 pilot said the Tucano was heading N at 3.2A. Leeming rang about 15min later and said their Tucano was on a RIS, and had been visual with the FA20.

MIL ATC OPS reports that the tape timings at RAF Leeming were found to be 1min 30sec ahead of UTC so they have been adjusted accordingly.

A Tucano ac was positioning to execute a SRA approach to Leeming under a RAS, from Leeming App (APP) at FL45. At 0949:17 the Tucano was passed the Leeming weather and descended to 2000ft on the Leeming QFE of 1014mbs. At 0950:37 APP asked the Tucano crew to "*report VMC below*". The pilot stated his requested climbout clearance would be "*to roll and depart ...and if possible to climb to Victor Mike on an easterly heading*". APP issued climbout instructions at 0951:23 as "*C/S...after your roll, climb maintaining runway track to 1 DME, before turning, not below 1000ft in the MATZ and turn right continuing climb and returning to this frequency*". At 0951:57 the Tucano pilot requested a PAR approach instead of an SRA but was informed: "*C/S...negative, with an IFR recovery lane, there are contacts infringing the recovery lane*". The Tucano was given several heading changes before being transferred to Leeming Talkdown at 0954:28 while heading 020° and maintaining 2000ft (QFE). The Tucano continued on SRA and APP passed TI to the Teesside Asst on a departure from Leeming on a SID East Alpha departure. This TI was not on the Tucano but another ac scheduled to depart.

Some time between 0957:43 and 0958:16 the APP controller's voice on the recording changes indicating a change of controller. At 1000:17 Teesside passed TI to Leeming Zone (ZON) on traffic "*7052...just out of Teesside*". ZON responded with "*yep, that's going for an NDB approach isn't it?*". Teesside confirmed this and acknowledged the SID East Alpha departure shortly to depart Leeming. At 1001:29 Teesside recontacted Leeming Zone (ZON) to pass TI on traffic "*15 miles west of the Gap...6021 squawk ...FL60*" which was inbound to Teesside RW05. ZON responded by passing TI on the SID East Alpha departure and "*another easterly departure warned outbound*". Teesside queried this and ZON confirmed the easterly departure would be on a squawk of 0417. ZON passed the present position and level of the Tucano and added "*we should be ahead of you I would have thought*" to which Teesside agreed.

The Tucano pilot called APP at 1003:56 "*from the overshoot*". When asked what type of service the Tucano crew required, the response was "*...Radar advisory, in the climb to Victor Mike on an easterly heading*". APP asked the crew if they were "*able to maintain radar information beneath cloud at the moment*" to which the response was "*negative*". The Tucano crew were informed by APP that they were "*beneath sector safety altitude, radar information, traffic northeast, 5 miles tracking southwest, indicating 3000 ft in the climb*". The Tucano crew advised they would "*maintain runway track for the time being*". APP then asked the Tucano crew to report "*passing 1500 ft (height of the Radar Vector Chart)*". The Tucano crew immediately responded that they were "*...passing 2000ft in the climb*". APP did not acknowledge this transmission. APP updated TI on the FA20 at 1004:49 as "C/S,

previously reported traffic is right, 2 o'clock, 2 miles, crossing right/left, indicating 3000ft". The Tucano crew called "looking" and after a request from APP called "passing 3000ft" at 1005:04. APP immediately replied "C/S, roger, avoiding action, turn, ...radar advisory, turn left heading 210°, traffic was right, 1 o'clock, 1 mile, crossing right/left indicating same height." The Tucano crew replied "(unreadable)...with the traffic, descending below and well clear". The Tucano crew stated they had "come hard starboard onto a heading of 120°" and were "victor mike between layers". APP asked the Tucano crew to avoid the Teesside Zone, confirmed their height and then limited radar service due to poor radar performance. The Tucano crew continued with the sortie.

Radar analysis of the Claxby Radar shows the Tucano, on completion of an SRA, climbing out of Leeming at 1003:48 tracking 340°, indicating Mode A 0417 and 012 Mode C. The Tucano's position is Leeming 350° at 1.8nm; the FA20 is in the Tucano's right 2 o'clock, 5.5nm, indicating Mode A 7052 and 033C. The Tucano's Mode C continues to indicate a climb and after the next sweep indicates 017 Mode C; at this stage the separation between the Tucano and FA20 has reduced to 4.8nm laterally. The Tucano then loses Mode C information for the next sweep and when it returns at 1004:07 it shows the Tucano's level to be 025 Mode C whilst the FA20 is in the Tucano's right 2 o'clock, 3.3 nm, indicating 033 Mode C. The Tucano continues to maintain a track of 340° and indicates a climb whilst the FA20 maintains a track of 240° and 033 Mode C. At 1004:33, the lateral separation between the 2 ac has reduced to 1.2 nm whilst the Mode C indication of the Tucano reads 031 and the FA20 indicates a climb and 034. At 1004:39, the indicated Mode C separation between the 2 ac is 600ft as the Tucano has descended to indicate 030C and the FA20 indicates a climb and 036, the lateral separation is 0.6 nm. The ac continue to converge and at 1004:46 the lateral separation between the 2 ac is 0.3 nm and the Tucano is indicating 030 Mode C and the FA20 037 [after they have passed]. After this point the separation between the 2 ac starts to increase as the FA20 passes through the Tucano's 12 o'clock.

The Tucano had flown to Leeming with the intention of carrying out a PAR but was informed that this was not possible as the recovery lane was IFR and there were contacts infringing the PAR beam: the crew were however advised that an SRA would be possible. The Tucano had been under a RAS from APP as it transited inbound and completed an SRA. On climbout, the Tucano crew requested a "RAS, in the climb to VM on an easterly heading." APP immediately asked whether the Tucano crew could maintain Radar Information below the cloud. However, the Tucano had already climbed through the cloud level and could not maintain VFR. APP responded by placing the Tucano under a RIS, as the ac was below the safety sector altitude, and passed TI on the conflicting FA20, which was 5 nm NE of the Tucano. The Tucano crew advised that they would be maintaining RW track and APP asked the Tucano crew to report passing 1500ft. The Tucano crew immediately responded with a call "passing 2000ft in the climb". However, APP did not copy this transmission as it was made at the same time as a landline transmission between APP and another outside agency. At 1004:49 APP passes further TI on the FA20 when the lateral separation between the ac is 2nm. APP then requests the Tucano's level passing, which is reported as 3000ft by the Tucano crew. APP immediately passes the Tucano crew "avoiding action, turn...radar advisory, turn left heading 210°, traffic was right 1 o'clock, 1 mile, crossing right-left indicating same height." The Tucano crew report "...with the traffic, descending well below and well clear". The Tucano crew later informed APP that they had come starboard onto a heading of 120° and were VMC between layers. APP instructed the Tucano to avoid the Teesside Zone. The Tucano crew were given RAS at 1005:49 that was limited due to poor radar performance.

APP reports her workload at the time of the Airprox as low and she had taken over control of the position some 5min previously. APP had not controlled the Tucano as it had positioned for the SRA but she was aware of the weather conditions around the airfield and the fact the Tucano was likely to encounter IFR conditions and request a RAS on climbout. APP had, correctly, ascertained that RAS would not be available for the Tucano crew, on immediate climbout, due to their low height and correctly applied RIS, asking the Tucano crew to report passing 1500ft, the level at which RAS could be provided and radar vectors given. The Tucano had already passed through this height and APP failed to copy the transmission made by the crew to report the Tucano was passing 2000ft in a climb to an unascertainable level. TI was passed to the Tucano crew on the FA20 when the 2 ac were 2nm laterally separated but no attempt was made by APP to co-ordinate the conflicting traffic with Teesside or to stop the Tucano off at an intermediate level below the FA20. Although APP fulfilled her obligations to the Tucano crew under RIS she was aware that the crew were IFR and requesting RAS and did little to try and deconflict the two ac. After the passing of this TI, APP requested the Tucano's level passing which was to confirm that the Tucano was above the RVC and APP was able to provide RAS and vectors. APP immediately gave an avoiding action turn onto 210° and reported the FA20 as 1nm laterally separated. The Tucano crew reported descending well below and well clear.

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ATSI reports that at the time of the Airprox the FA20 was in communication with the Teesside APR whilst the Tucano was in contact with the Leeming APR. (*Note: The time injection signal at Teesside was found to be 17 seconds slow. All times quoted have been adjusted for this.*)

The FA20 contacted Teesside APR on return to Teesside and the pilot requested a simulated single-engined ILS approach followed by a go around and then radar vectors for an NDB approach to land. Shortly after the FA20 pilot had contacted APR, details of the flight and its intentions were passed to Leeming by the Teesside ATSA, in accordance with the LoA. Leeming ATC advised that they had one Tucano that was carrying out an overshoot and then departing eastbound, "...we don't have anything warned but we'll give you a shout if we do". This conversation ended at 0951:02.

At 0954:55, the FA20 reported established on the ILS for RW05 at Teesside at a range of 9nm. Instructions had previously been passed for the FA20 to climb straight ahead to 2500ft after the go around. At 0959:30, the Teesside ATSA informed Leeming that the FA20 had gone around and during the discussion the ATSA advised that he could see Leeming traffic which was following the SID East Alpha (*This is described as: following departure from runway 34 at Leeming climb on runway track to 1 DME and then turn right onto 090° to intercept and follow the Leeming 060 radial by 6 DME. When passed FL65 turn left onto track 020° and climb to FL150.*)

Teesside APR instructed the FA20 crew to turn right onto 180° at 1000:15, and this was correctly acknowledged. Shortly afterwards, the crew were instructed to turn right heading 220° and climb to 3500ft. The FA20 was now 3nm SE of the airport downwind right hand for RW05. The Teesside ATSA telephoned Leeming to pass details of further inbound traffic, a B737, that was approximately 35nm SW of Teesside. He then asked whether Leeming had anything to affect this flight. Leeming advised the Teesside ATSA that they had a SID East Alpha and another Easterly departure; however, they added that the SID East Alpha had already gone and the Easterly departure (the subject Tucano) would be squawking 0417. They went on to say that this ac was 3nm S of Leeming tracking N. The ATSA replied "*That should be no problem at all*" and the conversation ended at 1001:45.

The Teesside Controller's report states that during this telephone conversation, Leeming advised that the Easterly departure (the subject Tucano) should be ahead of the FA20. This is not clear from the transcript of the conversation as 2 ac inbound to Teesside, the subject FA20 and the B737, were discussed.

Reference to the Great Dun Fell radar recording, used to provide Teesside with SSR information, shows that the FA20 left the Teesside CTA, maintaining 3500ft, at 1003:10, 5nm S of the airport. The controller did not advise the crew of any change of radar service and, at that time, the subject Tucano was not visible. It was not until 1003:35, that the Tucano's squawk appeared in the 11 o'clock position of the FA20, at a range of 6nm. Teesside APR passed no TI as the Tucano climbed ahead from Leeming tracking approximately 340°. The first Mode C readout from the Tucano is shown at 1003:43, when the two ac are 5.4nm apart, and indicated FL012. The ac continue to converge and it is clear that the Tucano is climbing. Leeming telephoned Teesside at 1004:10, and spoke to the ATSA as the controller was too busy to take the call.

At 1004:20, the Tucano was now in the 11 o'clock position of the FA20 at a range of 2.7nm with the Mode C readouts indicating FL027 and FL033 respectively. At this time the Teesside APR transmitted "*(C/sign) turn right heading three two zero degrees*". The pilot responded by saying "*(C/sign) in the climb with TCAS warning on the nose*". The controller then transmitted "*Traffic in your twelve o'clock range of half a mile three thousand three hundred feet climbing*". The 2 ac continue to converge and at 1004:34, they are 0.8 nm apart and 200 feet vertically. Leeming passed an avoiding action left turn onto 210° to the Tucano crew. The effect of this turn, coupled with the FA20 pilot's compliance with the TCAS RA, resulted in vertical separation being restored between the ac.

Teesside APR advised Leeming, via the Teesside ATSA, of the intentions of the FA20, however, no positive coordination was undertaken. Furthermore, when the FA20 left CAS, the controller did not inform the crew nor was there any change of service specified, as is required by MATS Part 1. When the Tucano was visible on radar, and in potential conflict with the FA20, no TI was passed to the crew. When it became very clear that the 2 ac were in conflict, no timely avoiding action was passed and the conflict was resolved by the FA20 crew reacting to TCAS and the Leeming Controller turning the Tucano.

HQ PTC comments that they fear that the Tucano pilot was badly served in his departure from Leeming, which should have been coordinated with Teesside even before he rolled through. Both ac were destined for the same

bit of airspace at the same level. A simple climb-out restriction or a vector off the SID could have resolved the conflict. Instead, the complexities of the RIS/RAS rules left the Leeming controller seeming to trust to luck that the Tucano pilot would gain sight of the FA20 before he needed to take any positive action. Whilst the trigger for this Report was a TCAS report, that it failed to get more serious than that was a matter of pure providence, not control. If the Rules, as presently constructed, inhibit the application of common sense, then they should be changed.

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.

Although there were many side issues, Members were dismayed to note that in this incident two ac, both in receipt of an ATC approach service, had come sufficiently close that positive visual avoiding action had been necessary. It was fortunate that the ac, although both technically IMC, were in a gap in the weather which had allowed the respective pilots, already in high workload situations due to their respective sortie requirements, to see and avoid each other. Members were concerned that arguments regarding the types of radar service - over RIS and RAS - were confusing and the real issue is that the primary purpose of ATC in such circumstances is to prevent ac from colliding. In this case the pilots had, in the interests of safety, been forced to disregard ATC instructions/clearances when TCAS and visual information told them that they were flying into conflict.

Specialists considered that the FA20 captain had acted in an exemplary manner, taking correct and timely action. Although there was some discussion regarding the Tucano pilot departing from his ATC clearance, he had done so in the interests of the safety of his ac, informing ATC of his actions (although, through no fault of his, they had not heard the transmission). He found himself in the unintended and unenviable situation of being IMC below safety altitude, not on a SID, and in receipt, albeit for a short period, of only a RIS. Leeming APP could have passed the Tucano pilot instructions that would have ensured both terrain separation and that he would not conflict with the FA20 (of which APP had been aware for some time) but she had not done so.

A military Member reiterated that he thought that there was a widespread confusion amongst military aircrew regarding RIS/RAS procedures and a sizable number considered that they did not meet their needs. A military ATC specialist informed the Board that there had been a DAP policy letter issued some years ago stating that ac on climbout under a RIS were to be provided with vectors but this had not been incorporated into any (military) instructions. The Board was also informed that as a result of this incident HQ 3 Gp had initiated action to review procedures in such circumstances.

Since the incident had occurred in the open FIR, albeit in the area covered by a LoA, Members considered that both controllers were mutually responsible for effecting co-ordination and neither did. The Teesside ATSA passed TI to Leeming APP but they mistakenly assessed that there would not be a conflict. Members could not determine how much information had been passed by the ATSA to the controller since their conversations are not recorded. In any case, specialists stressed that coordination must only be undertaken by controllers and not by assistants. Although there was reasonable information flow between the 2 units, there had been a marked reluctance to act on it, resulting in no coordination being agreed. Specialists were concerned that, although the LoA specifies the provision of Traffic Information, coordination procedures were neither agreed nor promulgated. HQ 3 Gp informed the Board that a review of the Teesside/Leeming LoA was already underway.

Members considered that Teesside APR should have changed the service given to the Falcon pilot from a control service to an advisory service as the ac left the Zone. In any case no control, advice or information had been passed to the FA20 pilot until it was too late and he had reacted to the TCAS RA which was his first indication of the presence of the Tucano. Members also considered it noteworthy that in this incident correct and timely reaction to a TCAS RA had not resolved the conflict due to the other (non-cooperative) ac manoeuvring aggressively to avoid the receiving FA20.

In the view of the Board this had been a serious incident and this resulted in considerable discussion among Members regarding the degree of risk. It was agreed that notwithstanding the circumstances, the pilots were able to see the other's ac and take effective action to generate reasonable separation which was sufficient to prevent there being any risk of collision.

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In view of the actions being taken in the light of this Airprox and the ongoing CAA work on the provision of services outside CAS the Board decided on this occasion not to make any recommendation(s).

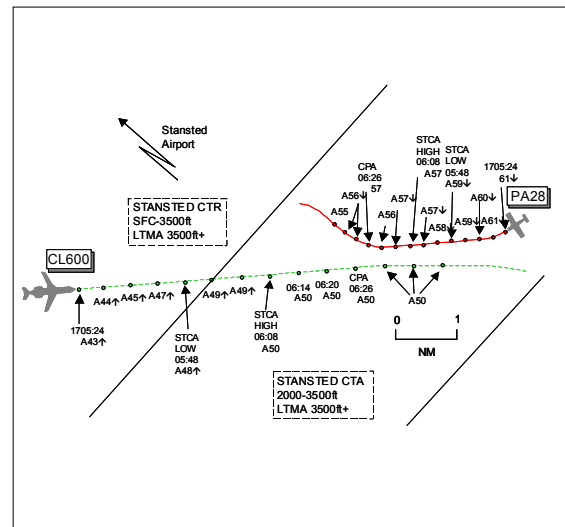
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Aware of each other's ac, a lack of positive control by Teesside APR and Leeming APP allowed the ac to fly into conflict.

Degree of Risk: C.

AIRPROX REPORT NO 204/04

Date/Time: 14 Oct 1706
Position: 5149N 00022E (7nm SE Stansted)
Airspace: LTMA (Class: A)
Reporting Ac Reported Ac
Type: CL600 PA28
Operator: Civ Comm Civ Pte
Alt/FL: 5000ft 6000ft
 (QNH 995mb) (QNH 995mb)
Weather VMC CLAC VMC CLAC
Visibility: UNL >10km
Reported Separation:
 600ft V/0.5nm H not seen
Recorded Separation:
 700ft V/0.4nm H

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

THE CL600 PILOT reports outbound from Stansted IFR following a CLN8R SID at 250kt. About 20nm W of CLN, level at 5000ft QNH, TCAS gave a TA alert then an RA warning on opposite direction traffic. At the time the visibility was unlimited, 200ft above cloud in VMC, he thought, and he sighted a PA28 which was seen to pass 0.5nm to his L and 600ft above in level flight. The PA28 was cleared to 6000ft QNH 995mb but apparently had set his altimeter subscale to 29.95in which is equal to 1014mb.

THE PA28 PILOT reports, 4 months post incident, flying enroute from Germany to Cranfield IFR at 120kt and in receipt of an ATS from Luton, he thought. ATC instructed him to descend to 6000ft to facilitate his arrival and as he descended he set the altimeter subscale to 995mb as instructed. About 10min later ATC questioned him whether his QNH setting was 995, which it was, and a few minutes later he was questioned again and informed that he was indicating a different altitude – too low. Immediately he heard another pilot complaining about another ac being too close and wondered if he was talking about him. He tried to visually acquire an ac but was unable to locate it even though the visibility was >10km and he was flying 2000ft above cloud in VMC. At this point he became so confused that he wondered if ATC was talking about millibars or inches of pressure even though he was pretty sure to remember that millibars are used in the UK, this being his first time in UK airspace. Not wishing to aggravate the situation, he let ATC know of his doubts, who immediately saw this as 'proof' that he was at the wrong altitude and started to vector him around traffic. He was then transferred to another controller who continued vectoring him towards his destination.

Later, after landing, he realised what had happened. He had collected the ac from Germany and shortly after departure, Frankfurt ATC told him that his transponder code showed 7 echoes and instructed him to turn it off but it had not dawned on him that the transponder might have other shortcomings. He had 1600hr total time, of which 1200hr had been ferrying ac, and this had not been the first time a transponder had been 'off'. He experienced a 600ft discrepancy before and should have acted on his experience. His suspicion was confirmed later as the transponder sometimes indicated erroneous altitude readings to ATC and to ac equipped with TCAS but gave a correct readout most of the time. From then on he avoided crowded airspace. He opined that the other ac's pilot had probably not seen him, as he had been unable to see the other ac, but its pilot had probably relied on TCAS which would have seen whatever his Mode C was sending. Finally he apologised for any confusion that he may have caused.

ATSI reports that the incident took place at 1706 UTC in Class A CAS of the LTMA. Both the flights involved were operating on IFR flight plans and, at the time of the incident, were in receipt of an Area Control service from the LTCC NE DEPS SC, a trainee accompanied by an OJTI.

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The CL600 had recently departed from Stansted on a CLN 8R SID, enroute to Copenhagen, while the PA28 was transiting the LTMA inbound to Cranfield from Aschaffenberg, Germany.

At 1649:40, the PA28 pilot made his first call to the NE DEPS SC, reporting at FL100. The controller responded by instructing the flight to adopt its current heading as a radar heading (276°). At this point the flight was about 5nm ESE of the CLN VOR and indicating correctly at FL100 on Mode C height readout. One minute later the PA28 was instructed to descend to FL80 and this was read-back correctly.

It is noticeable from the radar recording that over the course of the next five minutes or so, the PA28's allocated SSR Mode A code, with its associated c/s conversion, dropped out several times. On these occasions the code/callsign was replaced with Mode A '0000'. The Mode C information, however, was maintained, except for two brief occasions when firstly no SSR information was displayed and then the correct Mode A alone. These irregularities had also been observed by the SC who, at 1656, asked the flight to confirm it was transponding the allocated code. Twice the pilot reported recycling the transponder and, at 1658:40, the controller requested a level check to re-verify the Mode C indication. The result met the required criteria.

At 1659:25, the PA28 was issued a minor heading change with a L turn onto 260°. This adjustment would take the flight to the S of Stansted airport. Two minutes later, after the PA28 pilot had reported level at FL80, the flight was instructed to *"...descend altitude six thousand feet QNH niner niner fife millibars"*, to which the pilot responded *"...going down to six thousand for (PA28 c/s) er say your say the millibars again"*. The SC replied *"The QNH niner niner fife millibars"*, the pilot responding with simply *"niner niner five"*. The absence of a 'full' read-back (i.e. one that included both 'QNH' and 'millibars') was not followed up by the controller as required by MATS Part 1, Section 1, Chapter 6, Page 2, para 6 Vertical Position, 6.2, which states *"When transmitting altimeter pressure settings which are lower than 1000mb, controllers are to specify clearly the unit of measurement on the first transmission of the information to each ac and pay particular attention to the read-back to ensure that the correct setting has been understood by the pilot"*. However, in view of the contents of the pilot's enquiry, the controller had no reason to suspect the pilot's understanding of which units of pressure the cleared altitude was based.

Following departure from RW23 at Stansted, the CL600 pilot made his first call to NE DEPS at 1704:40, reporting maintaining 4000ft, the initial altitude on the CLN 8R SID. This SID requires a L turn onto the CLN VOR 269 radial and a climb to 6000ft, with steps at 4000ft and 5000ft. The SC instructed the flight to 'squawk ident', lifted the ATC speed restriction and issued a climb clearance to 5000ft. This was correctly read-back. At 1705:24, the PA28 was given a 10° heading adjustment to the R on to 270°. At this point, the radar recording shows the CL600 had just completed the L turn onto the SID track to CLN. It was climbing through 4300ft Mode C, with the PA28 at a range of 7.2nm in its 12 o'clock position at 6100ft Mode C. The two ac were on almost directly opposite tracks, which, if continued, would have involved the PA28 passing just to the S of the other ac. The NE DEPS SC then issued the CL600 flight with a reminder to maintain 5000ft on reaching and advised that there was traffic in its 12 o'clock a thousand feet above. A correct read-back was produced by the pilot who added, *"he's on TCAS"*. Over the next few sweeps of the radar the PA28's heading change was starting to become apparent with the effect of now placing the ac on a track just to the N of that of the CL600.

At 1705:48, STCA activated with a low severity warning and the controller transmitted an instruction to the PA28 to *"...maintain altitude six thousand feet on QNH nine nine five"*, the pilot responding *"maintaining six thousand nine nine five"*. Regrettably, on neither occasion was the term 'millibars' used. Detecting now that the PA28 had descended below 6000ft, the SC commendably did not hesitate in taking action instructing the CL600 flight to *"...turn right immediately heading one one five degrees"*. This coincided with STCA activating a high severity. Once a read back was obtained, the SC instructed the PA28 to turn R on to a heading of 300°. On neither occasion was the term 'avoiding action' used with the turn instructions nor was TI provided. At 1706:30, the pilot of the CL600 reported *"... clear of conflict he was er six hundred feet above"*. The radar recording shows that the two ac passed each other port to port (1706:26), separation reducing to 0.4nm horizontal and 700ft vertical when in each other's 10 o'clock position – the CL600 at 5000ft and the PA28 at 5700ft Mode C. By the next sweep (1706:32) they had passed and were in each other's 4 o'clock position, 0.6nm apart with 600ft of vertical separation, the PA28 having descended a further 100ft to 5600ft. The two ac continued to diverge, standard horizontal separation being achieved less than 30sec later. Apart from the 'clear of conflict' report from the CL600 crew, no other reference to any TCAS event was made on the RT neither were any sighting reports announced by either crew. After the event, the controller noted that the PA28 had descended further, levelling at 5500ft, Mode C. The controller passed this observation to the flight, instructing it to climb to 6000ft and turn L once more on to 270°. A series of exchanges then took place during which the controller attempted to confirm the unit and value

of the pressure setting on which the PA28 pilot was flying: unfortunately, a clear picture of the situation did not emerge [see UKAB Note (1)]. Ultimately an understanding was achieved resulting in the flight successfully maintaining (and indicating) 6000ft altitude after which it was safely transferred to the next frequency.

The reason for the level discrepancy has not been established conclusively. However, one possibility, for which there is some compelling evidence, may rest with the units of pressure that were possibly selected by the PA28 pilot prior to descent to an altitude. If he had selected on his altimeter sub-scale '29.95 inches' instead of '995 millibars', the ac would then have been flying above a datum equivalent to 1014mb. The 19mb difference between 1014mb and 995mb is equivalent to 513ft (27ft/mb). Consequently, such an error in the sub-scale setting could account for the PA28 indicating, and being, approximately 500ft below its assigned level.

UKAB Note (1): The TC NE DEPS RT transcript reveals the following exchange:

1707:20 ATC: *"PA28 c/s just confirm you've got the QNH nine nine five millibars set"*.

PA28: *"Affirmative nine nine five"*.

ATC: *"Roger and were you always maintaining altitude six thousand feet"*.

PA28: *"Yes that's affirmative what is are you talking about millime- millibar nine nine five"*.

ATC: *"Yeah millibars nine nine five millibars on the QNH and just confirm you're maintaining altitude six thousand feet"*.

PA28: *"I am I'm just not totally clear about your millibars I got er one zero one zero three from flight level how far off are we talking"*.

The controller asks the pilot to standby and transfers the CL60 to the next sector before continuing.

1708:20 ATC: *"Er PA28 c/s if you're on QNH one zero one three you actually six hundred feet out"*.

PA28: *"Okay so you're showing me six thousand six hundred"*.

ATC: *"Negative five thousand five hundred climb to climb now to altitude six thousand feet on altitude niner niner five milibars"*.

PA28: *"Okay am I six hundred too high or too low I'm not sure I'm sorry"*.

ATC: *"You're six hundred feet too low"*.

PA28: *"Okay thank you"*.

The controller issues climb to another ac on frequency whose pilot comments *"...sounds like he's set in inches not millibars"*. The controller replies *"...I think that's what he's done"*. Just over 30sec later

the controller transmits:

1709:30 ATC: *"PA28 c/s got you now maintaining altitude six thousand feet turn left heading two six five degrees"*.

PA28: *"Two six five I'm very close to six thousand I apologise"*.

ATC: *"Thank you there was just traffic that was five thousand er that was maintaining altitude five thousand feet which was meant to be a thousand feet beneath you but ended up only five hundred beneath you passed down your lefthand side"*.

PA28: *"Okay I was IMC right now I apologise"*.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Pilot Members discussed the differing equipment fitted to PA28 models which was dependant on where the ac was registered. Some ac had altimeters fitted with only 'inches' displayed on the subscale, some with only 'millibars' whilst others had dual subscales displaying both. Also noteworthy was the use of 'hectopascals' (millibars) in some countries.

The PA28 pilot had been sure that he had set 995mb during his descent from FL80 to 6000ft QNH and firmly believed that an equipment fault had resulted in the ac's encoding altimeter used by the transponder was giving erroneous levels. The controller had tried to establish the true situation but the resulting dialogue was less than clear as to where the problem lay. What was evident was the fact that, up until the time the PA28 pilot was given descent to an altitude requiring a change of the altimeter subscale, the Mode C readout had been accurate. Thereafter, as the flight descended and approached 6000ft, its height readout had indicated an incorrect level. The RT transcript had shown the PA28 pilot's correct read back of '995' but then, when clarification was sought immediately after the CL600 had passed, the PA28 pilot had stated being unclear about millibars and mentioned having '1013' and 'flight level'. The transponder's reply to the ground interrogator throughout the flight would have included the Mode C level, continuously referenced to FL (1013mb), irrespective of which pressure the pilot had set on the cockpit altimeter subscale. The controller, after seeing the ac's indicated level during the encounter, had informed the pilot the direction of the error (too low). Later, the PA28 was seen to have climbed and the controller had told the pilot that his indicated level was correctly showing 6000ft which the pilot also confirmed. Members agreed that, on the balance of probability, the PA28 pilot had mis-set the altimeter subscale and descended into conflict with the CL600.

The CL600 crew had received a TCAS TA alert then an RA warning, as well as TI, and visually acquired the PA28, watching it pass 0.5nm clear to their L and 600ft above. The controller was aware of the potential for conflict when he informed the CL600 crew to maintain 5000ft with opposite direction traffic 1000ft above. STCA had then alerted the controller, who had initially told the PA28 pilot to maintain 6000ft. Although he did not use the phrase 'avoiding action', the controller had issued an 'immediate' R turn to the CL600 flight followed by a R turn to the PA28 pilot. The subject ac passed with 700ft vertical and 0.4nm horizontal separation. These elements when combined were enough to persuade the Board that safety had been assured during the encounter.

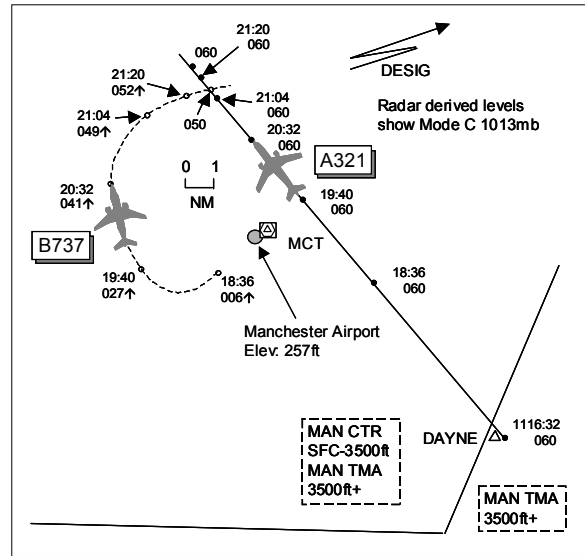
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA28 pilot descended into conflict with the CL600 owing to a probable altimeter subscale mis-setting.

Degree of Risk: C.

AIRPROX REPORT NO 205/04

Date/Time: 5 Nov 1121
Position: 5326N 00219W (5.5nm NW Manchester Airport - elev 257ft)
Airspace: Manchester TMA (Class: A)
Reporting Ac Reported Ac
Type: B737-300 A321
Operator: CAT CAT
Alt/FL: 5000ft↑ FL60
 (QNH)
Weather IMC IICL VMC CLBL
Visibility: 10km
Reported Separation:
 700ft V 0.5nm H 700ft V 1-2nm H
Recorded Separation:
 800ft V 0.7nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports outbound from Manchester following a DESIG 1Y SID at 250kt and in receipt of an ATS from MACC on 125.95MHz squawking 0365 with Mode C. ATC told him to turn onto heading 060° and to climb to FL190, at the time they were flying in and out of cloud. After a further R turn onto 070° and as they approached 5000ft, TCAS gave a TA alert with an intruder on a converging course from R to L maintaining 6000ft simultaneously with ATC assigning a further R turn onto 085°. On reaching 5300ft they stopped their climb and initiated a descent to 5000ft as the other traffic was sighted as an A321 heading 300° slightly R of their 12 o'clock range 0.5nm 700ft above. During the encounter no RA warning was received and he did not assess the risk.

THE A321 PILOT reports inbound to Manchester heading 320° at 220kt and in receipt of an ATS from Manchester APP on 119.52MHz squawking an assigned code with Mode C. A step descent had been given to FL60 and the radar heading assigned had taken their flight through the Manchester O/H. Shortly thereafter, a TCAS TA alert was received on converging traffic from the W below but climbing. The CPA on other ac was indicated on the TCAS display as 1-2nm W of their position and 700ft below. ATC then issued a turn onto a downwind heading and a frequency change to Manchester Director. No avoiding action was taken as only a TA was received and he did not assess the risk.

UKAB Note (1): The Manchester QNH was 1030mb and the Transition Altitude was 5000ft.

THE MANCHESTER APR reports the A321 was being vectored on a tactical heading of 320° from DAYNE as delaying action prior to turning the flight LH downwind for RW24R. Owing to his pre-occupation with 2 non-standard flights, a police ac at FL60 and a survey ac at 3400ft, which created a complex traffic situation with high workload, he omitted to turn the A321 downwind as planned. This resulted in the A321 disappearing in the Manchester overhead and into conflict with a departing B737 from RW24L. He first became aware of the conflict when STCA activated and the A321 crew reported a TCAS TA alert. Neither TI nor avoiding action was passed as the ac had already crossed and were clear of each other by this time.

THE MACC N UPPER RADAR CONTROLLER reports observing the B737 becoming airborne and owing to a Police ac operating NE of Manchester Airport by 10nm, he instructed the flight to turn onto heading 070°, after noise-abatement, and to climb above and well clear of the Police ac. No other ac were observed in the Manchester Airport area. After the B737 climbed through 5000ft, his Coordinator warned him that another ac had appeared on his display directly above the B737. As both ac's labels were garbling with the SMF flashing red, he turned the B737 onto heading 090° for avoiding action and advised the flight that there was traffic directly above them. As he could not ascertain the other ac's heading, he gave what he considered to be the best heading to quickly

AIRPROX REPORT No 205/04

resolve the conflict. Neither he nor the Coordinator had observed the other ac, an A321, enter his airspace prior to SMF activating.

THE MACC N UPPER COORDINATOR reports he saw radar controller turn the B737, as it climbed through 4000ft, and issue climb to remain S of a Police ac operating 10nm NE of Manchester at FL60. At some point after the B737 had turned onto 070°, he noticed that it had become 'garbled' with another ac of the same company which appeared to be on a heading of approximately 320°. As they had no other ac from that company expected in their sector, he alerted the radar controller's attention to this conflict but he was unable to read the height readout. STCA activated and almost immediately became high severity. The radar controller immediately gave avoiding action. At no point did he observe the other ac, an A321, enter the N Sector other than when it appeared out of the radar O/H N of Manchester Airport.

ATSI reports that at the time of the Airprox, the A321 crew were in communication with the Manchester APR and the B737 crew was in receipt of an Area Control Service from the Manchester N Upper Radar Controller located at MACC. The workload and traffic loading of the Manchester APR were described as 'busy but becoming quieter' at the time of the Airprox.

The APR was operating with both the Approach N and S positions bandboxed. He advised that this was quite normal for the time of day. To the NE of the Manchester CTR was a Police ac at FL60. The APR advised that this had been following the M6, W of the CTR boundary, and had then routed, without coordination, to its present position some 12nm NE of the airport. Additionally, there was a survey ac operating 15nm SW of the airport at 3000ft.

The crew of the A321 established communication with the APR at 1113:35, and reported descending to FL80. The APR instructed the flight to descend to FL60. Shortly afterwards, the APR instructed the crew to leave DAYNE (Manchester radial 134° at 11nm) heading 320° and reduce speed to 220kt. The APR's intention was to let the ac track towards the airfield and then instruct the crew to turn downwind LH, remaining S of the airfield, and be fitted into the approach sequence. However, at 1119:40, the A321 was crossing through the FAT of RW24R at Manchester, still heading 320° and level at FL60.

Following departure from RW24L, the B737 crew established contact with the Manchester N Upper sector. The pilot reported passing 3000ft for 5000ft and following a DESIG 1Y departure. The N controller cleared the crew to climb to FL190 with no speed restriction. This SID requires crews to make a R turn after departure and track NW before turning R and tracking E to DESIG, which is located 17nm NE of Manchester Airport. At 1120:00, the N controller instructed the crew of the B737 to turn R onto 070° towards DESIG. The pilot acknowledged this and complied. Shortly afterwards, at 1120:32, the ac was passing FL41 with the A321 5.5nm to the E, still maintaining FL60 having passed through the final approach to RW24R and now N of the airfield still on its assigned heading of 320°.

At 1121:05, the N controller instructed the crew of the B737 to continue the R turn onto heading 085°. At that time, the ac was passing FL49 whilst the A321 was in their 1 o'clock position at a range of 2.4 nm crossing from R to L. At 1121:20, having recognised the conflict, the N controller issued an avoiding action turn to the crew of the B737, by instructing them to turn R heading 090°, and passed TI on the A321, which had passed through their 12 o'clock position and was now in their 11 o'clock position at a range of 0.7nm and 800ft above, the CPA.

Meanwhile, the crew of the A321 had informed the APR that they had received a TCAS TA on traffic below them. The APR responded with "*Sorry ac calling say again*". The pilot then repeated his message that a TCAS TA had been received on traffic 700ft below. This time the APR responded "*A321 c/s roger turn right now heading zero seven zero*". This was designed to turn the ac away from the Police ac, also at FL60, and to vector it back towards the airport. Although the headings assigned initially reduced the rate of divergence, this did not adversely affect the overall outcome.

The Manchester APR advised that he had never intended that the A321 would operate to the N of the final approach to RW24R, and so he had dismissed any possible conflict between it and the B737 or the Police ac which was operating NE of the airport. The APR went on to say that he had planned to employ a commonly used technique of instructing the crew to descend to FL60 and then leave the holding fix at DAYNE, on a heading of 320°, before turning the ac onto a downwind heading. His normal practice, when using this method, was to 'cock out' the strip on his display, which would serve as a reminder that the ac had to be turned. However, on this

occasion he had forgotten to carry out this action. He had been working in the position earlier in this shift and was aware of the Police ac. When he took over the position, approximately 1hr prior to the Airprox, he had a strip on the Survey flight, however, this only specified a c/s and the word 'Survey'. He had attempted to establish the flight's intentions, but without success. He had not received much in the way of a handover from the outgoing controller, probably because he also knew little about its requirements. He had ascertained that the ac wished to operate in the vicinity of Cranage, which is located approximately 11nm SSW of Manchester Airport. He added that this had presented a problem, as it would potentially conflict with all departures from RW24 routeing to the S.

He explained that he was concerned about this flight and could find no associated documentation. He had attempted to contact the Watch Supervisor in order to establish its status, namely whether it was an approved Non-Standard Flight or just a casual request to conduct a photo survey. He tried all the usual telephone extensions but to no avail. He had left messages with other members of staff for the Watch Supervisor to call him back. The APR admitted that this had annoyed him somewhat and, even though it should not have done, it became a definite distraction to his working.

Whilst this had been happening, the A321 had come onto his frequency. When asked why he had descended it to the same level as the Police ac, he reiterated that as the A321 was to remain S of the airport and, provided the Police ac remained in the same operating area, some 12nm NE of the Airport, there would be no problem. On this occasion he had not followed his plan, almost certainly, he felt, as a result of the distraction caused by trying to contact the Watch Supervisor without success. As a consequence of this and the consequent omission to cock out the strip, the ac had slipped from memory completely.

He explained that the N controller, when climbing the B737, would have checked for traffic approaching from the two holding facilities, ROSUN and MIRSI, located to the N and NW of the airport respectively. The N controller would not have expected to see any traffic entering his airspace from the S, without coordination, and so would have climbed the B737 once clear of traffic from these two holds.

When the conflict alert facility activated the APR's initial reaction was that this was nothing to do with him, as none of his traffic was in that area. It was only when the pilot of the A321 advised of traffic beneath them that he suddenly remembered the ac's presence. The two ac had already passed each other and so the APR saw no benefit in passing TI. His priority now was to ensure that the A321 did not conflict with the Police ac, that was also at FL60, some 9nm to the NE of the A321 and so he instructed the crew to turn right onto a heading of 070° as well as instructing the Police ac not to route any further S from its present position.

Later investigation revealed that the Watch Supervisor had been engaged in a meeting at the time of the Airprox. He had received the message regarding the query relating to the status of the Survey flight, however, he was intending to return to the tower shortly and did not consider it necessary to prematurely terminate his meeting.

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 their investigations had shown the A321 had been displayed continuously on the Manchester radar system and had not disappeared into the radar O/H. Also, a review of standards had been carried out to ensure that police and special flights are better coordinated within the unit. Procedures and practices were also reviewed with respect to inbound routeings and airspace divisions within MACC as well as the supervisory aspects within the unit.

Pilot Members commented that the B737 crew had manoeuvred their ac whilst in receipt of a TCAS TA, stopping their climb and initiating a descent. Although this was contrary to ACAS recommended practice and their ATC clearance, their actions were understandable as they had only pre-empted a TCAS RA warning which would have followed had they continued their climb; the crew had informed ATC of this manoeuvre. Clearly the Manchester APR had become distracted from his primary duty as he had tried to obtain further details on the survey flight and establish its priority. Normally these tasks would have been carried out by the Supervisor, who, at the time, was in a meeting and had chosen not to return immediately to the tower. It was agreed that this lack of effective supervision had contributed to the Airprox. During this period, the APR had allowed the A321 to fly N of the RW24 C/L and into conflict with the B737 which was considered to be a part cause of the Airprox. Although the APR had

AIRPROX REPORT No 205/04

not intended to let this happen - he had omitted to 'cock out' its fps as an 'aide memoire' to turn the flight downwind LH before crossing the extended RW C/L - the A321 had entered N Upper airspace from the S without coordination. Although this would not have been expected, the N Upper Radar Controller had not detected the A321 when he vectored the B737. This was a second part cause of the Airprox.

The APR only became aware of the conflict when STCA activated and the A321 crew reported a TCAS TA alert by which time the subject ac had crossed; he had then turned the A321 downwind RH to avoid the police ac. The N Upper Radar Controller was told by his Coordinator of the A321's presence as STCA activated and he had turned the B737 further R which he believed was the best course of action at the time. The A321 had seen the climbing B737 on TCAS approaching from the W and watched it pass behind and 700ft below, only receiving a TA alert during the encounter. The B737 crew had received a TA alert on the A321 crossing at 6000ft and seeing the potential for conflict they had stopped their climb at 5300ft and descended down to 5000ft, visually acquiring the Airbus, he estimated 0.5nm ahead and 700ft above. These actions taken by the B737 crew 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:

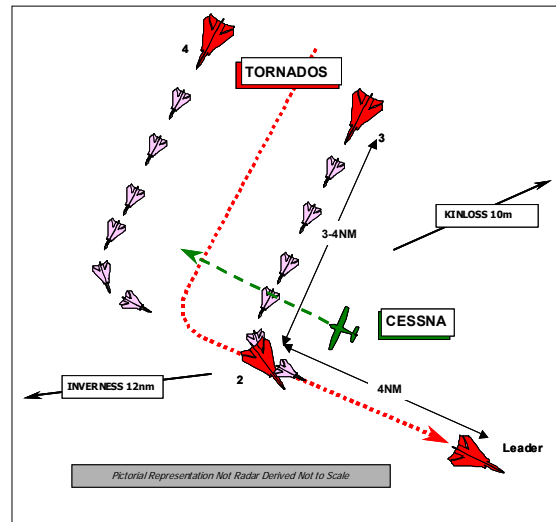
- a. The Manchester APR allowed the A321 to fly N of the RW24 C/L and into conflict with the B737.
- b. The MACC N Upper Radar Controller did not detect the A321 when he vectored the B737.

Degree of Risk: C.

Contributory Factor: Lack of effective supervision resulted in distraction to the APR.

AIRPROX REPORT NO 206/04

Date/Time: 10 Nov 1532
Position: 5735N 00346W (5nm WSW of Forres)
Airspace: Scottish FIR (Class: G)
Reporting Ac Reported Ac
Type: C152 Tornado GR4
Operator: Civ Trg HQ STC
Alt/FL: 1000ft 600ft AGL
(QFE 1020mb) (Rad Alt)
Weather VMC CLBC VMC CLBC
Visibility: >10km 30km
Reported Separation:
Nil V/500m H Nil V/6000ft H
Recorded Separation:
Not Recorded

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

THE C152 PILOT reports flying a training flight with a student from RAF Kinloss in a white ac with nav lights and anti-colls selected on, squawking as directed, (Mode C not fitted) and in receipt of an FIS from Lossiemouth. The student was in control climbing out from a PFL a heading of 300° at 65kt. While conducting the PFL she was aware that her vision was limited due to the ac attitude so her lookout was more thorough than normal. In the course of her scan she became visual with a Tornado 500m away (No2 of a pair she thought). She immediately took control and weaved the ac to try to locate its partner. She became visual with the No1 (she thought) and immediately initiated steep turn to the right. She contacted Lossiemouth to ask if they had any fast jet traffic on the radar but he answered 'affirm, no HT', she could not clearly remember what she said next but the controller asked for their type and she replied 'two Tornados'. This incident occurred in their established local training area. She assessed the risk of collision as being high.

THE TORNADO GR4 PILOT reports flying grey Tornado ac with HISLs selected on as No 3 in a 4-ship formation tactical training sortie in the UKLFS, squawking 7001. The formation was heading 160° at 400kt and was manoeuvring at a turning point near the coast between Inverness and the Kinloss MATZ and was in receipt of a FIS from Inverness App who had informed them that there was no known low-level traffic to conflict.

In accordance with bird avoidance procedures, the formation had climbed to 1100ft [Rad Alt] to cross the coastline and was slowly descending back to operating height. The leader and No2 had already passed the traffic unsighted. The No3 pilot saw and called a light ac as it appeared between the No2 ac and his own and then between the No4 ac and himself. At the closest point it was at least 6000ft away and slightly below the Tornados. Both he and the No4 were visual with the other ac and at no time did they assess that there was any risk of collision.

THE TORNADO STATION comments that the FSO spoke at length with the crew and confirmed that they were part of a correctly planned, briefed and authorised low-level training flight. At the time of the incident the formation had just left the Tain AWR, had rejoined and were in the process of manoeuvring for a split prior to attack a field target. In order to get the timing correct the ac had overshot their planned waypoint. At the time of the sighting the lead ac was ahead of the formation and No2 was manoeuvring for position, No3 and No4 were still in battle formation. The Cessna was first spotted ahead of No3 who called the contact to alert the other formation members. The Cessna was slightly lower than the GR4s and then passed between No3 and No4; No4 was also visual with the Cessna. However, although this report was filed by the No3, the crew who spotted the Cessna, it is not clear from their recollection which Tornado came the closest to the Cessna and it may have been one of the others, possibly No2. A copy of the route map and the relevant portion of the HUD video were provided. The other ac seen in the HUD video is the No2 ac manoeuvring for position and the Cessna does not appear in the HUD, but the audio with the R/T and intercom speech is recorded.

AIRPROX REPORT No 206/04

UKAB Note (1): The reporting pilot was contacted by the UKAB to verify the formation manoeuvres and relative positions. In addition, he stated that he thought that the Airprox had taken place between the No2 ac and the Cessna since the No4 and he had both seen it and avoided it by a large margin. He submitted the report since he had seen the incident and the No2 had not. This scenario would also fit the description of the incident reported by the Cessna pilot. The reporting pilot was not able to estimate the distance between the No2 ac and the Cessna except that it was closer than to him.

MIL ATC OPS reports that a C152 contacted Lossiemouth Approach (APP) at 1520:23, on departure from Kinloss for a local area flight in an established local training area, requesting a FIS. The C152 was placed under a FIS and told to "*report established in the LTA (Local Training Area)*".

Local Training Area defined Lossiemouth FOB C-5-4 as:

"An LTA is available in which light ac can operate VFR. All users are encouraged to make use of the FIS available from Lossiemouth Deps on VHF 118.9 kHz. Lossiemouth Deps will allocate a squawk as part of the departure clearance or when called by the ac. The dimensions of the LTA are as follows:

- a. Horizontal. The LTA lies within the area bounded by straight lines from Findhorn Bridge to Grantown-on-Spey to Loch Morlich (4nm E of Aviemore) then NW along the A9 to the River Nairn and then direct to Findhorn Bridge.
- b. Vertical. From surface to 10000ft except that portion that lies below W3D where the upper limit is 5800ft/FL60."

At 15:29:23, the C152 crew advised APP that their operating level would be up to 3000ft and APP recommended to the crew "*Inverness is shortly to get busy with the afternoon rush. If you could manoeuvre no further west than Nairn that would help*". No further RT exchanges were made until at 1536:45 when the C152 pilot started a series of transmissions enquiring whether APP had "*any fast jet traffic on radar*". After decluttering the SSR labels, APP confirmed that they did and it was "*indicating low-level*". The C152 confirmed: "*we're now visual*" and identified the fast jets as "*Tornados...2 of them*" and 45sec later the C152 pilot advised they were returning to base.

At the time of the Airprox, APP reported their workload as low with one ac on frequency. The C152 had been operating in the LTA for approximately 20min during which APP reported that radar contact on the C152 was "*intermittent*". APP had observed 3 ac depart Tain Range, Southbound through the area of operation of the C152. APP assessed the fast jets as a threat to traffic being controlled by other personnel in the Ops Room and warned them accordingly but did not pass TI to the C152 pilot. Under the application of a FIS it is regulated that "*Where a controller suspects, from whatever source, that a flight is in dangerous proximity to another aircraft, a warning is to be issued to the pilot. It is accepted this information may be incomplete and the controller cannot assume responsibility for its issuance at all times or for its accuracy*". APP had not identified the C152 but was aware of its area of operation and, although APP was not responsible for the separation or sequencing of the ac, a warning could have been passed to the C152 pilot regarding the proximity of the fast-jets.

HQ STC comments that this encounter could have been avoided if the ac were on the same frequency. Unfortunately, the Cessna was receiving a FIS from Lossiemouth in accordance with its SOPs and the Tornados, who were also complying their SOPs, were receiving a FIS from Inverness TWR. The latter SOP states that all fast-jet traffic will contact the TWR when within 15nm of Inverness. This has been implemented to enable Inverness to know about traffic whilst giving a FIS to the many ac that use their airfield.

It is recommended that the RAF Kinloss based Flying Club consider adopting the same procedure as recommended to fast jets, when operating within 15nm of Inverness airfield, in that they contact Inverness TWR on 122.6 for a FIS. From the Cessna pilot's report it would also be beneficial for RAF Lossiemouth ATC to brief the flying club on what information pilots can expect when flying under a FIS.

The GR4 Collision Warning System, currently expected in 2008/9, should mitigate the risk of a random a mid-air collision between small light ac and the Tornado GR4 in the future.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts of the relevant RT frequencies, a radar video recording (this did not show the incident), reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

Members noted that the C152 pilot must have been very alarmed by the situation in which she found herself in the middle of a 4-ship formation of Tornados. They further noted that she had handled this unfortunate situation in a professional and apparently calm manner.

The area where this incident took place is very busy airspace at low level with Lossiemouth and Tain traffic. The SOP for fast jets to call Inverness has evolved as a result of several previous incidents and generally works well, despite Inverness not being radar equipped. There was considerable discussion regarding the best agency to provide a service in this area and no firm conclusion was reached. The Board noted the HQ STC comment and that they had written to the flying club concerned on the topic. Members also noted that civilian pilots probably did not know the procedure adopted in that airspace and so HQ STC undertook to publicise it.

An ATC Member commented that there appeared to be a widespread lack of understanding by GA pilots of precisely what a FIS entailed. Pilots should not be given the impression that a FIS is a radar-based service as it may give them a false sense of protection. Notwithstanding that, without the benefit of Mode C derived altitude information, the controller would not have had any knowledge of the height of the C152. A military flying instructor also informed the Board that it is normal practise for pilots of military training ac to call on the in-use frequency that they were 'Descending on a PFL'. This gives the controller and other pilots some knowledge of the altitude at which the ac is operating and therefore whether there may be a conflict.

Members could not determine positively which Tornado had come closest to the C152. That being the case, it was also not possible to determine accurately what the miss-distance had been; they had however no reason not to accept the only information available i.e. the 500m horizontally reported by the C152 pilot. In the event she had seen the Tornado, most likely the No2 of the formation, and successfully avoided it; therefore there had not been a risk that the ac would have collided.

PART C: ASSESSMENT OF CAUSE AND RISK

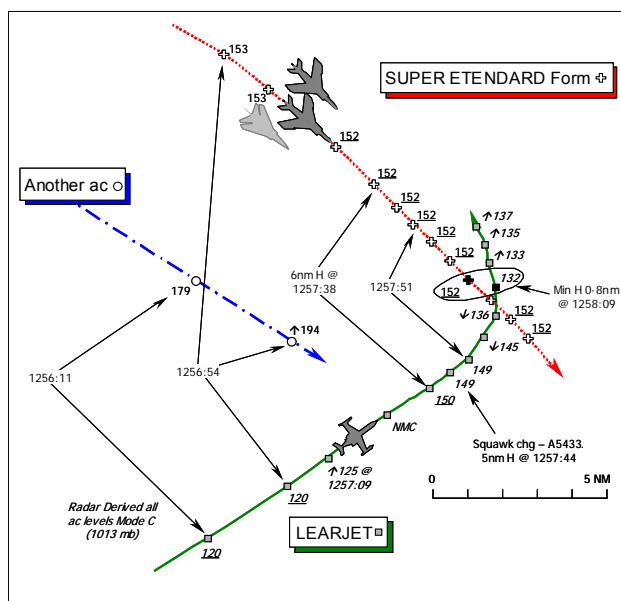
Cause: Conflict in the Lossiemouth AIAA.

Degree of Risk: C.

AIRPROX REPORT No 207/04

AIRPROX REPORT NO 207/04

Date/Time: 4 Nov 1258
Position: 5257N 00150E (26nm NE Norwich)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Learjet 45 Sup. Etendard formation
Operator: Civ Pte Foreign Mil
Alt/FL: FL132↑ FL150
Weather VMC HAZE VMC NR
Visibility: NR 10km+
Reported Separation:
>100ft V 500ft V/2nm H
Recorded Separation:
300ft V @ 5nm H
0.8nm H @ 2000ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LEARJET 45 PILOT reports that he had departed from Norwich bound for Memmingen in his striped grey ac under IFR. He thought he was in receipt of an ATS from London CONTROL [but was actually under a limited RAS from Norwich APPROACH] during the period of the Airprox. A squawk of A5433 was displayed with Mode C and significantly TCAS is fitted. Climbing through FL160, between Norwich and BODSO about 40nm NE of the airport [Airprox occurred 26nm NE of Norwich], heading 060° at 280kt, 3 fast moving ac were detected on TCAS heading towards his ac on, he thought, a reciprocal heading, when a TA was enunciated. This was followed by an RA, which commanded a descent. The RA was complied with and the other ac passed about 100ft above his jet with a “high” risk of a collision.

THE SUPER ETENDARD PILOT (SUPER E) reports that he was leading a pair of grey single seat ac egressing UK airspace back to Florennes following a Tactical Leadership Programme (TLP) mission. [Although he reported that he was in receipt of an ATS from LATCC (Mil) this was not the case at the time of the Airprox.] HISLs were on and a squawk of A4724 was displayed with Mode C. TCAS is not fitted.

Flying at 450kt, straight and level at FL150, they had spotted a foreign military Tornado jet ahead of them and decided to join on the ac. During the join-up they detected the Learjet at a range of 25nm on AI radar. Visual contact was gained at 5nm and it was evident that the Learjet was not conflicting with their trajectory as it passed some 2nm away and 500ft below the formation. The risk was assessed as **THE NORWICH APPROACH RADAR CONTROLLER (APR)** reports that the Learjet departed late due to flight planning problems. On departure the ac turned towards BODSO climbing initially to FL170 under the requested RAS, which was limited due to intense military activity over East Anglia. He instructed the Learjet pilots to stop off at FL120 and again at FL150 in an attempt to provide separation. The airways joining clearance was passed to the Learjet pilots whilst en route to their joining point at BODSO [cleared to join climbing to FL270] as it was allocated late by LACC. The Learjet displayed the assigned LACC squawk [A5433] immediately, which distracted him momentarily. When a gap became available he instructed the flight to climb to their CAS joining level, he thought. [The Learjet crew was actually instructed to climb to FL150 with observed traffic reported at FL180 base]. A large number of military ac that were part of a TLP exercise came onto his screen from the N heading SE at various levels climbing and descending, not working any contactable ATSU. He tried to give avoiding action of “hard left heading 330°” which was acknowledged, but shortly after the flight had a TCAS RA and the Learjet pilots followed the TCAS instructions. When clear of traffic, the Learjet was transferred to LACC. He opined that it was very difficult to provide effective avoiding action due to the rapid level and heading changes of the other traffic. The Learjet pilot did not advise at the time that he would be filing an Airprox.

ATSI reports with RT transcript that after correlating the RT tape transcript with the radar recording, it is apparent that the Norwich APPROACH [situated at RAF Coltishall] RT timings are about 5min slow.

The Norwich APR had informed the Learjet pilot, following his request, that he would be providing a RAS but limited due to the number of military ac in the vicinity. Appropriately, he stopped the Learjet's climb at FL120 beneath the lowest of the observed military ac detected to the N at FL150. Subsequently, he cleared the Learjet crew to climb to FL150 against traffic indicating FL180. Thereafter, he took avoiding action against traffic [the mixed Super E formation indicating FL152] at 1130 and 1000 o'clock, suggesting a L turn onto a heading of 330° with which the crew complied. As the Learjet crew took the turn, the Learjet flew into close proximity with the military formation whereupon the Learjet pilot reported a TCAS descent.

At the closest point the Learjet had descended to FL132, with the military traffic indicating FL152, at a minimum range of 0.8nm. The Norwich APR was placed in an invidious position attempting to provide a RAS, albeit limited, in an area where there were numerous contacts. As the Learjet took the 'avoiding action' L turn (the radar recording shows a GS of 412kt), it turned towards the mixed Super E formation.

There were no other flights on the frequency at the time of the Airprox. It would appear that the controller overlooked the presence of the Super E formation when clearing the Learjet crew to climb to FL150. He may well have been more concerned about clearing the flight up to its airways joining level and transferring it to LACC before it entered the airway, the boundary of which was only about 12nm away.

UKAB Note (1): The Debden radar recording illustrates this Airprox quite clearly. The Learjet is shown outbound on track BODSO levelling at FL120 at 1256:11 as instructed, just as 'Another ac' is shown climbing through FL179 on a SE'y track. At 1256:54, the Super E formation is shown SE bound indicating FL153 – and maintaining FL152 thereafter – some 13½nm to the N of the Learjet, the last of a stream of three tracks apparently egressing after the TLP exercise in line astern about 7nm apart at levels between FL145-160 (the preceding two tracks ahead of the Super E formation are not shown on the diagram as they pass clear.) It was at about this point that the APR instructed the Learjet crew to climb to FL150 after passing the CAS joining clearance 30sec earlier as 'Another ac' climbs through FL194 beneath some higher-level tracks. The Super E formation does not deviate from FL152 nor their steady SE'y course as the Learjet is shown at FL150 with the formation closing from the L at a range of 6nm. It was just before this point at about 1257:30, that the APR issued traffic information for the first time about the second group passing clear ahead of the Learjet: "...traffic [second track] in your left... 11:30 range of 8 miles left right indicating 150 descending", which it was not. Then within the same transmission about the subject formation: "...further traffic [Super E formation] left 10 o'clock range of 10 miles left right to 150 descending [which it was not]...if you require avoiding action you'll have to turn hard left onto a heading of 330". Whereupon the Learjet crew replied, "hard left onto 330 the heading [C/S]". The Learjet's Mode C indicates a shallow descent initially from this point in conformity with the reported TCAS RA, about which the crew advised the APR just after about 1258:00. The descent gathers pace, as the ac turns in tight toward the Super E formation closing rapidly from the L. The Learjet descends through FL136, some 1800ft below the Super E formation, just before it crosses 2nm ahead and below the latter. The descent provides 2000ft vertical separation as the Learjet 'bottoms out' at FL132, at the point of minimum horizontal separation of 0.8nm. Thereafter the ac open and the APR advises the Learjet crew that they are clear of the Super E formation and to resume their own navigation to BODSO and climb to FL270.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

There seemed to be little to add to the analysis of this Airprox provided by ATSI. This was an unfortunate occurrence and whilst the APR's workload did not appear to be high with only the Learjet on frequency, the radar recording had shown that it was indeed a complicated radar picture at the time and the APR was quite correct to limit the RAS he was providing to the Learjet crew. The ATSI report had suggested to the Board that the APR might possibly have misinterpreted the Mode C level of the displayed traffic before he instructed the Learjet pilots to climb to the very cruising level of the Super E formation. Alternatively, the APR might not have recognised that the formation was maintaining FL152 Mode C for although the formation was clearly displayed on the Debden Radar recording, the Board accepted this was not necessarily the same as the radar picture displayed to the

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Norwich APR. Whilst recognising that the APR would have been keen to get the Learjet up toward its assigned CAS joining level [climbing to FL270], the stark reality of hindsight suggested that if the APR had spotted the conflict earlier and held the Learjet down at FL120 for a little while longer then it would have forestalled the conflict. Having climbed the Learjet toward the Super E formation, it was not until the range between the subject ac was approaching 6nm that the Learjet crew was passed traffic information about the formation. The advisory avoiding action of a L turn, offered by the APR, resulted at these speeds in a relatively wide radius of turn and in the event vectored the Learjet towards the formation. The Board agreed unanimously that it was the combination of the APR's instruction to the Learjet crew to climb to FL150 and the subsequent vector that placed the ac into conflict with the Mixed Super E formation which was the cause of the Airprox.

The RT transcript had revealed from the transmitted traffic information that the APR had also perceived that 'Another Ac' and the Super E formation were descending when in fact the displayed Mode C showed this was not the case as the Super E formation had consistently maintained FL152 throughout the latter stages of the encounter. Given the high closing speed, the avoiding action L turn proffered by the APR at such a late stage had little chance of achieving the desired effect. So it was not until TCAS recognised the problem and enunciated an RA, which commanded the Learjet crew to descend out of the way of the formation that the conflict was resolved. This would appear to have occurred just after the avoiding action L turn had been initiated and resulted in the Learjet descending some 2000ft below the formation before the point of minimum horizontal separation at 0.8nm was reached as the formation passed clear. From his perspective, steady on course in a level cruise at FL150, the Super E formation leader's early detection of the Learjet on the ac's AI radar and his visual acquisition from 5nm coupled with the prevailing separation had in his opinion reduced the risk to nil. The Board concurred, Members agreeing unanimously that the TCAS RA descent and visual sighting had effectively removed any risk of a collision in these circumstances.

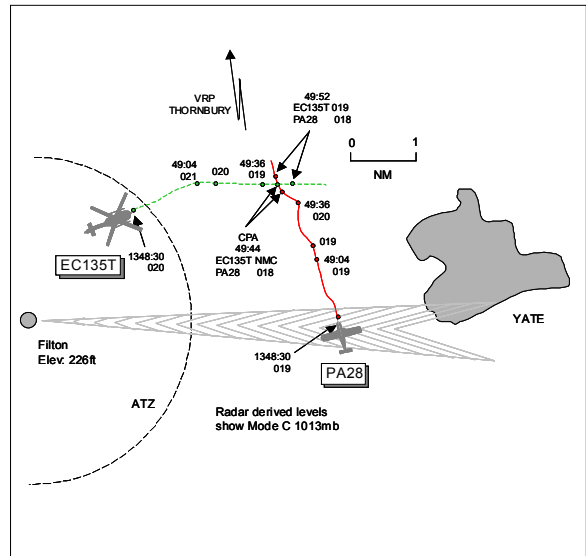
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Norwich APR vectored the Learjet into conflict with the mixed Super Etandard formation.

Degree of Risk: C.

AIRPROX REPORT NO 208/04

Date/Time: 4 Nov 1350
Position: 5133N 00229W (4.25nm NE Filton - elev 226ft)
Airspace: LFIR (Class: G)
Reporting Ac Reported Ac
Type: EC135T PA28
Operator: Civ Trg Civ Pte
Alt/FL: 2000ft 2000ft
 (QFE 1015mb) (RPS)
Weather VMC CLBC VMC
Visibility: 15km 20km
Reported Separation:
 200ft V/100m H 200-300ft V/2nm H
Recorded Separation:
 100ft/0.15nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EC135T PILOT reports heading 090° at 100kt downwind in the Filton radar pattern being vectored for an ILS under a RIS from Filton RADAR on 122.72MHz squawking an assigned code with Mode C. The visibility was 15km whilst flying 1000ft below cloud in VMC and the helicopter was coloured red with nav and strobe lights switched on. This was a training sortie for the Handling Pilot (HP) in the RH seat whose vision was obscured for instrument flying and he, the Capt and Non Handling Pilot (NHP), was maintaining a lookout as well as instructing. They had been steady on the same heading and level at 2000ft for a couple of minutes when the NHP saw a white object appear in the RH door window between the door frame, the HP’s helmet and body and his R arm which was resting on his leg. The object was close, 200-300m away and converging, but as the relative speed was so high, it was impossible to identify it as it passed just 200ft below and 100m to their R, moving from their 0230 position at first sighting to reappearing in their 0730 position heading away and apparently climbing back to the same level. He was now able to identify the object, an ac, as being a light fixed wing single engine type. There was no time to take avoiding action as the visual sighting was so late owing to his difficulties of seeing around obstacles to his view on the R and very little relative motion of the other ac. He assessed the risk as high. He assumed that Filton radar did not have radar contact on the ac as he had not received any warning of the conflicting traffic and he was not aware of any communication between ATC and the other ac’s pilot.

THE PA28 PILOT reports heading 340° at 110kt and 2000ft Cotswold RPS en route from Old Sarum to Shobdon and in receipt of a FIS from Filton on 122.72MHz. The visibility was 20km in VMC and the ac was coloured buff/red with strobe and landing lights switched on. He first saw a ‘buff’ coloured helicopter about 3nm away in his 10 o’clock position crossing L to R. He executed a slight L turn and descended 100ft to ‘give way’ to it as it was on a steady course and it was seen to pass 2nm clear and 200-300ft above with nil risk of collision. He could not recall receiving any TI regarding the helicopter but the controller was under considerable pressure, owing to ac movements, and the tone of his voice indicated this.

UKAB Note (1): Met Office archive data shows the Filton METAR as EGTG 1350Z 32006KT 9999 SCT035 13/03 Q1022= and the Cotswold RPS 1300-1400 was 1017mb.

THE FILTON APR reports that whilst vectoring the EC135T for a second instrument approach its pilot reported having to take “*violent avoiding action*”, he thought, on an ac passing beneath him and stated that he wished to file an Airprox. The traffic was seen to be the subject PA28 which was under a FIS from himself and at the time of the incident his workload was high.

ATSI reports that the Airprox occurred in Class G airspace whilst both ac were in communication with the Filton Approach/Approach Radar (APP/APR) Controller. The EC135T was on an IFR training flight and was being

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provided with a RIS whilst being vectored for an ILS Approach to RW27. The PA28 was transiting VFR, to the E of Filton, and was being provided with a FIS. The controller described his workload and traffic loading as high at the time of the Airprox. He commented that when he took over the position, some 15min earlier, the frequency had been quiet. However, thereafter, a high number of ac established communication. The RT recording reveals that up to 16 ac were in communication with Filton Approach in the 15min period prior to the incident. The movement figures for the 4 November show that it was one of the busiest days of the year. There were 42 ILS/NDB approaches carried out and, of the other flights, 138 were provided with a FIS, 119 with a RIS and 20 with a RAS.

The PA28 pilot made his initial call to Filton Approach, at 1345, and was instructed to standby, being No 4 in the queue. At the time, the EC135T was established on the RW27 ILS, also in communication with the APP/APR. Shortly afterwards, the EC135T pilot was cleared for a low approach and go around. After dealing with other traffic, the pilot of the PA28 was instructed to pass his message and he reported just passing Bristol routeing to Thornbury (a VRP situated 6nm NNE of Filton), before crossing the River Severn. An indication of the controller's workload is perceived when he asked the pilot to pass further details and added *"please make it quick"*. The pilot replied that he was flying a PA28 en route from Old Sarum to Shobdon at 2000ft. He was passed the Cotswold RPS, advised that he was being provided with a FIS and instructed to report passing Monmouth, a town situated 18nm NNW of Filton. This position was considered by the controller to be ideally suited for the transfer of the flight to Shobdon. After receiving a suitable acknowledgement from the pilot, he instructed him to squawk a Filton SSR Code, 4272. The controller explained that this was for monitoring purposes and would also indicate to other ATSU's that the flight was in communication with Filton. MATS Part 1, Section 1, Chapter 1, Page 2 refers: *'The controller may attempt to identify the flight for monitoring and co-ordination purposes only. Such identification does not imply that a radar 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 a radar service'*. At the time that the PA28 was instructed to squawk, the radar recording shows that there were 8 other ac displaying Filton SSR codes.

After its go around the EC135T pilot was instructed to maintain 2000ft QFE 1015mb and, at 1348:30, to turn R heading 090°, downwind RH for an ILS approach to RW27. The intentions of the pilot after the approach were ascertained and he was cleared, after the go around, for a R turn on his own navigation to Gloucester, climbing to an altitude of 3000ft. The controller then turned his attention to other traffic, including vectoring another training ac.

The controller said that he first became aware that an incident had occurred when the pilot of the EC135T reported *"...just had a light aircraft er take violent avoiding action, missed us by possibly a couple of hundred feet underneath..."* and stated that he intended filing an Airprox report. The APP/APR said he had looked at the radar and observed a radar return tracking NW, similar to the direction of the traffic reported by the EC135T. From the squawk, it was apparent that it was the PA28, although, he commented, its radar return had appeared to fade at the time. No comment about the occurrence was made on the frequency by the pilot of the PA28.

Filton Approach obtains primary radar coverage from the Marconi S264, situated on the airfield, and secondary radar is sourced from the NATS Clee Hill (CLH) site. Although the recording of the CLH radar shows the PA28's squawk continuously visible, the controller commented that in his experience, the area in which the PA28 was flying was prone to radar fade on the Filton display. Additionally, he reasoned that the primary return might not have shown because of tangential fading. Whatever the reason, and high workload may have been a factor, he had neither identified the PA28 nor observed it tracking into conflict with the EC135T. The Filton MATS Part 2, Section 4, Page 14, states that the APR is responsible for *'ensuring that all SSR codes are validated and verified'*. The APP/APR commented that he had believed that on its proposed routeing, from Old Sarum to Thornbury, the PA28 would pass further E than it actually did. He also mentioned that, because he was providing a RAS to an outbound IFR flight that was cleared to join CAS at RADNO, he had the range on the display selected to 50nm instead of the usual 25nm. This may have affected his ability to closely monitor all his traffic.

The MATS Part 1, Section 1, Chapter 5, Page 3, defines RIS as *'an air traffic radar service in which the controller shall inform the pilot of the bearing, distance and, if known, the level of the conflicting traffic. No avoiding action shall be offered. The pilot is wholly responsible for maintaining separation from other aircraft whether or not the controller has passed traffic information'*. On this occasion, it has not been possible to determine conclusively whether or not the PA28 was showing continuously on the Filton radar display. However, due to the controller's high workload it is equally possible that he did not monitor the ac's position and, consequently, was not able to pass TI to the pilot of the EC135T. In accordance with MATS Part 1 procedures, if the EC135T had been approaching an area where ac may not be showing on the radar display, the service provided should have been

limited. Section 1, Chapter 5, Page 4, refers: '*Outside controlled airspace in circumstances where controllers cannot continue to provide the following primary 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. In particular the service should be limited when...the aircraft is operating near to the limits of solid radar cover.*'

The controller said that, when he had taken over the APP/APR position, in view of the light workload at the time, he had allowed the ATSA to take a break. It was only after this that the traffic loading started to build up. He did not consider that the ATSA being present would have necessarily prevented the Airprox, adding that there is a 'call for assistance button' which, when pressed, activates a bell in the Training/Restroom. Anyone present is then to proceed to the Approach Room to assist the controller. However, the controller added that, in order to reach the button, it is necessary to stand up, diverting attention away from the radar display. He decided against trying to get the ATSA to return to the position, not wishing to distract himself from the traffic situation. The Filton MATS Part 2, Section 4, Page 8 lists certain actions which an Approach Controller should, when traffic levels increase, consider to ensure their workload does not become excessive: -

1. Ask for an additional controller to open up the Director console.
2. Reduce the LARS to 20nm or even 10nm.
3. Refuse training traffic that is well out of its slot.
4. Put training traffic in the hold until a suitable slot is available
5. Instruct aircraft to land and wait on the ground until situation eases.
6. Use a combination of the above to ensure a reasonable level of traffic'.

The controller commented that none of these actions were applicable: there were only 3 controllers on shift and as the spare controller had only just been relieved from the position, SRATCOH implications would have arisen later; most of the ac were already within 20nm of the airfield; any training flights were within their allocated slot time and the majority of the traffic was overflying.

UKAB Note (2): Analysis of the Clee Hill radar recording (SSR only) at 1348:30 shows the EC135T 2.4nm NE of Filton tracking 065° squawking assigned Filton code 4257 indicating FL020 (2060ft QFE 1015mb) with the PA28 4.6nm E of Filton crossing through the FAT tracking 340° squawking assigned code 4272 indicating FL019 (2020ft RPS 1017mb). At 1349:04 the EC135T steadies on an E'ly track at FL021 with the PA28 in its 1 o'clock range 2.1nm on crossing track from R to L at FL019. The subject ac continue to close on a line of constant bearing until 1349:36 when separation has reduced to 0.6nm, the EC135T at FL019 and the PA28 now 100ft above at FL020. Eight seconds later the CPA occurs, the PA28 is seen tracking 315° at FL018, having turned L and descended, with the EC135T in its 1 o'clock range 0.15nm, having crossed ahead L to R, showing NMC. The next radar sweep shows the ac quickly diverging, the EC135T showing FL019 with the PA28 0.3nm to its WNW still indicating FL018. Taking into account the EC135T's Mode C showing FL019 on the returns immediately before and after the CPA and its pilots report of flying level during the encounter, it is estimated the ac pass with about 100ft vertical separation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was clear that this incident had occurred in Class G airspace where both crews were wholly responsible for maintaining their own separation from other traffic through 'see and avoid'. A helicopter pilot Member said that the IF screens used in the EC135T, to obscure the HP's vision ahead, usually caused few problems with lookout for the NHP in the LH seat. Under the terms of a RIS, the Filton APR should have passed TI to the EC135T crew on any conflicting ac observed on radar but this did not occur. During a period of high workload, the APR had not noticed the deteriorating situation, which Members agreed had been a contributory factor to the incident. The APR should have limited the service, if radar performance was an issue, and it would have been reasonable for the

AIRPROX REPORT No 208/04

controller to decline the provision of a service to 'newcomers' on frequency, during this busy period, to allow him to prioritise his actions and concentrate on the traffic already under a service.

Looking at the geometry of the incident, the EC135T crew were required to 'give way', in accordance with the Rules of the Air. However, the EC135T NHP had only seen the PA28 when it was very close to his R before it passed very quickly behind, with no time to take any action, which Members agreed had amounted to effectively a non-sighting by the crew, which was a part cause of the Airprox. Members could not resolve the large discrepancy of the separation distances reported by the PA28 pilot for it appeared that he had seen the crossing EC135T but it was considerably closer than he had estimated – the radar recording shows a turn commencing with separation at 0.6nm. This led Members to agree that this had been a late sighting by the PA28 pilot and this was another part cause of the Airprox.

Turning to risk, fortunately the PA28 pilot had seen the potential conflict, albeit late, and had turned slightly L and descended, estimating he passed 2nm clear behind and 200-300ft below. The EC135T NHP had seen the PA28 briefly in his 0230 position 200-300m away before it passed 100m to his R and behind and 200ft below. The radar recording broadly supports the EC135T pilot's separation distances, the PA28 passing 100ft below and 0.15nm to the R of, and then behind, the helicopter. Taking all these elements into account, the Board concluded that although the PA28 pilot's action had removed the actual risk of collision, the flight paths flown by the subject ac had resulted in both ac passing close enough that safety had not been assured during the encounter.

PART C: ASSESSMENT OF CAUSE AND RISK

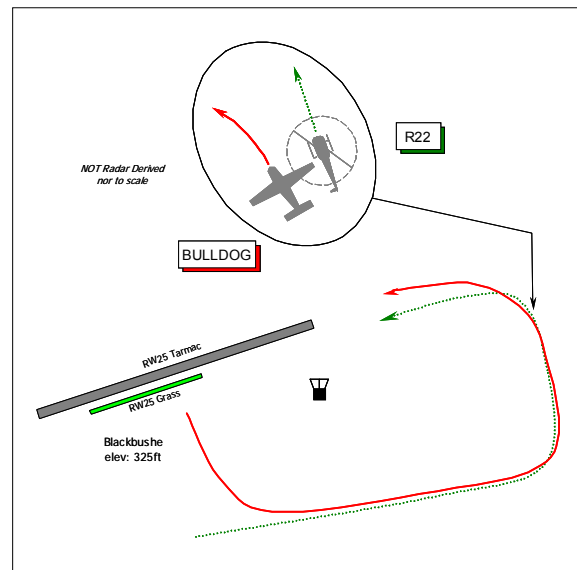
Cause: Late sighting by the PA28 pilot and an effective non-sighting by the EC135T pilot.

Degree of Risk: B.

Contributory Factors: During a period of high workload, the Filton APR did not pass TI.

AIRPROX REPORT NO 210/04

Date/Time: 13 Nov 1123 (Saturday)
Position: 5119N 00050W (Blackbushe a/d Cct- elev 325ft)
Airspace: Blackbushe ATZ (Class: G)
Reporting Ac Reported Ac
Type: R22 Bulldog
Operator: Civ Trg Civ Pvt
Alt/FL: 500ft 600ft
(QFE 1022mb) (QFE 1022mb)
Weather VMC nil cloud VMC CAVOK
Visibility: 10km+ >10km
Reported Separation:
50ft V/50ft H Not seen
Recorded Separation:
Not recorded

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

THE ROBINSON R22 HELICOPTER PILOT, a flying instructor, reports his ac has a predominantly white colour scheme and the red strobe was on. Flying at 500ft Blackbushe QFE (1022mb), he was conducting an instructional sortie in the helicopter cct to the grass RW25 at Blackbushe aerodrome. His student was flying the ac and they were in receipt of a FIS from the Blackbushe AFISO on 122.3MHz. SSR, although fitted, was selected off.

Whilst circuiting L in the helicopter cct, he had seen a Bulldog go around when he was at the midpoint of the DOWNWIND leg. But the Bulldog pilot appeared not to execute a standard 'GO AROUND' and immediately turned 90° L straight towards his helicopter and climbed, passing out of his field of view above and behind him. His student had turned L BASE and he could not see the Bulldog so he transmitted on the frequency saying that he could not see the aeroplane and asking for the Bulldog's position whereupon he then heard an RT call confirming that the Bulldog pilot had his R22 helicopter in sight. Heading 340° on L BASE at 70kt, flying straight and level, he was looking out for the Bulldog that was first seen 50ft above and slightly to port as it overtook his helicopter from behind and just slightly to port (10ft so overlapping at that point), descending from above through 500ft and in a slight L turn 50ft away, but he stressed that the aeroplane could not be seen until it was 50ft above and 10ft offset to the L because of the R22 blind arcs. In his opinion the risk was an "A". Moreover, he believed it would have been impossible for the Bulldog pilots' to see his R22 from their cockpit under these conditions as he had a clear view of the ac's underside from beneath the aeroplane.

He added that the Bulldog was very close in and as such required a steep approach to the tarmac runway. The helicopter landing point is halfway down the length of the tarmac runway, on the grass runway to the L and separation is normally assured by fixed wing ac being outside the (smaller) helicopter cct and much lower when at the same distance from the airfield and on FINALS to the tarmac on the R.

THE BULLDOG PILOT provided a very frank and comprehensive account, reporting that his aeroplane has retained its military "training command" colour-scheme, but white strobes are fitted above & below the fuselage. He was circuiting at Blackbushe to the tarmac RW25 at 70kt and in communication with Blackbushe INFORMATION on 122.3MHz. The weather was CAVOK with a light northerly wind and good visibility.

Whilst flying the Bulldog on a private training sortie, he was pilot-in-command flying the aeroplane from the right hand seat with another PPL holder occupying the left hand seat. They had just completed a PFL to RW25 at Blackbushe, with a Cessna ac departing from the RW, so he went around at 200ft and announced his intention to turn early onto the DOWNWIND leg whereupon the AFISO warned him of an R22 MID-DOWNWIND. Because of looking into the low sun, he initially did not see the R22 helicopter and so climbed steeply to the fixed wing circuit height to maintain vertical separation. As he levelled at 800ft QFE he briefly saw the R22 passing below him

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through his 1 o'clock. He turned late downwind and asked the non flying PPL holder in the left hand seat if she had the R22 in sight which she confirmed that she did – whereas he did not because of flying the left hand circuit (LHC) from the right hand seat. He flew a normal powered approach on a heading of 250° assuming, wrongly, that the PPL holder in the left hand seat still had the R22 in sight. He transmitted that they had the helicopter in sight because he had incorrectly assumed that his L hand seat pilot did so, although she did not correct him, because she had assumed that he now had it in sight, which he did not. The R22 pilot was then heard to transmit that he would be filing an Airprox.

At that stage he thought that the R22 pilot must have been concerned about their proximity when he turned his Bulldog L downwind. When they met the R22 instructor after landing, he was horrified to learn how close they had come on FINAL as he had not seen the R22 at that point, but assumed, wrongly, that the left seat pilot had the helicopter in sight.

Within his report he quoted several lessons “learned/relearned”:

Never assume – check

The Pilot Flying has responsibility for lookout – just because the other pilot holds a licence, don't assume that they will maintain a lookout.

Flying LHCs from the right hand seat in a low wing ac is potentially very dangerous.

The R22 is difficult to see, particularly looking into a low winter sun.

Experience and qualifications do not make you immune from human error.

Never assume – check.

He opined, frankly, that this was a “*high risk A*” Airprox because he did not see the R22, for which “he accepted full responsibility”, because of “pure human factors” insofar as he had assumed that the PPL holder in the left hand seat had the R22 in sight, whereas the PPL holder in the L seat had assumed that he had it in sight. He added that this was an inexcusable assumption, but “*Human Performance & Limitations in action*”.

THE BLACKBUSHE AERODROME FISO reports that both ac were operating in the circuit for RW25. He had passed traffic information to the Bulldog pilot about the R22 helicopter. However, the Bulldog flew in close proximity to the R22 – he estimated about 50ft away - when both ac were on FINAL.

ATSI had nothing further to add to the comprehensive reports from the pilots concerned.

UKAB Note (1): The Heathrow radar recording shows two primary contacts flying LHCs at Blackbushe. One contact, which is probably the R22, is shown flying steadily downwind to RW25 and passing 0.9nm S abeam the aerodrome at 1119:23. Another primary contact, which is probably the reported Bulldog, is shown opening from overhead the aerodrome southbound from 1119:32. The Bulldog turns downwind about 0.4nm astern of the helicopter, but catches up the R22 on Base leg, just before both contacts virtually merge. One contact - the Bulldog - disappears from radar, but the R22 is still shown as it turns rather erratically onto FINALS before contact is finally lost on the helicopter from 1124:26, at about 0.9nm from the aerodrome. Consequently, the Airprox is not shown on recorded radar.

UKAB Note (2): Analysis of the Blackbushe RT transcript supports the foregoing accounts.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, a transcript of the relevant RT frequency, radar video recordings and a report from the AFISO involved.

There was little to add to the comprehensive reports from both the R22 instructor pilot and importantly the Bulldog pilot whom the Board commended for his very full and frank account. It was significant that the Bulldog pilot had tried to reassure the R22 pilot on the RT that he had his helicopter in sight – wrongly as it turned out afterwards –

for this evidently mislead the helicopter pilot about the true circumstances insofar as neither of the Bulldog pilots had the helicopter in sight as they overflew it, whilst descending during BASE LEG and the turn onto FINALS. The Board accepted that the helicopter pilot could have done little to forestall this encounter as he would have been unable to see the Bulldog until it entered his field of view and overtook his R22. The Board concluded unanimously that the cause of this Airprox was that the Bulldog pilot flew into conflict with the R22 which he did not see. Furthermore, the events related here were a salutary lesson to all and, as the Bulldog pilot wisely noted, highlighted one of the basic tenets of good airmanship – “*never assume – check*” – which stands out loud and clear from this report.

Here, in this visual cct environment, the absence of Mode C data did not allow independent determination of the vertical separation that existed. However, the only pilot to witness the event at the time – the R22 instructor - had submitted that the Bulldog was only 50ft above his helicopter as the aeroplane overflew him, which had been reinforced by the AFISO’s account. Reflecting both pilots’ opinions as to the degree of inherent risk, the Members agreed that an actual risk of collision had indeed existed in the circumstances reported.

PART C: ASSESSMENT OF CAUSE AND RISK

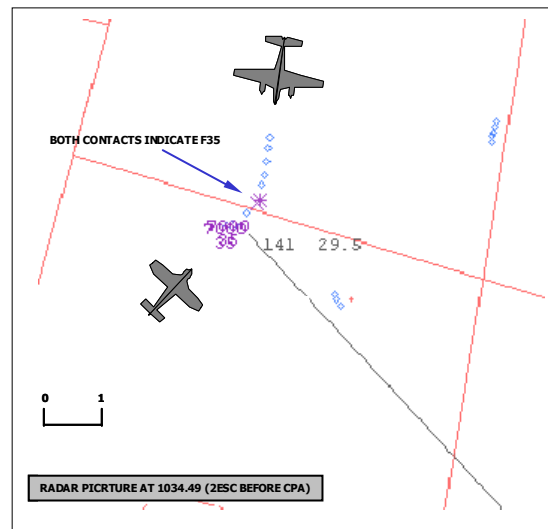
Cause: The Bulldog pilot flew into conflict with the R22 which he did not see.

Degree of Risk: A.

AIRPROX REPORT No 211/04

AIRPROX REPORT NO 211/04

Date/Time: 14 Nov 1035 (Sunday)
Position: 5114N 00117W (18nm N SAM)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: DR400 BE58
Operator: Civ Pte Civ Pte
Alt/FL: 3600-3800ft 3750ft
(RPS 1037 mb) (QNH mb)
Weather VMC CAVOK VMC CAVOK
Visibility: >30km >10km
Reported Separation:
>50m H 100ft V/0 H
Recorded Separation:
0 V/·1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DR400 PILOT reports flying a white ac on a VFR flight from Dunkeswell via Alderbury [VRP] and Stockbridge to White Waltham, heading 030° at 120k in good conditions and squawking 7000 with Mode C. He had been in contact with Solent Radar who gave him a FIS. He was asked for his location by FIS and reported Whitchurch which he had positively identified as he approached the village from the SW. Although he was not sure, he thought that they also asked for his altitude which he recalled as being 3600ft on 1037mb. Shortly after he was advised of a Beech Twin on a S heading in his vicinity and then the FIS was terminated by Solent Radar and he was told to contact Farnborough. When he was near Overton he became aware of the Beech Twin off his left wing at about 90° and very close (not more than 50m away) very slightly lower than him. He reacted by conducting a zoom climb, gaining enough height for the Beech to pass below him and he did not see the other ac again. As he had not yet contacted Farnborough he called Solent Radar which was still selected, advised them of an Airprox and requested the registration of the Beech. After a short period he then asked Solent Radar if they knew if the Beech had seen him. The reply came from the Beech pilot who said, "Yes definitely, the other ac must have been wrong" referring to him. He does not know at what stage the Beech saw him. He assessed the risk as being very high.

THE BE58 PILOT reports flying a white ac on a VFR flight from Gamston to Alderney via DTY-CPT-SAM squawking 7000 with Mode C. At the time he was 15-18 nm N of SAM heading 191° at 185kt and receiving a FIS from Solent Radar. He was aware that dangerous flights are carried out in the area of Popham so he was just keeping a good look out and saw the other ac ½nm away. Solent Radar had previously reported an ac at 3500ft to him flying W to E. He did not take any avoiding action but assessed the risk of collision as being high as the other pilot had in his opinion been flying dangerously.

ATSI reports that the DR400 pilot contacted Solent Approach at 1023 and reported outbound from Dunkeswell routing to White Waltham via Alderbury and Stockbridge at 3600 feet QNH 1037. The controller acknowledged this, passed the Southampton QNH of 1038 and advised the pilot that it would be a FIS. Southampton receive SSR information from the Pease Pottage radar which is out of service at present and since there is no alternative SSR feed for the unit, at the time of the Airprox, they were operating in a 'primary radar only' mode.

Approximately 8min later the Beech Baron pilot called and reported 15nm S of Compton routing to the SAM VOR at 3600ft QNH 1038. The controller acknowledged this and provided a FIS. A few minutes later the controller asked the DR400 pilot for his present position, which was stated as Whitchurch. TI was then passed on the southbound BE58 and at that time, the DR400 was in the 1 o'clock position of the BE58 at a range of 4nm and crossing from right to left. The height readout of the DR400 was 3400ft and that of the BE58 3500ft.

Traffic information was passed to the BE58 regarding the DR400. The controller then suggested that the DR400 pilot contact Farnborough which was acknowledged. The BE58 pilot then requested clearance through

Southampton airspace to the SAM VOR. At that time the DR400 was still in the 1 o'clock position of the BE58 at a range of 1.7nm and converging. Shortly afterwards, the pilot of the DR400 reported back on the Southampton frequency and stated that he had just had an 'Airmiss' with the BE58.

Both ac were operating VFR within Class G airspace and in receipt of a FIS. TI was passed to both pilots on the presence of the other aircraft. No apparent ATC errors disclosed.

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 authority.

Although both ac were operating VFR in Class G Airspace where 'See and Avoid' and the Rules of the Air are the prime means of collision avoidance, the respective pilots sensibly chose to utilise a FIS from Solent Radar. Despite being passed timely and accurate TI, the DR400 pilot did not see the Beech until it was 50m away. Although the forward visibility from a DR400 is limited by a high coaming and the Beech was almost head-on, presenting a small cross-section, having been warned of the presence of another ac in his area and that it was approaching, acquiring it visually and avoiding it should have been a priority for the pilot. Similarly, and again despite a warning of its approach from Solent Radar, the BE58 pilot did not see the DR400 until it was ½nm away and even then took no avoiding action, allowing it to pass within 100ft of his ac (both ac indicated the same height on the radar replay). Rule 17(2)(b)(i) of Rules of the Air requires that in a converging situation the ac with the other on its right gives way. In this case the BE58 had the Robin on its right but, even having seen the other ac a distance that was just enough to generate a safe avoidance margin, the pilot did not take any such action. A Member with extensive experience of GA and other flying described the lack of avoidance as being reckless.

Since both pilots had seen one another, albeit at a late stage, the Board determined that there had not been an actual risk that they would have collided; however due to the BE58 pilot not taking any avoiding action, safety had not been assured.

The Board commended the Solent Radar Controller for noting the potential confliction early and providing both ac with TI on each other even though he was not required to do so under the terms of the FIS that he was providing.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by the BE58 pilot who did not take avoiding action and a very late sighting by the DR400 pilot.

Degree of Risk: B.

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Date/Time: 17 Nov 0811

Position: 5616N 00300 W(22nm ENE
Edinburgh)

Airspace: Scottish FIR (Class: G)

Reporter: Edinburgh APR

First Aircraft Second Aircraft

Type: B757 BAe146

Operator: CAT CAT

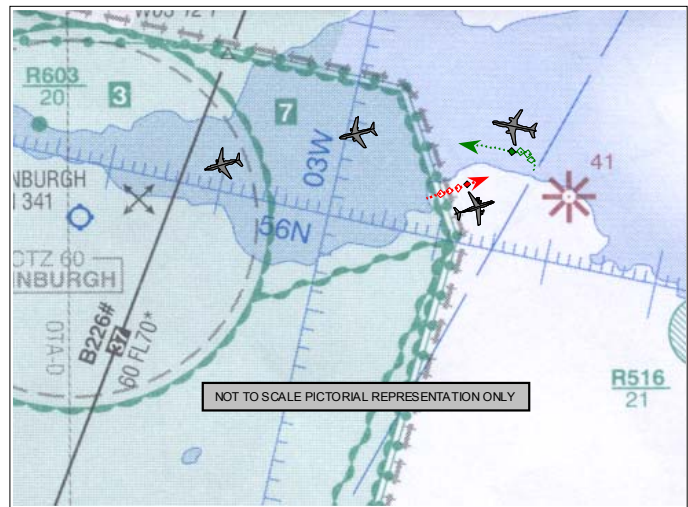
Alt/FL: NR 4000ft
(N/K)

Weather NR VMC CAVOK

Visibility: NR 8-10

Reported Separation:
NR ~4nm H/500ft V

Recorded Separation:
NR V/1.6nm H (See UKAB Note (1))



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EDINBURGH APR reports that he was on duty as APR mentor to a fairly new trainee but who was an experienced controller with a previous Edinburgh radar validation. Use of the TWEED holding facility had been discussed at the beginning of the training session. As the practical session progressed, it became apparent that the trainee would vector a number of ac outside CAS for sequencing onto final approach, which the mentor was happy to monitor so that after the session this error could be appropriately debriefed. It was during this period that the B757 was vectored downwind followed by the BAe146. The B757 was descended to 3000ft and the BAe146 to 4000ft but the mentor noted that the B757 was not descending very quickly. The trainee then turned the B757 onto a closing heading of 280°, which the mentor noted would close the ac to at best, 3nm but probably slightly less. He therefore told the trainee to check the 2 ac's altitudes, both of which were at or near 4000ft. The trainee turned the BAe146 right to increase separation but not in time to avoid a loss of separation that the mentor judged from the radar to be 2nm. He informed the Watch Manager. At no time did the trainee change the service to ac vectored outside CAS to an advisory service – hence he stated that the ac were under radar control in his report. Neither pilot made any comment and continued to approach and land normally.

THE B757 PILOT was contacted a few days after the event but had no recollection of the incident.

THE BAe146 PILOT reports flying a scheduled passenger flight from Paris to Edinburgh. He was heading 030° at 190kt while being vectored by Edinburgh APR for an NDB approach to RW 24. While on a downwind vector, prior to a turn to intercept the final approach course, he became visual with a B757 that appeared to be inbound on the final approach course. No TCAS Advisories were received; no corrective heading was given by ATC. The ac were on a diverging heading and from his position did not appear to be a threat.

UKAB Note (1): The Recording provided by Scottish Military was of poor quality and it was not possible to determine the actual separation. From the radar photograph provided by ATSI however, the separation was 1.6nm.

ATSI reports that the mentor was monitoring a trainee whilst operating the Edinburgh Approach/Approach Radar (APR) position in banded mode. He described his workload as medium. The trainee was an experienced controller who, although not operational on radar for a number of years, had previously held a Certificate of Competency for Approach/Approach Radar at the unit. At the time of the incident the ILS was out of service: consequently ac were being vectored for an NDB/DME Approach. Both the mentor and trainee commented that they did not consider this to be a factor in the occurrence.

The B757 pilot established communication with APR, at 0801, when he was approximately 27nm SSE of Edinburgh Airport. The pilot reported passing FL107 for FL80, on a heading of 355°, with speed reducing to 250kt. The pilot was instructed to continue on the heading and, shortly afterwards, was instructed to reduce speed to 210kt, number 6 in the traffic. The BAe146 pilot made his initial call on the frequency, at 0803, reporting heading 020°, descending to FL100, with a speed of 220kt. As the ac was approaching the E edge of the Scottish TMA, the trainee instructed the pilot to turn left heading 340° to remain within CAS. The BAe146 was number 7 in the traffic, 7nm behind the B757.

As levels became available, further descent was issued, in stages, to both flights, the B757 to 4000ft and the BAe146 to FL70. At 0807, the B757 pilot was instructed to turn right heading 060° downwind left hand for RW24. The radar recording, timed at 0807:00, shows the B757, now 12nm ESE of the airport, passing FL65, with a GS of 228kt, within CAS, 6nm W of the TMA boundary. The BAe146, passing FL90, is 5.8nm further S. It is evident that the ac being vectored ahead of the B757 is about to cross the boundary of CAS eastbound. As the B757 turned downwind it was instructed to descend to 3000ft, followed by the BAe146, still number five in traffic, with 30nm miles to touchdown, being given descent to 4000ft.

At 0809, the BAe146 pilot was instructed to turn right heading 060°, to position downwind behind the B757. The radar recording shows the latter, still heading 060°, just crossing the boundary of the TMA (Class E Airspace) into Class G Airspace. Its GS has now increased to 273kt, as the strong W wind has taken effect. Just before being turned onto base leg the B757 pilot was instructed to reduce speed to 180kt. Although he was, erroneously, given a right turn heading 355° for base leg, the pilot responded turning left. Both mentor and trainee said that they were aware of the error straight away but as the pilot corrected the direction of turn, there was no need to take any action. The BAe146 was then instructed to reduce speed to 180kt or less.

The radar photograph, timed at 0810:30, shows the B757, at FL48 (equivalent to an altitude of 4700 ft on the QNH of 1011mb) on base leg for RW 24, some 5nm outside the boundary of CAS, with the BAe146 7.5nm behind it at 4900ft. It was at this point that the trainee instructed the B757 pilot to turn left heading 280°, to close the final approach track from the left to report established. This resulted in the flight turning into conflict with the BAe146. The trainee said that, inexplicably, he had misread the B757's Mode C, believing it to be 1000ft lower than it actually was, when he positioned it towards final approach. Consequently, he assessed that the subject ac were vertically separated. The mentor explained that he had been seated to the right of his trainee, in front of the Radar 2 display, so as to accommodate access to the voice control switch mounted between the two positions. He added that the radar display he was using was set, as per normal for that position, to a range of about 60nm, compared to the 40nm range being utilised by his trainee and this may have affected his subsequent estimation of the horizontal separation. Nonetheless, he said that he realised immediately that the subject ac were in conflict and alerted his trainee accordingly. The latter instructed the BAe146, which was now also outside CAS, to turn right heading 090°. The radar recording shows that the ac were at the same level at the time, on converging tracks, 2.4nm apart, with the B757's GS 137kt, compared to the BAe146's 259kt. The trainee said that he realised that the requisite 3nm horizontal separation would not be maintained, but estimated that it would not reduce below about 2nm. With no risk of collision he assessed that the use of the term avoiding action was unnecessary and the ac had passed before TI could be issued. The radar recordings show the subject ac continuing to close and pass before the right turn given to the BAe146 takes effect. At 1.9nm, the B757 is 100ft above the BAe146. As they pass, at the minimum horizontal distance of 1.6nm, the B757 is passing 4300ft but the BAe146's Mode C has dropped out. The minimum vertical separation is recorded as 200ft after the ac have passed and are 2.4nm apart. Both the trainee and mentor believed that at least 2nm horizontal separation had been maintained during the incident.

There were a number of issues relevant to this incident, not least the interaction between the mentor and trainee. The latter had returned to Edinburgh in May 2003 and had achieved a Certificate of Competence in Aerodrome Control. Due to staffing considerations, he had been unable to commence radar training, although he had successfully completed an Assessment of Previous Competence (APC). However, an opportunity had arisen for two cycles radar training and the Airprox occurred on the first morning duty of the second cycle. Consequently, he had only completed about fifteen hours training at the time. The mentor, who had been on the same watch as the trainee when he was at the unit some seven years earlier, said that he was well aware of his trainee's experience and tended to let him control the traffic, mainly without any input on his part. He stressed that he was watching his trainee closely. He realised that the situation had arisen where either the Approach position should have been split or ac placed into the hold at TWEED. However, for the benefit of 'lessons learnt' he decided to let his trainee continue, even though he realised that it would mean that ac would have to be routed outside CAS. He

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agreed that this was not an ideal situation, but in view of the good radar performance, whereby any unknown traffic would be readily observed, and the clear weather conditions, he had considered it to be a safe option. Additionally, as the Scottish TMA is CLASS E in that area, it was possible for unknown VFR traffic to be inside CAS as well as outside in Class G. The mentor's view was that it was only because the trainee misread the B757's Mode C, that the incident occurred. There did appear to be a misjudgement of the horizontal separation by both mentor and trainee. The mentor said that his error of judgement may have been because he was looking at a radar display with increased range compared to what he was used to, combined with the extra potential for label overlap. The trainee said that he probably misjudged the distance because he was not fully accustomed to the radar display. He added that it had changed since he was at the unit previously. He admitted that he should have taken some action to either split the position or use the TWEED hold but he was aware that the mentor was closely monitoring his actions and thought that he would have intervened if necessary. He was fully aware that he was vectoring ac outside CAS, contrary to MATS Part 1 instructions, and admitted that the pilots should have been informed accordingly. He commented that the situation arose partly because he had not taken into account the strong westerly wind, which affected the ac as they turned downwind. He added that, previously during the training session, he had not experienced this wind effect because, due to a lack of traffic, he had not had to sequence using a downwind leg. MATS Part 1, Section 1, Chapter 5, Page 11, states that: *'Unless an ac has planned to leave controlled airspace, it is not to be vectored outside the horizontal or vertical limits, except: a) when an emergency situation arises requiring the ac to be vectored outside controlled airspace; b) when avoiding severe weather; the circumstances must be explained to the pilot before the ac leaves controlled airspace; c) when specifically requested by the pilot'*. This instruction is repeated verbatim in the Edinburgh MATS Part 2. Additionally, MATS Part 1, Section 1, Chapter 5, Page 2, states that: *'Pilots must be advised if a radar service commences, terminates or changes when: a) they are operating outside controlled airspace; or b) they cross the boundary of controlled airspace'*. On this occasion, ac were not only inappropriately routed outside CAS but also not informed of the change of circumstances. To all intents and purposes, the ac were being provided with a RAS outside CAS, although no agreement to this effect was reached with the pilots. To ensure adequate terrain clearance, the MATS Part 2 states that Edinburgh Radar shall not provide a RAS to ac that are *'more than 25 miles from Edinburgh below altitude 4500 ft'*. Although the B757 remained within this range, the BAe146 was routed out to 26nm at 4000 ft.

Both controllers mentioned the restricted airspace around Edinburgh; the CTR/TMA is split into an inbound and an outbound segment. The line delineating these segments is drawn between the Perth and Talla VORs, thus dividing the airspace in half and, consequently, limiting the space available to vector inbound ac. It is, therefore, necessary, when a number of inbound ac are in close proximity, to make an early decision as to whether ac should be routed to the Tweed hold. This should avoid having to extend the radar circuit to the extent that ac have to be vectored outside CAS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

ATC specialist Members thought that the Mentor might have allowed his previous knowledge or working relationship with the trainee to let the situation to develop further than would be normal in such circumstances. They commended him for his open and honest report that will highlight this incident to others.

The Board thought that the traffic density had increased to a level where positive measures were required to reduce it. Members accepted that on these occasions there may be self-imposed pressure, particularly among experienced controllers, to work through traffic peaks but they thought such practises should be resisted. They also considered that in this situation bandboxing was not desirable and the mentor should have requested assistance. As witnessed by the ac having to be routed outside CAS to achieve a correctly spaced arrival sequence, measures should have been implemented to alleviate the temporary peak in traffic density by making use of holding.

The Board also noted that the strong wind had played a significant part in this incident but pointed out that such conditions are not unusual at Edinburgh and should be anticipated. Members thanked ATSI for their comprehensive report but thought that this was a very simple example of a mentor allowing, albeit for understandable reasons, a situation to develop too far. Fortunately in this instance, although there had been an erosion of the pertinent separation, this had not resulted in a compromise to the safety of either ac.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Edinburgh APR Mentor allowed the Trainee to vector the B757 into conflict with the BAe146.

Degree of Risk: C.

AIRPROX REPORT No 213/04

AIRPROX REPORT NO 213/04

Date/Time: 9 Nov 1417

Position: 5138N 00003W (8nm W LAM)

Airspace: LTMA (Class: A)

Reporting Ac Reported Ac

Type: B757 B737-800

Operator: CAT CAT

Alt/FL: FL90 ↓FL90

Weather: NK VMC CLAC

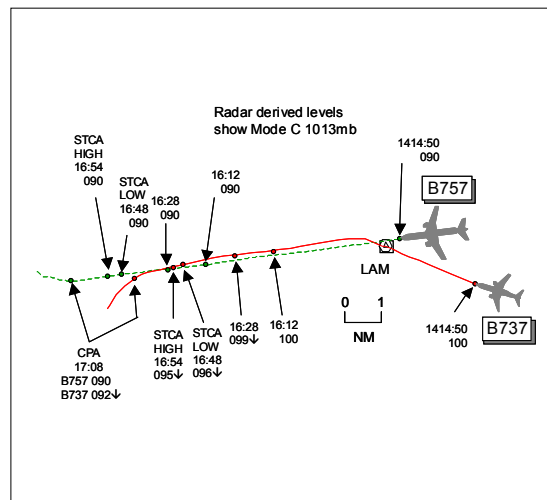
Visibility: 10nm

Reported Separation:

100ft V NR H 500ft V 4-5nm H

Recorded Separation:

200ft V 1.7nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B757 PILOT reports heading 270° at 210kt and FL90 inbound to Heathrow and receiving an ATS from Heathrow DIRECTOR on 119.72MHz. Eight miles after having left the LAM hold, another ac, which was seen on TCAS 200ft above and behind them, was given an avoiding action turn onto heading 180°. They were then given heading 360° for avoiding action, which was followed, with vertical separation reducing to 100ft during the encounter. No TCAS alerts were received other than the display showing a solid white diamond.

THE B737 PILOT reports heading 270° at 220kt inbound to Heathrow and receiving a RCS from Heathrow DIRECTOR. ATC told them to descend from FL100 to FL90. They had been following another ac, a B757, in the hold and had TCAS and visual contact on it ahead and below as the visibility was 10km about 3000ft above cloud in VMC. He commenced descent at 500fpm to give the controller time to direct the B757 to a lower FL before ATC issued a L turn onto 180°, estimating that the B757 was 4-5nm ahead and 500ft lower at the CPA. No TCAS alerts or warnings were received.

THE TC HEATHROW INTERMEDIATE DIRECTOR N reports being 'plugged in' for 20min prior to the incident. A RW change was planned for 1415Z so she worked the remaining traffic landing RW09L and put the traffic planned for RW27L into the holding stacks. The first ac was brought off LAM at FL80 and the second off BNN at FL80: however she was concerned about a Northolt inbound at FL70 which she was unable to descend owing to the last few Heathrow departures from RW09R routeing northbound on BPK and BUZ SIDs. To give maximum RW utilisation, the next 2 ac in the stack at LAM, the subject B757 and B737, needed to be changed around in the sequence i.e. the lower one second positioning behind the higher one. Her plan had been to achieve this once the ac had left the stack and were on headings. Owing to the non-standard way she had to deal with the Northolt traffic, when she referred back to the subject ac she thought it was safe to descend the higher one although her attention was with the other Northolt traffic. She thought that for positioning she turned the B737 onto heading 180° and then realised that separation had been lost. She gave avoiding action turns to both ac, turning the B737 L onto 180° and the B757 R onto 360°, after which standard separation was established shortly thereafter.

ATSI reports that the controller described the traffic loading as light at the time of the incident but owing to the complexity of the task, she considered her workload as moderate. When she took over the sector, some 20min earlier, she decided that the expected traffic did not warrant the need for a Support (SPT) Controller but confirmed that one was available if required. Even with hindsight, she thought that this was the correct decision although she did concede that a SPT may have noticed her subsequent error and alerted her accordingly.

When the controller took over the INT DIR N position, she was advised that a RW change from E'ly to W'ly operations was to take place at Heathrow, at, as far as she could recollect, 1415. Accordingly, when the B757 crew established communication with her, at 1402, they were instructed to hold at LAM at FL90, to expect about

10mins delay and to land on RW27L. Approximately 1min later, the B737 crew made their initial call on the frequency, reporting descending to FL100 on course to LAM and they too were instructed to hold.

The INT DIR N commented that, shortly before the RW change was about to take place, she had been working an executive jet (AC3), inbound for RW25 at Northolt, which was routeing via LAM at FL70. She added that, as the last 2 E'ly departures were on N'ly SIDs, the Northolt inbound presented a traffic scenario that she had not previously experienced i.e. how to vector and descend AC3 against the 2 outbounds. Her plan was to vector AC3 initially W and SW of LAM to pass behind the 2 outbounds, before issuing further descent and positioning it towards Northolt. In accordance with her plan, she telephoned TC N to ensure that they did not issue climb above 6000ft to the outbound ac until clear of this traffic. She said that she had spoken to a trainee, who, she thought, seemed rather confused about the situation. It was only later that she was told that the Heathrow RW change had not been promulgated by the previous watch, as required, and TC N had not been advised. Because of this perceived hesitation in understanding the situation by the trainee, the INT DIR N explained that she had felt she had to monitor the situation particularly closely to ensure that the outbound ac did not climb above 6000ft into conflict with the Northolt traffic.

Meanwhile, the INT DIR N had to formulate a plan for the Heathrow arrivals. She decided to vector the first ac from LAM (not one of the subject ac) followed by a second from Bovingdon (BNN). Her idea was then, in order to achieve maximum RW utilisation, to sequence the B737 ahead of the B757. She explained that as the former was classified as a medium and the latter as an upper medium, vectoring in that order would save one mile spacing. Accordingly, at 1413:20, the B737 flight was instructed to leave LAM heading 270°. The radar for that time shows: AC3 heading W from LAM at FL70; the last RW09R departure just airborne en route to Manchester; the B737 turning L, S of LAM, at FL100 and the B757 turning onto the inbound track, to the E of LAM, at FL90. Approximately 1min later (1414:50), the B757 flight was instructed to fly heading 270°, resulting in it tracking W from LAM, just ahead of the B737.

Having resolved the situation with the Northolt inbound against the Heathrow outbounds, the INT DIR N turned her attention back to the LAM traffic and, at 1416:10, instructed the B737 crew to descend to FL70. The radar recording shows that the subject ac were on similar tracks, with the B757, at FL90, 1.8nm ahead of the B737, at FL100. Consequently, any descent would result in a loss of separation. The INT DIR N explained that, for whatever reason, she had transposed the levels of the subject ac. She reasoned that, possibly, when she repositioned the subject acs' fpss from the stack display, where they would have been displayed in level order, she placed them in sequence order, in accordance with her plan. Therefore, when she cleared the B737 flight to descend, she believed it was below the B757. In order to vector the ac in the intended order, she instructed the B737 crew, at 1416:40, to turn L heading 180°. As soon as she finished transmitting, she recalled that STCA had activated with a high severity alert. As soon as the pilot had finished the read back to the turn instruction, she repeated the call, adding that it was for 'avoiding action'. The B757 flight was then given an 'avoiding action' R turn heading 360°. The radar recording reveals that, as the B737 was issued with the avoiding action turn, it was 1.7nm behind, and 500ft above, the B757. The horizontal distance between the two flights did not reduce below 1.7nm but vertical separation reduced to 200ft (1417:08) as the B737's L turn took effect. By the time the two ac were at FL90, the distance had increased to 2nm, with both in their respective turns.

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 ATSI report. Pilot Members wondered why the B737 crew, knowing that the B757 was ahead and below and in potential conflict, had not queried the descent clearance given by the INT DIR N. The crew had assumed that the controller would subsequently descend the B757 to a lower level but this was unfounded. ATCO Members agreed that the INT DIR N, in trying to save 1nm in spacing by reversing the traffic order, had added to the complexity of the situation. However, when she descended the B737, it placed the ac into conflict with the B757 which had caused the Airprox.

Looking at risk, following STCA activating, the INT DIR N had given avoiding action turns to both ac to deconflict their tracks. Meanwhile the B757 crew had noticed the B737 behind their ac on TCAS, which indicated +200ft, and were given a R turn onto 360° for avoiding action. The B737 crew had watched the B757, on TCAS and visually, and after initiating descent had followed the avoiding action L turn given. Neither crew had received any

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TCAS alerts nor warnings which was understandable owing to both ac flying similar speeds and being separated by 1.7nm. All of these elements when combined were enough to persuade the Board that safety had been assured during the encounter.

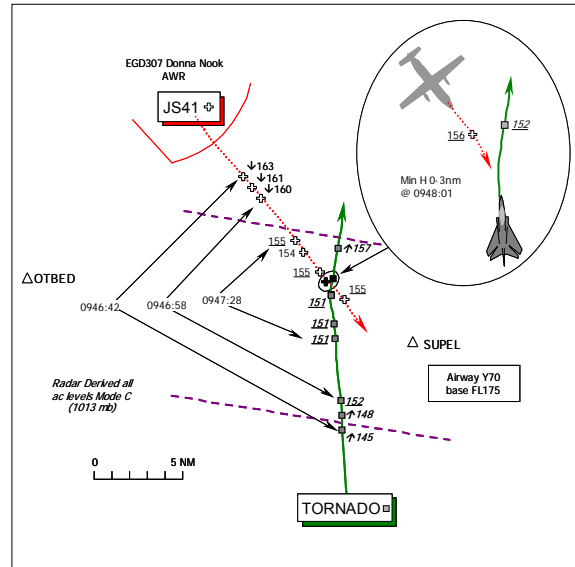
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The TC Heathrow INT DIR N descended the B737 into conflict with the B757.

Degree of Risk: C.

AIRPROX REPORT NO 214/04

Date/Time: 12 Nov 0948
Position: 5316N 00029E (5³/₄nm NW of SUPEL)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Tornado GR4 JS41
Operator: HQ STC CAT
Alt/FL: FL150 FL155
Weather VMC CAVOK VMC CLOC
Visibility: >30km 20km
Reported Separation:
 Nil V/1/2nm H nil V/1200m H
Recorded Separation:
 400ft V/0.3nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO GR4 PILOT reports his ac has a grey camouflage scheme but the HISLs were on whilst executing an en-route climb, VMC, in CAVOK weather. He was in receipt of a RIS from LATCC (Mil) on 277.75MHz and the assigned squawk of A6115 was selected with Mode C. Neither TCAS nor any other form of CWS is fitted.

Heading 005° some 14nm SE of Donna Nook Range at 395kt, approaching FL150 in the climb to their assigned level of FL190, traffic information was called to them about an ac at 11 o'clock - 8nm in a descent through FL160. The controller instructed him to level his jet at FL150 and he did so. After his navigator established AI radar contact with the reported traffic at 6nm range, visual contact was gained with the white twin-prop airliner – the JS41 – as they closed to 3nm. The JS41 was now in their L 10 o'clock and he assessed it was on a collision course with his jet so he immediately manoeuvred to the R as the other ac passed down their port side at the same level less than 1/2nm away. The pilot of the JS41 did not appear to take any action to avoid his jet and he assessed the risk as "high if avoiding action had not been taken". After they had informed the controller of the relative proximity of the JS41, she reported that the other ac was under a RIS provided by a different controller. In his and his navigator's view, rather than de-conflicting the two ac, the instruction to level his jet at FL150 put them in direct conflict with the airliner. He opined that had they been able to continue their climb they would have passed at least 2000ft above the JS41.

THE JS41 PILOT reports that his ac has a predominately white livery but the HISLs were on whilst in an en-route descent into Norwich from Edinburgh, whilst under a RIS with LATCC (Mil). The assigned squawk was selected with Mode C. TCAS although fitted was not released for operational use at the time of the Airprox [not available in service until January 2005].

Whilst descending to FL150, approaching a position 4nm SE of Donna Nook Range heading about 160° at 300kt, LATCC (Mil) called traffic at R 2 o'clock - 5nm climbing through FL150. The controller advised them to stop descent at FL155, which they did. He could not recall if there were any other transmissions about the jet - a Tornado GR4 – which they spotted at about 2nm away "on the nose" at the same level on a reciprocal heading. He turned his airliner slightly R, as did the Tornado pilot thereby avoiding any risk and the jet passed about 1200m away to port at the same level.

THE TORNADO GR4 PILOT'S STATION comments that it would appear that the instruction to level at FL150 put the Tornado into direct conflict with the reported JS41. In the pilot's opinion, had he been allowed to continue the climb he would have cleared the other traffic by at least 2000ft vertically. The other traffic did not appear in the field of view of the Tornado HUD recording, a copy of which was supplied including the cockpit voice recording to the UKAB.

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MIL ATC OPS reports that all RT and video tape timings correlate. However, the transcript timings did not include the seconds: the transcription unit concerned has been reminded of the need for accurate timings.

LATCC (Mil) [situated at West Drayton] Controller 11 – (Con 11) was working a pair of Tornado GR4s under a RIS climbing to FL180 whilst Controller 13 (Con 13) was providing a RIS to the JS41, which was descending to FL50 with a clearance to transit through EG D307 - Donna Nook AWR. Shortly after 0944:00, the GR4 leader indicated that his ac had a minor problem and that he intended returning to base whilst his No2 continued with the mission. For around the next 1½ min Con 11 made several communications transferring the Mode A squawk to the No 2 GR4, confirming that the No1 ac did not have an in-flight emergency and the nature of its problem, establishing its intentions and handing the No1 ac back to its base. At 0946:45, shortly before the handover was fully completed, Con 11 broadcast to the singleton subject No2 GR4 *“...stop climb FL150 traffic left 11 o'clock 8 miles crossing left-right FL160 descending”*, referring to the JS41. At the same time Con 11 was working a high level foreign transit ac as well as the two GR4s. The split of the GR4 pair with the additional handling of the No 1 GR4 resulted in Con 11's workload being much higher than normal and the controller did not update the Cleared Flight Level (CFL) on the Electronic Flight Progress Strip system [EFPS] so it continued to display to other controllers that the flight was climbing to FL180. The pilot of the subject GR4 acknowledged the traffic information and Con 11 completed the handover of the lead GR4. At 0947:30, Con 11 updated the traffic information to the subject GR4 crew, transmitting *“...previously reported traffic [the JS41] left 11 o'clock 3 miles crossing left-right FL154 descending”*: the pilot responded with *“...visual.”* Con 11 then continued *“roger...[C/S]... with that traffic in sight climb report level FL190”* which the GR4 pilot acknowledged by reading back the instruction. At 0948:15, the GR4 pilot reported that *“...we did avoid but...that was extremely close.”*

Meanwhile, Con 13 had seen the confliction between the 2 ac and, since the CFL still displayed FL180, assessed that the GR4 would climb and the JS41 would descend clear of each other. Nevertheless, the controller called the subject GR4 to the JS41 crew at 0947:10, *“...traffic right 1 o'clock 10 miles crossing right-left indicating FL150 in the climb believed to be a Tornado.”* The JS41 pilot acknowledged the call and Con 13 asked *“...you visual that aircraft?”* The JS41 pilot replied *“...nothing seen yet...”*. At this point the SUPERVISOR informed Con 13 that the GR4's CFL was incorrect and Con 13 advised the JS41 *“...he's actually stopped his climb at 150 if you want to stop 500 feet above.”* Con 13 called the traffic again *“...right 2 o'clock 4 miles right-left 500 feet below”* and again at 0947:45 *“...right 1 o'clock, 2 miles...”* The JS41 pilot reported *“visual...”* to which the controller replied *“...he's visual yourself, are you happy to continue descent?”* The pilot responded that he was *“happy to continue...”* and the controller then cleared the JS41 pilot to *“...descend FL50.”*

[UKAB Note (1): Analysis of the Claxby Radar recording at 0945:00, shows the JS41 crossing EGD307 on a south-easterly track, the assigned squawk [converted by the Code/Callsign Distribution System (CCDS)] indicating FL176 Mode C descending. At the same time the subject GR4 is shown about 34nm away from the JS41, tracking N from The Wash, squawking A6115 [Code/Callsign converted] and climbing through FL112 Mode C. By 0946:42, when the ac are about 15nm apart and about the time that Con 11 instructed the GR4 pilot to stop his climb at FL150, the GR4 indicates FL145 climbing with the JS41 indicating FL163 descending. The first indication that the GR4 is levelling in accordance with the instruction from CON 11 is at 0946:58, when the horizontal separation has reduced to just under 12nm and the GR4 indicates FL152 with the JS41 passing FL160 Mode C. At 0947:28, around the time that the GR4 pilot reported visual, the ac are 5-7nm apart with the GR4 indicating level at FL151 and the JS41 level at FL155. At 0947:45, around the time that the JS41 reported visual, the ac are 2-7nm apart, the GR4 indicating FL151 whilst the JS41 indicates FL154 momentarily. At a range of 1-3nm the GR4 indicates FL151 and the JS41 has returned to an indicated level of FL155. The CPA occurs at 0948:01, when the ac are 0-3nm apart and the GR4 indicates FL152 and the JS41 is 400ft above the jet at FL156, as the GR4 appears to turn R and cross ahead of the JS41. The ac are shown diverging at 0948:15, with the GR4 climbing through FL157 and the JS41 still indicating level at FL155.]

Since both pilots had elected to receive a RIS, neither controller was obliged to provide separation. However, in addition to passing the required traffic information, both controllers recognised a need to separate the ac in some way until the pilots could acquire the opposing ac visually and effect their own separation. Con 11 elected to stop the GR4 at FL150 but, due to a high workload, did not update the CFL on the EFPS, leading Con 13 to believe that the GR4 was continuing to climb up to FL180 and that the 2 ac would pass clear of each other vertically. Once Con 13 was made aware of this, a stop-off was suggested to the JS41 pilot that would allow 500ft between the ac. If Con 13 had been aware of the correct CFL earlier, a stop-off allowing 1000ft separation would probably have been suggested. Both controllers continued to pass accurate traffic information to their respective ac and both ac had reported visual and happy to continue before the ac had closed to a range of 2½nm. The Mode C readouts of both ac indicated at times a variance from the levels agreed by the pilots, and perhaps either controller could have queried this, but since

both ac were indicating within the +/- 200ft tolerance for Mode C it appears that both controllers gave priority to passing traffic information to enable the pilots to acquire each other visually. Once both pilots had reported visual, both controllers immediately confirmed that the pilots were happy to continue visually. Once they had received this assurance it was perfectly reasonable for the controllers to expect the pilots to maintain separation from each other without further assistance.

HQ STC comments that the ATC issues involved with this Airprox have already been identified. It is unlikely that such an event will be repeated as this encounter would probably have generated a TCAS RA in the Jetstream's cockpit as the JS41 descended to FL154 and the GR4 climbed to FL151 some 5nm from each other. This encounter should be within the TCAS II's algorithm for predicting a CPA between the ac, being within the 15-35 second window to generate an RA. Therefore, this provides a valuable lesson for controllers to be cognisant of when working to RIS rules with TCAS II equipped aircraft in Class G airspace. It is also likely that had the GR4's climb not been stopped then the separation margins would have been greater.

There is an interesting point to note within the GR4 cockpit in that the conflict was apparent for some time. The HUD video radar-lock symbology from the GR4 indicates that the JS41 is very-nearly co-height at 6nm. However, if the expected 1000ft separation at 6nm was to be achieved then the radar symbology would show the target 1° up in the HUD (using the '1 in 60 rule') increasing to 12° at a range of 0.5nm. This trend went unnoticed by the Tornado crew and they could have realised earlier that a conflict was about to occur and either questioned the controller's request for them to level at FL150 or taken avoiding action sooner. That said, the Tornado crew saw the Jetstream, recognised that it was going to be close, and manoeuvred effectively to negate any risk of 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, and reports from the appropriate ATC and operating authority.

It was apparent to the Board that the GR4 pilot's prime concern in making the Airprox report was the instruction from Con 11 to level at FL150 which in his view had placed his ac in direct conflict with the JS41 whereas the pilot reasoned that if the climb had been maintained it would have enabled his jet to pass clear above the JS41. The comprehensive Mil ATC Ops report had laid bare the full circumstances surrounding this Airprox and it was clear that Con 11 had been working hard with a difficult split of the GR4 pair which, coupled with the provision of service to other traffic, had resulted in a much higher than normal workload. Thus CON 11 was not able to update the Cleared Flight Level (CFL) on the Electronic Flight Progress Strip system [EFPS] that continued to indicate, incorrectly, to other LATCC (Mil) controllers that the GR4 was climbing to FL180 despite the stop-off at FL150. The Mil ATC Ops report had made it clear that under the RIS that was being provided by both controllers to their respective ac, separation remained wholly the responsibility of the respective pilots. However, once Con 11 recognised that there might potentially be a problem between these two ac, he elected to stop off the jet: in attempting to positively separate the two ac he had unwittingly produced an inherent conflict with the descending JS41. A civilian controller Member was most emphatic that controllers should not try and impose separation by issuing control instructions where this was clearly the purview of the pilot under a RIS. He stressed that in his view controllers should not issue level instructions that would in any way suggest that the responsibility for separating ac was being accepted by the controller when providing a RIS, a VFR service whereby pilots maintain their own visual separation from other traffic. However, other controller Members, both military and civilian, were of the opinion that whilst controllers must always be prepared to use their best judgement if the safety of ac is in doubt, it had been unwise to stop-off the GR4, though done with the best of intentions.

It was unfortunate that Con 13 was cognisant of the potential for a conflict between the 2 ac – the CFL still displayed that the jet was released to climb to FL180 which led the controller to believe that the GR4 would still climb and the JS41 would descend clear of the other ac – Con13 saw no need to take action until he was advised by the SUPERVISOR that the CFL for the jet was wrong. The Mil ATC Ops report had shown that although Con 13 & Con 11 perceived at the time a need to exercise positive control over the situation, it was too late for Con 13 to stop off the JS41 and effect the normal vertical minima of 1000ft. It was evident to the Board that the attempt to give 500ft separation was less than ideal in these circumstances and the tolerances applicable to Mode C, together with the fluctuations in the level actually flown by the pilots at the time, all played their part in bringing these two ac closer together than perhaps originally intended. The radar recording had shown that this was 300ft at one point as the JS41 dropped through its assigned level of FL155 but the GR4 was also consistently indicating above the level assigned by Con 11 which substantiated the provision of 1000ft of vertical separation as the accepted norm. Nevertheless,

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having tried to engineer less than the accepted minima, the Board agreed that both controllers had conscientiously passed a good level of traffic information which had eventually enabled both pilots to sight one another's ac – the GR4 pilot after a call giving 3nm range to the JS41 and the latter's pilot moments later when a range of 2nm was called. The STC comments had shown that the GR4 crew had information displayed to them from their AI radar, which could have shown to them that the separation was going to be less than perhaps they had anticipated. Nevertheless when seen, both pilots turned away from the other ac and continued with their respective climb and descent thereby resolving the conflict which had been induced by the enforced stop-off. The Board therefore concluded that this Airprox had resulted because Con 11 vectored the Tornado GR4 into conflict with the JS41 which was subsequently resolved by both pilots' actions. Moreover, the eventual sighting by both pilots and their avoidance manoeuvres, albeit at relatively close quarters, had effectively removed any risk of a collision.

Although the GR4 pilot's Command had suggested that such a conflict was unlikely to be replicated in the future because this operator's ac are fitted with TCAS that is now in operational use, a civilian controller Member noted a word of caution insofar as TCAS should not be considered as a primary means for the provision of separation between ac in the Open FIR. In the 'see & avoid' environment of Class G airspace, visual detection aided where appropriate by an ATS is the accepted norm. He stressed that TCAS was a final safety net and only there to help if all else went wrong. On that score the Board accepted wholeheartedly that TCAS had certainly proved its worth on many occasions.

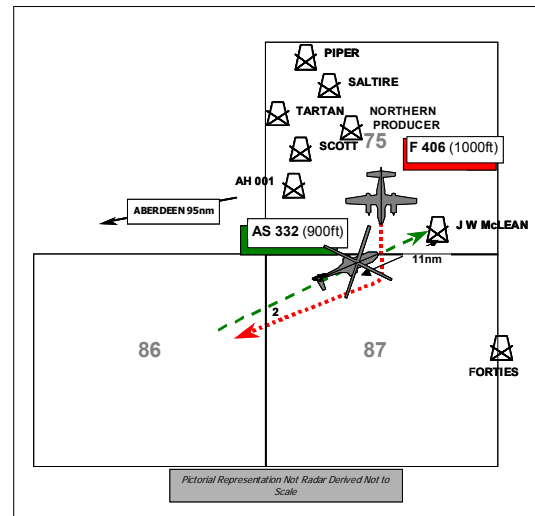
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: LATCC (Mil) Con 11 vectored the Tornado GR4 into conflict with the JS41 which was subsequently resolved by both pilots.

Degree of Risk: C.

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Date/Time: 17 Nov 1155
Position: 5755N 00050E (071° ADN 96nm)
Airspace: Scottish FIR (Class: G)
Reporting Ac Reported Ac
Type: AS332L F406
Operator: CAT Civ Comm
Alt/FL: 900ft 1000ft
 (QNH 1004mb) (QNH 1004mb)
Weather VMC CLBC VMC CLBC
Visibility: 5nm 8nm
Reported Separation:
 1- 300ft V¹/₄ -¹/₂nm H Not seen
Recorded Separation:
 Not recorded

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

THE AS332L PILOT reports flying a non-scheduled passenger flight from Aberdeen to an oil rig in the North Sea about 100nm off Aberdeen. The weather was poor with a wind of 45-50kt, blustery showers and the sea was mostly white with prominent sea-lanes. While heading 065° at 110kt and passing 900ft in the descent to his destination rig which was obscured by a shower, he saw a white low wing 2-engined ac about ¹/₂nm away passing from his 11 to 1 o'clock slightly above his height and turned left 20° to avoid it. There were fishing boats in the area so he thought that it might have been a fishery patrol ac. At the time the crew were trying to make out the rig and completing their final landing checks. ABERDEEN INFORMATION (INFO) reported no known traffic to conflict and the rig radio operator had no contact with any other ac.

THE F406 PILOT reports flying a white ac with Day-Glo markings with strobes, nav lights and anti-colls switched on, on a fishery patrol sortie. Although he did not see the other ac he provided extensive details of his mission. The first notification of the incident was after he had landed at Inverness, when Aberdeen ATC informed him that the pilot of a helicopter outbound to an oil rig had filed an Airprox report on his return to Aberdeen. They passed the details as reported above.

At the time they had been tracking S from the Piper area in ICES (International Committee for the Exploration of the Sea) square A75 at 1000ft and were asked by ABERDEEN INFO to call 'clearing the installations to the South'. On Box 2 they had just signed off with PIPER TRAFFIC and had just established contact with FORTIES TRAFFIC. At all times they also had good RT contact with ABERDEEN INFO. They then turned to take up a SW track towards the centre of ICES square A86C [the suffix C denotes the centre of square] and they called ABERDEEN INFO to inform them of their intentions and that they were clear of the 'Piper installations to the south'. At this time Aberdeen informed them of a helicopter on its way out to the J W McLean oil rig. The time of this call passed by Aberdeen ATC (checked from the tape) was 1158 – 3min after the Airprox. Before that time they were totally unaware of any activity in their area.

THE ABERDEEN CONTROLLER reports that while working as the HELS/REBROS Controller, he was controlling an AS332 outbound to the J W McLean Rig and the F406 on a fisheries patrol. F406 was operating at 1500ft and below under a FIS and patrolling S toward and through the installations around the Piper Field, and in two way contact with Piper.

Approaching ADN 80 DME, the AS332 was placed under a FIS(E) [FIS enhanced] and requested descent toward the J W McLean. The AS332 pilot was advised that there was no known traffic to affect his descent and requested to advise when he transferred his Flight Watch to the rig. Aware that the F406 could potentially become a conflict, the F406 was advised to report when S of the rigs in the Piper Field, he thought. Until then, he judged that the ac would not be in conflict with each other.

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Before the F406 pilot reported S of the Piper installations, the AS332 pilot advised that he had passed through 1500ft descending, had passed flight watch to the Rig and wished to QSY. As the helicopter was now below his area of responsibility and the F406 had not made the requested report, the AS332 left his frequency.

Some minutes later, the F406 pilot reported S of the Piper Installations, turning to the SW toward Square 86. He advised the F406 that the AS332 had descended toward the J W McLean some minutes previously; however as the reported track of F406 was the opposite direction to that of the descending helicopter, he passed no further TI. As the AS332 had left his frequency and was below his area of responsibility he was not able to pass TI to him regarding the F406. His Watch Manager later advised him that the AS332 reported an Airprox occurring at time 1155 involving a "light twin" ac.

UKAB Note (1): The transcript of the Aberdeen Radar/FIS RT shows the following transmissions:

Aberdeen to AS332	<i>'C/S Roger report transferring Flight Watch there's no known traffic to affect your descent'</i>	between 1149:10 and 20.
AS332 to Aberdeen	<i>'C/S Roger er leaving three thousand and er call you when ????? the flight watch'</i>	
Aberdeen to AS332	<i>'-Ger'</i>	
Aberdeen to F406	<i>'C/S report when you're south of the installations in your square seven five'</i>	between 1152:30 and 40.
F406 to Aberdeen	<i>'wilco C/S'</i>	
AS332 to Aberdeen	<i>'er through fifteen hundred now eighteen miles to run to the J W McLean they have our flight watch we'll call you on return'</i>	between 1153:30 and 40.
Aberdeen to AS332	<i>'C/S that's understood continue ????? ?????'</i>	
AIRPROX		1155
F406 to Aberdeen	<i>'er C/S were now clear of the Piper installation now we're tracking er generally to the South and West now towards the centre of our square eight six were good two way with Forties and they've advised us of a helicopter shortly to TO Aberdeen but we should remain to the North of them C/S'</i>	Between 1158:20 and 59:00
Aberdeen to F406	<i>'C/S roger er I've got no known traffic er out that way just be advised if you go anywhere near the J W McLean there is a xxxx super Puma C/S went on there about five minutes ago'</i>	
F406 to Aberdeen	<i>'C/S roger thank you'</i>	

ATSI reports that the Aberdeen controller was operating the combined HELS/REBROS sector. The AS332 reported on his frequency shortly after 1126 and reported an estimate for 80nm (on the 071° radial) as 1150. The controller placed the flight under a Modified RAS and asked the crew to report at 80nm or ready for descent to the J W McLean rig.

The F406 reported on the controller's frequency at 1130:30 and reported on a fisheries patrol, its present position being the Aberdeen 042° radial at 109nm. The pilot reported that he was eastbound routing from Grid Square 64 to Square 65 but no level information was provided nor requested. He added that he was still in communication with Sumburgh and not yet in contact with Piper. The controller asked the pilot to advise when he was two-way with Piper before turning Southbound and this was acknowledged.

Shortly after 1139, the F406 pilot reported two-way with Piper. Nine min later, the AS332 pilot reported at 83nm from Aberdeen and requested descent to the rig. The controller asked the crew to standby for descent and enquired whether they were two-way with the J W McLean to which the pilot replied "Affirm". The controller requested that the pilot reported when he was transferring the Flight Watch and that there was no known traffic to affect their descent. The helicopter commenced its descent and, at 1151:20, they were instructed to squawk standby, radar service was terminated and they were transferred to the REBROS frequency and, having established contact on the frequency, they were placed under a FIS.

The controller, being aware of the potential for conflict between the two flights, called the F406 pilot and asked him to "...report when you're south of the installations in your Square Seven Five" which the pilot acknowledged. This position would have been approximately 18nm N of the track being followed by the AS332 inbound to the rig. At 1153:30, the pilot of the AS332 reported passing 1500ft and 18nm from the rig. He added that the rig had the Flight Watch and they would call on their return. The Airprox is reported to have occurred at 1155 as the AS332 passed 900 ft in its descent towards the rig. The crew of the F406 did not see the helicopter.

At 1158:25, the F406 pilot reported "...now clear of the Piper installation now we're tracking generally to the South and West now towards the centre of our Square Eight Six..." At that time the F406 was (most probably) approximately 6nm S of where the Airprox is reported to have occurred and 22nm S of the position where the Aberdeen controller intended the pilot of the F406 to make his report.

The unit's MATS Part 2 advises that the area of responsibility for REBROS is between 1500ft and FL85, beyond 80nm E of Aberdeen to the Median Line. Below 1500ft the area is divided into nine Traffic Areas each with a specific VHF traffic frequency for pilots to pass positions, obtain deck clearances and for lifting calls. The Airprox occurred outside of the REBROS area.

The Aberdeen controller had formulated a plan that the Southbound F406 would be adequately clear of the helicopter until such time as it was S of the installations in Square 75 (i.e. a position approximately half way along the ac's track through Square 75). The phrase 'south of the installations in Square 75' was perhaps less specific than was required. As a result, the pilot of the F406 was considerably further S than the controller believed and in conflict with the track of the descending helicopter. A FIS relies on pilots making accurate position reports and TI is based on such reports. The Airprox took place outside of the REBROS area (i.e. below 1500ft) and so there was no obligation for the controller to pass TI. The crew of the AS332 had left the controller's frequency and so he was unable to pass TI to them on the F406. As soon as the F406 pilot made his report S of Square 75, the controller passed TI to him on the helicopter; however, it transpired that this was after the Airprox had occurred.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were unclear as to the function and responsibilities of oilrig personnel with regard to the provision of services to ac.

[Post Meeting Note: Although oil companies use differing terminology, the operatives on oil rigs are 'Offshore Radio Operators' and have similar responsibilities to a land-based A/G operator. Although this may include the provision of offshore specific information, it does not include the provision of any form of formal FIS but does include holding a radio watch].

Although there had been misunderstandings that had led to the Aberdeen Controller passing inaccurate TI, this was essentially an incident in the open FIR where 'see and avoid' applies. The understanding of the requested position report differed between the F406 pilot and the Aberdeen Controller who, notwithstanding that the ac were below his area of responsibility, had attempted to provide both with the best information that he could. This incident serves further to emphasise that precise terminology and accurate passing of positions is essential if the information is to be meaningful. Further, good practise, for obvious reasons, is to mention only fixed rigs when referring to them in position reporting and Members thought that the phraseology 'installations in your area square seven five' was open to differing interpretations. Lack of, or inaccurate, information can, and in this case may have, lead pilots to believe that there is no other traffic in their area and thus perhaps, even only subconsciously, reduce their lookout.

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An expert Member informed the Board that approaches to oilrigs and transfer to their frequency normally takes place at about 10nm and 1000ft, therefore the procedure flown by the AS332 was, in his view, quite normal.

Although in this case the F406 pilot had not seen the helicopter, possibly due to the very poor weather conditions, the AS332 pilot saw the F406 at an estimated ½nm (15sec) and made a gentle turn to ensure safe separation. Although this was a borderline case, Members thought, albeit probably due to the poor weather, this incident to be sighting issue rather than an FIR conflict.

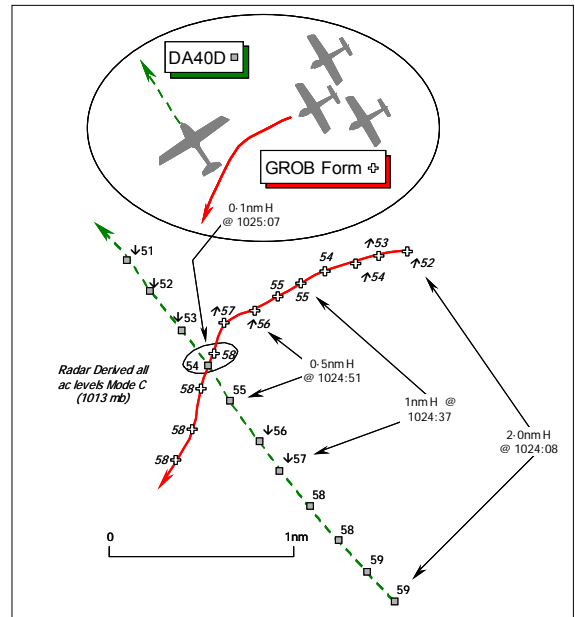
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sighting by the AS332 pilot and non-sighting by the F406 pilot.

Degree of Risk: C.

AIRPROX REPORT NO 216/04

Date/Time: 19 Nov 1025
Position: 5305N 00042W (8½nm SW of Waddington)
Airspace: Lincolnshire AIAA (Class: G)
Reporting Ac Reported Ac
Type: DA40D Grob Tutor
Operator: Civ Pte HQ PTC
Alt/FL: 4700ft FL50
 (RPS 1020mb)
Weather VMC Sky clear VMC nil cloud
Visibility: >30km Unlimited
Reported Separation:
 Nil V/300m H 200ft V/¾nm H
Recorded Separation:
 100ft V @ 0.5nm
 0.1nm H @ 400ft V



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DA40D PILOT reports that his ac is coloured white with blue/red markings and the HISLs were on. Whilst inbound to Retford/Gamston from Rochester VFR he was in receipt of a RIS from Waddington ZONE on 127.35MHz and squawking the assigned code of A3601 with Mode C on. TCAS is not fitted.

Descending at 500ft/min through 4700ft RPS (1020mb), heading 325°(M) at 14DME from Gamston at 125kt, following "radar contact at 1nm" a formation of 3 low-wing white single engine ac was spotted climbing in a port turn less than 1nm away. No avoiding action was taken because the other ac were already seen to be turning away and they passed 300m to starboard climbing through his ac's altitude. He assessed the risk as "very high", but added that workload was a relevant factor as he had been momentarily looking forward for his destination. He opined that the formation would have been just below the horizon, had blended in with the surface background and had been on a line of constant relative bearing, thereby defeating visual detection earlier.

THE GROB TUTOR PILOT reports he was leading a formation of 3 Tutor ac, all crewed by QFIs instructing QFIs under training. The ac are coloured white but the red strobes were on. They were not in receipt of an ATS but squawking A2637 with Mode C on whilst operating VFR in VMC with nil cloud and excellent visibility, but they were flying into the sun.

Heading 270° about 4nm E of Newark at 95kt, with the formation of 3 Tutors in echelon starboard at FL50, he was flying as the No2 at that point when the leader broke away to port to execute a change of formation leader and a formation renumber was initiated. Whilst the former leader – now the No3 - was joining into 'vic', another white ac was spotted by him – now the formation leader - at L 10 o'clock about 2nm away, slightly low and into the sun. A gentle climbing L turn was initiated to avoid it and take his formation above and astern of the other ac which passed about ¾ nm away and 200ft below his formation. The other ac was in sight at all times and no risk of collision existed.

[UKAB Note (1): The UK AIP at ENR 5-2-2, promulgates the co-ordinates of the Lincolnshire AIAA, which is active Monday to Friday 0700–1600 from an altitude of 2500ft to FL180. Pilots transiting the area are advised to maintain constant vigilance and a LARS is available from Waddington, Cottesmore & Coningsby. Furthermore at remarks it warns of "Considerable military flying training including in addition to airfield let down procedures, exercises in stalling, spinning, aerobatics, steep turns and formation flying."]

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MIL ATC OPS reports that Waddington ZONE was working the DA40 inbound to Gamston at FL65 under a RIS. The primary and secondary radar equipment was serviceable but the Unit SATCO reports that the background traffic was unusually high since, following a period of inclement weather, this was a “good weather” day with visibility in excess of 50km. Additionally, SATCO reports that the Mode C on the Tutors was intermittent, possibly due to the manoeuvring of the formation. ZONE 1’s workload was reported as medium to high with 6 or more ac on frequency and numerous calls were made on RT and landline. During the period of this Airprox the ZONE operating position was being handed over from the offgoing controller – ZONE 1 – to the relief controller – ZONE 2.

At 1013:55, the DA40 pilot called ZONE 1 and requested “...Radar Information Service.” ZONE 1 issued a squawk and at 1014:56, transmitted “...identified, FL65, Radar Information” and the pilot acknowledged this call. At 1018:26, ZONE 1 called 2 tracks to the DA40, whose pilot reported visual with 1 of them, at some point after this was passed ZONE 1 commenced a handover to ZONE 2. At 1022:06, during the handover between controllers, the DA40 pilot requested “...descent down to 1500ft” and ZONE 1 responded “...set the Barnsley pressure 1015 descend report level 1500ft.” ZONE 1 completed the handover to ZONE 2 and at 1024:37, the relief controller ZONE 2 passed traffic information about the Tutor formation to the DA40 pilot “...traffic right 1 o’clock 1 mile manoeuvring indicating similar level.” The DA40 pilot replied “...it’s basically a near miss...they’ve just passed over and gone behind me” and declared his intention to file an Airprox. Between the time that the DA40 pilot requested descent and the time that the Tutors were called to him, ZONE 1 & 2 made a total of 9 other transmissions.

[UKAB Note (2): The Claxby Radar recording shows the DA40, squawking A3601 indicating FL65 Mode C, about ½nm S of Barkston Heath tracking NW. At the same time, the Tutor formation can be seen manoeuvring some 8nm away squawking A2637 indicating FL56 Mode C. At 1022:06, when ZONE 1 transmitted the descent instruction to the DA40 indicating FL66, the subject ac are 5nm apart with the Tutor formation indicating FL49 Mode C. At 1023:08 when, the DA40 is shown at the start of its descent through FL64, the Tutor formation indicates FL49 in a gentle climb some 1500ft below the DA40. At a range of 2nm the ac are 700ft apart as the formation climbs through FL52 and the DA40 slowly descends through FL59. At 1024:37, the ac are 1nm apart the DA40 descending through FL57 and the Tutors 200ft below indicating FL55. The Tutors commence a L turn at 1024:51 when the ac are ½nm apart with the DA40 through FL55 and the Tutors climbing 100ft above the former through FL56. The ac continue to converge until the CPA of 0.1nm which occurs at 1025:07 with the DA40 indicating FL54 and the Tutors indicating level at FL58; thereafter the ac returns diverge.]

At the point of the handover between the offgoing and relief controllers, ZONE 1 reports that the DA40 and the Tutors were 7nm apart; ZONE 1 also reports that the Tutor formation was pointed out to ZONE 2 and it was made clear that the DA40 had not been given traffic information about the formation. Since the Tutors were manoeuvring and ZONE reported that their Mode C was intermittent it is highly likely that they were not considered a direct threat at this time and consequently ZONE 1 did not call them. During the handover of a control position, the offgoing handing over controller is required to brief the oncoming relief controller on the traffic situation and it is clear that ZONE 1 did this. In addition the transfer of a control position cannot be completed until the relief controller signifies his or her acceptance of the control position, consequently ZONE 2 could have asked for traffic information to be passed by the offgoing controller before accepting responsibility for the position; it is likely that with the high level of background traffic, the intermittent Mode C and the flight profile of the Tutors that ZONE 2 elected to keep watching the situation and accept the control position. When the DA40 requested descent from ZONE 1 the radar recording shows that the two radar returns were 5nm apart and, although the Tutor formation was manoeuvring and had not steadied on to their westerly track at that time, they were indicating 1700ft below the DA40. With hindsight, this would have been the best time to pass traffic information to the DA40 pilot but, as the Tutors were performing a series of tight orbits and their Mode C was intermittent, it is possible that they were not deemed a direct threat at this point. When ZONE 2 took over the position with a busy workload it is likely that, by the time the controller’s scan had returned to the DA40, the Tutors had settled on to a westerly heading resulting in the very late traffic information from Zone 2.

HQ PTC comments that this appears to be a successful example of lookout over other preoccupations in Class G airspace. Despite being into sun and in the middle of a formation change, the Tutor pilots were able to acquire and avoid the Diamond DA40 without the benefit of a prompt from ATC.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Whilst it was clear to Members that the crux of this Airprox was predominantly an issue of look-out in the 'see & avoid' environment of Class G airspace, the event had occurred within the Lincolnshire AIAA where the UK AIP entreats pilots in transit to obtain a radar service because of the considerable military flying training that takes place in the Area. The DA40 pilot had wisely complied with this advice but had not necessarily benefited from it as much as he might have expected. The comprehensive Mil ATC Ops report had made it clear that the traffic information about the Grob formation, provided by ZONE 2 at a range of 1nm under the RIS that pertained and after the operating position was handed-over, could feasibly have been given earlier. As the DA40 pilot had not spotted the formation until this point, Members considered whether the traffic information was passed in sufficient time for the DA40 pilot to make good use of it. Some did not consider that it provided him with an effective warning about the Grob Tutor formation that was closing from his right hand side, unseen until that point. The ATC report noted that there was an opportunity for ZONE 1 to pass traffic information to the DA40 pilot before or even during the 'hand-over' and that it would have been wise to have done so at that stage (possibly when the DA40 pilot had requested descent and the formation was already only 5nm away some 1700ft below the DA40). Notwithstanding the caveats applicable in the application of a RIS, controller Members pointed out that the lesson here was that traffic information has to be passed in good time so that a pilot can thereby make use of it, enabling him to acquire the traffic visually in sufficient time to do something about it if an avoidance manoeuvre becomes necessary. It was accepted that the Claxby radar recording did not replicate what was displayed to the Waddington ZONE Controllers at the time. Notwithstanding the unit SATCO's comment that the Grob Tutor's Mode C indication was intermittent, the formation manoeuvres should have been evident to ZONE 1 and there was every possibility that the formation could turn into conflict with the DA40 whose descent had been approved by ZONE 1 – as subsequently occurred. Good practice would suggest it would be better to call the traffic in the first instance with relative position and range so at least the DA40 pilot could have been looking in the right direction for the 3 Grobs – and the controller could have updated the information if necessary when the Mode C data became clearer. Nevertheless, this was not done until ZONE 2 belatedly warned the DA40 pilot when the formation was only 1nm away which, Members suggested, was far too late.

This Airprox also held another important lesson insofar as pilots should not always expect ATC to be able to tell them about everything in the vicinity. Indeed, there might be many occasions when other higher priority traffic might legitimately prevent a radar controller from passing traffic information in a timely manner or it might not be displayed to a controller at all. A GA Member therefore emphasised the importance of an effective all-round lookout scan to detect other ac at an early stage. Members recognised that the Grob Tutor formation was there to be seen by the DA40 pilot in the good weather conditions that prevailed and who in this instance, whether forewarned with traffic information or not, was required to give way under the 'Rules of the Air'. Indeed good airmanship would suggest that pilots of single ac, when confronted with an unwieldy formation, would give it as wide a berth as practicable if circumstances allowed. But pilots can only accomplish that if the other ac is seen in good time: for whatever reason the DA40 pilot had not seen the formation ac until after the Grob Tutor leader had spotted the DA40 and was turning his formation to pass astern of the descending aeroplane. Consequently, some suggested that the cause might have been, effectively, a non-sighting by the DA40 pilot where the lack of earlier traffic information was a contributory factor. However, even without the benefit of an ATS the Grob Tutor QFI leader had complied with the mutual responsibility placed on him to 'see & avoid' other traffic.

A civilian pilot Member questioned the wisdom of the Grob Tutor formation pilots for not operating under an ATS. Furthermore, the Member suggested that if the Grob formation had been operating on the same frequency as the DA40 then the latter might have gleaned that the 3 ac were operating in the area from any transmissions on RT. However, it was recognised that there might be many occasions when ac operating in the same locale will not all necessarily be communicating with a single ATSU, even though that might be desirable. The PTC Member said on this point that he accepted that if it was practicable to conduct the flight whilst under an ATS the Command's pilots were advised to do so, but this was not always feasible. The STC pilot Member, who has several years of experience operating the Grob Tutor in the training environment, reinforced this point: in a busy VFR traffic scenario in an area such as the Lincolnshire AIAA, reliance solely on 'see & avoid' might be the best way of achieving the aim of the sortie efficiently. Although the Grob is fitted with both UHF & VHF which permits reception on both frequencies simultaneously, the added complication of listening to ATC and responding to traffic calls whilst talking to and leading the formation can divide attention away from the difficult task of instructing and might not always be practicable. The PTC Member agreed and added that the acceptance of an ATS under certain circumstances might be more counter productive than of true benefit. Others still remained sceptical but all these factors had to be weighed carefully and it was evident that in this situation the formation leader had spotted the DA40 from 2nm away and had managed to manoeuvre his formation above the descending DA40 thereby

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resolving the impending conflict. Consequently, the Board agreed that this Airprox had resulted from a confliction in the Lincolnshire AIAA that had been resolved by the Grob Tutor formation leader.

With 6 pairs of eyes all looking out from the Grobs, albeit that the formation leader was responsible for conflict resolution, whilst it might have been less than ideal in the good weather conditions that prevailed, the leader's sighting had enabled him to turn the formation and avoid the other aeroplane. The radar recording had shown that this manoeuvre had resulted in the formation passing over 200yd away from the DA40 at the closest point as the three formation ac climbed which, coupled with the DA40's steady descent, added some 400ft of vertical separation at the same time. Consequently, the Board agreed that the Grob leader's avoiding action in these circumstances had effectively removed the risk of a collision.

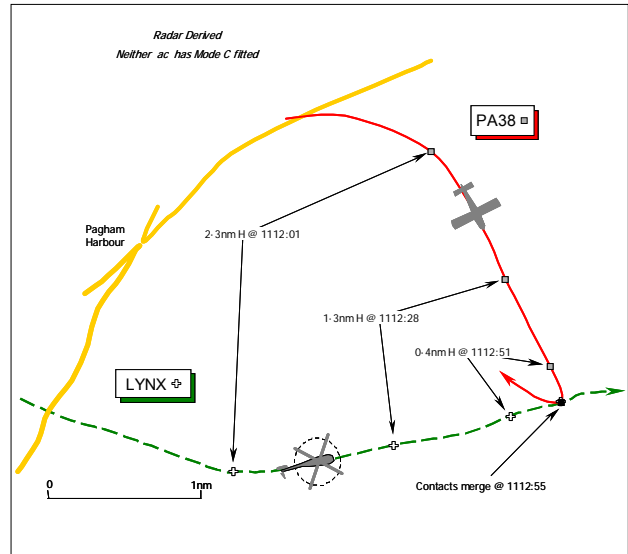
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in the Lincolnshire AIAA, resolved by the Grob Tutor formation leader.

Degree of Risk: C.

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Date/Time: 22 Nov 1112
Position: 5044N 00043W (2½nm NE of Selsey Bill)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Lynx HAS 3 PA38
Operator: CinC Fleet Civ Trg
Alt/FL: 3000ft NR
(1019mb) NR
Weather VMC Fog VMC NR
Visibility: 10km "fairly poor"
Reported Separation:
Nil V/100m H 200-300m H
Recorded Separation:
Contacts merged



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE WESTLAND LYNX HAS 3 PILOT reports his helicopter has a grey camouflage scheme and the anti-collision beacons were on, HISLs are not fitted. His flight-deck complement included a Flight Test Observer and they had departed from Fleetlands under VFR to conduct an engine air test in VMC, whilst in receipt of a FIS from Fleetlands TOWER on 135.7MHz. A squawk of A7000 was selected but neither Mode C nor a CWS is fitted.

Heading 090° some 2½nm NE of Selsey Bill at 90kt, flying level at 3000ft (1019mb), another ac was seen about 200m away "head to head", initiating a high AOB R turn. To avoid the other ac – a white single engine Light Ac (LA) with high 'T' tailplane - he also executed a rapid banked turn to the R as the LA passed about 100m away to port at the same level. Noting the difficulties of spotting a white ac against a light hazy background the LA may have been closing on a steady bearing, he thought, hence the late avoiding action turn by both pilots in otherwise good VMC. He assessed the risk as "high" and added that the cockpit workload was high.

THE PIPER PA38 TOMAHAWK PILOT reports his ac has a predominantly white colour scheme but the HISLs were on whilst conducting a VFR training flight from Shoreham in VMC. He was in communication with Shoreham APPROACH and squawking A7000; Mode C is not fitted.

Heading 275°, he thought, flying at 90kt off Pagham Harbour at an unreported altitude, he spotted the grey Lynx helicopter about ½nm away co-altitude. To avoid it he turned R and dived as the helicopter passed about 2-300m away to port at the same level with a medium risk of a collision. He added that it was a very misty day with fairly poor visibility.

ATSI reports that the PA38 took off at 1032 to depart to the W, flying under VFR. There were no further RT calls from the ac until 1141 when the pilot reported at Littlehampton to rejoin the cct. No mention was made on RT of any Airprox or close encounter with the Lynx helicopter.

UKAB Note (1): The Gatwick radar recording illustrates this Airprox quite clearly. The Lynx is shown coasting out (NMC fitted) just to the N of Selsey Bill, eastbound, as the PA38 (also NMC fitted), is shown in a wide R turn as it also coasts out. The two ac converge on a point about 2½ nm NE of Selsey Bill, and just before the contacts merge the PA38 is shown initiating a sharp R turn onto NW and indicative of the PA38 pilot's reported avoiding action turn. Nevertheless, the contacts merge at 1112:55. (The PA38 pilot is required by the Rules of the Air to give way in this situation.) Unfortunately, the absence of Mode C data prevents independent assessment the vertical separation that pertained.

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CinC FLEET comments that despite this being a clear cut case of a conflict in the open FIR the importance of a good look out no matter what the circumstances must be highlighted. Whilst recognising the need to conduct high workload sorties when engaged in flight test and evaluation, consideration must be given to aircraft safety especially in marginal weather conditions. Air Traffic Radar services are available in this area and the combination of reduced visibility and high cockpit workload (the crew of two were mid way through a period of avionics and engine vibration tests at the time of the incident) the option to call Solent Radar for a radar service would have provided an additional layer of safety compatible with the weather conditions and flight profile.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members were somewhat surprised that the Lynx crew was still in receipt of a FIS from their base at this range. A FIS from Goodwood - only some 6nm to the North – might have been more beneficial for the helicopter crew here, as they might have gleaned a better 'air picture' of the local GA traffic in the vicinity. Nevertheless, it seemed to some Members that the helicopter crew should have availed themselves of a radar service whilst engaged in the air test as it appeared that the high cockpit workload associated with an engine check test flight had focused the attention of the Lynx crew, diverting their eyes away from scanning ahead at the critical moment. The CinC FLEET Member explained that on completion of their air test the crew had continued with a navigational exercise and had indeed called Solent RADAR for a radar service which, the Member added, Fleetland's crews now also use routinely whilst engaged in air tests. Members agreed wholeheartedly that obtaining a radar service to supplement look-out seemed a wise precaution for such sorties. The STC Member observed that with the closure of Dunsfold ATC and the demise of the LARS in this area, no other ATSU had taken on this role which left a distinct "black hole" in the provision of ATC services at the lower altitudes outwith Solent Radar's coverage from Southampton.

It was evident from the reports provided that the crux of this Airprox was one of lookout for both of these acs' pilots in the 'see and avoid' environment of the Open FIR. The Board noted the absence of HISLs fitted to the Lynx and were concerned that even now this military helicopter was not provisioned with this indispensable aid to visual conspicuity. Furthermore, the Board noted the lack of any collision warning system (CWS) onboard the Lynx helicopter. The recently-concluded PTC TCAS trial had proved so effective in similar scenarios to this incident, attesting to the desirability of a CWS to supplement lookout scan. (Indeed, many police and pipeline helicopters which operate at the lower altitudes were now fitted with an ACAS I). In this situation it was indeed fortunate that the PA38 pilot had detected the grey helicopter against the background of the seascape at a range of ½nm, which a fast jet aircrew Member thought was commendable in the circumstances. In this crossing situation the PA38 pilot was required to give way under the 'Rules of the Air', but the 'Rules' can only work if pilots have spotted the other ac in time to afford appropriate separation. Fortunately, the PA38 pilot had spotted the helicopter a little earlier than the Lynx crew had seen his predominantly white coloured ac. Although the PA38 pilot had reported he was heading W at the time of the Airprox this did not appear to be the case. The radar recording had shown that the PA38 had been tracking in a SSE'ly direction almost perpendicular to the helicopter's course but it might have been that the PA38 pilot had just steadied on a westbound course when he spotted the helicopter, whereupon he had turned R to avoid it. This SSE'ly course coupled with the relative velocities of these ac had kept them on a constant relative bearing, thereby defeating visual detection and masking the PA38's presence from the Lynx crew until the last moment when they spotted the LA 200m away. The Board concluded unanimously that a late sighting by the PA38 pilot and a very late sighting by the Lynx crew had caused this Airprox.

Regarding the inherent risk, it was not feasible to determine with absolute certainty the vertical separation that pertained here because of the absence of Mode C data from both ac. Both pilots reports agreed that the other ac was at the same altitude however. Nonetheless, the radar recording had confirmed that the respective tracks had merged exactly in azimuth, attesting to the close proximity of the encounter. The PA38 pilot had spotted the helicopter in time to turn and dive his ac, reporting that the helicopter passed 200-300m away and thereby averting an actual collision. Similarly, the Lynx pilot was also able to take very robust action just in time, managing to alter the ac's flightpath sufficiently to afford 100m horizontal separation, he reported. The Board concluded, therefore, that the safety of the ac involved had certainly been compromised in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by the PA38 pilot and a very late sighting by the Lynx crew.

Degree of Risk: B.

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Date/Time: 18 Nov 0902

Position: 5301N 00007W (10nm S Coningsby)

Airspace: Lincolnshire AIAA (Class: G)

Reporting Ac Reported Ac

Type: KC135 Tornado F3

Operator: Foreign Mil HQ STC

Alt/FL: FL175 FL180

Weather: IMC IMC

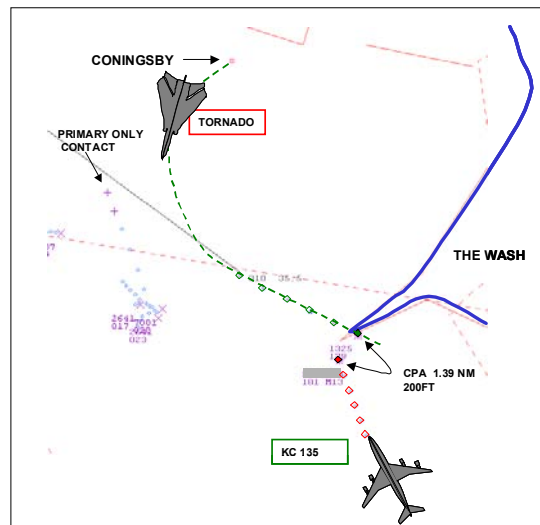
Visibility: NR NIL

Reported Separation:

200ft V/1/2nm H 1000ft V/4nm H

Recorded Separation:

200ftV/1.39nm (after Tornado had passed through the KC135's 12 o'clock at a range of 2.4nm)



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE KC135 PILOT reports flying a grey ac on an AAR sortie from Mildenhall squawking as directed with Mode C in receipt of a RIS from London Military Radar. They were heading N inbound CGY at 340kt in an en-route climb passing FL175 and cleared to FL210 by London Mil. Climbing through FL170 they received a yellow TCAS contact indicating approximately 700 to 800ft below them; the intruder ac quickly turned to a red square Resolution Advisory (RA). Since they were in a climb with the intruder below them they continued climbing until the TCAS directed a 'descend' and an 'increase descent'. The crew immediately pushed over to a rapid descent. They thought that the other ac was climbing below them and London Mil informed them that the ac had been conducting PIs with another ac and had accidentally locked on to them.

THE TORNADO F3 PILOT reports flying a grey Tornado F3 ac on an operational QRA scramble under a RAS from Coningsby Departures (DEP), heading 150° at 450kt under combat power. He was given an avoiding action turn then a further avoiding action of 'stop climb at FL140'. As he was already level at FL170 and had the conflicting traffic on AI radar at a range of 8nm at the same height, he continued the climb to FL180 and levelled, informing ATC. They then saw that the conflicting contact was continuing to climb from FL170 to FL180 so they made a sharp descent back to FL170, while also taking lateral separation on the traffic. With at least 1000ft of vertical separation and approximately 4nm lateral separation, AI radar contact was broken and a clear flight path assumed. He considered that there had not been any risk of collision and none was identified to him by ATC.

THE TORNADO STATION comments that the SFSO discussed the incident with the crew and analysed the ac video and cockpit voice recording. The pilot stated that the Tornado was departing Coningsby receiving a RAS from Coningsby DEP and was given avoiding action onto 120°. Shortly afterwards, further avoiding action was given to stop climb at FL140 on different traffic, SE 8nm tracking NW indicating FL170 climbing. From the ac video recording, this message was received as the ac was passing FL160 in a combat power climb. On levelling, radar contact on the traffic was gained right of the nose at 7nm. Radar lock was established at 30° right at 5nm with an accurate indicated height of 17100ft. The Tornado continued climb to FL180 to gain separation. It was then observed that the traffic was climbing to a similar level and the Tornado began a descent to FL170. The conflicting traffic was last seen 60° right of the nose at 2nm at FL180 indicating a lateral separation of 2nm, before the traffic went out of radar scan. Confident that separation had been achieved, the Tornado maintained heading and level and requested handover to Boulmer, which was already being negotiated by ATC.

MIL ATC OPS reports that the RT recordings at Coningsby were found to be 1min 50 sec fast so they were adjusted to UTC.

The KC135 was under a RIS from LATCC (Mil) Controller 13 (CON 13) climbing to FL210, northbound out of Mildenhall. At 0901:15, CON 13 transmitted "traffic 12 o'clock, 5 miles, right left indicating FL160". The KC135

crew responded "got him on TCAS, sir, negative visual". At 0901:45 CON 13 added "...in fact he's climbing..just passing your 12 o'clock at er 4 miles right left". At 0902:15 the KC135 reported a TCAS descent and shortly afterwards reported "we are at 180 now...and sir we are resuming climb" the crew later informed CON 13 that an Airprox would be filed. Simultaneously, an F3 contacted APP on climbout from Coningsby at 0900:16, requesting RAS. APP identified the F3, applied a RAS at 0900:20 and placed the ac under "own navigation, climb FL170". At 0901:07 APP passed "F3 C/S..avoiding action turn left heading 120, traffic was right one o'clock 6 miles tracking down your right hand side no height information." The F3 crew acknowledged taking the turn at 0901:18. Further avoiding action was passed by APP at 0901:30 "F3 C/S...further avoiding action stop climb FL130, further traffic was SE, 8 miles, tracking NW indicating FL170 in the climb". The F3 crew reported that they were already at FL170 and 4sec later the crew reported "weapons contact with that traffic". [weapons contact in a term widely used by fighter aircrew which means radar contact on the ac radar] APP responded with "C/S.. roger, own navigation with that traffic in contact". At 0901:55 the F3 reported "own navigation, C/S, climbing FL180". This was acknowledged by APP. At 0902:00 the F3 crew called "disregard descending FL170". APP initiated a handover to Boulmer at 0902:10.

Radar analysis of the Claxby Radar shows the F3 climbing out of Coningsby, at 0900:38, tracking 170°, indicating FL046C. The KC135 is 23nm SSE of Coningsby, tracking 340° indicating FL146 Mode C climbing. At 0900:58 the Mode A and C disappear from the F3; the Mode A returns after one sweep and the Mode C after 2 sweeps. At 0901:05 the F3 is seen to initiate a left turn to track 120°. The KC135 is in the F3's right one o'clock 12nm, crossing right/left indicating FL164. The contacts continue to converge and at 0901:36 the F3 is tracking 120° whilst indicating FL174 climbing with the KC135 in its right 2 o'clock, 6nm, indicating FL176. At 0901:45 the F3's Mode C disappears for one sweep. At 0901:53 with the F3's Mode C indicating FL181, the KC135 is in the F3's right 2 o'clock, 2.5nm crossing right left with Mode C FL 183 climbing. The F3 passes ahead of the KC135 and at 0902:00 the F3 is in the KC135's right 2 o'clock, 1.33nm, indicating Mode C FL178 whilst the KC135 is seen to descend to indicate Mode C FL180. From this point the contacts continue to diverge.

APP describes his workload at the time of the Airprox as high/medium intensity due to Approach being bandboxed with Director (DIR) and Departures (DEPS). APP was manned in a mentor/trainee team combination. The APP/DIR trainee was a fully qualified DEPS controller and had the traffic intensity risen to an unacceptable level then the controllers would have spilt back to individual consoles. APP was working 2 ac with associated landline calls. The F3 had been released on an Air Defence Priority Flight (ADPF) onto a heading of 180° and climbing to FL170. APP identified the F3 and applied a RAS: however, the F3's Mode C could not be verified due to the high rate of climb demonstrated by the ac resulting in spurious Mode C readouts. APP gave an avoiding action turn against non-squawking conflicting ac onto a heading of 120° which put the F3 into a lateral confliction with the KC135: however, APP opined that a further avoiding action turn was not appropriate due to other conflicting traffic and the proximity of Holbeach and Wainfleet Ranges, which were both active with multiple fast jets. APP attempted to apply a stop off level of FL130 to achieve vertical separation but the pilot reported that the F3 was already levelled at FL170 but that the crew did have "weapons contact" with the conflicting traffic. APP released the F3 crew under their own navigation with the stipulation "with that traffic in contact". The F3 crew acknowledged the release under their own navigation and reported climbing to FL180. Five sec later the F3 crew reported they were descending back to FL170 but no mention was made of the conflicting traffic. The phrase "weapons contact" is not recognised military ATC phraseology. Military aircrew should not rely on cockpit radar for flight safety purposes and as such mil controllers are not to assume that aircrew are capable of maintaining separation against the conflicting traffic regardless of having "weapons contact". The F3 was handed over to Boulmer without incident.

The KC135 was climbing out of Mildenhall northbound in the climb to FL210 under a RIS from CON 13 at LATCC(Mil). RT communication between CON 13 and the KC135 was poor and the controller on several occasions had to transmit messages 2 or 3 times before good 2-way communication was established. TI was successfully passed, after 3 attempts, to the KC135 crew on "traffic 12 o'clock, 5 miles, right left indicating FL160" although this TI was inaccurate as the traffic was actually crossing left/right: the KC135 crew reported "got him on TCAS sir, negative visual". Thirty sec later further TI was added "in fact he's climbing...just passing your 12 o'clock at er 4 miles right/left". A further 30sec later the KC135 crew reported taking a TCAS descent against the conflicting traffic. It is considered that CON 13 correctly applied RIS to the KC135 and although the TI passed was inaccurate regarding the crossing profile of the conflicting traffic, it is not believed that this had a bearing on this Airprox. In addition, although LATCC(Mil) had been informed earlier that a possible ADPF flight might be getting airborne from Coningsby, no verification of the ac getting airborne had been received by LATCC(Mil) Tactical Supervisor and thus the controller was not aware that the F3 had ADPF status.

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UKAB Note (1): The Tornado F3 was displaying an ADPF squawk.

HQ 3AF comments that this Airprox contains 2 elements common to many others, namely a large TCAS equipped ac against a non-TCAS equipped fighter and bandboxed control positions. The KC-135 crew, who were technically IMC, did not know that the F3 pilot was aware of their presence and moreover, taking their own avoiding action based on AI radar. In addition, it seems that RAS could have been applied more effectively to the Tornado F3. The point made by Mil ATC Ops over the phrase "weapons contact" is agreed. CON 13 appeared to be unaware of the significance of an ADPF squawk, early knowledge of which may have assisted the KC135 and resulted in less violent avoiding action.

HQ STC comments that the F3 crew were correct to report that they had radar contact with the conflicting ac to ATC, however, the phrase "weapons contact" was a term more generally used with Fighter Controllers. The assumption by the controller that it would be safe for the F3 to continue "own navigation with that traffic in contact" was flawed. Most fighter radars are capable of tracking multiple targets with systems such as the Tornado F3's Track While Scan. However the scan volumes employed cannot guarantee the detection of all traffic; therefore, it cannot be used for safely separating the F3 from all ac in IMC. Furthermore, the F3 was locked (or in single target track) to the KC135 so no other ac tracks would have detected or updated; therefore, they definitely cannot safely navigate whilst maintaining situational awareness and separation from all traffic in IMC.

The issue that LATCC (Mil) was unaware that the F3 had Air Defence Priority Flight (ADPF) status shows the poor communication of both intent and also the likely flight profile of the F3. The Tower would have had this information prior to scramble through the telebrief system (a secure hardwired comms system). Also, the Fighter Control Master Controller would have been able to promulgate this information to LATCC. Furthermore, the Tornado is clearly using an ADPF squawk in accordance with the UK Civ AIP at ENR 1.6.2. and is apparent on the radar recordings.

On commenting on the Tornado's actions, they were reacting in an appropriate fashion expected of them with this very high priority tasking. The performance climb and the expectation of the crew that other IMC air users will be cleared out of their way would have been at the forefront of their minds. That said, they did take appropriate action in avoiding the KC135 by descending and levelling off below the tanker's level. There would seem to have been little chance of collision as the Tornado was aware of the KC135 and could outmanoeuvre it easily. Of more concern is that the TCAS' non-cooperative RA (F3 is not TCAS II equipped) would seem to have given a descent to the KC135 when the F3 crew had also decided to descend to FL170. This was probably enunciated when the F3 was level to slightly above the KC135 but the F3 had seen the KC135 climbing and decided to descend below. In this particular occurrence the RA would seem to have made the CPA closer than it needed to be by the simple fact that non-cooperative RA advice had been given without coordinating with the human flying the F3.

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.

In order to give a broader understanding of the circumstances of the Tornado mission, a Military Member briefed the Board in confidence.

Both aircrew and controller Members considered it lamentable that the Tornado had not been afforded the priority required to conduct its important mission. A senior ex Military Controller suggested that ADPF status should, as far as is possible, open a clear path from a fighter to its target. Although HQ STC did not offer details it would seem that there was an internal breakdown in information flow that resulted in several key personnel not being aware that the flight had ADPF status and this, in turn, resulted in no such priority being given. Members accepted that this deficiency would undoubtedly have caused the Tornado crew great frustration as they believed that they were engaged on an exceptionally important operational mission yet they were being deconflicted from other routine flights rather than vice versa. Specialist Members considered that the London Mil Controller should have recognised the squawk, despite not receiving verbal notification, as that of an ADPF ac and, if in doubt, he should at the least have questioned it. It was accepted, however, that it may not have been possible to do this in the short time available and thus allow the KC135 commander to be given more information or a vector to keep it clear of the immediate area.

Specialists considered that there had been a lack of appreciation and anticipation by Coningsby ATC of the required priority and the high performance departure, about 450kt and 10000fpm ROC. Members noted that Coningsby APP reported his workload as being high. Had the Supervisor anticipated the importance and requirements of the flight, he may have considered splitting the 3 radar positions thereby affording the Tornado an experienced and dedicated (DEP) controller and also reducing the overall workload.

The Board is always concerned when a pilot under a radar service is forced to effect his own avoidance due to lack of adequate control or information; this incident was no exception. It was, however, unfortunate that the well intentioned avoidance taken by the (TCAS non-cooperative) Tornado crew had caused the KC135 to get first a Climb RA which changed to a Descend RA as the Tornado manoeuvred to maintain safe separation. Although the Board accepted the Mil ATC Ops and STC comments on the inadvisability and serious limitations of using the Tornado AI radar as a means of collision avoidance, the pilot had found himself in a situation where he knew from that same radar that he was in conflict with another ac 8nm away (about 30sec at their closing speed) and closing very rapidly so he had to take some action. Had he asked the controller rather than taking his own avoidance, this would perhaps have prevented an RA and a most uncomfortable 'rapid descent' from the KC135. In this incident, prompt and appropriate reaction to the TCAS RA(s) by the KC135 pilot prevented there being any risk that the ac would have collided.

Members were informed that, while not being standard ATC phraseology, the phrase 'Weapon Contact' is NATO standard and is widely used by fighter crews. Use of the phrase does not however imply the pilot is visual or has accepted any responsibility for collision avoidance. HQ3Gp have publicised this to military ATC personnel.

Such interception missions are vital to the security of the Nation and it is most important that all supporting services are aware of this and afford them the priority they require. The Board was disappointed that in this particular instance this had not been the case and ineffective military command, control and coordination had resulted in hindrance to the execution of the mission.

PART C: ASSESSMENT OF CAUSE AND RISK

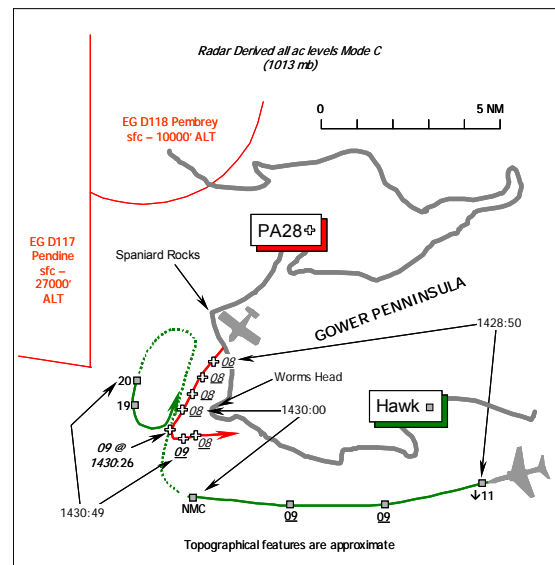
Cause: Coningsby APP was unable to achieve the separation required by a RAS, compounded by the avoiding action of the Tornado crew.

Degree of Risk: C.

AIRPROX REPORT No 221/04

AIRPROX REPORT NO 221/04

Date/Time: 25 Nov 1430
Position: 5133N 00420W (1½nm SW of Worms Head - Gower Peninsula)
Airspace: UKDLFS/FIR (Class: G)
Reporting Ac Reported Ac
Type: Hawk T Mk1W PA28
Operator: HQ PTC Civ Trng
Alt/FL: 1000ft 1300ft
(QFE 1020mb) (QNH)
Weather VMC CLBC VMC Haze
Visibility: 8km 5-7km
Reported Separation:
150ft V/100yd H 300ft V/300m H
Recorded Separation:
Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE HAWK T MK1 W PILOT reports that he was the rear seat Qualified Weapons Instructor (QWI) for this sortie and provided a comprehensive and laudably frank account. His ac has a black colour-scheme and the HISLs were on whilst commencing an ab-initio instructional range detail with a student at Pembrey Air Weapons Range (AWR) with the aim of teaching the student level bombing techniques. The letdown to low level in the vicinity of Mumbles Head in transit to the range with Cardiff RADAR was uneventful and the weather allowed them to switch en-route in VMC passing about 3000ft agl. After informing Cardiff RADAR that they were VMC and terminating the radar service, the controller advised them that there was no [known] traffic ahead to affect them. The pre-range checks were completed heading W from Mumbles Head and at approximately 5 miles to the SE of Worms Head, he took control of the ac from his student to fly the range join at 400kt. They made their first call on UHF 'Range Primary' overhead Worms Head: thus they were operating under a FIS from Pembrey, whilst squawking A7002 [the Danger Areas' general conspicuity squawk] with Mode C. Neither TCAS nor any other form of CWS is fitted. Just after leaving Worms Head heading 360°, flying level at exactly 1000ft Pembrey QFE he felt the stick "twitch" in his hand. Just as he asked the student whether he had made the input, the stick was forcefully moved forward by the student to avoid a near collision with a light ac (LA), which the student had spotted. As his ac bunted, he caught a glimpse of a LA that he had not seen until this point, as it passed about 100yd close down the starboard side and 150ft above his jet, with a "high" risk of a collision. In his opinion, had the student not overridden his control and taken avoiding action, they might possibly have struck or passed dangerously close to the LA. He filed an Airprox report with the Pembrey Range Control Officer (RCO) on RT. At the time of the Airprox he was flying in VMC, some 700ft clear below cloud where the visibility was 8km. During the subsequent debrief, the student informed him that on sighting the LA about 600yd away, he had no time to warn of its presence and took control out of necessity.

THE PA28-181 PILOT reports he was conducting a training flight from Swansea around the Western Gower in his brown and cream coloured ac, returning back to Swansea. He was in communication with Swansea APPROACH who was affording a "full ATC service", he thought. A squawk of A7000 was selected with Mode C on. No TCAS is fitted.

Flying in VMC, level at 1300ft Swansea QNH with no cloud and an in-flight visibility of 5-7km, southbound at 105kt he spotted the black Hawk jet about 1½nm away as it approached on a reciprocal heading. No avoiding action was taken – he opined because they were not going to collide – and the Hawk passed some 300m down the starboard side about 300ft below his ac. He assessed the risk of a collision as "low".

Questioning whether it was sensible for the Hawk to be flying at a speed of 400kt, and why the jet was not fitted with TCAS, he suggested that the Hawk crew could have called Swansea APP and got traffic information about

his flight. Furthermore, he said “if the RAF want to use this as a regular route perhaps this could be communicated to the local airfields.”

UKAB Note (1) The Meteorological Office do not record the Swansea aerodrome data within their archives, but their analysis of the relevant charts indicates the Swansea QNH would have been about 1021mb.

THE HAWK PILOT'S STATION comments that this Airprox occurred just prior to entering Pembrey Range, on a well-used entry route in Class G airspace. It serves as a reminder as to how important it is for all members of the crew to stay alert and, if the circumstances dictate, take positive action. Subsequent to this Airprox the squadron commander has arranged for the QWI to visit Swansea Flying Club, whereby the instructor pilot can inform them of the normal routes used around the S Wales coast and the Club will be given the opportunity to reciprocate, with the intention of engaging them in a 2-way education process.

UKAB Note (2): This Airprox is not shown on radar recordings. However, the Burrington Radar recording does show the Hawk westbound from abeam Mumbles Head, descending to 900ft Mode C (1013mb) over the Bristol Channel routeing clockwise around the Gower Peninsula. Meanwhile the PA28 is shown coasting out on a SW'ly track between Worms Head and Spaniard Rocks indicating 800ft Mode C (1013mb). Radar contact on the Hawk is lost after 1430:00, and the jet is not shown again until after the encounter, but an indication of the possible ac track is shown on the diagram. It would appear that the Hawk turned R inbound to the range as reported, whence the crew would have encountered the PA28 indicating some 8-900ft Mode C; given a local QNH of about 1021mb this would equate to an altitude of approximately 1040-1140ft amsl. The Airprox probably occurred just before the PA28 turned L eastbound whence the LA is shown to have climbed to 900ft Mode C (1013mb) in the turn at 1430:26. The Hawk is not shown again until 1430:49, after the incident, turning L about off Worms Head back toward the Range descending from 2000ft Mode C.

HQ 1 GP RANGES, the STC authority responsible for AWRs, comments that there is little that can be added from their perspective. The Hawk pilot was positioning to enter the Pembrey Sands AWR and was operating in Class G airspace. Although in RT contact with the AWR, the range operates with no radar and therefore could not offer the Hawk a radar service. The conflicting ac was not in contact with the AWR and, therefore, the AWR had no knowledge of its presence.

UKAB Note (3): The UK AIP at ENR 5-1-3-7 notifies EG D118 Pembrey as extending from the surface to an altitude of 10000ft amsl within the promulgated co-ordinates and active 0900–1700 Mon - Thur. A DAAIS is available from PEMBREY RANGE on 122.75MHz. The reference also includes at *Remarks*: “*Caution: Associated aircraft operations outside area boundary*”. Furthermore, the AIP entry notes that ac operating in these areas are unable to comply with Rule 17 of the Rules of the Air.

HQ PTC comments that both this & Airprox 172/04 involved the same Hawk pilot flying the same ac types and occurred, in each case, while the Hawk was positioning to join Pembrey Range. In the case of 172/04 each pilot took appropriate avoiding action away from the other. Whereas, in this case the Hawk student pilot took control to take avoiding action but the PA28 pilot did not deem it necessary. Both were seen as bearing a significant risk. Whilst these are strictly VFR encounters in Class G airspace, a student pilot's workload at this stage of a weapons sortie is such that he does not need such an unsettling complication. We are pleased that Valley has agreed to visit Swansea Flying Club to brief them and seek their co-operation in remaining clear of the area.

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 AWR and ac operating authorities. Two Airprox had occurred in this locale within the space of several months: this and 172/04. Fortunately circumstances permitted their assessment concurrently by the Board: much of the discussion was relevant to both incidents and has therefore been included here.

Although the PA28 pilot had reported that Swansea ATC was providing a “full ATC service”, Members recognised that in a non-radar environment Swansea APPROACH was able to offer little more than a FIS to this VFR flight in Class G airspace. In all probability this would not have resulted in any form of specific warning to the PA28 pilot about the Pembrey Range traffic. Indeed Swansea ATSU has recently (from 5 Jan 2005) been downgraded from an Aerodrome Control service to an Air/Ground Station and the Approach Control service withdrawn. Conversely, radio contact with Pembrey Range DAAIS might have elicited some earlier warning for the PA28 pilot about the

AIRPROX REPORT No 221/04

Hawk ac operating into, and in the vicinity of, the AWR thereby enabling the RCO also to potentially warn the Hawk's QWI of the presence of the PA28. The Board welcomed the proactive stance taken by Valley to visit the local GA flying community at Swansea - anything that can be done to improve the general awareness of each other's flying activities might engender improved flight safety in the congested lower airspace and was to be welcomed. The PTC Member opined that the Swansea Flying Club already had some information displayed about the range activities at Pembrey. Nevertheless, a civilian Member questioned how other non-Swansea based civilian pilots could find out about the Pembrey range patterns commonly in use. Whilst he recognised that general warnings had been included in the AIP about the military pilots' inability to comply with the normal requirement of the Rules of the Air when operating in the vicinity of the AWR, he was concerned that this information was not readily available to the rest of the GA community. Military aircrew Members pointed out that although the range patterns are rigidly adhered to (and similar in some respects to aerodrome ccts) the actual patterns flown were specific to each ac type, the nature of the munitions in use, the delivery technique being practiced and the speed of the ac, so it was difficult to be precise about the whole gamut of possible permutations - far better to obtain information from the DAAIS itself who can then also pass on information to those pilots operating on the range. It was stressed that most AWR patterns will extend outside the actual Range co-ordinates, but another GA Member said that, in his opinion, the information in the relevant AIPs was sufficient. Nevertheless, he also echoed the importance of calling the DAAIS itself and the usefulness of the information, which was provided solely for the benefit of non-participating pilots transiting the vicinity. The PA28 pilot had questioned why the Hawk trainer was not fitted with TCAS. The Board has long been an advocate of the fitment of collision warning systems. Previously the Board had been briefed that PTC had conducted a trial fitment of a Tucano with ACAS 1 and it was in similar scenarios to this incident - a head-on closing geometry - that the trial fitment had proved so effective. Indeed 30sec warning had been achieved, which attested to the desirability of a collision warning system to supplement lookout scan. The Board wholeheartedly endorsed the acquisition of such equipment to assist military pilots and its use here might well have averted this Airprox.

Turning to the specifics of this incident, the PA28 pilot had spotted the black Hawk jet 1½nm away as it approached from the S. Possibly here the jet's colour-scheme and the larger aspect presented by the inbound R turn through the IP at Worms Head had aided visual detection of this small black ac as it tracked from L - R in the turn. Nevertheless, this was a good spot by the PA28 pilot, who clearly was not able to manoeuvre as rapidly as the Hawk pilot in his nimble jet. The PA28 pilot was apparently content with the horizontal separation and did not deem it necessary to avoid the Hawk or turn to effect greater separation which he assessed was 300m. This was significantly more than that reported by the Hawk QWI who had only glimpsed the LA as it passed by 100yd away to starboard. Unfortunately, although the PA28's Mode C was shown here (unlike Airprox 172/04 where the PA28 had not been shown at all), both ac were not shown on the radar recording at the critical moment so it was impossible to reconcile the anomaly of the horizontal separation. Whereas, the PA28's indicated level (equating to about 1040-1140ft amsl 1021mb) just before the encounter and the Hawk pilot's reported height (equating to about 1030ft amsl 1021mb) suggested that they were extremely close and almost co-altitude in the vertical plane. However, it was apparent that this fleeting encounter had been over extremely quickly as the student pilot had not even had time to warn his instructor when he spotted the PA28 and bunted the jet. It was fortunate that he had done so, according to his instructor's very comprehensive account, and in the Board's view it appeared that he had acted out of bare necessity. The Members commended the student pilot for taking control in this tricky situation and the Board concluded unanimously that this Airprox was the result of a conflict in Class G airspace which had been resolved by the Hawk student pilot. The received wisdom from this Airprox was the very same as that from 172/04 - in the see and avoid environment of the 'Open FIR' never assume that the other pilot has seen your ac - because here the Hawk student pilot had seen the LA a lot later than the latter's pilot.

The PTC Member, who echoed the Hawk pilot's acute concern, reaffirmed the seriousness of this situation. Nevertheless, the student pilot had evidently seen the LA in time to do something about it, which effectively removed the actual risk of a collision. However, the Board agreed unanimously that the safety of the ac involved had not been assured.

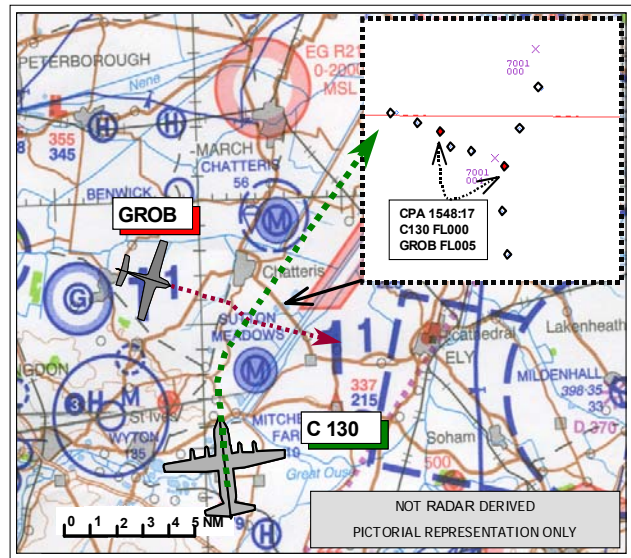
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: B.

AIRPROX REPORT NO 222/04

Date/Time: 25 Nov 1548
Position: 5225N 00005E (S of Chatteris)
Airspace: UKDLFS (Class: G)
Reporting Ac Reported Ac
Type: C130J Grob Tutor
Operator: HQ STC HQ PTC
Alt/FL: 250ft agl 500ft agl
(Rad Alt)
Weather VMC HAZE VMC below
HAZE
Visibility: NR 6-7km
Reported Separation:
300ft V/1/2nm H 300ft V/>1/2 nm H
Recorded Separation:
500ft V/0.6nm H

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

THE C130J PILOT reports flying a tactical para-dropping sortie initially at 210kt and 250ft, with HISLS on and in receipt of a FIS from Marham APP, squawking 7001 with Mode C. Following an uneventful departure from Wattisham Airfield at 1530, a low-level route was followed for 40min leading to a para drop at Frog Hill DZ at 1610Z. Prior to approaching a turning point to route NE, TCAS traffic was observed at 300ft above their height flying towards their ac but no ac was seen visually. After turning onto a heading of 038°, still at 250ft agl, the other ac was seen on TCAS to continue flying towards them still maintaining the 300ft height separation. Just S of Chatteris, TCAS gave a TA alert and indicated that the ac was descending towards them. Visual contact was gained with the ac at 1.5-1nm and they initiated a level right break to avoid it. The single engine ac was then seen to be in a right turn to pass behind them but was also thought to be descending. At this stage they were extremely close to another para drop site and a Low Level avoidance area: however, they regained track without entering any restricted airspace or avoidances and tried to file an Airprox with Marham APP on UHF. Due to communication problems, confirmation that Marham had received their radio call was not gained until about 10 minutes later on VHF.

THE GROB TUTOR PILOT provided a very brief report stating that he was flying a low-level Continuation Training sortie at 500ft agl, solo in a white ac with HISLS, nav lights and landing lights on and squawking 7001 with Mode C. While heading 110° at 120kt 2nm S of Chatteris he saw the strobes of a grey C130 ac, which had blended in with the background, at a distance of 1-1/2nm. He avoided it by executing a climbing right turn to go behind it.

MIL ATC OPS reports the C130 was in intermittent RT contact with Marham; in addition the ac only painted occasionally on their radar so no service was provided.

THE C130 STATION comments that this incident proves the value of TCAS especially in its plan form display that allows contacts to be detected at some distance from the host ac. In this case the C130 crew were aware of the other ac even when it was some 10nm away and monitored the situation carefully. On visual sighting of the other ac avoiding action was initiated and neither pilot assessed there to have been a risk of collision. In sum, this incident was a reminder to all of the value of good lookout and that TCAS is an excellent aid to situational awareness.

THE GROB STATION commented that despite the proximity of the C130, the Tutor pilot continuously had it in sight and a collision was most unlikely.

HQ STC comments that the C130 pilot was entirely correct to react to the TA from the TCAS through visual acquisition. All crews flying ac equipped with TCAS II should use this incident to remind themselves that RAs will

AIRPROX REPORT No 222/04

not occur below 900ft AGL descending and 1100ft AGL ascending and that visual acquisition is essential for safe avoidance manoeuvres with TCAS TAs below 1000ft AGL. However, inaccuracies in the horizontal display means that the information cannot be relied upon (in error by up to 30°) and that the displayed vertical separation is the only data that should be reacted to with sole reference to TCAS. STC Flight Safety recently distributed guidance on this subject, contained in a newsletter from Eurocontrol, to all RAF TCAS II users. Further work is ongoing with reference to guidance for RAF crews utilising TCAS II in the low-level and visual circuit environment.

HQ PTC comments that this was a routine encounter in the UKLFS where both ac were able to see and avoid the other reasonably comfortably. The utility of TCAS, even at low-level, in maintaining awareness of other traffic is encouraging. HQ PTC would wish to contribute to the STC development of guidance for its use in this environment.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Although this had been a routine encounter in the FIR at low-level it was unique in that the C130 crew had first been alerted to the presence of the Grob, well in advance of any conflict, by TCAS(II). Whilst not operating in the flight regime for which it was envisaged, it did, in this case, prove its worth by alerting the C130 pilots to the Grob and facilitating early visual acquisition in poor visibility. It was also noteworthy that the Grob pilot first acquired the grey C130 in the same poor visibility from its HISL. In this incident, two items of safety equipment relatively recently introduced into military ac allowed visual acquisition of the opposing ac early enough to allow the pilots to take effective avoiding action thus preventing there being any risk that the ac would have collided.

It was observed by a Member that had both ac been operating on the same frequency (Lakenheath was ideally situated), the pilots might have had even earlier notification of each other's presence.

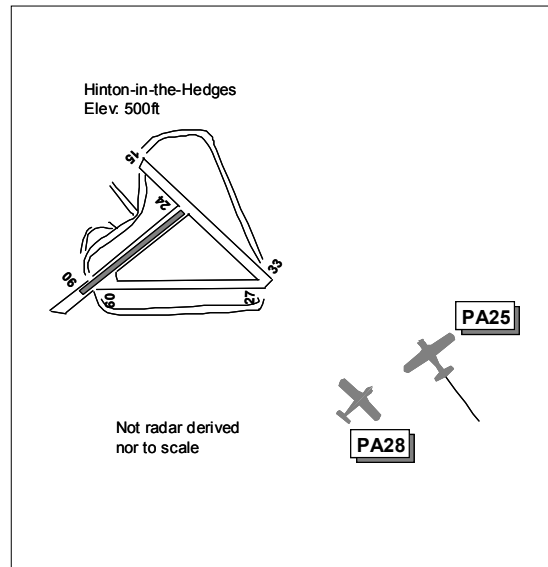
PART C: ASSESSMENT OF CAUSE AND RISK

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

Degree of Risk: C.

AIRPROX REPORT NO 223/04

Date/Time: 27 Nov 1410 (Saturday)
Position: 5201N 00111W (1nm SE Hinton-in-the-Hedges - elev 500ft)
Airspace: LFIR (Class: G)
Reporting Ac Reported Ac
Type: PA28 PA25
Operator: Civ Pte Civ Club
Alt/FL: 1500ft NK
(QNH 1021mb) (N/K)
Weather VMC CLBC VMC CLBC
Visibility: 40km 5nm
Reported Separation:
50-100ft not seen
Recorded Separation:
NR

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

THE PA28 PILOT reports joining the LH cct at Hinton-in-the-Hedges to land on RW24 and making RT calls to Hinton 'Traffic' on the promulgated frequency of 119.45MHz squawking 7000 with Mode C. The visibility was 40km below cloud in VMC and the ac was coloured blue with strobe lights switched on. He had joined on the downwind leg heading 060° at 100kt and 1500ft QNH 1021mb (1000ft agl) and was No2 behind a Rockwell 114 ahead. He was also aware that a 'paradrop' was imminent (2min). When abeam the RW24 threshold, he looked up to see a white coloured PA25 Pawnee with a cable attached, registration X-XX, in his 1 o'clock position, in the top of the windscreen about 100-200ft above crossing from R to L descending, the distance was such that he could not see if anything was attached to the tow cable. He dived to avoid any contact with the cable; the PA25 was by now in his 10'clock when he passed under the cable end, estimating he missed the cable by 50-100ft. He saw the PA25 continue its descent and landing on RW27 grass, its pilot's first RT call was just prior to landing and he assessed the risk as high.

UKAB Note (1): During a subsequent telephone conversation with the PA28 pilot, he said that he was familiar with Hinton-in-the-Hedges as the maintenance organisation used by the ac's operator was based there and this trip was to pick up another ac and pilot. He had not telephoned to obtain PPR prior to his arrival but he was complying with the airfield regulations and in his experience the telephone was not always manned and he would not have obtained any additional information if he had telephoned. He had followed the RC114 into the LH visual cct and had been keeping a close watch on it, planning to turn in close behind it to ensure that he was on the ground before parachuting commenced.

THE PA25 PILOT reports that gliders and tug ac were operating LH ccts onto RW27 at Hinton-in-the-Hedges and making RT calls to Hinton 'Traffic' on 119.45MHz. The visibility was 5nm below cloud and the ac was coloured white/red with wingtip xenon strobe lights switched on. At the time of the incident, his tug ac was in the LH cct and he had reported downwind and finals for RW27; he had not seen the reporting ac. Powered traffic operates RH onto RW24, he thought. Hinton is a PPR unlicensed airfield, with local operations agreed daily.

UKAB Note (2): The UK AIP at ENR 5-5-1-3 promulgates Hinton-in-the-Hedges as a Glider Launching Site centred 520145N 0011229W for winch and aerotow launches where cables may be encountered to 2000ft agl during daylight hours; site elevation 500ft amsl.

UKAB Note (3): Pooleys Flight Guide states Hinton-in-the-Hedges is PPR for operations, active SR to SS. Ccts are variable with gliding and parachuting taking place daily throughout the year.

AIRPROX REPORT No 223/04

UKAB Note (4): The Airfield Operator confirmed that the telephone was not always manned and that PPR was not strictly enforced, particularly with regular visiting pilots who are familiar with the airfield regulations. These regulations are displayed on the wall of the 'office' for visiting pilots, which are summarised as follows:

The airfield is unlicensed - parachuting and glider activity take place daily;

The RT is not always manned – pilots are to broadcast their intentions on 119.45MHz 'Hinton Traffic' to let people know what they are doing and are to listen to other traffic calls;

No O/H or crosswind joins;

Visiting ac are to call 5nm away;

Pilots are to avoid overflying villages and habitation in the vicinity of the airfield.

The Operator also confirmed that ccts are variable, there being no specified direction nor segregation between powered ac and gliders when gliding operations are in progress.

UKAB Note (5): The Airprox occurred below recorded radar coverage.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Without formal segregation of the diverse aerial activities in the Hinton cct area, all pilots need to exercise extreme caution within the airfield environs and maintain a very good lookout for traffic in order to discharge their responsibilities for avoiding aerial collisions through 'see and avoid'. Although RT calls on a 'traffic' frequency assist pilots in building a mental picture of acs' positions and establishing their pilots' intentions, this element is supplementary to the pilot's look-out. In this Airprox, both pilots had reported making the appropriate cct position calls on the 'traffic' frequency but without the benefit of an RT recording/transcript, it was unclear exactly what had been 'broadcast' on the frequency. It was clear to Members that the PA25 pilot had descended into the RW27 LH cct and into conflict with the PA28, which he did not see, and this was a part cause of the Airprox. Also, the PA28 pilot had joined the RW24 LH cct but only saw the PA25 very late which was a second part cause.

Turning to risk, the PA28 pilot was undoubtedly surprised to see the PA25 appear in his 1 o'clock close in and crossing R to L, about 100-200ft above and descending, with a tow-cable attached. He had immediately dived his ac and passed under the cable by 50-100ft. The Board agreed that the actions taken by the PA28 pilot had removed the actual collision risk but the subject ac had passed in such close proximity, with the PA28 unsighted by the PA25 pilot, to an extent such that safety had not been assured during the encounter.

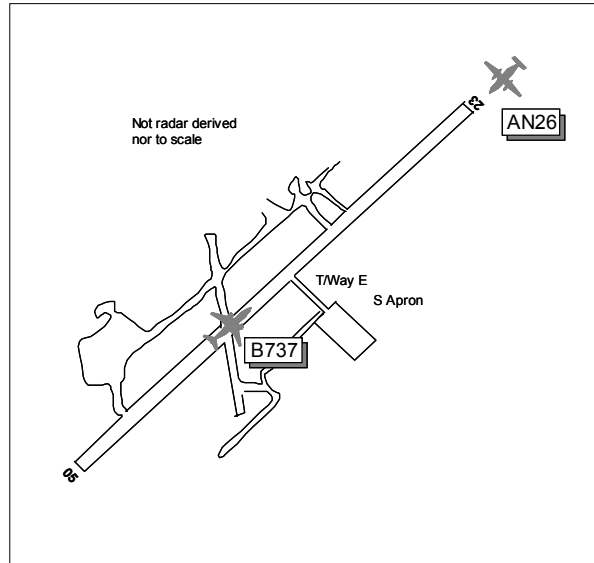
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Non-sighting by the PA25 pilot and a very late sighting by the PA28 pilot in the Hinton cct area.

Degree of Risk: B.

AIRPROX REPORT NO 224/04

Date/Time: 1 Dec 2235 NIGHT
Position: 5221N 00128W (RW23 Coventry Airport - elev 267ft)
Airspace: ATZ (Class: G)
Reporting Ac Reported Ac
Type: B737-500 AN26
Operator: CAT CAT
Alt/FL: GL ↓DH
 (agl) (QNH 1012mb)
Weather VMC MIST VMC NR
Visibility: NR
Reported Separation:
 200ft V NR
Recorded Separation:
 NR

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

THE B737 PILOT reports after landing RW23 at Coventry they commenced a backtrack to vacate at taxiway E as per ATC instructions from Coventry TOWER on 119.25MHz. The Capt transmitted a warning to the Tower that there were patches of shallow fog on the RW reducing the visibility on the surface well below that being reported on the ATIS. On completing the 180° turn they immediately saw the landing lights of another ac on finals at a distance of about 2-3nm although the ac was somewhat above the glideslope. The crew were surprised at its proximity but almost straight away they heard ATC instruct the flight, AN26 c/s, to go-around. The AN26 crew did not reply and obviously continued their descent whilst ATC instructed the AN26 flight to go-around at least 2 further times. They were unable to increase their taxi speed (15kt) to the next turn-off (E) owing to the reduced visibility around the RW – the taxiway was invisible to the crew. Around the RW23 threshold, the AN26 began climbing and passed directly overhead at no more than 200ft and about 10sec later they were able to vacate the RW at 'E'. Throughout the incident the other ac was clearly visible to the crew who had both sets of landing lights and turn-off lights on as well as the taxi light, logo lights and wing inspection lights. As no avoidance was being taken by the AN26 crew and owing to its close proximity, the Capt was preparing to taxi their ac off the RW onto the grass.

THE AN26 PILOT reports heading 231° at 160kt on finals to RW23 at Coventry and in receipt of an ATS from Coventry TOWER, he thought, on 119.25MHz. Their approach was carried out by vectoring from ATC and a B737 had landed ahead of them. The controller did not give permission to land so on reaching Decision Height (DH) they decided to go-around because the B737 was still on the RW; he reported his go-around to ATC. A normal landing was effected after repositioning and it appeared that the B737 was slow taxiing off the RW to cause the go-around.

UKAB Note (1): The procedure minima for a CAT1 ILS/DME Approach onto RW23 are: -

Ac CAT A DH 155ft, B 164ft, C 178ft and D 191ft.

THE COVENTRY APP/APR reports vectoring both ac for an ILS approach onto RW23 under a RAS, the AN26 being positioned No2 with approximately 6-7nm spacing which reduced to 5nm when established on the ILS. He requested the AN26 crew to reduce speed and the crew changed frequency to Tower, he thought, on 119.25MHz at a range of 3nm from touchdown. The ADC advised him that the AN26 would go-around and he gave a radar heading of 360° and coordinated this with Birmingham APP.

THE COVENTRY ADC reports that he instructed the B737 crew to backtrack to vacate RW23 onto the S Apron. The AN26 crew reported on frequency, he thought, on an ILS approach and were instructed to continue approach for late clearance with an ac to vacate. It became apparent that the B737 was not going to vacate in time so, when

AIRPROX REPORT No 224/04

the AN26 was at 1.5-2nm from touchdown, he instructed the flight to go-around. The crew did not acknowledge and appeared to continue their approach so he repeated the instruction. This time the crew acknowledged but was very slow to execute the go-around, resulting in the ac passing about 200ft overhead the backtracking B737. The AN26 flight was told to climb to 2000ft altitude and to turn R onto heading 360, which had been coordinated with the APR. However, the crew did not acknowledge these instructions and shortly thereafter the APR confirmed the flight had called him.

The Coventry METAR was EGBE 2220Z 0000KT 2000 MIFG SKC 03/02 Q1012=

ATSI reports that both ac were inbound to Coventry RW23, the B737 was vectored ahead of the AN26 by the Coventry APR. Once established on the ILS, at 2230, the B737 was transferred to the TWR frequency and the ADC cleared the flight to land RW23 at 2231. The radar recording shows that, at the time, the AN26 was 4.7nm behind the B737, with an indicated ground speed over 20kt faster. Shortly afterwards, the ADC was informed, via intercom, that the AN26 was turning in "*six behind slowing down*". The radar recording indicates that the spacing between the subject ac was still 4.7nm.

By 2232:30, the pilot of the AN26 was asked if he could reduce to 140kt and this was agreed. He was advised that he was "*...just coming up to five miles from touchdown the seven three seven is just touching down*". A discussion then took place on intercom as to whether the situation would be resolved, as, in the words of the ADC "*it was looking a bit tight*". At 2233 the AN26 pilot was requested to reduce to minimum safe approach speed. Although the controller followed this up by requesting this speed, the pilot only acknowledged with his callsign. By this time the B737 had landed and was backtracking the RW, preparatory to clearing to the R to proceed to the S apron parking. The only taxiway available to this area is situated approximately half way along the RW. No further two-way contact with the AN26 was made until after the pilot reported going around.

The RT transcript reveals that the AN26 flight was never transferred to the TWR frequency. However, it would appear that the APR believed that he had carried out this action, as, when the pilot reported on short final ready to land, the APR did not reply. At the same time, the ADC, who was also monitoring the APR frequency, heard this transmission and believed it had been made on the ADC frequency. Consequently, he responded, transmitting "*roger continue for late landing clearance er the seven three seven to vacate*". As the situation continued to develop, the AN26 was transmitting on the APR frequency and the ADC was continuing to respond on the ADC frequency. Presumably, the APR was listening to the ADC frequency and hearing these responses believed that the AN26 was in two-way communication with his colleague although in both cases a light would have illuminated on the RT panel to show the frequency being received.

The ADC realised that the AN26 would not be able to land as the B737 was still on the RW and asked the APR what he wanted the flight to do. A R turn heading 360 was agreed. After a comment from the B737 pilot about mist around the touchdown area affecting visibility, the ADC instructed the AN26 to go around. Naturally, no reply was forthcoming so the controller asked the pilot to acknowledge. Shortly after this (2234:50) the pilot reported (on the APR frequency) going around. The ADC attempted to pass further instructions but for the previously mentioned reason, did not receive a reply. Further discussion took place on intercom between the two controllers, neither apparently realising that the AN26 had been on the APR's frequency throughout. It was only when the pilot reported at 1300ft that the APR responded, assuming it must have been transferred back to his frequency. Thereafter it was repositioned to the ILS.

UKAB Note (2): 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, transcripts of the relevant RT frequencies, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

It was apparent that there were two different viewpoints of the incident from each cockpit. From the B737 viewpoint, the crew had seen the approaching AN26 on finals, whilst backtracking the RW, and had heard ATC issue 'go-around' instructions to the AN26 flight but the B737 crew heard no response. Understandably the B737 crew were concerned as it appeared that, whilst their ac was still on the RW, the AN26 flight was continuing its approach for landing with its crew not acknowledging nor complying with the ATC instruction to go-around. From the AN26 cockpit, the crew had flown their approach to Decision Height and, owing to the B737 on the RW and

no clearance from ATC, had commenced a go-around. Unbeknown to the B737 crew, the AN26 was not on the Tower frequency although the Coventry team believed that the APR had transferred the flight to ADC but the RT transcript did not substantiate this. The ADC believed that the AN26 was 'with him' on the ADC frequency as he erroneously replied to the AN26 crews calls, which were on the APR frequency that he was monitoring. ATCO Members were critical of the ATC technique employed where intercom is used for the passing of extended information, instead of using a telephone. This necessitated having 2 frequencies open, using a push button to call/communicate with the other controller but, as was seen in this incident, this could lead to a misunderstanding of the traffic/frequency situation. The ADC had realised that the spacing between the subject ac had been 'tight', being insufficient to allow time for the B737 to backtrack and vacate before being able to issuing landing clearance to the AN26 crew. The ADC had tried to resolve the confliction by telling the AN26 crew to 'go-around', when 1.5-2nm from touchdown, but, as the flight had not been transferred from the APR to the ADC, the AN26 crew did not hear the go-around instructions addressed to their flight. Some Members opined that the go-around had been carried out by the AN26 crew to resolve a potential confliction, in accordance with normal operating procedures, which could amount to a 'sighting report' by the B737 crew. Other Members disagreed, believing that a combination of all the elements discussed had caused the Airprox in that the AN26 was not transferred from Coventry APR to ADC and therefore did not hear the go-around instruction which was necessitated by insufficient spacing. The Director UKAB called for a vote which resulted in an equal split in voting Members. So, in accordance with his terms of reference, the Director cast his deciding vote, an extraordinary event, in favour of the latter view.

Turning to risk, although the ATC 'go-around' instruction went unheard, the AN26 crew had correctly executed a missed approach at DH owing to the RW being obstructed. This was executed later than ATC intended but nevertheless in accordance with normal aviation practice and procedures. This had caused some concern to the B737 crew as the AN26 passed overhead their ac during the go-around. However, the Board were in doubt that the visual sighting of the B737 on the RW by the AN26 crew and subsequent go-around flown had been effective in removing any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The AN26 was not transferred from Coventry APR to ADC and therefore did not hear the go-around instruction which was necessitated by insufficient spacing.

Degree of Risk: C.

AIRPROX REPORT No 225/04

AIRPROX REPORT NO 225/04

Date/Time: 27 Nov 1401 (Saturday)

Position: 5214N 00114W (Snitterfield Airfield
- elev 375ft)

Airspace: London FIR (Class: G)

Reporting Ac Reported Ac

Type: Slingsby T21 Socata
Glider TB21TC

Operator: Civ Club Civ Pte

Alt/FL: 900-1000ft NR
(QFE)

Weather VMC CLBC VMC

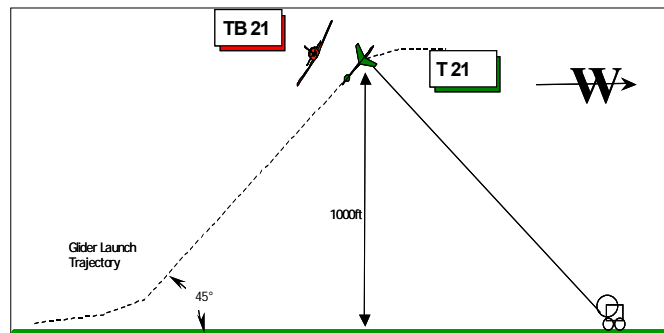
Visibility: 20nm NR

Reported Separation:

0 V/500ft H NR

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE T21 SLINGSBY GLIDER PILOT reports flying a red and white glider, solo on a training sortie from Snitterfield, with no radio or SSR fitted. He was passing 900/1000ft on a winch launch at an attitude of about 45° nose-up, heading 270° at 45kt, when a single-engined low-wing ac with red trim appeared at his height on his left, and in a hard, level turn away from him. The other ac had initially been obscured due to the glider attitude before it appeared a few hundred metres away. He did not take any avoiding action as the other ac was already turning away and was avoiding him. Although he only saw it only for a second, he assessed that it had passed within 500ft of him; he did not assess the risk. The Duty Instructor had also observed the incident from the ground.

THE SOCATA TB21 PILOT provided a brief report. He was flying a private flight from Gloucester to Coventry VFR below CAS in a white, grey and red ac. While heading about 050° at 140kt, he saw a glider being launched and turned right to avoid it. He considered that the incident had not constituted an Airprox since his course correction was adequate to ensure no likely conflict.

UKAB Note (1): Snitterfield is promulgated in the UKAIP (ENR 5-5-1-5) as a glider launch site (winch and tug) up to 2000ft agl, HJ.

UKAB Note (2): The recording of the Clee Hill radar shows the TB21 pass 0.3nm S of the centre of the glider site at FL013. The elev of the airfield is 375ft and the QNH was 1022mb. The TB21 therefore was indicating 1135ft agl as it passed the site.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The radar recording showed that there was little doubt that the TB21 had flown close to the glider site at the time that the T21 was being launched. Although the site is located in a choke point for VFR traffic, Members considered that there is ample room to avoid it to the N and that planning to fly close to gliding sites is not good airmanship. Flying through a winch launch site can endanger both ac as a launch cable can cut through a light ac wing with a 'chain-saw' like effect.

The incident demonstrates again the importance of trying to maintain a good lookout when on a winch launch since, even though such sites are annotated on charts, encroachments are frequent.

Since there was no other information available, at least horizontally, the Board assumed that the miss-distance was close to that reported by the glider pilot. The TB21 pilot had, however, seen the glider and conducted a hard turn away thus ensuring that there was not a risk that the ac would have collided. Further, the Glider pilot had seen the other ac turning away from him and decided that he did not need to take any further action so he continued with the launch.

PART C: ASSESSMENT OF CAUSE AND RISK

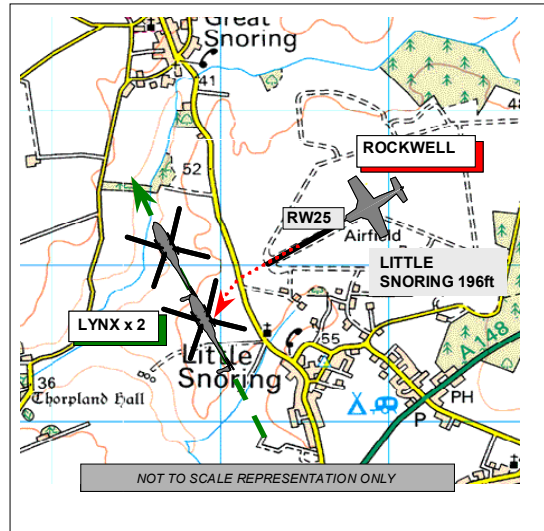
Cause: The TB21 pilot flew close enough to a glider on a winch launch to cause its pilot concern.

Degree of Risk: C.

AIRPROX REPORT No 226/04

AIRPROX REPORT NO 226/04

Date/Time: 8 Dec 1350
Position: 5251N 00054E (Little Snoring)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Lynx Mk7 Rockwell 114 Cmdr
Operator: JHC Civ Trg
Alt/FL: 50-100ft 30ft
(Rad Alt) (QNH 1029mb)
Weather VMC VMC CLBC
Visibility: >5km >10nm
Reported Separation:
200ft V/100m H 200ft V/500m H
Recorded Separation:
Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LYNX PILOT reported that he was LHS captain, but not HP, of the lead ac of a 2-ship, low-level tactical training sortie in the UKDLFS from Wattisham. The ac were camouflaged green in colour with HISLs and anti-colls switched on and were approaching a tactical holding area 1500m to the W of Little Snoring Light Ac Landing Site, at 80kt and 100ft agl. They were preparing to descend into the holding area on a heading of 334° and he had warned the pilot in the RH seat [HP] that there was an airfield to the right and a village and indicated the position of the landing area. The pilot looked right for any traffic from Little Snoring, called descending and transmitted 'Descend Descend Descend' to the formation. Both ac descended and his pilot and the crew of the second Lynx reported an ac passing within 100m H and 200ft V above the formation. His pilot had seen the ac at a distance of 600m getting airborne from the SW RW at Little Snoring and had elected to remain on course and descend as the best form of avoiding action, a decision with which he concurred. The formation was low-level, outside CAS and was monitoring Wattisham APP on 125.8 MHz and squawking 4537. The risk of collision between any of the ac involved was low. All ac were unaffected but they were unsure if the other pilot had seen their formation. Having completed the low-level section of their mission, they climbed to 500ft and reported the Airprox to Wattisham APP. He then elected to land at Little Snoring and talked to some people on the ground to confirm what ac it was and that they were safe. He was informed that the ac was a Rockwell 114 based at Old Buckenham.

THE ROCKWELL PILOT who was an instructor and very experienced ex-military pilot, reported that he was the HP of a training flight from Little Snoring to Old Buckenham in a green and white ac with HISLs and anti-colls selected on, in receipt of a FIS from Norwich and squawking 7000 with Mode C. Shortly after takeoff from RW25 at a height of about 50ft, he first saw at a distance of 800m and about 100ft above him, an Army helicopter cross his nose from left to right. Experience had taught him in such circumstances always to look for a second ac and in this case this was justified as his scan revealed another helicopter. He initiated a climbing turn to the left to avoid both, passing 500m behind and slightly above them. He considered the incident as being a normal hazard associated with light ac integrating with military low level operations. Since both pilots had seen the opposing ac early and acted accordingly, he considered that there had been a minimal risk of their colliding.

HQ JHC Comments that both pilots saw each other and took appropriate avoiding action, thereby averting any possible conflict. However, this incident is a timely reminder to all aviators on the importance of a constant and thorough lookout and the increased risks when operating near to other airfields.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

[Although the radar recording showed the helicopters approach, they disappeared just before the incident].

Members noted that in this incident good airmanship and lookout by both pilots had prevented there being any risk to their respective ac as early acquisition permitted early and effective avoiding action. Light aircraft operating sites without the benefit of an ATZ are vulnerable and users and passing traffic alike should be aware of this: they should still be regarded as active airfields and a good lookout maintained.

This incident is an example of good airmanship by both crews and will be publicised by military and GA communities as a display of good practise.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in the FIR/UKDLFS resolved by both pilots.

Degree of Risk: C.

AIRPROX REPORT No 227/04

AIRPROX REPORT NO 227/04

Date/Time: 8 Dec 1055

Position: 5748N 00305W (Spey Bay 10nm NE of Lossiemouth)

Airspace: Lossiemouth AIAA (Class: G)

<u>Reporting Ac</u>	<u>Reported Ac</u>
Sea King MK3	Tornado GR4

<u>Operator:</u> HQ STC	HQ STC
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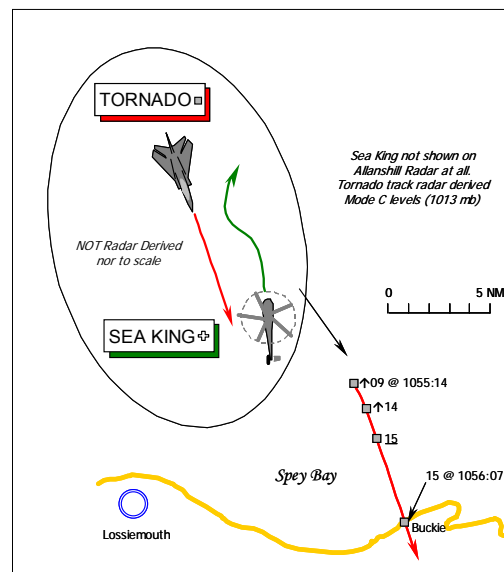
<u>Alt/FL:</u> 1000ft (Rad Alt)	1500ft↑ (Rad Alt)
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<u>Weather</u> VMC CLOC	VMC CLBC
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<u>Visibility:</u> >20km	30km
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<u>Reported Separation:</u> 50ft V/300m H	Not seen
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<u>Recorded Separation:</u> Not recorded	
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PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SEA KING MK3 PILOT reports that his helicopter has a bright yellow colour-scheme and the HISLs were on whilst carrying out a training sortie in Spey Bay about 8nm ENE of Lossiemouth. The PF was handling the ac under an IF visor from the R seat (RHS), whilst the L seat (LHS) pilot was operating as safety pilot with the crewman assisting with lookout from between the pilots seats: the radar operator was also manning his radar. They were operating VFR in VMC with nil cloud or weather at their altitude and a flight visibility of >20km, whilst in receipt of a FIS from Lossiemouth APPROACH (APP) on 118.9MHz VHF and squawking A3732 with Mode C selected on. Neither TCAS nor any other form of CWS is fitted.

Just before the PF carried out a simulated IMC let down into Spey Bay at 90kt, flying level at 1000ft Rad Alt in a 20° AoB L turn through N the LHS pilot spotted a Tornado ac, low in the 11 o'clock - ½nm away heading S in a gentle climb. The LHS safety pilot immediately assessed the Tornado was on a collision course and ordered the RHS pilot to break R and descend. The RHS PF complied and turned the Sea King hard to starboard and descended as the Tornado jet climbed through their level, some 300m to port of the helicopter. The Tornado crew did not appear to take any avoiding action nor did the jet pilot indicate that he had seen their Sea King. He received an information call from APP after their own avoiding action had been initiated.

Assessing the risk as “very high”, he opined that if the LHS pilot had not spotted the Tornado ac, a collision would have occurred.

THE TORNADO GR4 PILOT reports that he was engaged in a low-level transit and in receipt of a FIS from Lossiemouth APP, squawking A7001 with Mode C. Neither TCAS nor any other form of CWS is fitted. They were operating VFR in “nice weather conditions” of broken cloud at around 4000ft, with excellent visibility below.

Heading 160°(T) at 420kt between 300ft - 500ft Rad Alt routing from Helmsdale across the Moray Firth to coast-in at Buckie, he called APP for traffic information and was informed that there was a Sea King helicopter operating in the Spey Bay area up to 1000ft asl. Aware that the Sea King SAR helicopters conduct winching to and from boats in the area, he concentrated his look out below and level with his ac. ATC then called to say that the previously reported helicopter traffic was at a range of 2nm: at this point he believed that he had seen the SAR helicopter and reported visual contact to APP. But as he drew closer, it became apparent that it was not the Sea King he had spotted and so to get above the helicopter’s reported operating altitude band he initiated an immediate climb to 1500ft Rad Alt. No avoiding action was taken, as the helicopter was not seen at all. He did not assess the risk.

UKAB Note (1): This Airprox is not shown on recorded radar. The Allanshill Radar recording shows the Tornado GR4 climbing into coverage at 1055:14, some 12nm ENE of Lossiemouth as it passes 900ft unverified Mode C just to the SE of the reported Airprox position, probably just moments after the Airprox occurred. The Sea King is not shown at all, either as a primary or secondary contact. A level of 900ft (1013mb) would equate to an altitude of about 1122ft amsl, calculated from the Lossiemouth QFE of 1019mb and elevation of 42ft amsl, whereas the Sea King pilot reports he was operating at 1000ft Rad Alt at the time of the Airprox. The GR4 levels at 1500ft (1013mb) and coasts in as reported in the vicinity of Buckie.

MIL ATC OPS reports that the Sea King helicopter was operating in the Spey Bay area up to 1000ft, Lossiemouth QFE (1019mb), receiving a FIS from Lossiemouth APP on VHF. At 1051:48, the GR4 crew freecalled APP, on UHF, at 1051:53 saying "...coasting out about 10 miles north of Helmsdale, gonna be routeing 20 miles to the east of your field at low-level. Any traffic?". The GR4 was advised, by APP, "[C/S]...roger the Sea King is operating just north of Spey Bay up to 1000ft...". At 1052:13, the GR4 was placed under a FIS by APP. At 1054:52, APP passed traffic information to the GR4 crew - "[C/S] traffic believed to be you has the Sea King, 12 o'clock 2 miles manoeuvring no height information". The GR4 crew responded "...visual, thanks". At 1055:18, traffic information was passed to the Sea King crew as "[C/S] traffic believed to be you has traffic north west 1 mile tracking south east is a fast jet low level visual with you". The Sea King crew reported "copied that, [C/S] visual". The GR4 left APP's frequency at 1056:02.

The APP position was manned by a mentor screening a trainee controller who were not operating under any pressure or a high work load. Both ac were being provided with a FIS by APP; however the ac were on different frequencies. The Sea King had been operating in the Spey Bay area up to 1000ft when the GR4 crew freecalled APP some 45nm NNE of Spey Bay and was passed traffic information on the approximate position and height of the Sea King. Nearly 3min later the GR4 crew were passed further traffic information on the Sea King when it was reported as "12 o'clock, 2 miles, no height". The GR4 crew reported visual. [UKAB Note (2): Although the GR4 crew reported visual according to the Unit's report they had not sighted the subject helicopter at the time.]

JSP 552 235.125.1d stipulates that under the conditions of FIS:

"where a controller suspects from whatever source that a flight is in dangerous proximity to another aircraft, a warning is to be issued to the pilot. It is accepted this information may be incomplete and the controller cannot assume responsibility for its issuance at all times or for its accuracy".

APP passed traffic information on the Sea King to the GR4 crew on 2 occasions, firstly on initial contact and then an update when the GR4 was believed to be 2nm from the helicopter. However, the Sea King crew did not receive any traffic information about the flight profile of the GR4 until the fast jet was believed to be horizontally separated by 1nm - "[Sea King C/S] traffic believed to be you has traffic north west 1 mile tracking south east is a fast jet low level visual with you". An earlier warning of the proximity of the GR4 to the Sea King crew would have provided an earlier opportunity for the helicopter crew to gain visual contact on the jet.

THE PILOTS' STATION conducted a thorough review of this occurrence reporting that the Tornado was transiting at 300-500ft asl from a position 10nm N of Helmsdale to coast in near Buckie. The Sea King was carrying out a simulated IMC self let down procedure using the ac's radar from 1000ft to 50ft onto a training vessel at a point 8nm N of Spey Bay. The Sea King RHS pilot was 'under the hood' with lookout being the responsibility of the LHS pilot and the crewman who was standing between the pilots' seats. The Tornado crew were warned by APP 4min before the Airprox that the Sea King was operating up to 1000ft N of Spey Bay.

At a range of 2nm from the Sea King the Tornado crew were warned again by APP. The Tornado pilot replied "visual" but quickly realised that he had mis-identified a boat as the Sea King. The pilot, therefore, pulled up to be above the Sea King's operating height and in so doing the Tornado passed 300m abeam the Sea King, that was at 1000ft, with 50ft vertical separation at the closest point.

The Sea King was in a 20° bank gentle L turn when the LHS safety pilot of the Sea King first identified the Tornado at a range of about 1nm, flying directly towards him. The safety pilot instructed the flying pilot to break R and as he did so APP (the same controller but working VHF) advised the Sea King crew about the fast jet. The safety pilot watched the Tornado pass 300m to the L in a climb and reported visual contact. There were no apparent signs that the pilot of the Tornado had seen the Sea King. The Sea King safety pilot did well to spot the Tornado,

AIRPROX REPORT No 227/04

head on, at around 7sec on what they believe was a certain collision; the flying pilot did equally well to manoeuvre the helicopter out of the Tornado's flight path.

The crew of the Tornado had correctly assumed that the Sea King was operating with a boat but had incorrectly deduced that it was winching at low level. Therefore, they concentrated their lookout below the horizon. The pilot then saw what he believed to be the training vessel with a helicopter above it and called visual. However, as the Tornado got closer the pilot realised that he had mis-identified another boat for the helicopter. His immediate reaction was to pull up above the Sea King's notified operating height of 1000ft, which subsequently reduced rather than increased separation. It is probable that before and during the pull-up, the canopy arch of the Tornado obscured the Sea King from the Tornado crew's view. However, crews are aware of the obstructed view from the Tornado cockpit and should have cleared the area into which they were climbing.

Had it been possible for ATC to give earlier warning of the Sea King then the Tornado crew would have had more time to acquire and avoid the Sea King. Unfortunately the performance of the Lossiemouth primary radar at low level is very poor and in the area of the Airprox it is also blanked by terrain. Consequently APP had only intermittent contact with both ac. The problem was exacerbated by the lack of SSR coverage which reduced the ability of ATC to obtain and provide height information; the SSR is located at Kinloss (a further 20nm distant). In the area of the Airprox SSR suffers similar blanking to the primary surveillance radar equipment (SRE) thus a height readout was not possible.

In the wake of this Airprox, Lossiemouth aircrews have been reminded of the need for effective lookout and of the limitations of the Lossiemouth SRE. The *modus operandi* of SAR helicopter training has been publicised to the Tornado Sqns. In addition, the standard local routing of fast jet traffic has been re-emphasised to the Sea King SAR flight to highlight areas of high fast jet activity and to enhance current deconfliction procedures. Concurrent with this, the Station will continue to press for improvements to the SRE. Cosmetic improvements to the performance of the Lossiemouth SRE are ongoing but fundamental improvements are required to provide a robust service.

HQ STC comments that this was a very close call on the edge of Lossie's radar coverage. An earlier call by Lossiemouth APP to the Sea King may have given the LHS pilot an earlier spot. The GR4 pilot was concentrating his search in the area he expected to see the helo. When what he thought was the helo turned out not to be he manoeuvred his ac out of the Sea King's most likely area of ops and into conflict. It is difficult not to concentrate your scan in one area when you expect to find traffic there. However, crews should do their best to ensure that the lookout is split and an all-round lookout maintained as much as possible.

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 action taken by Lossiemouth subsequent to this Airprox was clearly worthwhile. However, it was unfortunate that although both acs' crews were receiving a FIS from the same ATSU, both were operating on different frequencies – the Sea King on VHF and the Tornado on UHF. It was suggested that the Sea King crew might have preferred to operate on VHF to obtain a better air picture of the GA traffic in the vicinity and thus improve their situational awareness. Alternatively, it might have allowed them a quieter frequency upon which to conduct their training sortie. Moreover, VHF does generally give better range but at these distances from their base this should have not been a problem for the helicopter crew. It was unfortunate that the VHF frequency in use could not be re-broadcast on UHF and visa versa. The DASC advisor pointed out that Lossiemouth ATC, in line with all other RAF terminal ATSUs fitted with the same communications system, is unable to cross-couple VHF & UHF together and thereby re-broadcast messages received via UHF on VHF frequencies and vice versa. Consequently, there was no means whereby the Sea King crew could have gleaned any information about the presence of the Tornado solely from the GR4 crew's transmissions to APP or the latter's responses.

Although fitted with a radar, the Sea King's equipment is not designed for Air – Air detection. Therefore, the Sea King radar operator would not have been able to provide an independent warning about the approaching jet and thus the helicopter crew was entirely dependant on APP for passing on any early warning to them about the approach of the GR4 (if indeed the controller considered that it would be in close proximity to the helicopter).

Whilst recognising that the crews of the Sea King and the GR4 were operating VFR, in the 'see and avoid' environment of Class G airspace, and were entirely responsible for their own lookout, avoidance and separation from other traffic, APP had conscientiously passed traffic information to the GR4 crew about the helicopter on two occasions which had provided the GR4 crew with a helpful warning that the helicopter was operating directly in their path. Consequently, the GR4 crew had been looking out for the Sea King but crucially the pilot's report revealed that they had assumed it was operating closer to the surface than they had actually been told - "...up to 1000ft..." - and, significantly, had misidentified a boat for the helicopter which in the Boards view was a contributory factor. The erroneous visual call from the GR4 crew to APP might have reassured the controller but when APP passed on to the Sea King crew that the GR4 crew had supposedly seen them the helicopter pilot might have been concerned that the GR4 pilot had intentionally flown so close. In fact the GR4 pilot's report revealed that he had not seen the Sea King at all as they passed by a mere 300m away according to the latter pilot's report. Thus the GR4 crew's decision to climb up above the Sea King crew's notified maximum operating altitude, evidently taken with the intention of remaining clear above the helicopter, had the reverse effect and effectively brought the ac into conflict at about the same altitude. The GR4 crew's lack of visual acquisition at these distances was in the Board's view fundamental to the cause. However, the Sea King crew also had a mutual responsibility to see and avoid the jet, which because they did not receive such a prompt warning from APP was also of concern to the Board. The Mil ATC Ops report had shown that the Sea King crew had been told about the jet when it was only 1nm away to the NW. The Board accepted that neither ac was in solid radar cover nor the crews in receipt of a radar service but, as APP was not operating under any pressure or a high work load, Members agreed with the Mil ATC Ops perspective that the helicopter crew should have been given an earlier warning of the jets approach by the controller as there was good reason to suppose the two ac would be close proximity which subsequently proved to be the case. The key here is if you tell one crew about a conflicting ac you should clearly tell the other crew but the warning must be given in time so that use can be made of it. Indeed the Sea King pilot reports here that the safety pilot had spotted the jet before this warning, which was given after they had initiated their own avoiding action R turn, so it was of no significance to the overall outcome. The camouflage grey GR4 of small cross sectional area would have been difficult to spot from above whilst approaching head-on against the seascape and the Board concluded that if the safety pilot in the Sea King's LHS had not detected it when he did the situation could have turned out very differently. Nonetheless, this very late sighting by the Sea King pilot was also intrinsic to the cause. The Board therefore agreed that this Airprox was the result of a non-sighting by the Tornado GR4 crew and a very late sighting by the Sea King crew.

It was unfortunate that the Airprox occurred too low for the Allanshill Radar to detect the helicopter and illustrate the event. Consequently, with only the Sea King crew as witness to the occurrence, the Board had only the helicopter pilot's account upon which to base their assessment of the inherent risk. From his perspective the Sea King pilot had said that the jet was only 300m to port at the closest point and the latter's crew certainly had the opportunity to spot the helicopter. But with only one ac's crew visual with the other this was indeed a close call. Thus it was very fortunate that the alert safety pilot in the helicopter's LHS had spotted the GR4 when he did, at about ½nm, which had enabled him to warn the PF. Even so it seemed that the avoiding action carried out at the last moment by the PF had done enough to clear the helicopter from the Tornado GR4's path and remove the actual risk of a collision. Therefore, the Members agreed unanimously that the safety of the ac involved had certainly been compromised in these circumstances.

[Post Meeting Note: The Board had noted the Station comments regarding the performance of the Lossiemouth primary radar at low level which the Unit considered to be very poor. Subsequently, Mil ATC Ops advised that an analysis has been undertaken of the effect on the Lossiemouth SRE low level coverage performance from an alternate radar site at a higher elevation than the current site. Although the analysis suggested that the radar performance would be improved regarding low-level coverage, a significant increase in 'sea clutter' was also indicated, which negated any improvement in the low-level primary coverage. The Lossiemouth Watchman Radar meets military requirements as does the supplied SSR data from Kinloss. No further action is planned by HQ 3 Gp.]

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the Tornado GR4 crew and a very late sighting by the Sea King crew.

Degree of Risk: B.

Contributory Factors: The Tornado crew misidentified a boat for the Sea King.

AIRPROX REPORT No 228/04

AIRPROX REPORT NO 228/04

Date/Time: 12 Dec 1323 (Sunday)

Position: 5221N 00014W (Brooklands Farm, Alconbury)

Airspace: London FIR (Class: G)

Reporting Ac Reported Ac

Type: Paramotor Grob Tutor

Operator: Civ Club HQ PTC

Alt/FL: 700ft 1000ft
(QNH) (QFE 1024)

Weather NK CLBC VMC CLBC

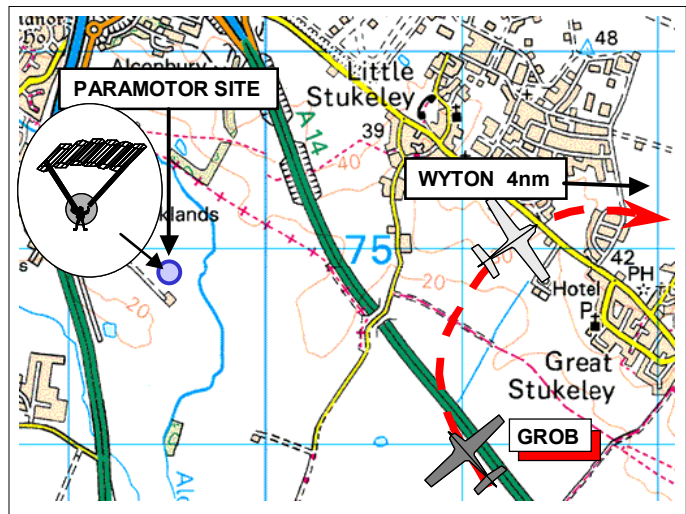
Visibility: 4-5km NR

Reported Separation:
0 V/2-300ft H Not seen.

(assessed from the ground)

Recorded Separation:

Not recorded (See UKAB Note (2))



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PARAMOTOR INSTRUCTOR reports that he was instructing a student by radio from the ground at Brooklands Farm microlight site on his third paramotor flight when the student called that there was an ac heading straight at him from the S at the same height, which he reported as 700ft on the Wyton QNH [equivalent to 565ft agl] which the instructor had set 30min prior to the incident. The paramotor was coloured red and black and at the time of the incident was heading S at 10kt. As he was calling, the Grob pilot saw him [he thought] and turned right to avoid him. The incident was witnessed by other pilots on the ground who thought that the ac were around 300ft apart when the Grob turned right on to an E'ly track.

UKAB Note (1): The pilot of the paramotor could not be contacted by the UKAB to verify the details reported above by the Instructor. The paramotor Instructor was contacted by the UKAB secretariat but did not provide any more detail relevant to the incident.

THE GROB TUTOR PILOT, a very experienced instructor, reports flying an instructional sortie with a cadet in a white ac with HISLs and nav lights selected on, squawking 7000 with Mode C [he thought], in receipt of a FIS from Wyton. He was passing heading 060° at 120kt and 1000ft (QFE), on recovery to Wyton at the time of the incident. He did not see any other ac and did not consider that any hazard had existed.

UKAB Note (2): The recording of the Debden radar shows at 1322:00 a 7000NMC contact tracking NW towards Brooklands Farm. Twenty sec later at a position 1½nm SE Brooklands Farm it commences a right turn onto an E track (see diagram), passing 1.01nm to the E of the centre of the site at 1322:40 and then diverging. The contact then enters the Wyton circuit. The radar cover in that area is good and it is probable that all ac operating at that height would have been displayed. Although the contact squawking 7000NMC cannot be positively identified as the reported Grob, due to the similarity between details reported, it is thought most likely that it was the reported ac. The paramotor does not show on radar.

UKAB Note (3): Brooklands Farm is notified in the UKAIP Mil Vol 3 1-2-6-6 as a Microlight Site.

UKAB Note (4): Wyton is promulgated in the AIP ENR 2-2-2-4 as an ATZ of 2.5nm centred on the longest notified RW (09/27).

HQ PTC had nothing to add.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The radar video recording showed that the Grob had tracked 1nm to the E of the position of the incident reported by the paramotor instructor and had avoided the paramotor site by a good margin. Further it was probable that, based on the paramotor ground-based instructor and the Grob pilot's reports, the vertical separation was more than 400ft. The Board determined that there had been no risk to either ac and that this was a sighting report.

PART C: ASSESSMENT OF CAUSE AND RISK

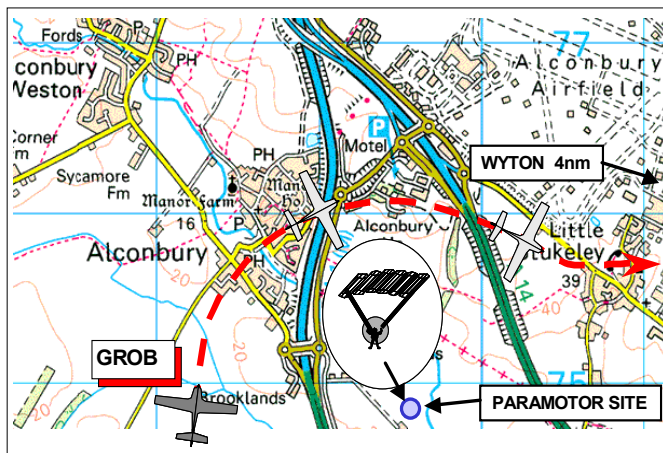
Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT No 229/04

AIRPROX REPORT NO 229/04

Date/Time: 12 Dec 1327 (Sunday)
Position: 5221N N 00014W (Brooklands Farm Alconbury)
Airspace: London FIR (Class: G)
Reporting Ac Reported Ac
Type: Paramotor Grob Tutor
Operator: Civ Club HQ PTC
Alt/FL: 700ft 1000ft
(QNH) (QFE 1024mb)
Weather VMC CLBC VMC CLBC
Visibility: 4-5km 10km
Reported Separation:
100ft VI NR H 500ft V/2nmH
Recorded Separation:
Not recorded (See UKAB Note (3))



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE PARAMOTOR INSTRUCTOR reports that he was instructing a student by radio from the ground at Brooklands Farm microlight site on his third paramotor flight when the student called that there was an ac heading towards him from the W just above his height, which he reported as 700ft on the Wyton QNH [equivalent to 565ft agl] which the instructor had set 30min prior to the incident. The paramotor was coloured red and black and at the time of the incident was heading W at 10kt. The Grob pilot saw him [he thought] and turned right onto SE to avoid him and then continued towards Wyton. The paramotor Instructor saw the Grob 10sec before the ac passed with about 100ft separation.

UKAB Note (1): This incident occurred 5min after Airprox 228/04 with the same pilot and another Grob Tutor.

UKAB Note (2): The pilot of the paramotor could not be contacted by the UKAB to verify the details reported above by the Instructor. The paramotor Instructor was contacted by the secretariat but did not provide any more detail relevant to the incident.

THE GROB TUTOR PILOT a very experienced instructor, reports flying an air experience sortie with a cadet in a white ac with HISLs selected on, squawking 7000 with Mode C, in receipt of a FIS from Wyton. He was heading 060° at 120kt on recovery to Wyton when ATC reported on APP frequency that an Airprox had been reported S of Alconbury [Airprox 228/04]. About 3min later he first saw a red paraglider 3nm away and transmitted to ATC that he had 'a red parachute thing with an engine on' visual. He also pointed out the contact to his passenger and was fully aware of their relative positions throughout and did not consider there to have been any risk of collision.

UKAB Note (3): The recording of the Debden radar shows at 1326:00 a 7000 contact indicating FL007 (1165ft amsl, ~1000ft agl) tracking NNW to the W of Brooklands Farm. Forty sec later at a position 0.7nm NW of Brooklands Farm it commences a right turn onto an E track (see diagram), passing 0.7nm to the N of the centre of the site at 1326:45 and then diverging. The contact continues E and enters the Wyton circuit. The radar cover in that area is good and it is probable that all ac operating at that height would have been displayed. From the timings and reports, the 7000 FL007 contact was identified as the reported Grob. The paramotor does not show on radar.

UKAB Note (4): Brooklands Farm is notified in the UKAIP Mil Vol 3 1-2-6-6 as a Microlight Site.

UKAB Note (5): Wyton is promulgated in the AIP ENR 2-2-2-4 as an ATZ of 2.5nm centred on the longest notified RW (09/27).

HQ PTC had nothing to add.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The radar video recording showed that the Grob had tracked 0.7nm to the N of the position of the incident reported by the paramotor instructor and had avoided the paramotor site by a good margin. Further it was probable that, based on the paramotor ground-based instructor and the Grob pilot's reports, the vertical separation was more than 400ft. The Board determined that there had been no risk to either ac and that this was a sighting report.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT No 230/04

AIRPROX REPORT NO 230/04

Date/Time: 9 Dec 1358

Position: 5602N 00307W (10nm NE
Edinburgh Airport - elev 135ft)

Airspace: Scottish TMA (Class: E)

Reporting Ac Reported Ac

Type: B737-800 DHC8

Operator: CAT CAT

Alt/FL: 3400ft↓ ↓4000ft
(QNH 1020mb) (QNH)

Weather VMC NK VMC NK

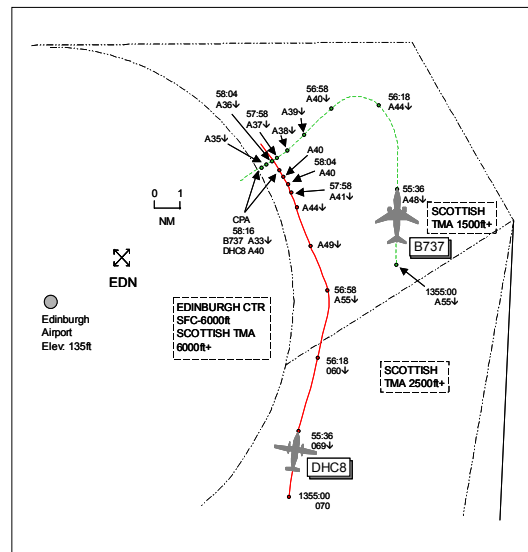
Visibility: 9km

Reported Separation:

400ft V/O-5nm H 200ft V/1nm H

Recorded Separation:

700ft V/O-7nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports inbound to Edinburgh tracking the ILS to RW24 and in communication with Edinburgh Radar 121.2MHz squawking 7341 with Mode C. Having been cleared for the approach and descending at 1000fpm and 180kt, another ac, a DHC8, was turned onto base leg into their flight path. A TCAS TA alert enabled the crew to visually acquire the DHC8 to their L, above but descending. This gave rise to an RA 'increase descent' then 'adjust vertical speed' commands which were followed whilst the DHC8 was seen to cross from L to R 0.5nm behind and 400ft above. By now the ac was descending through 3400ft QNH 1020mb having deviated about 300ft whilst following the TCAS guidance.

THE DHC8 PILOT reports heading 330° at 180kt and cleared to 4000ft by Edinburgh APPROACH on 121.2MHz. When just about to level at 4000ft, TCAS gave a TA alert on traffic in their 12 o'clock range 1nm 200ft below, he thought. An RA 'monitor vertical speed' warning was received by which point they had levelled at 4000ft so the A/P was left in. The other ac was seen as a B737 which had initiated a TCAS 'descent'.

THE EDINBURGH APP/APR reports that shortly after taking over the position he was vectoring 3 IFR inbounds, working an overflight and a VFR helicopter. The B737 was being positioned for an ILS approach onto RW24 and on first contact was given descent to 4000ft whilst about 12nm behind him was a DHC8. The B737 was further cleared for descent to 3000ft and turned onto a closing heading about 16nm from touchdown. At about this time the DHC8 was turned onto heading 330° to remain inside CAS and, as the B737 was observed passing 3800ft, he cleared the DHC8 to 4000ft. He then turned his attention to another ac which was being positioned downwind as No2. Shortly after this the DHC8 crew asked if the B737 was level at 4000ft as it was showing 300ft below them. The labels were garbling so he could not see the displayed levels but before he could do anything the B737 crew reported a TCAS descent.

ATSI reports that the controller described his workload and traffic loading as moderate in the 10min he had been in position prior to the incident. He said that he had been vectoring 3 inbound ac and had also been controlling an IFR overflight, inbound to Dundee, and a helicopter flying VFR.

The first of the 3 inbounds to establish communication with Edinburgh Approach was an Embraer routing to STIRA from the N. The other two flights, the subject ac, were inbound from the S. The controller explained that his initial plan was that if the Embraer made a visual approach from the N it would be number one. He would then sequence the B737 and the DHC8 in turn. In the event, he decided that this was not possible and changed the landing order to the B737 first, followed by the Embraer and then the DHC8.

Both the B737 and the DHC8 were handed over from Scottish Control, heading 005°, descending to FL70. The B737, positioned 8nm ahead of the DHC8, was given descent to 4000ft. The APR then turned his attention to vectoring the Embraer downwind RH for RW24. At 1355, the B737 was given further descent to 3000ft and, shortly afterwards, the DHC8 was instructed to descend to 4000ft on a heading of 015°. The B737 was placed on a closing heading for the ILS at 1355:40, when it was about 16nm from touchdown. Approximately 30sec later, the pilot reported established on the LLZ and was cleared to “*descend with the ILS*”. At the time, the B737 was passing 4400ft, with the DHC8 9.6nm S of it and the Embraer RH downwind, passing 6nm N of the airport.

The controller explained that, instead of turning the DHC8 R onto a downwind heading, which might have resulted in the flight leaving CAS as it was sequenced No 3, he decided to vector it through the FAT over the top of the B737, and position it downwind RH behind the Embraer. Accordingly, he instructed the DHC8 (1356:30) to turn L heading 335°, later (1357:50) amended to 315°, and informed the pilot of his intentions. He commented that he had observed the B737’s Mode C showing 3800ft and assumed it would be in a continuous descent to 3000ft. Consequently, he believed that vertical separation would be achieved between this ac and the DHC8, which was descending to 4000ft. MATS Part 1, Section 1, Chapter 5, Page 10, states that ‘*An ac climbing or descending may be considered to have passed through a level when the Mode C readout indicates that the level has been passed by 400 feet or more and continuing in the required direction*’. The APR did not comply correctly with this convention but, even if he had, it is considered that its use, in the circumstances where a pilot might choose to reduce the descent rate to establish earlier on the Glide Path, is not appropriate. MATS Part 1 also states that ‘*When SSR is used to assess vertical separation the Mode C responses are to be continually monitored to ensure that the vertical distance is never less than the prescribed minimum*’. The APR commented that it was difficult to monitor the Mode C responses of the subject ac as their labels overlapped. He believed that the B737 must subsequently have levelled off at 3700ft, as the pilot of the DHC8 reported traffic 300ft below (1358:00). He had not noticed this at the time, presumably because of label overlap. He said that he only became aware of the situation when the pilot of the DHC8 queried the B737’s altitude as 300ft below and the pilot of the latter reported a TCAS descent. By this time it was too late to take any action as the ac were about to pass and the situation was being resolved by TCAS.

[UKAB Note (1): The Lowther Hill radar recording at 1357:58 shows the DHC8 tracking 335° descending through 4100ft QNH with the B737 crossing through its 12 o’clock range 1.4nm tracking 240° descending through 3700ft QNH. On the next sweep at 1358:04 the DHC8 is level at 4000ft QNH, which is maintained, with the B737 now in it’s 11 o’clock range 1nm descending through 3600ft, 400ft below but with an increased ROD. Thereafter the horizontal separation decreases whilst vertical separation increases until the CPA occurs at 1358:16, the DHC8, having started its L turn onto 315°, is now tracking 325° and is passing 0.7nm behind the B737 which is descending through 3300ft QNH.]

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 considered that the intended plan of the Edinburgh APR was sound but based on the DHC8 crossing the FAT at 4000ft, 1000ft above the B737 which was descending to 3000ft to established on the ILS. However, in the execution, the APR had not ensured that the B737 had descended to maintain 3000ft to provide the requisite vertical separation. Instead, when the B737 crew reported LLZ established, the APR had cleared the flight to “*descend with the ILS*” which had allowed the crew to adjust their current flight profile to intercept the G/P. Therefore when the APR vectored the DHC8 L to cross through the FAT it had come into conflict with the B737, which had reduced its ROD, and this caused the Airprox.

The B737 crew had received a TCAS TA alert and visually acquired the descending DHC8 on a crossing track L to R. However an RA ‘increase descent’ command was generated which the crew promptly followed whilst watching the DHC8 cross 0.5nm behind and 400ft above. Meanwhile, the DHC8 crew had also received a TA alert then a coordinated RA ‘monitor vertical speed’ warning as they levelled at 4000ft, during which they saw the B737 crossing about 1nm ahead R to L and 200ft below and descending. The APR only became aware of the conflict when the DHC8 crew queried the B737’s level, the radar labels were garbling at the time, after which TCAS manoeuvring had begun to take effect. The recorded radar had shown the B737 passing 1.4nm ahead of the DHC8 with 400ft vertical separation with CPA of 0.7nm and 700ft shortly thereafter. Taking all of these elements

AIRPROX REPORT No 230/04

into account, the actions taken by both crews with the combination of the visual sightings and the geometry of the encounter, were enough to persuade the Board that any risk of collision had been quickly and effectively removed.

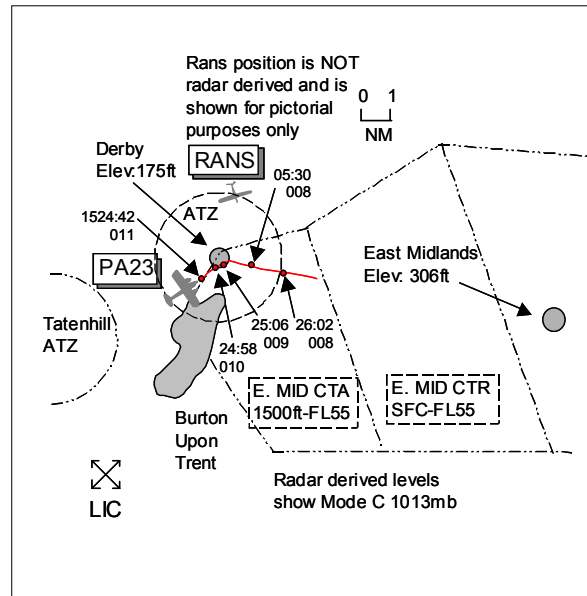
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Edinburgh APR vectored the DHC8 into conflict with the B737.

Degree of Risk: C.

AIRPROX REPORT NO 231/04

Date/Time: 11 Dec 1525 (Saturday)
Position: 5251N 00137W (O/H Derby A/D - elev 175ft)
Airspace: ATZ (Class: G)
Reporter: Derby A/G Operator
First Ac Second Ac
Type: Rans S6 PA23
Operator: Civ Pte Civ Pte
Alt/FL: 800ft↓ NK
 (QFE)
Weather VMC NR NK
Visibility: NR
Reported Separation:
 c0.25nm H
Recorded Separation:
 NR

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

THE DERBY A/G OPERATOR reports that at 1525Z a twin engine a/c was observed at approximately 1000ft agl flying from W to E directly O/H Derby tower – no RT call had been received by him. He immediately warned traffic that was inbound on R base about the twin and another ac, the subject Rans S6, took evasive action to separate from the twin, which was by now at about 800ft agl. He contacted East Midlands ATC who confirmed the identity of the ac as a PA23 inbound to land.

THE RANS S6 PILOT reports flying a local sortie and returning to Derby and in communication with Derby A/G on 118.35MHz. About 0.5nm N of the airfield heading 180° at 60kt and positioning RH downwind for RW35 at 800ft QFE descending, the A/G operator called to warn him of twin engine ac passing O/H. He immediately saw the twin ahead, crossing R to L at about the same level, and he turned R to pass behind it, which he did by 0.25nm max. He then turned L to widen his cct when clear of the twin and landed normally. He assessed the risk as moderate, saying he would have got a lot closer to the other ac had he not turned after receiving the traffic warning.

THE PA23 PILOT declined to submit a report.

UKAB Note (1): Met Office archive data shows the East Midlands METAR as EGNX 1520Z VRB03KT CAVOK 10/06 Q1027=

THE EAST MIDLANDS APR reports the PA23 pilot called on his frequency W of Burton on Trent for entry into the East Midlands CTR and was given a squawk for conspicuity, but was not identified on radar. After co-ordination he transferred the flight to the ADC. A few minutes later he was advised by Derby that a light twin had passed through their ATZ and flown close to the RANS S6 in the aerodrome circuit. The locally based PA23 pilot later contacted him (the APR) but said that he had been nowhere near Derby aerodrome.

ATSI comments that the East Midlands RT frequency recording reveals the PA23 pilot called at 1524 reporting inbound from Tatenhill, just to the W of Burton on Trent. A squawk of 4556 was issued, the RW was given as 27 and the QNH as 1027mb. One minute later the pilot was instructed to route direct downwind RH for RW27 and at 1526 the flight was transferred to TWR. The pilot was not informed that he was identified or the type of service being provided, although the controller ringed FIS on his report form. At 1529, Derby telephoned East Midlands to ask about a twin engine ac that had just overflowed not above 1000ft estimated and commented that an ac in the cct had had to take evasive action.

AIRPROX REPORT No 231/04

UKAB Note (2): The UK AIP promulgates Derby ATZ as a circle radius 2nm centred on the longest notified RW (17/35) 525135N 0013703W from surface to 2000 aal, except that part of the circle that comprises the East Midlands CTA, base 1500ft amsl (1325ft aal). An A/G service is available on 118.35MHz during the Aerodrome operational hours:- Winter Mon-Sat 0900-SS, Sun & PH 0930-SS and Summer Mon-Sat 0800-1600, Sun & PH 0830-1600.

UKAB Note (3): Sunset at Derby was 1550Z.

UKAB Note (4): The UK AIP at ENR 1-4-10 para 2.7.2, promulgates that for flight within ATZs situated in Class G airspace: *"When flying within an ATZ the requirements of Rule 39...must be complied with"*.

In order to comply with Rule 39 during the notified hours of operation the procedures to be adopted by pilots are stipulated at para 2.7.2.3:

Before taking off or landing at an aerodrome with an ATZ or transiting through the associated airspace, obtain...information from the A/G radio station to enable the flight to be conducted with safety.

Radio equipped ac must maintain a continuous watch on the appropriate radio frequency and advise the...A/G radio station of their position and height on entering the zone and immediately prior to leaving it.

Furthermore, para 2.7.2.4 stipulates that:

Failure to establish 2-way radio communication with the...A/G station during their notified hours of operation must not be taken as an indication that the ATZ is inactive. In that event...pilots should remain clear of the ATZ.

UKAB Note (5): The Airprox is not seen on recorded radar. Analysis of the Claxby radar recording first reveals the PA23 at 1524:42, 1nm SW of Derby aerodrome tracking 065° squawking A4556 and thus identified from this East Midlands assigned code, indicating FL011 Mode C (1013mb) (about 1520ft QNH 1027mb – about 1345ft aal). Sixteen seconds later a R turn is seen as the PA23 passes overhead Derby with Mode C showing FL010 (1420ft QNH). The Mode C indicates FL009 (1320ft QNH) on the next radar sweep before the PA23 steadies on a track of 100° towards East Midlands shortly thereafter. The radar sweep at 1525:30 shows the PA23 levelling at FL008 (1220ft QNH – about 1045ft aal) before it exits the ATZ at 1526:02. The RANS S6 does not show on recorded radar at all and is shown on the diagram for pictorial purposes only.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report solely from the RANS S6 pilot, transcripts of the relevant RT frequencies, radar video recordings, reports from the A/G operator & air traffic controller involved and a report from the appropriate ATC authority.

It was explained that the radar recording had reliably evinced the identity of the PA23 from the assigned East Midlands SSR code. Therefore, with only the A/G Operator's account and that of the RANS S6 pilot, it was unfortunate that the subject PA23 pilot had declined to submit his side of the story and some valuable flight safety lessons may have been missed as a consequence.

The Board commended the alert A/G operator for promptly warning the RANS S6 pilot about the presence of the PA23 when he spotted it overhead the aerodrome, after it had intruded into the ATZ without first calling on the A/G frequency. In the Board's opinion, he had provided a valuable service to the RANS pilot which had undoubtedly helped him to give the PA23 a wider berth and avoid the intruder.

However, the RANS pilot should not have been placed in this position in the first place. The Rules of the Air as replicated at Part A are quite specific on this topic and there should be no room for misunderstanding. Pilots in transit who wish to cross an active ATZ must first call on the promulgated frequency to ascertain the traffic situation: with this information pilots can then consider whether it is safe to proceed. Moreover, pilots must maintain a continuous watch on the frequency whilst within the ATZ and report when leaving it. These transmissions from the transiting pilot also clearly have the additional purpose of alerting pilots flying within the ATZ to the presence of the transit ac. This warning was clearly denied to the RANS pilot until the PA23 was spotted by the alert A/G Operator. For a local pilot to do this, who should have been fairly familiar with the local airspace

was, in the Board's opinion in the absence of a report from the PA23 pilot, poor airmanship. From the East Midlands APR's report and that of ATSI, the controller was not cognisant of the ATZ infringement at the time. So with little further debate the Board concluded unanimously that this Airprox had been caused by the PA23 pilot who had entered the Derby ATZ without complying with the requirements of Rule 39 of the Rules of the Air and who flew into conflict with the RANS S6. The prompt warning from the A/G Operator had permitted the RANS S6 pilot to spot the other ac in time to turn to avoid it thereby effecting, he reported, about 0.25nm of horizontal separation. Consequently, the Board agreed that this had effectively removed any risk of a collision in the circumstances reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA23 pilot entered the Derby ATZ without complying with the requirements of Rule 39 of the Rules of the Air and flew into conflict with the RANS S6.

Degree of Risk: C.

AIRPROX REPORT No 232/04

AIRPROX REPORT NO 232/04

Date/Time: 10 Dec 1024

Position: 5349N 00253W (6nm NE Blackpool
- elev 34ft)

Airspace: LFIR (Class: G)

Reporting Ac Reported Ac

Type: B737-200 Gemini Flash IIA
Flexwing M/light

Operator: CAT Civ Trg

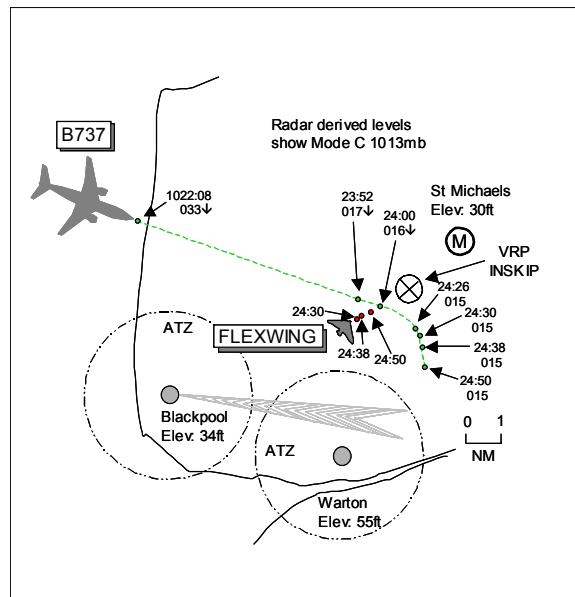
Alt/FL: 1700ft 1500ft
(QNH) (QFE)

Weather IMC MIST 'good'

Visibility: 2500m 'very good'

Reported Separation:
200ft V/300ft H 200ft V/500m H

Recorded Separation:
NR



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE B737 PILOT reports heading 100° at 220kt being vectored RH downwind for RW28 at Blackpool and in receipt of a RAS from Blackpool APR. Level at 1700ft QNH, he thought, they saw a M/light in their 1 o'clock range 500ft in a descending R turn which passed in the opposite direction 300ft down their RH side about 200ft below their level. The M/light was a single engine pusher type with a red leading edge to the high-wing; no lighting was observed. The Blackpool airfield visibility was reported as 2500m in mist and the radar had shown neither primary nor secondary returns from the M/light and no target had been displayed on TCAS. Owing to the M/light's descending flight path on first contact, he assessed there to be no risk of collision and he took no avoiding. This had been a late sighting, their view over the ac's nose had been poor owing to the pitch attitude at 220kt.

THE GEMINI FLASH FLEXWING MICROLIGHT PILOT reports flying a local general handling sortie from St Michaels M/light Site non-radio. The flying conditions were good with very good visibility and the ac's 'pod' was coloured red beneath the high wing with a red leading edge. About 2nm WSW of Inskip VRP heading 270° at 1500ft QFE and 42kt he saw a low wing twin-engine ac flying straight and level in the opposite direction about 3nm away. No avoiding action was necessary and the other ac, which carried a distinctive colour scheme on its fuselage, was seen to pass about 200ft above and 500m clear to his R with no risk of collision.

BLACKPOOL APR reports that whilst vectoring the B737 under a RAS downwind RH for RW28 at 1700ft QNH, the crew reported 'getting close' to a M/light. No positive contact was seen on radar or any transponding ac, there being no other traffic on the Approach frequency of 119.95MHz.

The Blackpool METAR was EGNH 1020Z 13010KT 2500 HZ BKN031 04/02 Q1021=

ATSI had nothing to add.

UKAB Note (1): The Airprox is not seen on recorded radar. The St Annes radar recording at 1022:08 shows the B737 coasting-in 5nm NNW of Blackpool tracking 110° descending through FL033 (3540ft QNH 1021mb). The B737 continues on a steady track, passing to the S of Inskip VRP, before turning R and then levelling at FL015 (1740ft QNH) at 1024:26. Four seconds later a primary only radar return appears to the S of the B737's track history, believed to be the Flexwing M/light, 1.8nm SW of Inskip and 1.9nm to the WNW of the B737. This intermittent radar return tracks slowly NE bound towards Inskip whilst the B737 continues to diverge to its SE. The Airprox is believed to occur as the descending B737 approaches Inskip, as reported by the M/light pilot, before the M/light paints on 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, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

Members were surprised that this incident had been reported as an Airprox since both pilots reported that there was no risk and that no avoiding action was required. One Member opined that perhaps the B737 pilot might have been unaware of the class of airspace (G) and his responsibility for visual collision avoidance therein but this was pure conjecture. It was also suggested that, if they had not already done so, Blackpool should promulgate their normal arrival and departure routes to the numerous clubs and other local airspace users.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace.

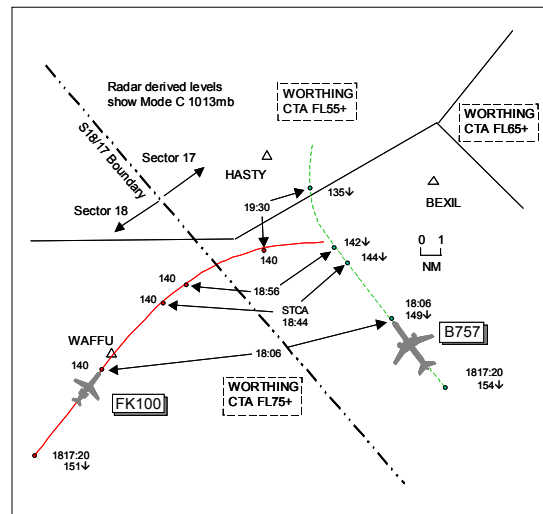
Degree of Risk: C.

Post-Meeting Note: The Secretariat wrote to Blackpool Airport with a copy of this Report, requesting that consideration be given to the suggestion in the final paragraph of Part B above.

AIRPROX REPORT No 233/04

AIRPROX REPORT NO 233/04

Date/Time: 23 Dec 1819 NIGHT
Position: 5041N 00033E (3nm S HASTY)
Airspace: Worthing CTA (Class: A)
Reporter: TC BIG/TIMBA SC
First Ac Second Ac
Type: B757 FK100
Operator: CAT CAT
Alt/FL: ↓FL90 NR
Weather VMC NR VMC NR
Visibility: NR NR
Reported Separation:
NR not seen
Recorded Separation:
500ft V/3-5nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE OFFGOING TC BIG/TIMBA SC reports that during the handover of the Sector, one of his last transmissions was to issue a descent clearance to the B757 crew to FL90. He was unaware of the FK100 which was inbound to Manston.

THE ONCOMING TC BIG/TIMBA SC reports having taken over the sector after the previous controller had descended the B757 to FL90 inbound to TIMBA. STCA flashed 'white' on the B757 'data block' and other traffic which was not on his radar display. He changed range and then instructed the B757 crew to turn R onto N. He was not aware of any coordination that had taken place regarding the FK100 on airway G27 inbound to Manston. At the time his workload had dramatically increased owing to complicated stack swaps of BIG to OCK and LAM to BIG which required detailed coordination.

THE TC S COORDINATOR reports that the LACC S18P telephoned the SW Coordinator position when the FK100 was near NEVIL and said that it was a courtesy call and that S18 was descending the flight into Manston and that TC had probably had no traffic to affect it. No call was subsequently received from S17P regarding the subject ac. The B757 was then transferred to the BIG/TIMBA Sector in conflict with the FK100.

THE LACC S18P reports that in the vicinity of NEVIL he coordinated the FK100 with TC SW Coordinator as TI, descending along airway G27. There were no conflicting outbounds on S18 at the time.

THE LACC S17T reports the FK100 was coordinated into the sector at FL140 and the B757 was transferred to TC descending to FL150. Whilst controlling other traffic at ABB she was alerted by the S17P that the B757 was descending below FL150. She turned the FK100 R onto heading 100° to ensure that the flight would pass behind the B757 and gave the crew TI who reported 'visual'. At the same time, the S17P was trying to telephone TC SE Coordinator but the telephone call went unanswered. Since the B757 was now through FL130 she put the FK100 flight back onto its own navigation to DVR and handed-over the flight to Manston ATC in the normal manner. She believed that the FK100 was 'known traffic' to the TC BIG/TIMBA SC as it had been coordinated with SW in the usual manner, and from previous experience, when S17 telephones to coordinate with TC SE, they are told that they know about it as they are doing SW as well.

THE LACC S17P reports that having taken over the position, her first task was to coordinate out of the sector to S15 a Manston inbound, which she did at FL140. She then observed that TC SE had descended the B757 from FL150 and which was now in conflict with the FK100 at FL140. She alerted the S17T, who was busy streaming a/c further S in the sector, before she attempted to telephone TC SE Coordinator. They took some time to answer and on the second attempt she managed to point out their (FK100) traffic was maintaining FL140 and routeing via DVR to Manston; the Coordinator acknowledged this and rang off. He heard the FK100 crew respond to the TI

passed by the S17T that he was visual with the ac. After 5min the TC SE Coordinator rang to discuss the situation. It appeared that he, being the SW Coordinator, was aware of the traffic but it appears that the TC BIG/TIMBA SC was not. Neither he nor his predecessor had reiterated the traffic to the TC Coordinator SW/SE (Bandboxed).

THE B757 PILOT reports during descent into Gatwick they were cleared by ATC direct to TIMBA and to descend from FL150 to FL90 with speed 290kt reducing to 250kt. They became aware of proximate traffic on a constant bearing approximately in their 9 o'clock position at a similar level. When near to HASTY ATC told them to turn R onto heading 360°, the proximate traffic then passed behind and the flight was subsequently cleared back to TIMBA. During the entire manoeuvre the TCAS traffic remained 'proximate' with neither a TA nor RA warning resulting. At the time they believed the radar heading to be normal vectoring for traffic spacing and were unaware of the Airprox; the other ac was not seen visually.

THE FK100 PILOT reports that they were not aware of an Airprox during their flight inbound to Manston. No abnormal indications were apparent in the cockpit nor were any TCAS alerts/warnings received.

ATSI reports that at the time of the Airprox, the B757 flight was in communication with the TC BIG/TIMBA SC, having recently been transferred from LACC S17, and the FK100 flight was in communication with the LACC S17T. The S17T described both the workload and traffic loading as 'medium' whilst the TC S Coordinator advised that the workload and traffic loading were both about to become 'very busy'. The TC SE sector, comprising the BIGGIN and TIMBA sectors, were being operated in a bandboxed mode as the traffic on TIMBA was quiet but BIGGIN was likely to get rather busy. The TC Coordinator was operating as a 'S' Coordinator, combining the functions of SE and SW.

The B757 was inbound to Gatwick from the S, via TIMBA, and was transferred from LACC S17 to TC SE at 1816:27 descending to the Standing Agreement level of FL150. The TC BIG/TIMBA SC instructed the flight to descend to FL90. Meanwhile, the FK100 was maintaining FL140, under the control of the S17T, routeing NE bound along the English Channel towards DVR. STCA activated when the 2 ac were 8.1nm apart and both controllers issued turn instructions. Minimum separation recorded (1819:30) was 3.5nm laterally and 500ft vertically as the FK100 passed behind the B757.

At 1805:20, the B757 crew established communications with the S17T reporting at FL350 routeing to GUBAR (approx 45nm SE of SFD). The S17T instructed the crew to route direct to TIMBA, which required a heading of 318°, and to continue on this as a radar heading. Shortly afterwards, a clearance to descend to FL270 was issued and then one to FL150 to be level abeam BEXIL. At that time, the B757 was still over France, some 14nm SE of ABB, and had not yet commenced its descent from FL350.

The TC S Coordinator received a telephone call, at 1814:10, from the LACC S18P. He said, "*Just traffic information, you've probably got nothing to affect it, the FK100, just dropping down in the Channel there*". The TC S Coordinator, having checked that there was no traffic at or below FL170 (the top of the TC airspace in this area being FL175), which S18 would not have been aware of, acknowledged the call, however, he did not regard this as 'formal co-ordination'. When this call was made, the FK100 was in the vicinity of DRAKE, some 40nm W of the B757, passing FL206 for FL140 and on a converging NE'y track. Shortly afterwards, the S17T instructed the B757 flight to route direct to TIMBA and, at 1815:50, instructed the crew to contact the TC BIG/TIMBA SC. At the time of transfer, the B757 was passing FL173 for FL150 with the FK100 in its 10 o'clock at a range of 31nm passing FL175 for FL140.

The TC BIG/TIMBA SC was seated in front of a radar display showing the Biggin sector but the adjacent display showed the TIMBA sector. When the B757 called on frequency, the FK100 was visible on the TIMBA radar display, 26 nm from the B757, but not on the BIG one. The TC BIG/TIMBA SC instructed the crew of the B757 to descend to FL90 as he was not aware of any traffic to conflict with this ac. Shortly afterwards, a new controller took over the position. His first task was to switch traffic from the BIG stack to the OCK stack as traffic was being swapped from the LAM hold to BIG with delays in excess of 20min for holding ac.

At 1817:20, the FK100 having been transferred from S18, contacted the S17T passing FL151 for FL140. In its 2 o'clock position, at a range of 18.7nm was the B757, which was passing FL154 and crossing from R to L. The S17T instructed the crew of the FK100 to maintain FL140 on reaching and route direct to DVR. At 1818:44, STCA activated when the subject ac were 8.1nm apart and converging. The TC BIG/TIMBA SC was not aware of the source of this activation, as the FK100 had been hidden behind a 'palette' displayed at the bottom of his display.

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Shortly before STCA had activated, the S17T had instructed the FK100 to turn R onto a heading of 100° and then passed TI on the B757. In her written report, the S17T stated that this R turn was "...to ensure he would pass behind the the B757...". Meanwhile, the TC BIG/TIMBA SC transmitted simply "B757 c/s turn right heading north", thus turning the ac in the direction of the hold at Timba.

The LACC MATS Part 2, DVR 2.1 para 2.1.7, is quite specific in respect of E'bound traffic operating on airway G27 (which is aligned between NEVIL on the FIR boundary, NE'wards to LYD) below FL180. S18 should telephone coordinate these flights with TC SW and S17 should telephone coordinate them with TC SE. All 3 LACC controllers (S18P, S17T and S17P) stated that they knew the correct coordination process, however, it was frequently not followed due to complacency. It was reported that, on the vast majority of occasions, the TC S Coordinator position was operated by 1 person and not split into SW and SE. This meant that when S17 telephoned to coordinate such flights with the TC Coordinator, it was regularly the same individual that S18 had spoken to and therefore was duplicate coordination.

However, on this occasion, even though the TC SW and SE Coordinator was the same person, the call made by the S18P was not taken as coordination but, as specified, simply TI. No mention of the FK100's level was made and the TC Coordinator would have checked the radar to ensure that there were no LTMA outbound routeing via SFD or MID to conflict with traffic routeing eastbound on G27. This was the first of a number of shortfalls in the coordination sequence that took place. The S18P went on to coordinate the flight, at FL140, with S17. The S17T reported that she had heard the S18P telephone the TC Coordinator but had not annotated the paper strip with 'TC' as was her normal practice. She fully accepted that it was the responsibility of S17 to ensure separation between the two flights. Prior to the B757 being transferred from S17 to TC SE, she had checked the radar display and did not believe that there was any likelihood of a conflict between it and the FK100. The LACC MATS Part 2 GEN 2.7.2 Standing Agreement Traffic states "*Any potential conflict with traffic within or entering the offering sector's airspace, whether in communication with that sector or not, is to be resolved before transfer of communications take place*".

The S17P advised that during her routine check of the radar, she had observed the B757 descend through FL150 and alerted the Tactical controller, before attempting to contact the TC S Coordinator. The intention was to try and agree a course of action before the two ac came into close conflict. The call was initiated at 1818:06, when the ac were 13.5nm apart, but not answered as the Coordinator was engaged on another call and at 1818:35, just as the call was answered, the S17P rang off. At 1818:55, the S17P rang again and it was answered promptly. STCA had activated some 10sec earlier, and now the B757 was passing FL144, in the 1 o'clock position of the FK100, which was maintaining FL140, at a range of 8.1nm. The S17P advised the TC Coordinator that the FK100 was heading 100° and maintaining FL140.

The S17T later advised that, in her opinion, STCA activated too late to be of use. The vector lines had been used to confirm that the FK100 would pass behind the B757 and although TI was passed she felt there was no need to prefix the turn instruction with 'avoiding action' as "...there was at least a minute until the conflict".

It is understood that subsequent to this Airprox, revised procedures have been devised for the handling of such flights. A Standing Agreement is now in place for such traffic and strips are automatically produced for the TC controller(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 many air traffic controllers involved and reports from the appropriate ATC authorities.

It was clear to Members that this Airprox had occurred at a complex boundary of responsibility, not just between adjacent sectors but also at the airspace boundary between LACC and LTCC where, normally, the inbound standing agreement level of FL150 would allow the B757 to be transferred safely without co-ordination and without hindrance to further descent. However, the FK100 was following a route at a level that would conflict with any traffic descended below the standing agreement level in TC's area of responsibility and hence the flight had to be co-ordinated in accordance with the promulgated procedures in the MATS Pt 2. The LACC S18P had reported that the FK100 had been "*coordinated with TC SW CO-ORDINATOR [actually bandboxed with SE as TC S CO-ORDINATOR] as traffic information descending along airway G27.*" This was a contradiction in terms and the ATSI

report had made it clear that the landline communication initiated by S18P with the bandboxed TC S CO-ORDINATOR was not 'co-ordination' *per se*, being perceived by the latter quite reasonably only as traffic information of a very general nature and that a further call would be made to formally effect coordination if necessary. The Board agreed with this view and it was clear that this rather convoluted message did not contain the specific information that the FK100 was being descended to FL140 through TC's area of responsibility and did not indicate beforehand to the TC S CO-ORDINATOR that there could be a conflict with any traffic descended below the inbound Standing Agreement level of FL150 - as the B757 here. Indeed, normally this call would have only related to outbound traffic from TC SW. Consequently, the 'bandboxed' TC BIG/TIMBA SC was unaware of any potential conflict when the B757 crew was instructed after initial contact to descend to FL90. Controller Members intimately familiar with the procedures on these Sectors reinforced the comments in ATSI's comprehensive analysis which had shown that it was S18P's responsibility to co-ordinate across the prevailing flow of Gatwick outbounds whilst S17P was responsible for co-ordinating the G27 traffic inbound to Manston across flights inbound to the LTMA. It was evident to the Board that whilst this was a difficult task, the exacting requirements of the co-ordination required to ensure that the FK100 could be safely crossed through TC's traffic in this area was clearly stipulated in the LACC MATS Pt 2. The Board recognised the inherent responsibility placed upon both S18P and S17P to do this and both had fallen somewhat wide of the mark; the latter because she had assumed that it had been done by S18P when it had not and that as the TC SW & SE CO-ORDINATOR positions were bandboxed together she assumed incorrectly that it would be a duplication. Such assumptions were clearly unwise and the Board noted that the 3 LACC controllers involved were aware of the correct procedure laid down in the MATS Part 2 instructions which, had they been followed assiduously, would have prevented the Airprox. Nevertheless, it was the responsibility of S17 to ensure separation between these two ac and whilst aware of both the FK100 and the B757, but not believing that there was any likelihood of a conflict between them, S17T unwittingly transferred the B757 to TC BIG/TIMBA SC under the Standing Agreement and therefore released for descent. The Board concluded, therefore, that this Airprox had resulted because the LACC S17 controllers had transferred the B757 to the TC BIG/TIMBA SC without co-ordinating the FK100 with TC. The NATS Ltd advisor briefed the Board on the valuable follow-up safety campaign conducted at the unit about 'assumptions', which clearly must be guarded against. Several other lessons had also been identified from this Airprox and some notable improvements made: it was clear to the Members that the provision of FPSs to highlight G27 traffic to the TC SCs was a helpful enhancement which together with the timely revision of procedures should reduce any potential for a recurrence. The company had evidently taken effective remedial action which reassured the Board.

Members noted that the FK100 had been outside the displayed range of the TC BIG/TIMBA SC's radar display when the STCA activated. A controller Member reassured the Board that it was normal practice to operate in this manner when 'bandboxed' and it only needed a simple flick of a switch to open out the displayed radar range and quickly identify the conflicting track. Members noted that the efficacy of the STCA indication had been commented upon by the S17T controller: the NATS Ltd advisor emphasised that it was a SHORT TERM conflict alert system and explained that at these ranges – the minimum separation was 3.5nm - the STCA had worked as it was designed to do and had triggered within the appropriate timescale. Indeed, Members noted that the minimum separation achieved here was more than the minima stipulated for use by TC controllers between known traffic in the terminal environment had the FK100 been co-ordinated into their sector. However, as it had not and was not known traffic – contrary to the S17T's belief at the time – 5nm horizontal separation would have been the norm. A TC controller Member explained that the LACC controllers were also endeavouring to achieve 5nm from their perspective so prescribed separation had indeed been eroded.

Controller and pilot Members alike recognised the seriousness of the situation in this overall complex traffic scenario with a "very busy" period of traffic looming for TC. Neither the FK100 crew nor the B757 crew were aware of anything untoward: although the latter had been aware of the presence of another ac - the FK100 - it was only as proximate traffic and it was evident that TCAS had not been required to act because of the corrective action taken by the respective controllers, the relative geometry and the extant separation. Comment was made that the term 'avoiding action' should have been used to highlight the problem to both acs' crews. Nevertheless, it was evident that the TC SC's R turn instruction onto N, promptly executed by the B757 crew, was effective by increasing the separation. Another controller Member emphasised that the conflict between the FK100 and the B757 might not have been readily apparent to the S17T controller as the B757 had been in a continuous descent. Indeed, it had been reported that having checked her display S17T did not believe there was any likelihood of a conflict until she astutely observed the B757 descending below FL150. Nonetheless, when spotted S17T had promptly turned the FK100 to pass clear astern of the B757 thereby ensuring effective resolution of the conflict. The Board agreed unanimously that both controllers' actions, coupled with the B757's descent and the extant horizontal separation, had effectively removed any risk of a collision in these circumstances.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LACC S17 controllers transferred the B757 to the TC BIG/TIMBA SC without co-ordinating the FK100.

Degree of Risk: C.
